

Catalogue No. BRB2007



BALL & ROLLER BEARINGS



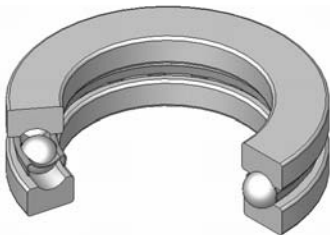
- Technical Information A1-A7

- Deep Groove Ball Bearings



Series		
600	Miniature.....	B1
6000	Single Row.....	B2
6200	Single Row.....	B3
6300	Single Row.....	B4
6400	Single Row.....	B5
61800	Single Row.....	B6
61900	Single Row.....	B7
62200	Single Row.....	B8
62300	Single Row.....	B9
63000	Single Row.....	B10
16000	Single Row.....	B11
1200	Self-Aligning.....	B12
1300	Self-Aligning.....	B13
2200	Self-Aligning.....	B14
2300	Self-Aligning.....	B15
87	Felt-seal type.....	B16
88	Felt-seal type.....	B16
WC87	Felt-seal type.....	B17
WC88	Felt-seal type.....	B18
1600	Single Row (Inch).....	B19
R	Single Row (Inch).....	B20
RLS	Single Row (Inch).....	B21
RMS	Single Row (Inch).....	B21
CSK	One-way clutch bearings.....	B22
75/76 DLG	Snap ring radial bearings	B23
RSCM, RU, CR	HVAC Series	B24
SPECIAL	Special bore bearings.....	B25-B26
EMQ	Electric Motor Quality.....	B27-B31
SS	Stainless steel (metric / inch)	B32-B33

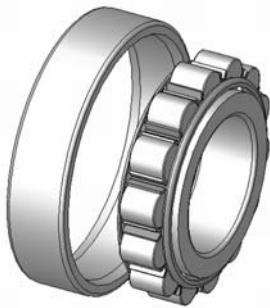
- Angular Contact Ball Bearings



7200	Single Row.....	C1
7300	Single Row.....	C2
5200	Double Row.....	C3
5300	Double Row.....	C4

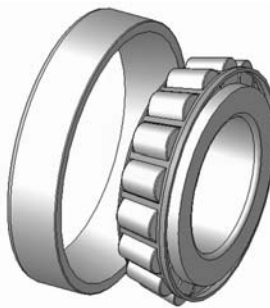
- Thrust Ball Bearings

511	Single Direction.....	D1
512	Single Direction.....	D2
513	Single Direction.....	D3



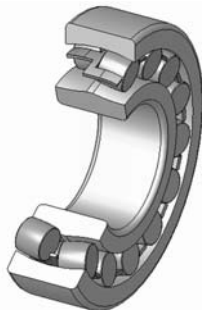
- Cylindrical Roller Bearings N, NJ, NU, NUP

1000	Single Row.....	E1
200	Single Row.....	E2
2200	Single Row.....	E3
2300	Single Row.....	E4
300	Single Row.....	E5
400	Single Row.....	E6
NU5200	Single Row.....	E7



- Tapered Roller Bearings

30200	Metric Series.....	F1
30300	Metric Series.....	F2
31300	Metric Series.....	F3
32000	Metric Series.....	F4
32200	Metric Series.....	F5
32300	Metric Series.....	F6
33000	Metric Series.....	F7
33100	Metric Series.....	F8
33200	Metric Series.....	F9
INCH TAPER	Inch Series.....	F10

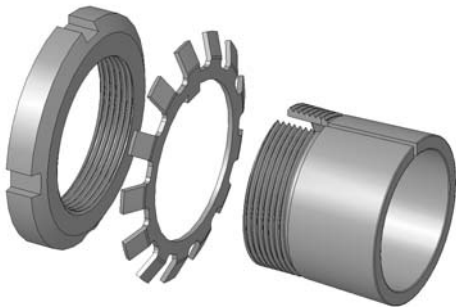


- Spherical Roller Bearings

22200	Spherical Roller bearings.....	G1-G3
22300	Spherical Roller bearings.....	G1-G3
23000	Spherical Roller bearings.....	G1-G3
24000	Spherical Roller bearings.....	G1-G3
24100	Spherical Roller bearings.....	G1-G3

- Adaper Sleeves

H200	Adaper Sleeves (metric).....	H1
H2300	Adaper Sleeves (metric).....	H2
H300	Adaper Sleeves (metric).....	H3
H3100	Adaper Sleeves (metric).....	H4
HA200	Adaper Sleeves (inch).....	H5
HA2300	Adaper Sleeves (inch).....	H6
HA300	Adaper Sleeves (inch).....	H7
HA3100	Adaper Sleeves (inch).....	H8
HE200	Adaper Sleeves (inch).....	H9
HE2300	Adaper Sleeves (inch).....	H10
HE300	Adaper Sleeves (inch).....	H11
HE3100	Adaper Sleeves (inch).....	H12
KM	Locknut (metric).....	H13
MB	Lockwasher (metric).....	H14
N/AN	Locknut (inch).....	H15
W	Lockwasher (inch).....	H16



Bearing Lubrication

Lubrication is essential to prevent premature bearing failure. Probably the most critical factor in maintaining operating conditions, the lubricant functions to:

- 1) minimize friction between rolling elements and raceways,
- 2) act as a preventative against rust and corrosion,
- 3) dissipate heat build-up, and
- 4) provide a barrier against the entry of foreign matter.

The type of lubricant used also plays a critical factor in

operating efficiency. Conventional types fall into the classifications of oil or grease, each with specific properties correct for different bearing applications. Generally, grease is the preferred choice due to its ease of application and maintenance, performing well in the 0°F to 300°F operating range. Oil, however, does function better in extreme temperature conditions, below -40°F or above 350°F.

The following chart recommends the key lubricants used by RBL bearings.

CHARACTERISTICS OF GREASE LUBRICANTS USED IN BEARING PRODUCTS

COMPANY TRADEMARK	MIL SPEC	BASE OIL	THICKENER	OPERATING RANGE	CHARACTERISTICS
Dow Corning DC41		Silicon	Carbon	-0° to 550°F	Worked penetration of 280. Excellent for high temperature requirements.
DuPont Krytox 240AC	MIL-G-27617A	Fluorocarbon	Uidax	-30° to 550°F	Worked penetration of 295. Excellent for both high and low temperature applications.
Exxon Beacon 325	MIL-G-3278	Diester	Lithium	-65° to 250°F	Excellent for low temperature applications.
Exxon Polyrex EM		Mineral	Polyurea	-20° to 350°F	Long performance life. Excellent for high speeds and high temperature.
Kyodo Yushi Multemp SB-M		Synthetic Hydrocarbon	Diurea	-40° to 400°F	Long performance life. Excellent for high and low temperature applications.
Kyodo Yushi Multemp SRL		Synthetic Hydrocarbon	Lithium	-40° to 300°F	Long performance life. Excellent for high and low temperature applications.
Mobil 28	MIL-PRF-81322F	Synthetic Hydrocarbon	Clay Bentonite	-65° to 350°F	Excellent for high and low temperature applications.
Shell Aeroshell 7	MIL-G-23827B	Diester	Microgel	-100° to 300°F	Worked penetration of 288. Excellent for low temperature lubrication qualities.
Shell Alvania 2	MIL-G-18709	Mineral	Lithium	-20° to 250°F	Worked penetration of 287. General purpose lubrication.

Shaft and Housing Fits

FOR METRIC RADIAL BALL AND ROLLER BEARINGS

To select the proper fits, it is necessary to consider the type and extent of the load, bearing type, and certain other design and performance requirements.

The required shaft and housing fits are indicated in Tables 1 and 3. The terms “Light”, “Normal” and “Heavy” loads refer to radial loads that are generally within the following limits (C being the Basic Dynamic Load Rating computed in accordance with ABMA-ANSI Standards).

Radial Load	Ball Bearings	Roller Bearings
Light	up to 0.07C	up to 0.08C
Normal	from 0.07C to 0.15C	from 0.08C to 0.18C
Heavy	over 0.15C	over 0.18C

Shaft Fits. Table 1 indicates the initial approach to shaft fit selection. Note that for most normal applications where the shaft rotates and the radial load direction is constant, an interference fit should be used. Also, the heavier the load, the greater is the required interference. For stationary shaft conditions and constant radial load direction, the inner ring may be moderately loose on the shaft.

Note that for pure thrust (axial) loading, heavy interference fits are not necessary as a moderately loose to tight shaft fit only is needed.

Table 2 shows how the tolerance ranges of the various classifications deviate from the basic bore diameters.

Housing Fits. Table 3 indicates the initial approach to housing fit selection. Note that the use of clearance or interference fits is mainly dependent upon which bearing ring rotates in relation to the radial load. For indeterminate or varying load directions, avoid clearance fits. Clearance fits are preferred in axially split housings to avoid distorting bearing outer rings. The extent of the radial load also influences the choice of fit.

Table 4 shows how the tolerance ranges of the various classifications deviate from the basic outside diameters.

Example:

Bearing No. 6203 (17mm x 40mm x 12mm).

Application: Electric motor (shaft and bearing inner ring rotating).

Load 20 lbs. radial

Per catalog Page 5: Basic Dynamic Load Rating (c) = 2153 lbs.

$$\frac{\text{Load}}{c} = \frac{20 \text{ lbs.}}{2153 \text{ lbs.}} = .009$$

Radial load is less than .07 of Dynamic Load rating (c); therefore, load is “light”.

Table 1: Inner ring rotating, light radial load, 17 mm inner diameter: Tolerance classification should be h5.

Table 2: 17mm inner diameter (.6693”) and h5 tolerance: Shaft diameter tolerance is +0”, –.0003”. Shaft diameter should be .6693” max., .6690” min.

Table 3: Outer ring stationary, light load, housing not split axially: Tolerance classification should be H6.

Table 4: 40mm outer diameter (1.5748”) and H6 tolerance: Housing bore diameter tolerance is +0”, +.0006”. Housing bore diameter should be 1.5754” max., 1.5748” min.

TABLE 1 – SELECTION OF SHAFT TOLERANCE CLASSIFICATIONS
For Metric Radial Ball and Roller Bearings of Tolerance Classes ABEC-1, RBEC-1

DESIGN & OPERATING CONDITIONS			BALL BEARINGS					CYLINDRICAL ROLLER BEARINGS					SPHERICAL ROLLER BEARINGS							
Rotational Conditions	Inner Ring Axial Displaceability	Radial Loading	BORE d				Tolerance Classification ¹	BORE d				Tolerance Classification ¹	BORE d				Tolerance Classification ¹			
			mm		inch			mm		inch			mm		inch					
			Over	Incl.	Over	Incl.		Over	Incl.	Over	Incl.		Over	Incl.	Over	Incl.				
Inner Ring Rotating in relation to load direction or Load Direction indeterminate	Light	Normal	0	18	0	0.71	h5 j6 ²	0	40	0	1.57	j6 ² k6 ² m6 ² n6 p6	0	40	0	1.57	j6 ² k6 ² m6 ² n6 p6			
			18	All	0.71	All		40	140	1.57	5.51		40	100	1.57	3.94				
			140	320	5.51	12.6		100	320	3.94	12.6		100	320	3.94	12.6				
			320	500	12.6	19.7		320	500	12.6	19.7		320	500	12.6	19.7				
			500	All	19.7	All		500	All	19.7	All		500	All	19.7	All				
			40	40	0	1.57		40	40	0	1.57		40	40	0	1.57				
	40	100	1.57	3.94	40	65	1.57	2.56	40	65	1.57	2.56								
	100	140	3.94	5.51	65	100	2.56	3.94	65	100	2.56	3.94								
	140	320	5.51	12.6	100	140	3.94	5.51	100	140	3.94	5.51								
	320	500	12.6	19.7	140	280	5.51	11.0	140	280	5.51	11.0								
	500	All	19.7	All	280	500	11.0	19.7	280	500	11.0	19.7								
	500	All	19.7	All	500	All	19.7	All	500	All	19.7	All								
Inner Ring Stationary in relation to load direction	Light	Normal	18	100	0.71	3.94	k5 m5	0	40	0	1.57	m5 m6 n6 p6 r6 r7	0	40	0	1.57	m5 m6 n6 p6 r6 r7			
								40	65	1.57	2.56		40	65	1.57	2.56				
								65	140	2.56	5.51		65	100	2.56	3.94				
	140	200	5.51	7.87	100	140	3.94	5.51	100	140	3.94	5.51								
	200	500	7.87	19.7	140	200	5.51	7.87	140	200	5.51	7.87								
	500	All	19.7	All	200	All	7.87	All	200	All	7.87	All								
Inner Ring Stationary in relation to load direction	Inner Ring must be easily axially displaceable	Light	All Sizes				g6	All Sizes				g6	All Sizes				g6			
		Normal	All Sizes					h6	All Sizes				h6	All Sizes				h6		
		Heavy	All Sizes						h6	All Sizes				h6	All Sizes				h6	
Light	All Sizes				h6	All Sizes				h6	All Sizes				h6					
Normal	All Sizes					h6	All Sizes				h6	All Sizes				h6				
Heavy	All Sizes						h6	All Sizes				h6	All Sizes				h6			
Pure Thrust (Axial) Load			All Sizes					j6	Consult Bearing Manufacturer											

TABLE 2 – SHAFT DIAMETER TOLERANCE LIMITS
For Metric Radial Ball and Roller Bearings of Tolerance Classes ABEC-1, RBEC-1

Dimensions and deviations in inches and millimeters. Tolerance Limits in Inches.

BORE d						TOLERANCE CLASSIFICATIONS											
inch			mm			g6	h6	h5	j5	j6	k5	k6	m5	m6	n6	p6	r6
Over	Incl.	Dev.	Over	Incl.	Dev.												
0.1181		0	3		0	-0.002	0	0	+0.001	+0.002	+0.002		+0.004				
	0.2362	-0.003		6	-0.08	-0.005	-0.003	-0.002	-0.001	-0.001	0		+0.002				
0.2362		0	6		0	-0.002	0	0	+0.002	+0.003	+0.003		+0.005				
	0.3937	-0.003		10	-0.08	-0.006	-0.004	-0.002	-0.001	-0.001	0		+0.002				
0.3937		0	10		0	-0.002	0	0	+0.002	+0.003	+0.004		+0.006				
	0.7087	-0.003		18	-0.08	-0.007	-0.004	-0.003	-0.001	-0.001	0		+0.003				
0.7087		0	18		0	-0.003	0	0	+0.002	+0.004	+0.004		+0.007				
	1.1811	-0.004		30	-0.10	-0.008	-0.005	-0.002	-0.002	-0.002	+0.001		+0.003				
1.1811		0	30		0	-0.004	0	0	+0.002	+0.004	+0.005	+0.007	+0.008	+0.010			
	1.9685	-0.045		50	-0.14	-0.010	-0.006	-0.002	-0.002	+0.001	+0.001	+0.004	+0.004				
1.9685		0	50		0	-0.004	0	0	+0.002	+0.005	+0.006	+0.008	+0.009	+0.012	+0.015		
	3.1496	-0.006		80	-0.15	-0.011	-0.007	-0.003	-0.003	+0.001	+0.001	+0.004	+0.004	+0.008			
3.1496		0	80		0	-0.005	0	0	+0.002	+0.005	+0.007	+0.010	+0.011	+0.014	+0.018	+0.023	
	4.7244	-0.008		120	-0.20	-0.013	-0.009	-0.004	-0.004	+0.001	+0.001	+0.005	+0.005	+0.009	+0.015	+0.020	+0.027
4.7244		0	120		0	-0.006	0	0	+0.003	+0.006	+0.008	+0.011	+0.013	+0.016	+0.020	+0.027	+0.035
	7.0866	-0.010		180	-0.25	-0.015	-0.010	-0.004	-0.004	+0.001	+0.001	+0.006	+0.006	+0.011	+0.017	+0.026	

¹ Tolerance classifications shown are for solid steel shafts. Numerical values are listed in Table 2. For hollow or non-ferrous shafts, tighter fits may be needed.

² If greater accuracy is needed, substitute j5, k5 and m5 for j6, k6 and m6 respectively.

Shaft and Housing Fits (continued)

FOR METRIC RADIAL BALL AND ROLLER BEARINGS

TABLE 3 – SELECTION OF HOUSING TOLERANCE CLASSIFICATIONS
For Metric Radial Ball and Roller Bearings of Tolerance Classes ABEC-1, RBEC-1

DESIGN AND OPERATING CONDITIONS				TOLERANCE CLASSIFICATION ¹
Rotational Conditions	Loading	Other Conditions	Outer Ring Axial Displaceability	
<u>Outer Ring Stationary</u> in relation to load direction	Normal or Heavy	Heat input through shaft	Outer Ring easily axially displaceable	G7 ³
		Housing split axially		H7 ²
	Shock with temporary complete unloading	Housing not split axially		Transitional Range ⁴
Light		Split not recommended	J6 ²	
	Normal or Heavy		Outer Ring not easily axially displaceable	K6 ²
Heavy Shock	Thin wall housing not split	M6 ²		
<u>Outer Ring Rotating</u> in relation to load direction		Light	Heavy	N6 ²
	Normal or Heavy	P6 ²		

¹ For cast iron steel housings, numerical values are listed in Table 4. For housings of non-ferrous alloys tighter fits may be needed.
² Where wider tolerances are permissible, use tolerance classifications H8, H7, J7, K7, M7, N7 and P7 in place of H7, H6, J6, K6, M6, N6 and P6 respectively.
³ For large bearings and temperature differences between outer ring and housings greater than 10°C, F7 may be used instead of G7.
⁴ The tolerance zones are such that outer ring may be either tight or loose in the housing.

TABLE 4 – HOUSING BORE TOLERANCE LIMITS
For Metric Radial Ball and Roller Bearings of Tolerance Classes ABEC-1, RBEC-1

OUTER DIAMETER D						TOLERANCE CLASSIFICATIONS														
Over	inch Incl.	Dev.	Over	mm Incl.	Dev.	F7	G7	H8	H7	H6	J6	J7	K6	K7	M6	M7	N6	N7	P6	P7
.3937		0	10		+0	+0.006	+0.002	0	0	0	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007	-0.008	-0.009	-0.010	-0.011
	.7087	-0.003		18	-0.08	+0.013	+0.009	+0.011	+0.007	+0.004	+0.002	+0.004	+0.001	+0.002	-0.002	0	-0.004	-0.002	-0.006	-0.004
.7087		0	18		+0	+0.008	+0.003	0	0	0	-0.002	-0.004	-0.004	-0.006	-0.007	-0.008	-0.009	-0.011	-0.012	-0.014
	1.1811	-0.035		30	-0.09	+0.016	+0.011	+0.013	+0.008	+0.005	+0.003	+0.005	+0.001	+0.002	-0.002	0	-0.004	-0.003	-0.007	-0.006
1.1811		0	30		+0	+0.010	+0.004	0	0	0	-0.002	-0.004	-0.005	-0.007	-0.008	-0.010	-0.011	-0.013	-0.015	-0.017
	1.9685	-0.045		50	-0.11	+0.020	+0.013	+0.015	+0.010	+0.006	+0.004	+0.006	+0.001	+0.003	-0.002	0	-0.005	-0.003	-0.008	-0.007
1.9685		0	50		+0	+0.012	+0.004	0	0	0	-0.002	-0.005	-0.006	-0.008	-0.009	-0.012	-0.013	-0.015	-0.018	-0.020
	3.1496	-0.005		80	-0.13	+0.024	+0.016	+0.018	+0.012	+0.007	+0.005	+0.007	+0.002	+0.004	-0.002	0	-0.006	-0.004	-0.010	-0.008
3.1496		0	80		+0	+0.014	+0.005	0	0	0	-0.002	-0.005	-0.007	-0.010	-0.011	-0.014	-0.015	-0.018	-0.020	-0.023
	4.7244	-0.006		120	-0.15	+0.028	+0.019	+0.021	+0.014	+0.009	+0.006	+0.009	+0.002	+0.004	-0.002	0	-0.006	-0.004	-0.012	-0.009
4.7244		0	120		+0	+0.017	+0.006	0	0	0	-0.003	-0.006	-0.008	-0.011	-0.013	-0.016	-0.018	-0.020	-0.024	-0.027
	5.9055	-0.007		150	-0.18	+0.033	+0.021	+0.025	+0.016	+0.010	+0.007	+0.010	+0.002	+0.005	-0.003	0	-0.008	-0.005	-0.014	-0.011
5.9055		0	150		+0	+0.017	+0.006	0	0	0	-0.003	-0.006	-0.008	-0.011	-0.013	-0.016	-0.018	-0.020	-0.024	-0.027
	7.0866	-0.010		180	-0.25	+0.033	+0.021	+0.025	+0.016	+0.010	+0.007	+0.010	+0.002	+0.005	-0.003	0	-0.008	-0.005	-0.014	-0.011
7.0866		0	180		+0	+0.020	+0.006	0	0	0	-0.003	-0.006	-0.009	-0.013	-0.015	-0.018	-0.020	-0.024	-0.028	-0.031
	9.8425	-0.012		250	-0.30	+0.038	+0.024	+0.028	+0.018	+0.011	+0.009	+0.012	+0.002	+0.005	-0.003	0	-0.009	-0.006	-0.016	-0.013
9.8425		0	250		+0	+0.022	+0.007	0	0	0	-0.003	-0.006	-0.011	-0.014	-0.016	-0.020	-0.022	-0.026	-0.031	-0.035
	12.4016	-0.014		315	-0.35	+0.043	+0.027	+0.032	+0.020	+0.013	+0.010	+0.014	+0.002	+0.006	-0.004	0	-0.010	-0.006	-0.019	-0.014

Bearing Life and Load Ratings

How long a ball bearing will last under load depends on two groups of variables. First, there are the bearing's physical characteristics, which include how it is designed, the material from which it is made, and how it is manufactured. Secondly, there are the conditions under which it is applied, such as load, operating speed and temperature, the way it is mounted, and the way it is lubricated.

Even if a ball bearing is operated under ideal conditions — where it has been properly mounted, lubricated, protected from foreign particles, and not subjected to extreme temperature or speed — it will ultimately fail due to either material fatigue or wear. Fatigue failure results from the repeated stresses that are developed in the contact areas between the balls and raceways. Failure shows up as spalling of the load-carrying surfaces. Excessive wear occurs when operating conditions are other than ideal. These conditions are generally those which cause high friction and/or heat within the bearing.

PREDICTING BEARING LIFE

It is not possible to predict the exact fatigue life of an individual bearing. Instead, the designer of a system incorporating ball bearings must rely on the results of extensive research and testing done on the life of groups of identical bearings operated under identical conditions. Tests show that lifetimes of such operated bearings vary due to intricate differences between individual bearings. These lifetimes, however, follow definite statistical distributions. Load ratings, boundary dimensions, and tolerances for ball bearings and cylindrical roller bearings are computed from ABMA and ISO standards.

Such statistical distributions can be represented by equations which relate predicted bearing life to factors like the load it must bear, its operating speed, and the bearing's physical characteristics. It is up to the designer to then determine which bearing is best for a particular application by use of these equations.

L_{10} , or *rating life*, is the life most commonly used in load calculations. It is the life in units of either hours or millions of revolutions that 90% of a group of apparently identical ball bearings will complete or exceed. Another accepted form is L_{50} , or *median life*. It is the life which 50% of a group of bearings will complete or exceed. L_{50} is usually not more than five times L_{10} .

Another important definition is that of the *basic dynamic load rating* "C". For a radial ball bearing, the basic dynamic load rating is the constant radial load which a group of identical bearings with a stationary outer ring can theoretically endure for 500 hours at $33\frac{1}{3}$ RPM (1,000,000 revolutions).

The relationship between bearing life and applied load can be expressed as:

Life in Revolutions:

$$L_{10} = \left(\frac{C}{P}\right)^3 \times 10^6$$

Life in Hours:

$$L_{10} = \left(\frac{C}{P}\right)^3 \frac{16667}{N}$$

Where:

L_{10} = The rating life

C = The basic dynamic capacity as shown in the catalog

P = The equivalent radial load on the bearing in pounds

N = Speed in RPM

Consult the factory for other life factors.

EQUIVALENT RADIAL LOAD

Bearings often must carry a combination of radial and thrust loads. The equations stated in the previous section are based solely on radially loaded bearings. Therefore, when radial and axial loads are present, an *equivalent radial load* (P) must be calculated. The equivalent radial load is the greater of:

$$P = XF_r + YF_a$$

$$P = F_r$$

Where:

P = Equivalent radial load in pounds

F_r = Applied radial load in pounds

F_a = Applied axial load in pounds

X = Radial load factor = 0.56

Y = Axial load factor dependent on the magnitude of F_a/C_0

C_0 = Catalog static load rating in pounds (definition to follow):

F_a/C_0	Y
0.014	2.30
0.028	1.99
0.056	1.71
0.084	1.55
0.11	1.45
0.17	1.31
0.28	1.15
0.42	1.04
0.56	1.00

Bearing Life and Load Ratings

C_0 , the *static load rating*, is the non-rotating radial load which produces a maximum contact stress of 667,000 pounds per square inch at any point within the bearing.

When static load exceeds the catalog rating, a significant decrease in bearing smoothness and life can be expected when rotation is resumed.

As with dynamic load ratings, static loads are usually a combination of radial and thrust loads. Equivalent static load must therefore be calculated.

The static equivalent load for radial ball bearings is the greater of:

$$P_0 = .6 F_r + .5 F_a$$

$$P_0 = F_r$$

Where:

- P_0 = Equivalent static radial load in pounds
- F_r = Applied radial load in pounds
- F_a = Applied axial load in pounds

EXAMPLES OF LIFE AND LOAD CALCULATIONS

Example 1:

Determine the L_{10} life hours of a 6203 ball bearing operating at 800 RPM with a radial load of 250 lbs.

The Basic Dynamic capacity from the catalog is $C = 2153$ lbs.

- L_{10} = Unknown
- $C = 2153$ lbs.
- $F_r = P = 250$ lbs.
- $N = 800$ RPM

$$L_{10} = \left(\frac{C}{P} \right)^3 \left(\frac{16667}{N} \right)$$

$$L_{10} = \left(\frac{2153}{250} \right)^3 \left(\frac{16667}{800} \right)$$

$$L_{10} = 13307 \text{ hours}$$

Example 2:

Determine the minimum static and dynamic load ratings required to carry a 300 pound radial load, and 75 pound axial load for 3500 hours at 650 RPM.

- $C = \text{Unknown}$ $C_0 = \text{Unknown}$
- $P = \text{Unknown}$ $P_0 = \text{Unknown}$
- $Y = \text{Unknown}$ $X = .56$
- $F_r = 300$ lbs. $F_a = 75$ lbs.
- $N = 650$ RPM $L = 3500$ hrs.

$$P_0 = .6 F_r + .5 F_a = 217.5 \text{ lbs.}$$

$$\text{or } P_0 = F_r = 300 \text{ lbs.}$$

Therefore $P_0 = C_0$ minimum = 300 lbs.

$$F_a/C_0 = 75/300 = 0.25$$

Then by interpolation $Y = 1.19$

Equivalent radial load

$$P = XF_r + YF_a = .56 (300) + 1.19 (75) = 257.3 \text{ lbs.}$$

$$\text{or } P = F_r = 300 \text{ lbs. Therefore } P = 300 \text{ lbs.}$$

$$L_{10} = \left(\frac{C}{P} \right)^3 \left(\frac{16667}{N} \right)$$

$$\text{or } C = \left(\frac{L_{10}N}{16667} \right)^{1/3} P$$

$$\text{or } C = \left(\frac{(3500)(650)}{16667} \right)^{1/3} 300 = 1545 \text{ lbs.}$$

Answer: C_0 minimum = 300 lbs., C minimum = 1545 lbs.

Radial Internal Clearance Chart

Radial internal clearance is a measure of the radial looseness, or play between the inner and outer rings. Precision bearings are available in five classes of looseness. The amount of looseness necessary is dependent on many factors such as shaft

alignment, shaft and housing fits, bearing speed, etc. As RPM, shaft misalignment, and press fits increase in magnitude, so should radial play.

RADIAL INTERNAL CLEARANCE, SINGLE ROW, RADIAL CONTACT, BALL BEARINGS

Tolerance Limits for Radial Internal Clearance of Single Row, Radial Contact Ball Bearings Under No Load

(Applicable to Bearings of ABEC-1, ABEC-5, ABEC-7 and ABEC-9 Tolerance Classes)

TOLERANCE LIMITS IN .0001 INCH

BASIC BORE DIAMETER		ACCEPTANCE LIMITS									
d – mm		C-2		STANDARD		C-3		C-4		C-5	
Over	Incl.	Low	High	Low	High	Low	High	Low	High	Low	High
2.5	6	0	3	1	5	3	9	—	—	—	—
6	10	0	3	1	5	3	9	6	11	8	15
10	18	0	3.5	1	7	4.5	10	7	13	10	18
18	24	0	4	2	8	5	11	8	14	11	19
24	30	0.5	4.5	2	8	5	11	9	16	12	21
30	40	0.5	4.5	2.5	8	6	13	11	18	16	25
40	50	0.5	4.5	2.5	9	7	14	12	20	18	29
50	65	0.5	6	3	11	9	17	15	24	22	35
65	80	0.5	6	4	12	10	20	18	28	26	41
80	100	0.5	7	4.5	14	12	23	21	33	30	47
100	120	1	8	6	16	14	26	24	38	35	55
120	140	1	9	7	19	16	32	28	45	41	63
140	160	1	9	7	21	18	36	32	51	47	71
160	180	1	10	8	24	21	40	36	58	53	79
180	200	1	12	10	28	25	46	42	64	59	91

For additional information concerning mounting procedures, lubrication, variable speeds and loads, safety or service factors, and other technical data necessary for proper bearing selection, contact our Engineering Department.

Ball Bearings

Basic Type & Series	
600:	Metric, Single Row Miniature Light Series
1200:	Metric, Self-aligning Light Series
1300:	Metric, Self-aligning Medium Series
2200:	Metric, Self-aligning Light Series
2300:	Metric, Self-aligning Medium Series
6000:	Metric, Single Row Extra Light Series
6200:	Metric, Single Row Light Series
6300:	Metric, Single Row Medium Series
6400:	Metric, Single Row Heavy Series
16000:	Metric, Single Row Series
61800:	Metric, Single Row Ultra Light Series
61900:	Metric, Single Row Extremely Light Series
62200:	Metric, Single Row Series
62300:	Metric, Single Row Series
63000:	Metric, Single Row Series
87:	Metric, Single Row Felt-seal Series
88:	Metric, Single Row Felt-seal Series

Internal Clearance	
C1:	Smaller than C2
C2:	Smaller than Standard
No code:	Standard
C3:	Greater than Standard
C4:	Greater than C3

Vibration Code	
No Code:	Standard Bearing
V2 :	See Page B27

SS

62

05

ZZ

C3

EMQ

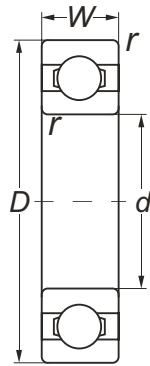
V2

Prefix Code
SS: Stainless Steel

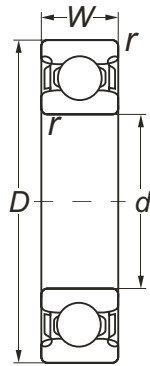
Bore Size	
For bore series 04 and above,	
Bore Diameter = Bore Series X 5	
Bore Series	Bore Diameter
00:	10 mm
01:	12 mm
02:	15 mm
03:	17 mm
04:	20 mm
05:	25 mm
10:	50 mm
12:	60 mm
18:	90 mm

Application Codes	
No Code:	Standard Bearing
EMQ:	Electric Motor Quality

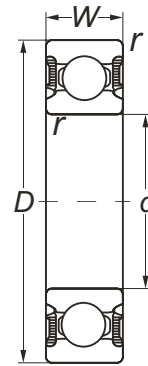
Shield / Seal Codes			Interchange							
One Side	Both Sides	Description	FAG	MRC	Nachi	NSK	NTN	SNR	SKF	Torrington/ Fafnir
Z	ZZ	Fixed Shield(s)	Z/ZZ	F/FF	Z/ZZ	Z/ZZ	Z/ZZ	Z/ZZ	Z/ZZ	D/DD
RU	2RU	Non-contact Seal(s)	RSD/2RSD	N/A	NKE/2NKE	V/VV	LB/LLB	N/A	RZ/2RZ	PL/PPL
RS	2RS	Contact Seal(s)	RS/2RS	Z/ZZ	NSL/2NSL	DU/DDU	LU/LLU	E/EE	RS/2RS	P/PP
BR	2BR	Dbl lip Contact Seal(s)	N/A	N/A	N/A	N/A	LC/LLC	E10/EE10	N/A	Y/YY
RD	2RD	Extremely Light Contact Seal(s)	N/A	N/A	NSE/2NSE	N/A	LH/LLH	N/A	N/A	V/VV
RDT	2RDT	Same as 2RD - for Large Size Ball Bearings	N/A	N/A	NSE/2NSE	N/A	LH/LLH	N/A	N/A	V/VV
NR		Snap Ring on Outer Ring O.D.	NR	G	NR	NR	NR	NR	NR	G



Open

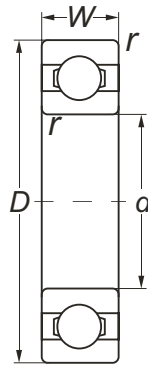


Shields-ZZ

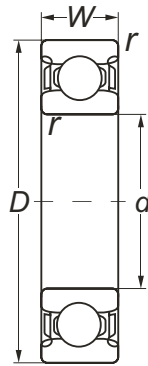


Seals-2RS

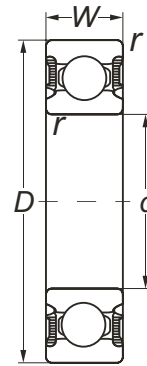
Inner bore <i>d</i> mm	open	Bearing number		Principal dimensions			Basic load ratings		Max runout speed		Mass kg
		open	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic <i>C</i>	static <i>C₀</i>	grease	
							N		r/min		
3	693	693 ZZ	693 2RS	8	3	0.15	558	180	54000	63000	0.0006
3	W693	W693 ZZ	W693 2RS	8	4	0.15	558	180	54000	63000	0.0007
4	694	694 ZZ	694 2RS	11	4	0.15	967	350	45000	52000	0.0018
4	604	604 ZZ	604 2RS	12	4	0.2	1290	490	43000	51000	0.0020
4	624	624 ZZ	624 2RS	13	5	0.2	1290	490	36000	45000	0.0032
5	685	685 ZZ	685 2RS	11	5	0.15	716	282	35000	45000	0.0011
5	695	695 ZZ	695 2RS	13	4	0.2	1077	432	34000	43000	0.0024
5	605	605 ZZ	605 2RS	14	5	0.2	1330	505	39000	46000	0.0035
5	625	625 ZZ	625 2RS	16	5	0.3	1320	440	32000	40000	0.0048
5	635	635 ZZ	635 2RS	19	6	0.3	2336	895	22000	30000	0.0200
6	686	686 ZZ	686 2RS	13	5	0.15	1082	442	33000	42000	0.0019
6	696	696 ZZ	696 2RS	15	5	0.2	1082	442	32000	40000	0.0038
6	606	606 ZZ	606 2RS	17	6	0.3	2263	845	30000	38000	0.0060
6	626	626 ZZ	626 2RS	19	6	0.3	2522	1057	28000	36000	0.0081
7	687	687 ZZ	687 2RS	14	5	0.15	898	458	31000	40000	0.0021
7	697	697 ZZ	697 2RS	17	5	0.3	1605	720	30000	38000	0.0052
7	607	607 ZZ	607 2RS	19	6	0.3	2838	1078	28000	36000	0.0080
7	627	627 ZZ	627 2RS	22	7	0.3	3282	1356	26000	34000	0.0130
8	688	688 ZZ	688 2RS	16	5	0.2	1252	592	29000	38000	0.0031
8	698	698 ZZ	698 2RS	19	6	0.3	2237	917	28000	36000	0.0073
8	608	608 ZZ	608 2RS	22	7	0.3	3369	1363	26000	34000	0.0120
8	628	628 ZZ	628 2RS	24	8	0.3	3350	1400	24000	32000	0.0170
9	609	609 ZZ	609 2RS	24	7	0.3	3435	1430	22000	30000	0.0140
9	689	689 ZZ	689 2RS	17	5	0.2	1378	797	28000	36000	0.0032
9	699	699 ZZ	699 2RS	20	6	0.3	1500	800	27000	34000	0.0082
9	629	629 ZZ	629 2RS	26	8	0.3	4557	1955	22000	30000	0.0200



Open

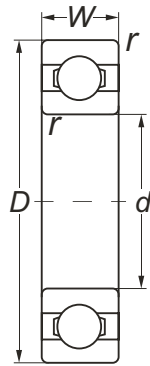


Shields-ZZ

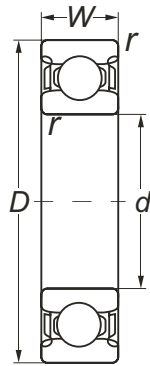


Seals-2RS

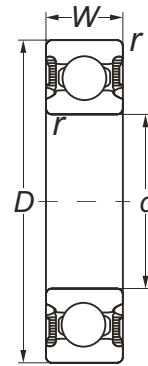
Inner bore <i>d</i> mm	open	Bearing number		Principal dimensions			Basic load ratings		Max runout speed		Mass kg
		with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co	grease oil	r/min	
10	6000	6000 ZZ	6000 2RS	26	8	0.3	3600	1500	21000	25200	0.0190
12	6001	6001 ZZ	6001 2RS	28	8	0.3	4000	1800	18200	22400	0.0220
15	6002	6002 ZZ	6002 2RS	32	9	0.3	4400	2200	15400	19600	0.0300
17	6003	6003 ZZ	6003 2RS	35	10	0.3	4800	2600	13300	16800	0.0390
20	6004	6004 ZZ	6004 2RS	42	12	0.6	7400	4000	11900	14000	0.0690
25	6005	6005 ZZ	6005 2RS	47	12	0.6	8900	5200	10500	12600	0.0800
30	6006	6006 ZZ	6006 2RS	55	13	1.0	10600	6600	8400	10500	0.1200
35	6007	6007 ZZ	6007 2RS	62	14	1.0	12700	8100	7000	9100	0.1600
40	6008	6008 ZZ	6008 2RS	68	15	1.0	13400	9200	6650	8400	0.1900
45	6009	6009 ZZ	6009 2RS	75	16	1.0	16600	11600	6300	7700	0.2500
50	6010	6010 ZZ	6010 2RS	80	16	1.0	17200	12800	5950	7000	0.2600
55	6011	6011 ZZ	6011 2RS	90	18	1.1	22400	16900	5250	6300	0.3900
60	6012	6012 ZZ	6012 2RS	95	18	1.1	23600	18500	4690	5600	0.4200
65	6013	6013 ZZ	6013 2RS	100	18	1.1	24500	20000	4410	5250	0.4400
70	6014	6014 ZZ	6014 2RS	110	20	1.1	30100	24800	4200	4900	0.6000
75	6015	6015 ZZ	6015 2RS	115	20	1.1	31700	26800	3920	4600	0.6400
80	6016	6016 ZZ	6016 2RS	125	22	1.1	38000	32000	3710	4400	0.8500
85	6017	6017 ZZ	6017 2RS	130	22	1.1	39500	34400	3500	4200	0.8900
90	6018	6018 ZZ	6018 2RS	140	24	1.5	46800	40000	3360	3900	1.1500
95	6019	6019 ZZ	6019 2RS	145	24	1.5	48400	43200	3150	3700	1.2000
100	6020	6020 ZZ	6020 2RS	150	24	1.5	48400	43200	3010	3500	1.2500
105	6021	6021 ZZ	6021 2RS	160	26	2.0	58200	52400	2800	3300	1.6000
110	6022	6022 ZZ	6022 2RS	170	28	2.0	65500	58800	2660	3100	1.9500
120	6024	6024 ZZ	6024 2RS	180	28	2.0	68100	64000	2380	2800	2.0500
130	6026	6026 ZZ	6026 2RS	200	33	2.0	84800	80000	2240	2600	3.1500
140	6028	6028 ZZ	6028 2RS	210	33	2.0	88800	86400	2100	2500	3.3500
150	6030	6030 ZZ	6030 2RS	225	35	2.1	100000	100000	1820	2200	4.8000
160	6032	6032 ZZ	6032 2RS	240	38	2.1	114400	114400	1680	2100	5.9000
170	6034			260	42	2.1	134400	138400	1540	1900	7.9000
180	6036			280	46	2.1	152000	160000	1400	1800	10.500
190	6038			290	46	2.1	156000	172800	1400	1800	11.000
200	6040			310	51	2.0	216000	245000	1900	2400	14.000
220	6044			340	56	2.5	247000	290000	1800	2200	18.500
240	6048			360	56	2.5	255000	315000	1700	2000	19.500



Open

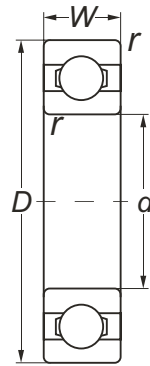


Shields-ZZ

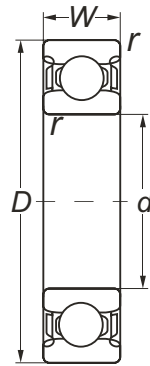


Seals-2RS

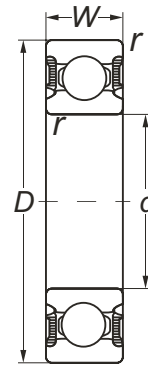
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		open	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C	static Co	grease	
							N		r/min		
10	6200	6200 ZZ	6200 2RS	30	9	0.6	4000	1800	16800	21000	0.030
12	6201	6201 ZZ	6201 2RS	32	10	0.6	5500	2400	15400	19600	0.037
15	6202	6202 ZZ	6202 2RS	35	11	0.6	6200	3000	13300	16800	0.046
17	6203	6203 ZZ	6203 2RS	40	12	0.6	7600	3800	11900	14000	0.065
20	6204	6204 ZZ	6204 2RS	47	14	1.0	10100	5200	10500	12600	0.107
25	6205	6205 ZZ	6205 2RS	52	15	1.0	11200	6200	8400	11200	0.125
30	6206	6206 ZZ	6206 2RS	62	16	1.0	15600	8900	7000	9100	0.205
35	6207	6207 ZZ	6207 2RS	72	17	1.0	20400	12200	6300	7700	0.290
40	6208	6208 ZZ	6208 2RS	80	18	1.0	24500	15200	5900	7000	0.370
45	6209	6209 ZZ	6209 2RS	85	19	1.0	26500	17200	5200	6300	0.410
50	6210	6210 ZZ	6210 2RS	90	20	1.0	28000	18500	4900	5900	0.460
55	6211	6211 ZZ	6211 2RS	100	21	1.5	34800	23200	4400	5200	0.610
60	6212	6212 ZZ	6212 2RS	110	22	1.5	38000	26000	4200	4900	0.780
65	6213	6213 ZZ	6213 2RS	120	23	1.5	44700	32400	3700	4400	0.990
70	6214	6214 ZZ	6214 2RS	125	24	1.5	48400	36000	3500	4200	1.050
75	6215	6215 ZZ	6215 2RS	130	25	1.5	53000	39200	3300	3900	1.200
80	6216	6216 ZZ	6216 2RS	140	26	2.0	56100	44000	3100	3700	1.400
85	6217	6217 ZZ	6217 2RS	150	28	2.0	66500	51200	3000	3500	1.800
90	6218	6218 ZZ	6218 2RS	160	30	2.0	76400	58800	2600	3100	2.150
95	6219	6219 ZZ	6219 2RS	170	32	2.0	86400	65200	2500	3000	2.600
100	6220	6220 ZZ	6220 2RS	180	34	2.0	99200	74400	2300	2800	3.150
105	6221	6221 ZZ	6221 2RS	190	36	2.0	106400	83200	2200	2600	3.700
110	6222	6222 ZZ	6222 2RS	200	38	2.0	114400	94400	2100	2500	4.350
120	6224	6224 ZZ	6224 2RS	215	40	2.0	116800	94400	1900	2300	5.150
130	6226	6226 ZZ		230	40	2.5	124800	105600	1800	2200	5.800
140	6228			250	42	2.5	132000	120000	1600	2100	7.450
150	6230			270	45	2.5	139200	132800	1400	1800	9.400
160	6232			290	48	2.5	148800	148800	1300	1600	14.500
170	6234			310	52	3.0	169600	179200	1300	1600	17.500
180	6236			320	52	3.0	183200	192000	1200	1500	18.500
190	6238			340	55	3.0	204000	224000	1100	1400	23.000
200	6240			360	58	3.0	216000	248000	1100	1400	28.000
220	6244			400	65	3.0	236800	292000	1000	1200	37.000
240	6248			440	72	3.0	286400	380000	900	1100	51.000



Open

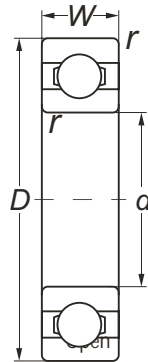


Shields-ZZ

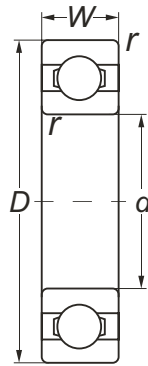


Seals-2RS

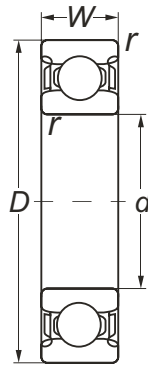
Inner bore <i>d</i> mm	Bearing number			Principal dimensions			Basic load ratings		Max runout speed		Mass kg
	open	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co	grease oil	r/min	
10	6300	6300 ZZ	6300 2RS	35	11	0.6	6400	2700	10500	16800	0.053
12	6301	6301 ZZ	6301 2RS	37	12	1.0	7700	3300	9800	15400	0.059
15	6302	6302 ZZ	6302 2RS	42	13	1.0	9100	4300	8400	14000	0.082
17	6303	6303 ZZ	6303 2RS	47	14	1.0	10800	5200	7700	13300	0.120
20	6304	6304 ZZ	6304 2RS	52	15	1.1	12700	6200	6600	11200	0.142
25	6305	6305 ZZ	6305 2RS	62	17	1.1	18000	9200	5200	9800	0.230
30	6306	6306 ZZ	6306 2RS	72	19	1.0	22400	12800	4400	7700	0.350
35	6307	6307 ZZ	6307 2RS	80	21	1.5	26500	15200	4200	7000	0.460
40	6308	6308 ZZ	6308 2RS	90	23	1.5	32800	19200	3500	6300	0.630
45	6309	6309 ZZ	6309 2RS	100	25	1.5	42100	25200	3100	5600	0.830
50	6310	6310 ZZ	6310 2RS	110	27	2.0	49400	30400	3000	5200	1.050
55	6311	6311 ZZ	6311 2RS	120	29	2.0	57200	36000	2600	4600	1.350
60	6312	6312 ZZ	6312 2RS	130	31	2.0	65500	41600	2300	4200	1.700
65	6313	6313 ZZ	6313 2RS	140	33	2.0	73800	48000	3300	3900	2.100
70	6314	6314 ZZ	6314 2RS	150	35	2.0	83200	54400	3100	3700	2.500
75	6315	6315 ZZ	6315 2RS	160	37	2.0	91200	61200	3000	3500	3.000
80	6316	6316 ZZ	6316 2RS	170	39	2.0	99200	69200	2600	3100	3.600
85	6317	6317 ZZ	6317 2RS	180	41	2.5	106400	77200	2500	3000	4.250
90	6318	6318 ZZ	6318 2RS	190	43	2.5	114400	86400	2300	2800	4.900
95	6319	6319 ZZ		200	45	2.5	122400	94400	2200	2600	5.650
100	6320	6320 ZZ		215	47	2.5	139200	112000	2100	2500	7.000
105	6321	6321 ZZ		225	49	2.5	145600	122400	1900	2300	8.250
110	6322			240	50	2.5	162400	144000	1800	2200	9.550
120	6324			260	55	2.5	166400	148800	1600	2100	14.500
130	6326			280	58	3.0	183200	172800	1500	1900	18.000
140	6328			300	62	3.0	200800	196000	1400	1800	22.000
150	6330			320	65	3.0	220800	228000	1300	1600	26.000
160	6332			340	68	3.0	220800	228000	1200	1500	29.000
170	6334			360	72	3.0	249600	272000	1100	1400	34.500
180	6336			380	75	3.0	280800	324000	1100	1400	42.500
190	6338			400	78	4.0	296800	344000	1100	1300	49.000
200	6340			420	80	4.0	301600	372000	1000	1200	55.500
220	6344			460	88	4.0	328000	416000	900	1100	72.500



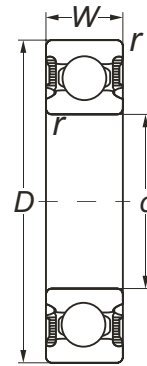
Inner bore <i>d</i> mm	Bearing number open	Principal dimensions			Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static C ₀	grease oil r/min		
17	6403	62	17	1.0	18300	8600	8400	10500	0.27
20	6404	72	19	1.0	24500	12000	7000	9100	0.40
25	6405	80	21	1.5	28600	15400	6300	7700	0.53
30	6406	90	23	1.5	34800	18800	5900	7000	0.74
35	6407	100	25	1.5	44200	24800	4900	2900	0.95
40	6408	110	27	2.0	50900	29200	4600	5600	1.25
45	6409	120	29	2.0	60800	36000	4200	4900	1.55
50	6410	130	31	2.0	69600	41600	3700	4400	1.90
55	6411	140	33	2.0	79600	49600	3500	4200	2.30
60	6412	150	35	2.0	86400	55600	3300	3900	2.75
65	6413	160	37	2.0	95200	62400	3100	3700	3.30
70	6414	180	42	2.5	114400	8300	2600	3100	4.85
75	6415	190	45	2.5	122400	91200	2500	3000	6.80
80	6416	200	48	2.5	130400	100000	2300	2800	8.00
85	6417	210	52	3.0	139200	109600	2200	2600	9.50
90	6418	225	54	3.0	148800	120000	2100	2500	11.50



Open

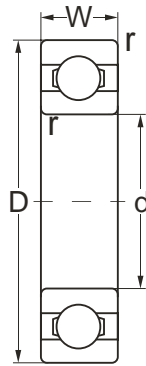


Shields-ZZ

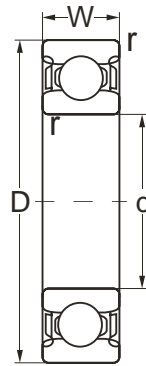


Seals-2RS

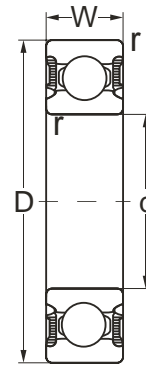
Inner bore <i>d</i> mm	Bearing number			Principal dimensions			Basic load ratings		Max runout speed		Mass kg
	open	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static C ₀	grease	oil	
									r/min		
10	61800	61800 ZZ	61800 2RS	19	5	0.3	1100	400	25200	30100	0.0055
12	61801	61801 ZZ	61801 2RS	21	5	0.3	1100	500	22400	26600	0.0063
15	61802	61802 ZZ	61802 2RS	24	5	0.3	1200	600	19600	23800	0.0074
17	61803	61803 ZZ	61803 2RS	26	5	0.3	1300	700	16800	21000	0.0082
20	61804	61804 ZZ	61804 2RS	32	7	0.3	2100	1200	13300	16800	0.0180
25	61805	61805 ZZ	61805 2RS	37	7	0.3	3400	2000	11900	14000	0.0220
30	61806	61806 ZZ	61806 2RS	42	7	0.3	3500	2300	10500	12600	0.0270
35	61807	61807 ZZ	61807 2RS	47	7	0.3	3800	2500	9100	11200	0.0300
40	61808	61808 ZZ	61808 2RS	52	7	0.3	3900	2700	7700	9800	0.0340
45	61809	61809 ZZ	61809 2RS	58	7	0.3	4800	3400	6600	8400	0.0400
50	61810	61810 ZZ	61810 2RS	65	7	0.3	4900	3800	6300	7700	0.0520
55	61811	61811 ZZ	61811 2RS	72	9	0.3	6600	4900	5900	7000	0.0830
60	61812	61812 ZZ	61812 2RS	78	10	0.3	6900	5300	5200	6300	0.1100
65	61813	61813 ZZ	61813 2RS	85	10	0.6	9300	7300	4900	5900	0.1300
70	61814	61814 ZZ	61814 2RS	90	10	0.6	9600	8000	4600	5600	0.1400
75	61815	61815 ZZ	61815 2RS	95	10	0.6	10000	8600	4400	5200	0.1500
80	61816	61816 ZZ	61816 2RS	100	10	0.6	9900	8600	4200	4900	0.1500
85	61817	61817 ZZ	61817 2RS	110	13	1.0	15600	13200	3700	4400	0.2700
90	61818	61818 ZZ	61818 2RS	115	13	1.0	15600	13600	3700	4400	0.2800
95	61819	61819 ZZ	61819 2RS	120	13	1.0	15900	14000	3500	4200	0.3000
100	61820	61820 ZZ	61820 2RS	125	13	1.0	15900	14600	3300	3900	0.3100
105	61821	61821 ZZ	61821 2RS	130	13	1.0	16600	15600	3100	3700	0.3200
110	61822	61822 ZZ	61822 2RS	140	16	1.0	22400	20800	3000	3500	0.6000
120	61824	61824 ZZ	61824 2RS	150	16	1.0	23200	22400	2600	3100	0.6500
130	61826	61826 ZZ	61826 2RS	165	18	1.0	30100	34400	2500	3000	0.9300
140	61828	61828 ZZ	61828 2RS	175	18	1.0	31200	37200	2300	2800	0.9900
150	61830			190	20	1.0	39000	48800	2100	2500	1.4000
160	61832			200	20	1.0	39500	51200	1900	2300	1.4500
170	61834			215	22	1.0	49400	62400	1800	2200	1.9000
180	61836			225	22	1.0	49900	65200	1600	2100	2.0000
190	61838			240	24	1.5	60800	78400	1500	1900	2.6000
200	61840			250	24	1.5	60800	81600	1500	1900	2.7000
220	61844			270	24	1.5	62400	88000	1300	1600	3.0000
240	61848			300	28	2.0	86400	120000	1200	1500	4.5000



Open

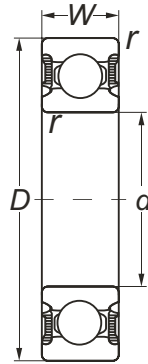


Shields-ZZ



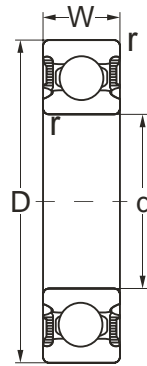
Seals-2RS

Inner bore d mm	Bearing number			Principal dimensions			Basic load ratings		Max runout speed		Mass kg
	open	with shields	with seals	D	W mm	r	dynamic C N	static Co	grease	oil	
									r/min		
10	61900	61900 ZZ	61900 2RS	22	6	0.3	1500	600	23800	28000	0.010
12	61901	61901 ZZ	61901 2RS	24	6	0.3	1800	700	21000	25200	0.011
15	61902	61902 ZZ	61902 2RS	28	7	0.3	3200	1600	16800	21000	0.016
17	61903	61903 ZZ	61903 2RS	30	7	0.3	3400	1800	15400	19600	0.018
20	61904	61904 ZZ	61904 2RS	37	9	0.3	5000	2900	12600	15400	0.038
25	61905	61905 ZZ	61905 2RS	42	9	0.3	5300	3200	11200	13300	0.045
30	61906	61906 ZZ	61906 2RS	47	9	0.3	5800	3600	9800	11900	0.051
35	61907	61907 ZZ	61907 2RS	55	10	0.6	7600	4900	7700	9800	0.080
40	61908	61908 ZZ	61908 2RS	62	12	0.6	11000	7400	7000	9100	0.120
45	61909	61909 ZZ	61909 2RS	68	12	0.6	8000	5300	6300	7700	0.140
50	61910	61910 ZZ	61910 2RS	72	12	0.6	11600	8300	5900	7000	0.140
55	61911	61911 ZZ	61911 2RS	80	13	1.0	12700	9100	5600	6600	0.190
60	61912	61912 ZZ	61912 2RS	85	13	1.0	13200	9600	5200	6300	0.200
65	61913	61913 ZZ	61913 2RS	90	13	1.0	13900	10700	4600	5600	0.220
70	61914	61914 ZZ	61914 2RS	100	16	1.0	19000	14600	4400	5200	0.350
75	61915	61915 ZZ	61915 2RS	105	16	1.0	19300	15400	4200	4900	0.370
80	61916	61916 ZZ	61916 2RS	110	16	1.0	20000	16300	3900	4600	0.400
85	61917			120	18	1.0	25500	24000	3700	4400	0.550
90	61918			125	18	1.0	26500	25200	3500	4200	0.590
95	61919			130	18	1.0	27000	26800	3300	3900	0.610
100	61920			140	20	1.0	33800	33200	3100	3700	0.830
105	61921			145	20	1.0	35300	35200	3000	3500	0.870
110	61922			150	20	1.0	34800	36000	2800	3300	0.900
120	61924			165	22	1.0	44200	45600	2500	3000	1.200
130	61926			180	24	1.5	52000	53600	2300	2800	1.600
140	61928			190	24	1.5	53000	57600	2200	2600	1.700
150	61930			210	28	2.0	70700	74400	1900	2300	3.050
160	61932			220	28	2.0	73800	78400	1800	2200	3.250
170	61934			230	28	2.0	74800	84800	1600	2100	3.400
180	61936			250	33	2.0	9500	107200	1500	1900	5.050
190	61938			260	33	2.0	9300	107200	1500	1900	5.250
200	61940			280	38	2.0	11800	132800	1400	1800	7.400
220	61944			300	38	2.0	120800	144000	1300	1600	8.000
240	61948			320	38	2.0	127200	160000	1200	1500	8.600



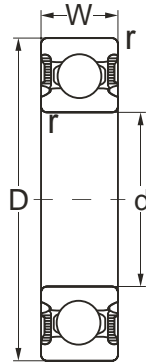
Seals-2RS

Inner bore <i>d</i> mm	Bearing number with seals	Principal dimensions			Basic load ratings		Max runout speed grease r/min	Mass kg
		<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co		
10	62200 2RS	30	14	0.6	4000	1800	11900	0.040
12	62201 2RS	32	14	0.6	5500	2400	10500	0.045
15	62202 2RS	35	14	0.6	6200	3000	9100	0.054
17	62203 2RS	40	16	0.6	7600	3800	8400	0.083
20	62204 2RS	47	18	1.0	10100	5200	7000	0.130
25	62205 2RS	52	18	1.0	11200	6200	5900	0.150
30	62206 2RS	62	20	1.0	15600	8900	5200	0.240
35	62207 2RS	72	23	1.0	20400	12200	4400	0.370
40	62208 2RS	80	23	1.0	24500	15200	3900	0.440
45	62209 2RS	85	23	1.0	26500	17200	3500	0.480
50	62210 2RS	90	23	1.0	28000	18500	3300	0.520
55	62211 2RS	100	25	1.5	34800	23200	3000	0.700
60	62212 2RS	110	28	1.5	38000	26000	2800	0.970
65	62213 2RS	120	31	1.5	44700	32400	2500	1.250
70	62214 2RS	125	31	1.5	48400	36000	2300	1.300



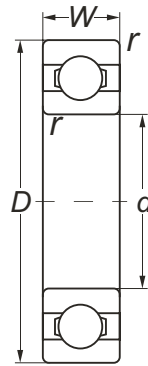
Seals-2RS

Inner bore d mm	Bearing number with seals	Principal dimensions			Basic load ratings		Max runout speed grease r/min	Mass kg
		D	W mm	r	dynamic C N	static Co		
10	62300 2RS	35	17	0.6	6400	2700	10500	0.06
12	62301 2RS	37	17	1.0	7800	3300	9800	0.07
15	62302 2RS	42	17	1.0	9100	4300	8400	0.11
17	62303 2RS	47	19	1.0	10800	5200	7700	0.15
20	62304 2RS	52	21	1.0	12700	6200	6600	0.20
25	62305 2RS	62	24	1.0	18000	9200	5200	0.32
30	62306 2RS	72	27	1.0	22400	12800	4400	0.48
35	62307 2RS	80	31	1.5	26500	15200	4200	0.66
40	62308 2RS	90	33	1.5	32800	19200	3500	0.89
45	62309 2RS	100	36	1.5	42100	25200	3100	1.15
50	62310 2RS	110	40	2.0	49400	30400	3000	1.55
55	62311 2RS	120	43	2.0	57200	36000	2600	1.95
60	62312 2RS	130	46	2.0	65500	41600	2300	2.50
65	62313 2RS	140	48	2.0	73800	48000	2200	3.00
70	62314 2RS	150	51	2.0	83200	54400	2100	3.55



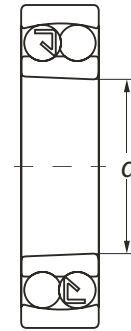
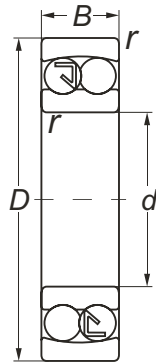
Seals-2RS

Inner bore d mm	Bearing number with seals	Principal dimensions			Basic load ratings		Max runout speed grease r/min	Mass kg
		D	W mm	r	dynamic C N	static Co		
10	63000 2RS	26	12	0.3	3600	1500	13300	0.025
12	63001 2RS	28	12	0.3	4000	1800	11900	0.029
15	63002 2RS	32	13	0.3	4400	2200	9800	0.039
17	63003 2RS	35	14	0.3	4800	2600	9100	0.052
20	63004 2RS	42	16	0.6	7400	4000	7700	0.086
25	63005 2RS	47	16	0.6	8900	5200	6600	0.100
30	63006 2RS	55	19	1.0	10600	6600	5600	0.160
35	63007 2RS	62	20	1.0	12700	8100	4900	0.210
40	63008 2RS	68	21	1.0	13400	9200	4400	0.260
45	63009 2RS	75	23	1.0	16600	11600	3900	0.340
50	63010 2RS	80	23	1.0	17200	12800	3500	0.370

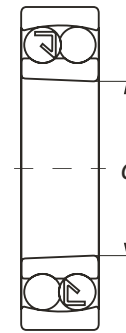
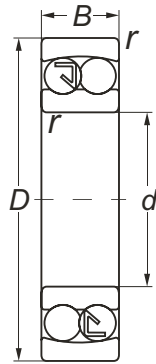


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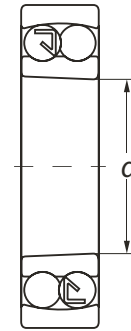
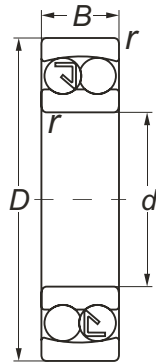
Inner bore <i>d</i> mm	Bearing number open	Principal dimensions			Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic <i>C</i> N	static <i>C_o</i>	grease oil	r/min	
10	16000	28	8	0.3	3600	1500	19600	23800	0.022
12	16001	30	8	0.3	4000	1800	18200	22400	0.023
15	16002	32	8	0.3	4400	2200	15400	19600	0.025
17	16003	35	8	0.3	4800	2600	13300	16800	0.032
20	16004	42	8	0.3	5500	3200	11900	14000	0.050
25	16005	47	8	0.3	6000	3800	9800	11900	0.060
30	16006	55	9	0.3	8900	5800	8400	10500	0.085
35	16007	62	9	0.3	9900	6500	7000	9100	0.110
40	16008	68	9	0.3	10600	7300	6000	8400	0.130
45	16009	75	10	0.6	12400	8600	6300	7700	0.170
50	16010	80	10	0.6	13000	9100	5900	7000	0.180
55	16011	90	11	0.6	15600	11200	5200	6300	0.260
60	16012	95	11	0.6	15900	12000	4600	5600	0.280
65	16013	100	11	0.6	16900	13200	4400	5200	0.300
70	16014	110	13	0.6	22400	20000	4200	4900	0.430
75	16015	115	13	0.6	22800	21600	3900	4600	0.460
80	16016	125	14	0.6	26500	25200	3700	4400	0.600
85	16017	130	14	0.6	27000	21440	3500	4200	0.630
90	16018	140	16	1.0	33200	24960	3300	3900	0.850
95	16019	145	16	1.0	33800	26560	3100	3700	0.890
100	16020	150	16	1.0	35300	28160	3000	3500	0.910
105	16021	160	18	1.0	41600	32640	2800	3300	1.200
110	16022	170	19	1.0	45700	36480	2600	3100	1.450
120	16024	180	19	1.0	48400	40960	2300	2800	1.600
130	16026	200	22	1.0	63400	52160	2200	2600	2.350
140	16028	210	22	1.0	64400	55360	2100	2500	2.500
150	16030	225	24	1.0	73800	62720	1800	2200	3.150
160	16032	240	25	1.5	79600	69120	1600	2100	3.700
170	16034	260	28	1.5	95200	82560	1500	1900	5.000
180	16036	280	31	2.0	110400	93440	1400	1800	6.600
190	16038	290	31	2.0	94720	106240	1400	1800	7.900
200	16040	310	34	2.0	107520	121600	1300	1600	8.850
220	16044	340	37	2.0	111360	130560	1200	1500	11.500
240	16048	360	37	2.0	113920	140800	1100	1400	14.500



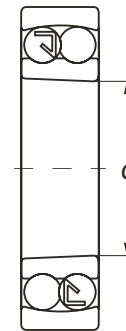
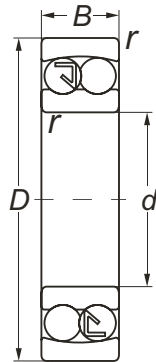
Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max runout speed		Weight kg
	cylindrical bore	tapered bore	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co	grease oil	r/min	
10	1200		30	9	0.6	4400	900	16800	21000	0.340
12	1201		32	10	0.6	4900	1100	15400	19600	0.040
15	1202		35	11	0.6	5900	1400	13300	16800	0.049
17	1203		40	12	0.6	7000	1700	12600	15400	0.073
20	1204	1204 K	47	14	1.0	10100	2700	10500	12600	0.120
25	1205	1205 K	52	15	1.0	11400	3200	9100	11200	0.140
30	1206	1206 K	62	16	1.0	12400	3700	7000	9100	0.220
35	1207	1207 K	72	17	1.1	15200	4800	6300	7700	0.320
40	1208	1208 K	80	18	1.1	15900	5500	5900	7000	0.420
45	1209	1209 K	85	19	1.1	18300	6200	5200	6300	0.470
50	1210	1210 K	90	20	1.1	21200	7300	4900	5900	0.530
55	1211	1211 K	100	21	1.5	22000	8400	4400	5200	0.710
60	1212	1212 K	110	22	1.5	24900	9700	3900	4600	0.900
65	1213	1213 K	120	23	1.5	28000	11200	3700	4400	1.150
70	1214		125	24	1.5	27600	10900	3500	4200	1.250
75	1215	1215 K	130	25	1.5	31200	12400	3300	3900	1.350
80	1216	1216 K	140	26	2.0	31700	13600	3100	3700	1.650
85	1217	1217 K	150	28	2.0	39000	16600	2800	3300	2.050
90	1218	1218 K	160	30	2.0	45700	18800	2600	3100	2.500



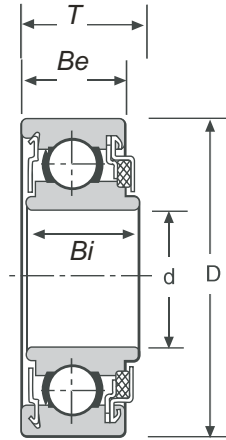
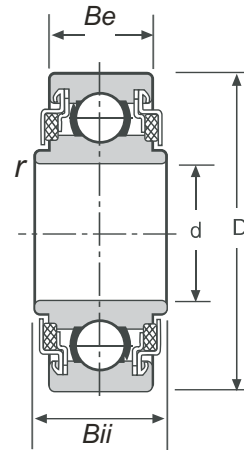
Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max runout speed		Weight kg
	cylindrical bore	tapered bore	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease oil	r/min	
12	1301		37	12	1.0	7400	1700	12600	15400	0.067
15	1302		42	13	1.0	8600	2000	11900	14000	0.094
17	1303		47	14	1.0	10100	2700	9800	11900	0.130
20	1304	1304 K	52	15	1.1	11400	3200	8400	10500	0.160
25	1305	1305 K	62	17	1.1	15200	4300	6600	8400	0.260
30	1306	1306 K	72	19	1.1	18000	5400	6300	7700	0.390
35	1307	1307 K	80	21	1.5	21200	6800	5200	6300	0.510
40	1308	1308 K	90	23	1.5	27000	8900	4600	5600	0.720
45	1309	1309 K	100	25	1.5	31200	10700	4400	5200	0.960
50	1310	1310 K	110	27	2.0	34800	11200	3900	4600	1.200
55	1311	1311 K	120	29	2.0	40500	14400	3500	4200	1.600
60	1312	1312 K	130	31	2.0	46800	17600	3100	3700	1.950
65	1313	1313 K	140	33	2.0	52000	20400	3000	3500	2.450
70	1314		150	35	2.1	59200	22000	2800	3300	3.000
75	1315	1315 K	160	37	2.1	63400	24000	2600	3100	3.550
80	1316	1316 K	170	39	2.1	70700	26800	2500	3000	4.200
85	1317	1317 K	180	41	3.0	78000	30400	2300	2800	5.000
90	1318	1318 K	190	43	3.0	93600	35200	2200	2600	5.800



Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max runout speed		Mass kg
	cylindrical bore	tapered bore	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static C ₀	grease oil	r/min	
10	2200		30	14	0.6	6400	1300	15400	19600	0.470
12	2201		32	14	0.6	6800	1500	14000	18200	0.530
15	2202		35	14	0.6	6900	1600	12600	15400	0.060
17	2203		40	16	0.6	8400	2000	11900	14000	0.088
20	2204		47	18	1.0	13400	3300	9800	11900	0.140
25	2205	2205 K	52	18	1.0	13400	3500	7700	9800	0.160
30	2206	2206 K	62	20	1.0	19000	5300	6600	8400	0.260
35	2207	2207 K	72	23	1.1	24500	7000	5900	7000	0.400
40	2208	2208 K	80	23	1.1	25500	8000	5200	6300	0.510
45	2209	2209 K	85	23	1.1	26000	8400	4900	5900	0.550
50	2210	2210 K	90	23	1.1	27000	8900	4400	5200	0.600
55	2211	2211 K	100	25	1.5	31200	10700	4200	4900	0.810
60	2212	2212 K	110	28	1.5	39000	13600	3700	4400	1.100
65	2213	2213 K	120	31	1.5	45700	16000	3500	4200	1.450
70	2214		125	31	1.5	35300	13600	3300	3900	1.500
75	2215	2215 K	130	31	1.5	35300	14400	3100	3700	1.600
80	2216	2216 K	140	33	2.0	52000	20400	2800	3300	2.000
85	2217	2217 K	150	36	2.0	46800	18800	2600	3100	2.500
90	2218	2218 K	160	40	2.0	56100	22800	2500	3000	3.400

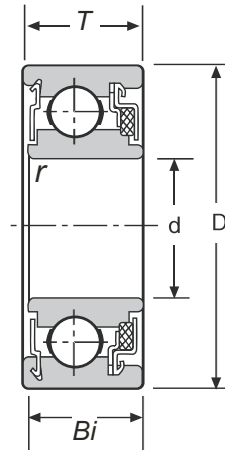


Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max runout speed		Mass kg
	cylindrical bore	tapered bore	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static C ₀	grease oil	r/min	
12	2301		37	17	1.0	9300	2100	11900	14000	0.095
15	2302		42	17	1.0	9500	2300	10500	12600	0.110
17	2303		47	19	1.0	11600	2800	9100	11200	0.160
20	2304		52	21	1.1	14500	3800	7700	9800	0.210
25	2305	2305 K	62	24	1.1	19300	5200	6600	8400	0.340
30	2306	2306 K	72	27	1.1	24900	7000	5900	7000	0.500
35	2307	2307 K	80	31	1.5	31700	8900	4900	5900	0.680
40	2308	2308 K	90	33	1.5	43200	12800	4400	5200	0.930
45	2309	2309 K	100	36	1.5	50900	15400	3900	4600	1.250
50	2310	2310 K	110	40	2.0	50900	16000	3700	4400	1.650
55	2311	2311 K	120	43	2.0	60800	19200	3300	3900	2.100
60	2312	2312 K	130	46	2.0	69600	22800	3100	3700	2.600
65	2313	2313 K	140	48	2.0	76400	26000	2800	3300	3.250
70	2314		150	51	2.1	88800	30000	2600	3100	3.900
75	2315	2315 K	160	55	2.1	99200	34400	2300	2800	4.700
80	2316	2316 K	170	58	2.1	108000	39200	2200	2600	6.100
85	2317	2317 K	180	60	3.0	112000	40800	2100	2500	7.050
90	2318	2318 K	190	64	3.0	122400	45600	1900	2300	8.450

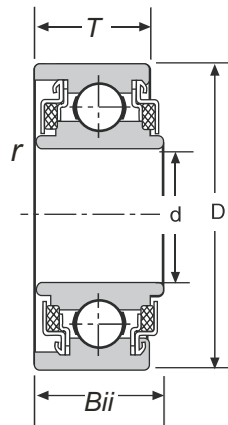
**87000
Shielded
and Sealed**

**88000
Double
Sealed**


Inner bore <i>d</i> mm	Bearing number		Principal dimensions						Basic load ratings		Mass kg
			<i>D</i>	<i>Be</i>	<i>Bii</i> mm	<i>Bi</i>	<i>T</i>	<i>r</i>	dynamic C	static Co	
5	87035	88035	19	8	12.624	9.804	10.319	0.3	2331	881	0.012
6	87036	88036	19	8	12.624	9.804	10.319	0.3	2331	881	0.012
6	87006	88006	24	8	12.624	9.804	10.319	0.3	3323	1397	0.025
7	87037	88037	22	8	12.624	9.804	10.319	0.3	3292	1361	0.020
7	87007	88007	24	8	12.624	9.804	10.319	0.3	3329	1410	0.023
8	87038	88038	22	8	12.624	9.804	10.319	0.3	3292	1361	0.022
8	87008	88008	24	8	12.624	9.804	10.319	0.3	3323	1410	0.026
9	87039	88039	26	8	12.624	9.804	10.319	0.6	4559	1948	0.048
9	87009	88009	30	9	16.401	12.192	12.700	0.6	4657	2068	0.041
10	87500	88500	30	9	16.401	12.192	12.700	0.6	4657	2068	0.047
11	87011	88011	32	10	15.400	12.192	12.700	0.6	6116	2785	0.045
12	87501	88501	32	10	15.400	12.192	12.700	0.6	6116	2785	0.043
13	87013	88013	32	10	15.400	12.192	12.700	0.6	6116	2785	0.057
14	87014	88014	35	11	14.399	12.192	12.700	0.6	6784	3323	0.054
15	87502	88502	35	11	14.399	12.192	12.700	0.6	6784	3323	0.052
16	87016	88016	35	11	14.399	12.192	12.700	0.6	6784	3323	0.095
15	87602	88602	42	13	17.000	14.000	15.000	1.0	8630	4341	0.075
17	87503	88503	40	12	16.601	13.665	14.288	0.6	8630	4341	0.127
17	87603	88603	47	14	18.000	15.000	16.000	1.0	12833	6646	0.118
20	87504	88504	47	14	17.750	15.240	15.875	1.0	12833	6646	0.181
20	87604	88604	52	15	23.000	18.000	19.000	1.0	14012	7940	0.138
25	87505	88505	52	15	16.749	15.240	15.875	1.0	14012	7940	0.295
25	87605	88605	62	17	25.000	21.000	21.000	1.0	14012	7940	0.295
26	87026	88026	52	15	16.749	15.240	15.875	1.0	14012	7940	0.134
30	87506	88506	62	16	24.000	19.000	20.000	1.0	8763	5071	0.260
30	87606	88606	72	19	27.000	23.000	23.000	1.0	8763	5071	0.441
35	87507	88507	72	17	25.000	20.000	21.000	1.0	9430	5916	0.348
35	87607	88607	80	21	29.000	25.000	25.000	1.5	9430	5916	0.545
40	87508	88508	80	21	27.000	24.000	24.000	1.0	13167	8096	0.536
40	87608	88608	90	23	31.000	27.000	27.000	1.5	13167	8096	0.750
45	87509	88509	85	21	27.000	24.000	24.000	1.0	14679	9119	0.555
45	87609	88609	100	25	35.000	30.000	30.000	1.5	14679	9119	0.995
50	87510	88510	90	22	30.000	26.000	26.000	1.0	15836	10453	0.636
55	87511	88511	100	23	31.000	27.000	27.000	1.5	19528	13211	0.809
60	87512	88512	110	25	33.000	29.000	29.000	1.5	26244	13656	1.064

WC87000
Shielded
and Sealed

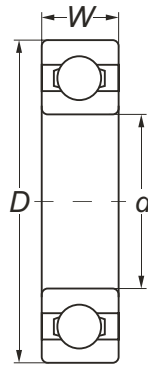


Inner bore <i>d</i> mm	Bearing number	Principal dimensions				Basic load ratings		Mass kg
		<i>D</i>	<i>T</i>	<i>Bi</i>	<i>r</i>	dynamic C N	static Co	
5	WC87035	19	10.319	9.804	0.3	2331	881	0.012
6	WC87036	19	10.319	9.804	0.3	2331	881	0.012
6	WC87006	24	10.319	9.804	0.3	3323	1397	0.025
7	WC87037	22	10.319	9.804	0.3	3292	1361	0.020
7	WC87007	24	10.319	9.804	0.3	3329	1410	0.023
8	WC87038	22	10.319	9.804	0.3	3292	1361	0.022
8	WC87008	24	10.319	9.804	0.3	3323	1410	0.026
9	WC87039	26	10.319	9.804	0.6	4559	1948	0.048
9	WC87009	30	12.700	12.192	0.6	4657	2068	0.041
10	WC87500	30	12.700	12.192	0.6	4657	2068	0.047
11	WC87011	32	12.700	12.192	0.6	6116	2785	0.045
12	WC87501	32	12.700	12.192	0.6	6116	2785	0.043
13	WC87013	32	12.700	12.192	0.6	6116	2785	0.057
14	WC87014	35	12.700	12.192	0.6	6784	3323	0.054
15	WC87502	35	12.700	12.192	0.6	6784	3323	0.052
16	WC87016	35	12.700	12.192	0.6	6784	3323	0.095
17	WC87503	40	14.288	13.665	0.6	8630	4341	0.127
20	WC87504	47	15.875	15.240	1.0	12833	6646	0.181
25	WC87505	52	15.875	15.240	1.0	14012	7940	0.295
26	WC87026	52	15.875	15.240	1.0	14012	7940	0.134
30	WC87506	62	20.000	19.000	1.0	8763	5071	0.260
35	WC87507	72	21.000	20.000	1.0	9430	5916	0.348
40	WC87508	80	24.000	24.000	1.0	13167	8096	0.536
45	WC87509	85	24.000	24.000	1.0	14679	9119	0.555
50	WC87510	90	26.000	26.000	1.0	15836	10453	0.636
55	WC87511	100	27.000	27.000	1.5	19528	13211	0.809

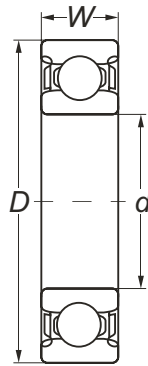


88000
Double
Sealed

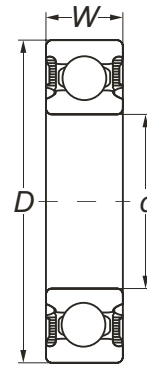
Inner bore <i>d</i> mm	Bearing number	Principal dimensions				Basic load ratings		Mass kg
		<i>D</i>	<i>Bii</i> mm	<i>T</i>	<i>r</i>	dynamic C N	static Co	
5	WC88035	19	12.624	10.319	0.3	2331	881	0.012
6	WC88036	19	12.624	10.319	0.3	2331	881	0.012
6	WC88006	24	12.624	10.319	0.3	3323	1397	0.025
7	WC88037	22	12.624	10.319	0.3	3292	1361	0.020
7	WC88007	24	12.624	10.319	0.3	3329	1410	0.023
8	WC88038	22	12.624	10.319	0.3	3292	1361	0.022
8	WC88008	24	12.624	10.319	0.3	3323	1410	0.026
9	WC88039	26	12.624	10.319	0.6	4559	1948	0.048
9	WC88009	30	16.401	12.700	0.6	4657	2068	0.041
10	WC88500	30	16.401	12.700	0.6	4657	2068	0.047
11	WC88011	32	15.400	12.700	0.6	6116	2785	0.045
12	WC88501	32	15.400	12.700	0.6	6116	2785	0.043
13	WC88013	32	15.400	12.700	0.6	6116	2785	0.057
14	WC88014	35	14.399	12.700	0.6	6784	3323	0.054
15	WC88502	35	14.399	12.700	0.6	6784	3323	0.052
16	WC88016	35	14.399	12.700	0.6	6784	3323	0.095
17	WC88503	40	16.601	14.288	0.6	8630	4341	0.127
17	WC88603	47	18.000	16.000	1.0	12833	6646	0.118
20	WC88504	47	17.750	15.875	1.0	12833	6646	0.181
20	WC88604	52	23.000	19.000	1.0	14012	7940	0.138
25	WC88505	52	16.749	15.875	1.0	14012	7940	0.295
25	WC88605	62	25.000	21.000	1.0	14012	7940	0.295
26	WC88026	52	16.749	15.875	1.0	14012	7940	0.134
30	WC88506	62	24.000	20.000	1.0	8763	5071	0.260
35	WC88507	72	25.000	21.000	1.0	9430	5916	0.348
40	WC88508	80	27.000	24.000	1.0	13167	8096	0.536
45	WC88509	85	27.000	24.000	1.0	14679	9119	0.555
50	WC88510	90	30.000	26.000	1.0	15836	10453	0.636
55	WC88511	100	31.000	27.000	1.5	19528	13211	0.809



Open



Shields-ZZ



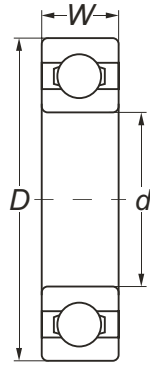
Seals-2RS

Inner bore <i>d</i> inch	Bearing number			Principal dimensions inch				Basic load ratings		Mass lbs
	open	with shields	with seals	<i>D</i>	<i>W</i>			dynamic	static	
					open	with shields	with seals	C	Co	
								N		
0.1875	1601	1601-ZZ	1601-2RS	0.6875	0.2500	0.2500	0.3125	1514	744	0.009
0.2500	1602	1602-ZZ	1602-2RS	0.6875	0.2500	0.2500	0.3125	1514	744	0.014
0.3125	1603	1603-ZZ	1603-2RS	0.8750	0.2813	0.2813	0.3438	3060	1380	0.021
0.3750	1604	1604-ZZ	1604-2RS	0.8750	0.2813	0.2813	0.3438	3228	1420	0.019
0.3125	1605	1605-ZZ	1605-2RS	0.9063	0.3125	0.3125	0.3125	3060	1420	0.037
0.3750	1606	1606-ZZ	1606-2RS	0.9063	0.3125	0.3125	0.3125	3128	1420	0.048
0.4375	1607	1607-ZZ	1607-2RS	0.9063	0.3125	0.3125	0.3125	3128	1420	0.049
0.3750	1614	1614-ZZ	1614-2RS	1.1250	0.3750	0.3750	0.3750	3930	2230	0.077
0.4375	1615	1615-ZZ	1615-2RS	1.1250	0.3750	0.3750	0.3750	3930	2230	0.071
0.5000	1616	1616-ZZ	1616-2RS	1.1250	0.3750	0.3750	0.3750	3930	2230	0.066
0.4375	1620	1620-ZZ	1620-2RS	1.3750	0.4375	0.4375	0.4375	4620	2790	0.100
0.5000	1621	1621-ZZ	1621-2RS	1.3750	0.4375	0.4375	0.4375	4620	2790	0.106
0.5625	1622	1622-ZZ	1622-2RS	1.3750	0.4375	0.4375	0.4375	4620	2790	0.101
0.6250	1623	1623-ZZ	1623-2RS	1.3750	0.4375	0.4375	0.4375	4620	2790	0.089
0.6250	1628	1628-ZZ	1628-2RS	1.6250	0.5000	0.5000	0.5000	8230	4700	0.161
0.7500	1630	1630-ZZ	1630-2RS	1.6250	0.5000	0.5000	0.5000	8230	4700	0.145
0.6250	1633	1633-ZZ	1633-2RS	1.7500	0.5000	0.5000	0.5000	8230	4700	0.204
0.7500	1635	1635-ZZ	1635-2RS	1.7500	0.5000	0.5000	0.5000	8230	4700	0.188
0.7500	1638	1638-ZZ	1638-2RS	2.0000	0.5625	0.5625	0.5625	8720	5190	0.266
0.8750	1640	1640-ZZ	1640-2RS	2.0000	0.5625	0.5625	0.5625	8720	5190	0.247
1.0000	1641	1641-ZZ	1641-2RS	2.0000	0.5625	0.5625	0.5625	8720	5190	0.225
1.1250	1652	1652-ZZ	1652-2RS	2.5000	0.6250	0.6250	0.6250	11544	7713	0.646
1.2500	1654	1654-ZZ	1654-2RS	2.5000	0.6250	0.6250	0.6250	11544	7713	0.421
1.2500	1657	1657-ZZ	1657-2RS	2.5625	0.6875	0.6875	0.6875	14975	9996	0.474
1.3125	1658	1658-ZZ	1658-2RS	2.5625	0.6875	0.6875	0.6875	14975	9996	0.441

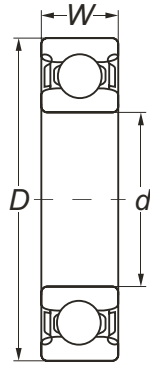


DEEP GROOVE BALL BEARINGS

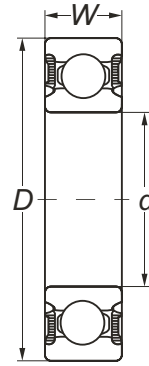
R SERIES



Open



Shields-ZZ

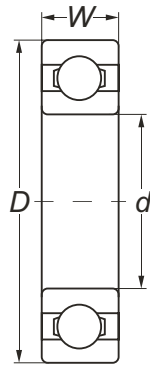


Seals-2RS

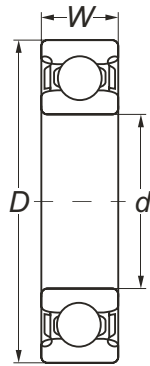
Inner bore <i>d</i> inch	Bearing number			Principal dimensions inch			Basic load ratings		Mass lbs
	open	with shields	with seals	<i>D</i>	<i>W</i> open	<i>W</i> with shields or with seals	dynamic C	static Co N	
.1250	R2	R2-ZZ	R2-2RS	.3750	.1562	.1562	312	120	.003
.1250	R2A	R2A-ZZ	R2A-2RS	.5000	.1719	.1719	312	120	.003
.1875	R3	R3-ZZ	R3-2RS	.5000	.1562	.1960	956	490	.006
.1875	R3A	R3A-ZZ	R3A-2RS	.5000	.1960	.1960	956	490	.006
.2500	R4	R4-ZZ	R4-2RS	.6250	.1960	.1960	1 480	620	.010
.2500	R4A	R4A-ZZ	R4A-2RS	.7500	.2188	.2812	2 810	1 160	.020
.3750	R6	R6-ZZ	R6-2RS	.8750	.2188	.2812	3 320	1 340	.024
.5000	R8	R8-ZZ	R8-2RS	1.1250	.2500	.3125	5 070	2 400	.039
.6250	R10	R10-ZZ	R10-2RS	1.3750	.2812	.3438	6 050	3 250	.081
.7500	R12	R12-ZZ	R12-2RS	1.6250	.3125	.4375	9 360	5 100	.104
.8750	R14	R14-ZZ	R14-2RS	1.8750	.3750	.5000	10 100	5 850	.157
1.0000	R16	R16-ZZ	R16-2RS	2.0000	.3750	.5000	10 100	6 000	.187
1.1250	R18	R18-ZZ	R18-2RS	2.1250	.3750	.5000	12 500	7 500	.198
1.2500	R20	R20-ZZ	R20-2RS	2.2500	.3750	.5000	14 000	9 300	.209
1.3750	R22	R22-ZZ	R22-2RS	2.5000	.4375	.5625	15 000	10 000	.232
1.5000	R24	R24-ZZ	R24-2RS	2.6250	.4375	.5625	16 800	11 800	.309

DEEP GROOVE BALL BEARINGS

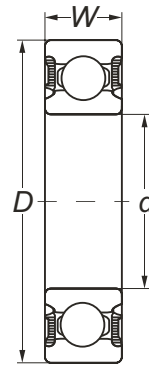
RLS and RMS SERIES



Open



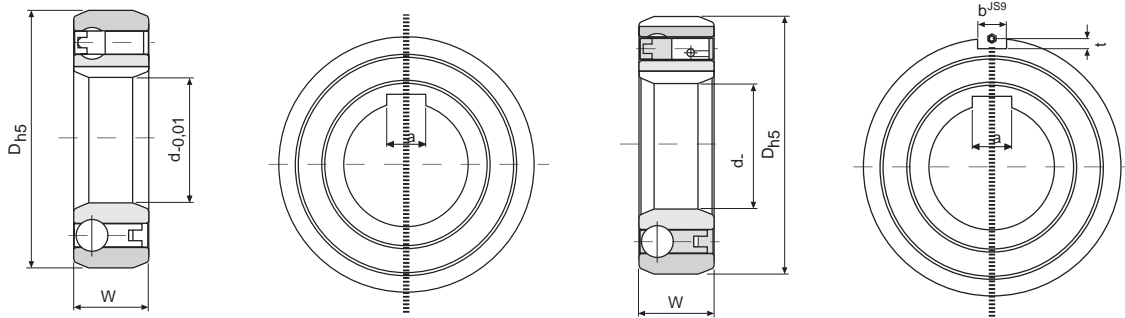
Shields-ZZ



Seals-2RS

Inner bore <i>d</i> mm	Bearing number			Principal dimensions		Basic load ratings		Max runout speed		Mass kg
	open	with shields	with seals	<i>D</i> inch	<i>W</i> inch	dynamic C N	static Co	grease oil	r/min	
.5000	RLS4	RLS4-ZZ	RLS4-2RS	1.3125	0.3750	6890	3100	22000	28000	0.041
.6250	RLS5	RLS5-ZZ	RLS5-2RS	1.5625	0.4375	9560	4500	17000	20000	0.059
.7500	RLS6	RLS6-ZZ	RLS6-2RS	1.8750	0.5625	12700	6200	15000	18000	0.120
.8750	RLS7	RLS7-ZZ	RLS7-2RS	2.0000	0.5625	15100	7500	14000	17000	0.120
1.0000	RLS8	RLS8-ZZ	RLS8-2RS	2.2500	0.6250	17800	8800	11000	14000	0.170
1.1250	RLS9	RLS9-ZZ	RLS9-2RS	2.5000	0.6250	19500	10000	10000	13000	0.220
1.2500	RLS10	RLS10-ZZ	RLS10-2RS	2.7500	0.6875	22500	11800	9500	12000	0.300
1.3750	RLS11	RLS11-ZZ	RLS11-2RS	3.0000	0.6875	27700	14500	8400	10500	0.370
1.5000	RLS12	RLS12-ZZ	RLS12-2RS	3.2500	0.7500	34800	18315	7800	9500	0.430

.5000	RMS4	RMS4-ZZ	RMS4-2RS	1.6250	0.6250	11400	5000	18000	22000	0.100
.6250	RMS5	RMS5-ZZ	RMS5-2RS	1.8125	0.6250	13500	6500	16000	19000	0.120
.7500	RMS6	RMS6-ZZ	RMS6-2RS	2.0000	0.6875	15900	7800	13000	16000	0.160
.8750	RMS7	RMS7-ZZ	RMS7-2RS	2.2500	0.6875	18600	9150	12000	15000	0.210
1.0000	RMS8	RMS8-ZZ	RMS8-2RS	2.5000	0.7500	22500	11400	11000	14000	0.270
1.1250	RMS9	RMS9-ZZ	RMS9-2RS	2.8125	0.8125	28100	14600	9000	11000	0.370
1.2500	RMS10	RMS10-ZZ	RMS10-2RS	3.1250	0.8750	33200	18000	8500	10000	0.500

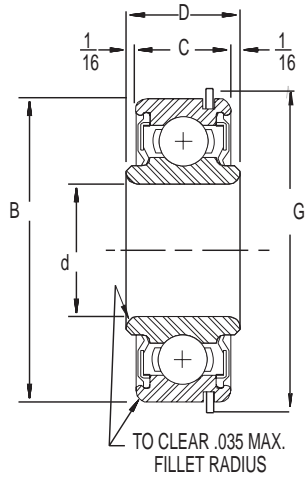


Inner bore d mm	no KW	Bearing number		Principal dimensions		Keyway dimensions		Torque Tkn (N.m)	Basic load ratings		Mass kg
		inner race KW	inner and outer race KW	D mm	W	inner race $a \times t$ mm	outer race $b \times t$ mm		C N	Co	
8	CSK 8	CSK 8 P	CSK 8 PP	22	9	3 x 0.5	2 x 0.5	2.5	3280	860	0.015
12	CSK 12	CSK 12 P	CSK 12 PP	32	10	4 x 1.2	2 x 0.6	7.5	6100	2700	0.040
15	CSK 15	CSK 15 P	CSK 15 PP	35	11	5 x 1.2	2 x 0.6	13.5	7400	3420	0.050
17	CSK 17	CSK 17 P	CSK 17 PP	40	12	5 x 1.2	2 x 1	24.5	7900	3800	0.070
20	CSK 20	CSK 20 P	CSK 20 PP	47	14	6 x 1.6	3 x 1.5	40.0	9400	4460	0.110
25	CSK 25	CSK 25 P	CSK 25 PP	52	15	8 x 2	6 x 2	68.0	10700	5460	0.140
30	CSK 30	CSK 30 P	CSK 30 PP	62	16	8 x 2	6 x 2	110.0	11700	6450	0.210
35	CSK 35	CSK 35 P	CSK 35 PP	72	17	10 x 2.4	8 x 2.5	140.0	12600	7280	0.300
40	CSK 40	CSK 40 P	CSK 40 PP	80	22	12 x 3.3	10 x 3	260.0	15540	12250	0.500

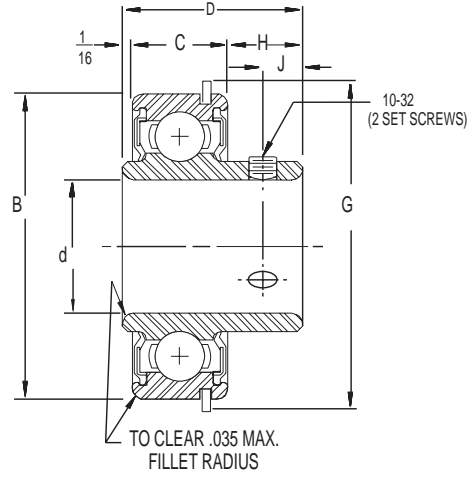
The CSK series one-way (clutch) bearing consists of a 62 series ball bearing (except CSK8 and 40).
 CSK-P series features a keyway on the inner race
 CSK-PP series features a keyway both on the inner and outer race.

DEEP GROOVE BALL BEARINGS

7500 and 7600 SERIES



7500-DLG



7600-DLG

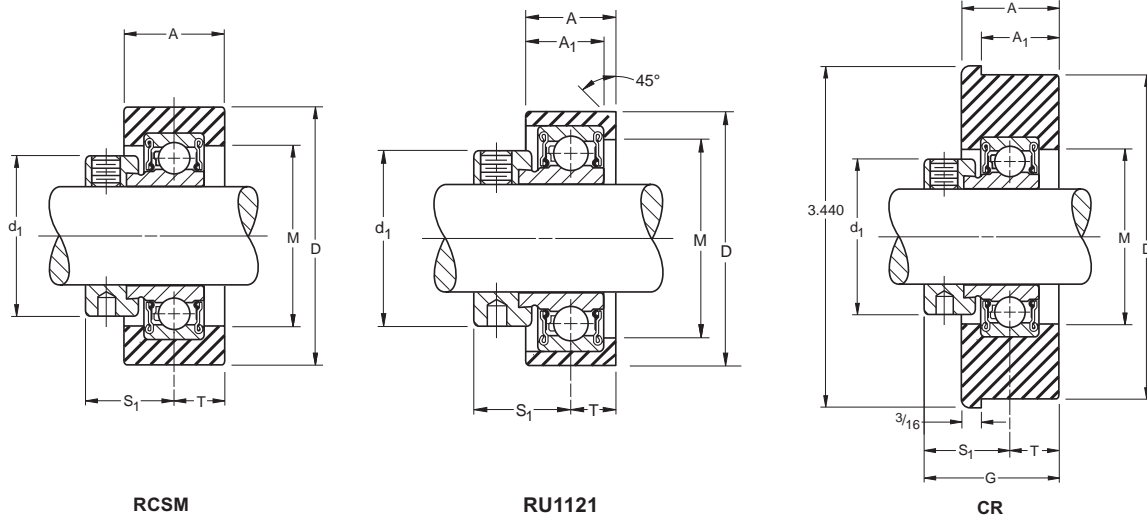
Inner bore <i>d</i> Inch	Bearing number	Principal dimensions								Basic load ratings		Mass lb
		<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>J</i>	dynamic C	static Co	
.5000	7508 DLG	1.7500	.625	.750	.136	.042	1.921			3100	6000	.30
.6250	7510 DLG	1.7500	.625	.750	.136	.042	1.921			3100	6000	.28
.7500	7512 DLG	1.7500	.625	.750	.136	.042	1.921			3100	6000	.25
.8750	7514 DLG	2.0000	.625	.750	.136	.042	2.156			4800	9000	.32
1.0000	7516 DLG	2.0000	.625	.750	.136	.042	2.156			4800	9000	.29
1.1250	7518 DLG	2.5625	.750	.875	.190	.065	2.844			8000	13000	.65
1.2500	7520 DLG	2.5625	.750	.875	.190	.065	2.844			8000	13000	.60

.5000	7608 DLG	1.7500	.625	1.092	.136	.042	1.921	.405	.233	3100	6000	.38
.6250	7610 DLG	1.7500	.625	1.092	.136	.042	1.921	.405	.233	3100	6000	.34
.7500	7612 DLG	1.7500	.625	1.092	.136	.042	1.921	.405	.233	3100	6000	.31
.8750	7614 DLG	2.0000	.625	1.179	.136	.042	2.156	.492	.261	4800	9000	.43
1.0000	7616 DLG	2.0000	.625	1.179	.136	.042	2.156	.492	.261	4800	9000	.36
1.2500	7620 DLG	2.5625	.750	1.417	.190	.065	2.843	.905	.261	8000	13000	.76

Maximum suggested speed 5000 RPM

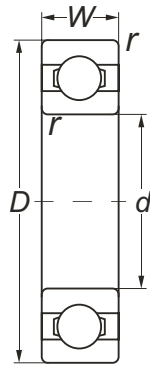


HVAC BEARINGS
RCSM, RU, CR - SERIES

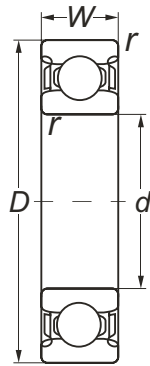


Inner bore <i>d</i> Inch	Bearing number	Principal dimensions								Housing radial Load ratings N	Mass Lb
		<i>D</i>	<i>A</i>	<i>A</i> ₁	<i>G</i>	<i>M</i> Inch	<i>d</i> ₁	<i>S</i> ₁	<i>T</i>		
1/2	RSCM 1/2	2.5312	1.0000			1.3750	1.1250	0.8750	0.50	880	0.87
5/8	RSCM 5/8	2.5312	1.0000			1.5625	1.3125	0.9219	0.50	1120	1.04
3/4	RSCM 3/4	2.5312	1.0000			1.7812	1.5000	0.9219	0.50	1340	1.16
1	RSCM 1	2.5312	1.0000			1.8750	1.6562	0.7812	0.50	1340	1.38
3/4	RU 1121-12	1.8125	0.7187	0.6250		1.3750	1.1875	0.7344	0.39	880	0.60
1	RU 1121-16	2.2500	0.8125	0.7125		1.7500	1.5000	0.9219	0.39	1340	0.90
3/4	CR 3/4	3.2900	1.0000	0.8750	1.4219	1.5625	1.3125	0.9219	0.50	670	0.70
1	CR 1	3.2900	1.0000	0.8750	1.4219	1.7812	1.5000	0.9219	0.50	880	0.75

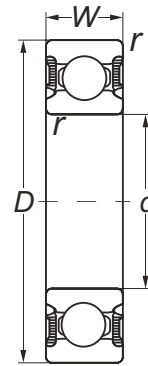
Thrust load is 1/3 of radial load rating. Maximum suggested speed - 2400 RPM



Open



Shields-ZZ



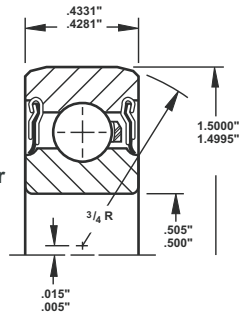
Seals-2RS

Inner bore <i>d</i> mm	Bearing number			Principal dimensions			Basic load ratings		Max runout speed		Mass kg
	open	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C	static Co	grease	oil	
							N		r/min		
12.7	6201-08	6201-08 ZZ	6201-08 2RS	32	10	0.6	6180	3060	15400	19600	0.037
12.7	6202-08	6202-08 ZZ	6202-08 2RS	35	11	0.6	7450	3700	13300	16800	0.046
12.7	6203-08	6203-08 ZZ	6203-08 2RS	40	12	0.6	9560	4780	11900	14000	0.065
13.0	6201-13	6201-13 ZZ	6201-13 2RS	32	10	0.6	6180	3060	15400	19600	0.037
13.0	6202-13	6202-13 ZZ	6202-13 2RS	35	11	0.6	7450	3700	13300	16800	0.046
13.0	6203-13	6203-13 ZZ	6203-13 2RS	40	12	0.6	9560	4780	11900	14000	0.065
14.0	6202-14	6202-14 ZZ	6202-14 2RS	35	11	0.6	7450	3700	13300	16800	0.046
15.0	6203-15	6203-15 ZZ	6203-15 2RS	40	12	0.6	9560	4780	11900	14000	0.065
15.875			99502-H	34.93	11	0.6	7740	3732	13300	16800	0.046
15.875	6202-10	6202-10 ZZ	6202-10 2RS	35	11	0.6	7450	3700	13300	16800	0.046
15.875	6203-625	6203-625 ZZ	6203-625 2RS	40	12	0.6	9560	4780	11900	14000	0.065
16.0	6202-16	6202-16 ZZ	6202-16 2RS	35	11	0.6	7450	3700	13300	16800	0.046
16.0	6203-16	6203-16 ZZ	6203-16 2RS	40	12	0.6	9560	4780	11900	14000	0.065
19.05	6203-12	6203-12 ZZ	6203-12 2RS	40	12	0.6	9560	4780	11900	14000	0.065
19.05			Z9504-AB	45.22	15.49	1.0	9770	6177	10500	12600	0.107
19.05	6204-12	6204-12 ZZ	6204-12 2RS	47	14	1.0	9770	6177	10500	12600	0.107
22.225	6204-14	6204-14 ZZ	6204-14 2RS	47	14	1.0	9770	6177	10500	12600	0.107
25.4	6205-1	6205-1 ZZ	6205-1 2RS	52	15	1.0	10666	6933	8400	11200	0.125

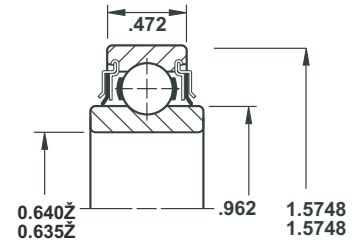
Bearing Number 202NPP9

Special Features

- 1/2 in. Bore**
- O.D. corner turned to a 3/4 in. radius**
- Special heavy stiff seals of Buna-N rubber**
- Crimped-in seal**



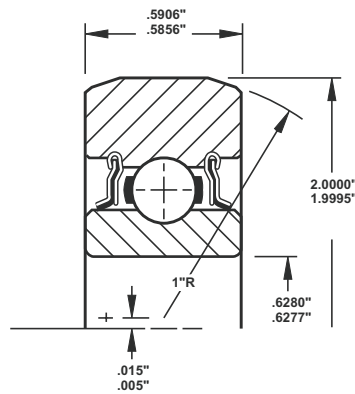
Bearing Number 203KRR2



Bearing Number 203KRR3

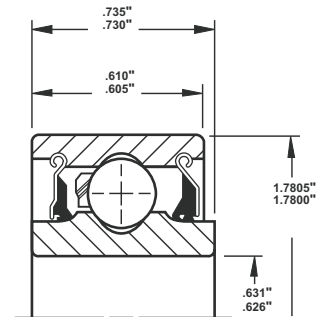
Special Features

- 5/8 in. Bore**
- 2 in. O.D.**
- Thick outer ring**



Bearing Number 204RY2

- Special Features*
- 5/8 in. Bore**
 - Gothic Arch Race**





In terms of vibration, RBL deep groove ball bearings fall into groups V, V1, V2 V3 by vibration velocity gauge and / or groups Z, Z1, Z2, Z3, Z4 by vibration acceleration gauge.

Z & V: For general applications. Standard deep groove ball bearings in compliance with RBL are in

Z1 & V1: For applications where there are primary requirements for vibration.

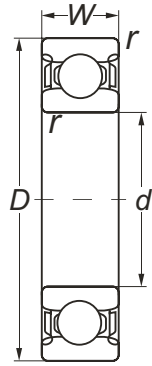
Z2 & V2: For Y electric motors or equivalent where there are special requirements for vibration.

Z3 & V3: For applications where there are strict requirements for vibration.

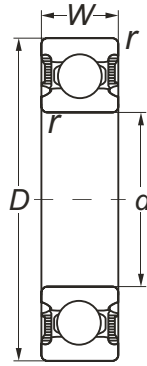
Vibration Classification of Radial Ball Bearings in Velocity Measure (Unit: $\mu\text{m/s}$)												
d (mm)	Class V			Class V1			Class V2			Class V3		
	L	M	H	L	M	H	L	M	H	L	M	H
5	110	72	60	90	60	50	58	36	30	35	21	18
6	110	72	60	90	60	50	58	36	30	35	21	18
7	130	96	80	110	80	65	72	48	40	44	28	24
8	130	96	80	110	80	65	72	48	40	44	28	24
9	130	96	80	110	80	65	72	48	40	44	28	24
10	160	120	100	140	100	85	90	60	50	55	35	30
12	160	120	100	140	100	85	90	60	50	55	35	30
15	210	150	120	180	130	100	110	78	60	65	46	35
17	210	150	120	180	130	100	110	78	60	65	46	35
20	260	190	150	220	160	125	130	100	75	80	60	45
22	260	190	150	220	160	125	130	100	75	80	60	45
25	260	190	150	220	160	125	130	100	75	80	60	45
28	260	190	150	220	160	125	130	100	75	80	60	45
30	300	240	190	250	200	160	150	120	100	90	75	60
32	300	240	190	250	200	160	150	120	100	90	75	60
35	300	240	190	250	200	160	150	120	100	90	75	60
40	360	300	260	300	250	220	180	150	130	110	90	80
45	360	300	260	300	250	220	180	150	130	110	90	80
50	420	320	320	350	270	270	210	160	160	125	100	100
55	420	360	360	350	300	300	210	180	180	125	110	110
60	480	360	440	400	300	370	240	180	220	145	110	130

Gauging conditions:
 Low frequency band (L): 50 - 300 Hz
 Medium frequency band (M): 300 - 1,800 Hz
 High frequency band (H): 1,800 - 10,000 Hz
 Test Speed: 1,800 rpm

Vibration Classification of Radial Ball Bearings in Acceleration Measure (Unit: dB)														
d (mm)	6000 series				6200 series					6300 series				
	Z	Z1	Z2	Z3	Z	Z1	Z2	Z3	Z4	Z	Z1	Z2	Z3	Z4
3	35	34	32	28	36	35	32	30		37	36	33	31	
4	35	34	32	28	36	35	32	30		37	36	33	31	
5	37	36	34	30	38	37	34	32		39	37	35	33	
6	37	36	34	30	38	37	34	32		39	37	35	33	
7	39	38	35	31	40	38	36	34						
8	39	38	35	31	40	38	36	34						
9	41	40	36	32	42	40	37	35						
10	43	42	38	33	44	42	39	35	30	46	44	40	37	32
12	44	43	39	34	45	43	39	35	30	47	45	40	37	32
15	45	44	40	35	46	44	41	36	31	48	46	42	38	33
17	46	44	40	35	47	45	41	36	31	49	47	42	38	33
20	47	45	41	36	48	46	42	38	33	50	48	43	39	34
22	47	45	41	36	48	46	42	38	33	50	48	43	39	34
25	48	46	42	38	49	47	43	40	36	51	49	44	41	37
28	49	47	43	39	50	48	44	41	37	52	50	45	42	38
30	49	47	43	39	50	49	44	41	37	52	50	45	42	38
32	50	48	44	40	51	49	45	42	38	52	51	46	43	39
35	51	49	45	41	52	50	46	43	39	54	52	47	44	40
40	42	51	46	42	54	52	47	44	40	56	54	49	45	41
45	55	42	48	45	56	54	49	46	43	58	56	51	47	44
50	57	54	50	47	58	55	51	48	45	60	57	52	48	46
55	59	56	52	49	60	57	52	50	47	72	59	54	51	48

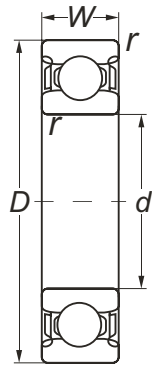


Shields-ZZ

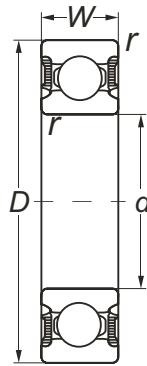


Seals-2RS

Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max speed r/min	Mass kg
	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co		
3	623 ZZ C3 EMQ V2	623 2RS C3 EMQ V2	10	4	0.15	607	200	60000	0.0020
4	624 ZZ C3 EMQ V2	624 2RS C3 EMQ V2	13	5	0.2	1300	500	50000	0.0032
5	625 ZZ C3 EMQ V2	625 2RS C3 EMQ V2	16	5	0.3	1700	670	43000	0.0048
6	626 ZZ C3 EMQ V2	626 2RS C3 EMQ V2	19	6	0.3	2200	860	40000	0.0081
7	607 ZZ C3 EMQ V2	607 2RS C3 EMQ V2	19	6	0.3	2200	860	41000	0.0080
7	627 ZZ C3 EMQ V2	627 2RS C3 EMQ V2	22	7	0.3	3200	1300	35000	0.0130
8	608 ZZ C3 EMQ V2	608 2RS C3 EMQ V2	22	7	0.3	3200	1300	39000	0.0120
8	628 ZZ C3 EMQ V2	628 2RS C3 EMQ V2	24	8	0.3	3200	1300	37000	0.0170
9	609 ZZ C3 EMQ V2	609 2RS C3 EMQ V2	24	7	0.3	3300	1400	36000	0.0140
9	629 ZZ C3 EMQ V2	629 2RS C3 EMQ V2	26	8	0.3	4500	2000	33000	0.0200

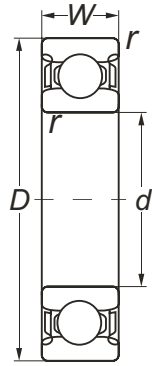


Shields-ZZ

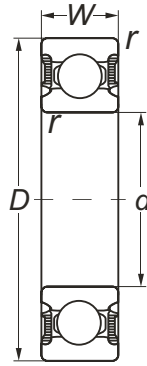


Seals-2RS

Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max speed r/min	Mass kg
	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co		
10	6000 ZZ C3 EMQ V2	6000 2RS C3 EMQ V2	26	8	0.3	3600	1500	33000	0.0190
12	6001 ZZ C3 EMQ V2	6001 2RS C3 EMQ V2	28	8	0.3	4000	1800	30000	0.0220
15	6002 ZZ C3 EMQ V2	6002 2RS C3 EMQ V2	32	9	0.3	4400	2200	25000	0.0300
17	6003 ZZ C3 EMQ V2	6003 2RS C3 EMQ V2	35	10	0.3	4800	2600	23000	0.0390
20	6004 ZZ C3 EMQ V2	6004 2RS C3 EMQ V2	42	12	0.6	7400	4000	18000	0.0690
25	6005 ZZ C3 EMQ V2	6005 2RS C3 EMQ V2	47	12	0.6	8900	5200	16000	0.0800
30	6006 ZZ C3 EMQ V2	6006 2RS C3 EMQ V2	55	13	1.0	10600	6600	13000	0.1200
35	6007 ZZ C3 EMQ V2	6007 2RS C3 EMQ V2	62	14	1.0	12700	8100	10000	0.1600
40	6008 ZZ C3 EMQ V2	6008 2RS C3 EMQ V2	68	15	1.0	13400	9200	10000	0.1900
45	6009 ZZ C3 EMQ V2	6009 2RS C3 EMQ V2	75	16	1.0	16600	11600	9600	0.2500
50	6010 ZZ C3 EMQ V2	6010 2RS C3 EMQ V2	80	16	1.0	17200	12800	9200	0.2600
55	6011 ZZ C3 EMQ V2	6011 2RS C3 EMQ V2	90	18	1.1	22400	16900	8100	0.3900
60	6012 ZZ C3 EMQ V2	6012 2RS C3 EMQ V2	95	18	1.1	23600	18500	7200	0.4200
65	6013 ZZ C3 EMQ V2	6013 2RS C3 EMQ V2	100	18	1.1	24500	20000	6700	0.4400
70	6014 ZZ C3 EMQ V2	6014 2RS C3 EMQ V2	110	20	1.1	30100	24800	6500	0.6000
75	6015 ZZ C3 EMQ V2	6015 2RS C3 EMQ V2	115	20	1.1	31700	26800	6100	0.6400
80	6016 ZZ C3 EMQ V2	6016 2RS C3 EMQ V2	125	22	1.1	38000	32000	5700	0.8500
85	6017 ZZ C3 EMQ V2	6017 2RS C3 EMQ V2	130	22	1.1	39500	34400	5300	0.8900
90	6018 ZZ C3 EMQ V2	6018 2RS C3 EMQ V2	140	24	1.5	46800	40000	5100	1.1500

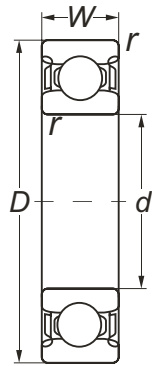


Shields-ZZ

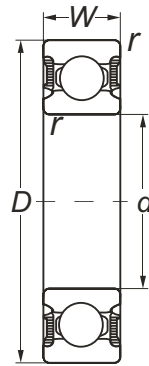


Seals-2RS

Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max runout speed r/min	Mass kg
	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C N	static Co		
10	6200 ZZ C3 EMQ V2	6200 2RS C3 EMQ V2	30	9	0.6	4000	1800	27000	0.030
12	6201 ZZ C3 EMQ V2	6201 2RS C3 EMQ V2	32	10	0.6	5500	2400	25000	0.037
15	6202 ZZ C3 EMQ V2	6202 2RS C3 EMQ V2	35	11	0.6	6200	3000	22000	0.046
17	6203 ZZ C3 EMQ V2	6203 2RS C3 EMQ V2	40	12	0.6	7600	3800	20000	0.065
20	6204 ZZ C3 EMQ V2	6204 2RS C3 EMQ V2	47	14	1.0	10100	5200	16000	0.107
25	6205 ZZ C3 EMQ V2	6205 2RS C3 EMQ V2	52	15	1.0	11200	6200	14000	0.125
30	6206 ZZ C3 EMQ V2	6206 2RS C3 EMQ V2	62	16	1.0	15600	8900	11000	0.205
35	6207 ZZ C3 EMQ V2	6207 2RS C3 EMQ V2	72	17	1.0	20400	12200	9000	0.290
40	6208 ZZ C3 EMQ V2	6208 2RS C3 EMQ V2	80	18	1.0	24500	15200	9000	0.370
45	6209 ZZ C3 EMQ V2	6209 2RS C3 EMQ V2	85	19	1.0	26500	17200	8000	0.410
50	6210 ZZ C3 EMQ V2	6210 2RS C3 EMQ V2	90	20	1.0	28000	18500	7500	0.460
55	6211 ZZ C3 EMQ V2	6211 2RS C3 EMQ V2	100	21	1.5	34800	23200	6700	0.610
60	6212 ZZ C3 EMQ V2	6212 2RS C3 EMQ V2	110	22	1.5	38000	26000	6400	0.780
65	6213 ZZ C3 EMQ V2	6213 2RS C3 EMQ V2	120	23	1.5	44700	32400	5700	0.990
70	6214 ZZ C3 EMQ V2	6214 2RS C3 EMQ V2	125	24	1.5	48400	36000	5400	1.050
75	6215 ZZ C3 EMQ V2	6215 2RS C3 EMQ V2	130	25	1.5	53000	39200	5000	1.200
80	6216 ZZ C3 EMQ V2	6216 2RS C3 EMQ V2	140	26	2.0	56100	44000	4700	1.400
85	6217 ZZ C3 EMQ V2	6217 2RS C3 EMQ V2	150	28	2.0	66500	51200	4600	1.800
90	6218 ZZ C3 EMQ V2	6218 2RS C3 EMQ V2	160	30	2.0	76400	58800	4000	2.150

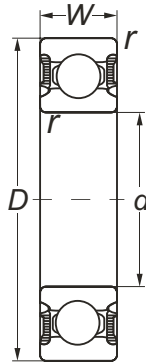


Shields-ZZ



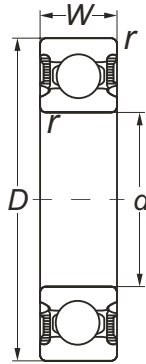
Seals-2RS

Inner bore <i>d</i> mm	Bearing number		Principal dimensions			Basic load ratings		Max speed r/min	Mass kg
	with shields	with seals	<i>D</i>	<i>W</i> mm	<i>r</i>	dynamic C	static Co N		
10	6300 ZZ C3 EMQ V2	6300 2RS C3 EMQ V2	35	11	0.6	6400	2700	24000	0.053
12	6301 ZZ C3 EMQ V2	6301 2RS C3 EMQ V2	37	12	1.0	7700	3300	22000	0.059
15	6302 ZZ C3 EMQ V2	6302 2RS C3 EMQ V2	42	13	1.0	9100	4300	18000	0.082
17	6303 ZZ C3 EMQ V2	6303 2RS C3 EMQ V2	47	14	1.0	10800	5200	16000	0.120
20	6304 ZZ C3 EMQ V2	6304 2RS C3 EMQ V2	52	15	1.1	12700	6200	14000	0.142
25	6305 ZZ C3 EMQ V2	6305 2RS C3 EMQ V2	62	17	1.1	18000	9200	12000	0.230
30	6306 ZZ C3 EMQ V2	6306 2RS C3 EMQ V2	72	19	1.0	22400	12800	10000	0.350
35	6307 ZZ C3 EMQ V2	6307 2RS C3 EMQ V2	80	21	1.5	26500	15200	9500	0.460
40	6308 ZZ C3 EMQ V2	6308 2RS C3 EMQ V2	90	23	1.5	32800	19200	7700	0.630
45	6309 ZZ C3 EMQ V2	6309 2RS C3 EMQ V2	100	25	1.5	42100	25200	6900	0.830
50	6310 ZZ C3 EMQ V2	6310 2RS C3 EMQ V2	110	27	2.0	49400	30400	6600	1.050
55	6311 ZZ C3 EMQ V2	6311 2RS C3 EMQ V2	120	29	2.0	57200	36000	5800	1.350
60	6312 ZZ C3 EMQ V2	6312 2RS C3 EMQ V2	130	31	2.0	65500	41600	5200	1.700
65	6313 ZZ C3 EMQ V2	6313 2RS C3 EMQ V2	140	33	2.0	73800	48000	4600	2.100
70	6314 ZZ C3 EMQ V2	6314 2RS C3 EMQ V2	150	35	2.0	83200	54400	4300	2.500
75	6315 ZZ C3 EMQ V2	6315 2RS C3 EMQ V2	160	37	2.0	91200	61200	4300	3.000
80	6316 ZZ C3 EMQ V2	6316 2RS C3 EMQ V2	170	39	2.0	99200	69200	4000	3.600
85	6317 ZZ C3 EMQ V2	6317 2RS C3 EMQ V2	180	41	2.5	106400	77200	3600	4.250
90	6318 ZZ C3 EMQ V2	6318 2RS C3 EMQ V2	190	43	2.5	114400	86400	3400	4.900



Seals-2RS

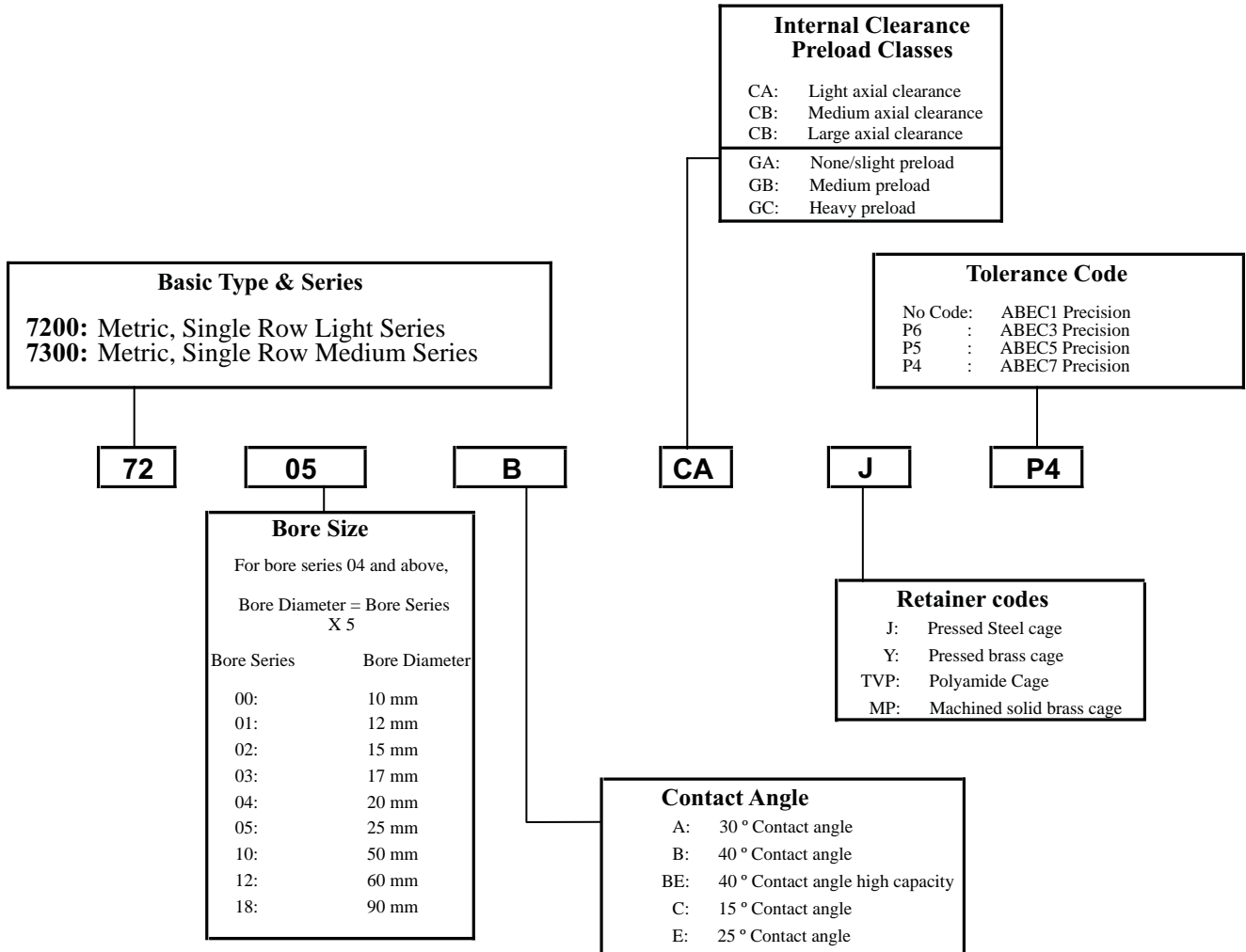
Inner Bore <i>d</i> mm	Bearing number with seals	Principal dimensions			Basic load ratings		Max runout speed Grease R/min	Mass kg
		<i>D</i>	<i>W</i> mm	<i>R</i>	dynamic C N	static Co		
10	SS 6000 2RS	26	8	0.3	3600	1500	17000	0.0190
12	SS 6001 2RS	28	8	0.3	4000	1800	17000	0.0220
15	SS 6002 2RS	32	9	0.3	4400	2200	15000	0.0300
17	SS 6003 2RS	35	10	0.3	4800	2600	13000	0.0390
20	SS 6004 2RS	42	12	0.6	7400	4000	11000	0.0690
25	SS 6005 2RS	47	12	0.6	8000	4600	9500	0.0800
30	SS 6006 2RS	55	13	1.0	10000	6400	8000	0.1200
35	SS 6007 2RS	62	14	1.0	13000	8300	7000	0.1600
40	SS 6008 2RS	68	15	1.0	13600	9400	6300	0.1900
10	SS 6200 2RS	30	9	0.6	4000	1800	17000	0.030
12	SS 6201 2RS	32	10	0.6	5500	2400	16000	0.037
15	SS 6202 2RS	35	11	0.6	6200	3000	14000	0.046
17	SS 6203 2RS	40	12	0.6	7600	3800	12000	0.065
20	SS 6204 2RS	47	14	1.0	10100	5200	10000	0.107
25	SS 6205 2RS	52	15	1.0	11200	6200	9000	0.125
30	SS 6206 2RS	62	16	1.0	15600	8900	7500	0.205
35	SS 6207 2RS	72	17	1.0	20400	12200	6300	0.290
40	SS 6208 2RS	80	18	1.0	24500	15200	5600	0.370
20	SS 6304 2RS	52	15	1.1	12700	6200	9000	0.142
25	SS 6305 2RS	62	17	1.1	18000	9200	7500	0.230
30	SS 6306 2RS	72	19	1.0	22400	12800	6300	0.350
35	SS 6307 2RS	80	21	1.5	26500	15200	5600	0.460
40	SS 6308 2RS	90	23	1.5	32800	19200	5000	0.630

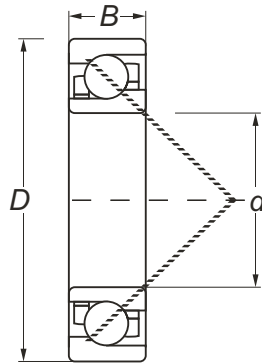


Seals-2RS

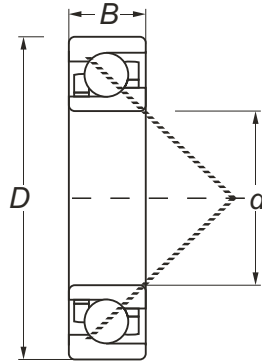
Inner bore <i>d</i> inch	Bearing number with seals	Principal dimensions inch			Basic load ratings		Mass lbs
		<i>D</i>	<i>W</i> open	<i>W</i> with seals	dynamic C N	static Co	
.1250	SS R2-2RS	.3750	.1562	.1562	160	150	.003
.1250	SS R2A-2RS	.5000	.1719	.1719	300	200	.003
.1875	SS R3-2RS	.5000	.1562	.1960	956	360	.006
.1875	SS R3A-2RS	.5000	.1960	.1960	956	490	.006
.2500	SS R4-2RS	.6250	.1960	.1960	1 200	460	.010
.2500	SS R4A-2RS	.7500	.2188	.2812	1 800	660	.020
.3750	SS R6-2RS	.8750	.2188	.2812	2 650	1 050	.024
.5000	SS R8-2RS	1.1250	.2500	.3125	4 100	1 750	.039
.6250	SS R10-2RS	1.3750	.2812	.3438	4 800	2 500	.081
.7500	SS R12-2RS	1.6250	.3125	.4375	6 300	3 400	.104
.8750	SS R14-2RS	1.8750	.3750	.5000	8 000	4 400	.157
1.0000	SS R16-2RS	2.0000	.3750	.5000	8 000	4 400	.187
1.1250	SS R18-2RS	2.1250	.3750	.5000	7 600	4 700	.198
1.2500	SS R20-2RS	2.2500	.3750	.5000	10 500	6 200	.209
1.3750	SS R22-2RS	2.5000	.4375	.5625	9 800	6 300	.232
1.5000	SS R24-2RS	2.6250	.4375	.5625	10 300	7 000	.309

Angular Contact Ball Bearings

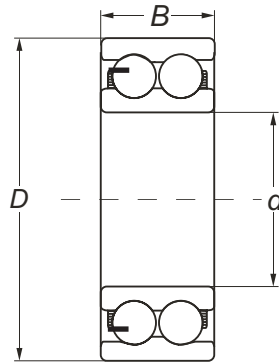




Inner bore d mm	Bearing number	Principal dimensions		Basic load ratings		Max runout speed		Mass kg
		D mm	B mm	dynamic C N	static C_0	grease oil	r/min	
10	7200	30	9	5600	2600	13300	19600	0.030
12	7201	32	10	6000	3000	12600	18200	0.036
15	7202	35	11	7000	3800	11900	16800	0.045
17	7203	40	12	8800	4800	10500	14000	0.065
20	7204	47	14	11200	6600	8400	11900	0.110
25	7205	52	15	12400	8100	7000	10500	0.130
30	7206	62	16	19000	12400	5900	8400	0.200
35	7207	72	17	24500	16600	5600	7700	0.280
40	7208	80	18	29100	20800	4900	6600	0.370
45	7209	85	19	30100	22400	4600	6300	0.420
50	7210	90	20	31200	24400	4200	5600	0.470
55	7211	100	21	39000	30400	3900	5200	0.620
60	7212	110	22	45700	36400	3500	4600	0.800
65	7213	120	23	53000	43200	3100	4200	1.000
70	7214	125	24	57200	48000	3000	3900	1.100
75	7215	130	25	58200	51200	3000	3900	1.200
80	7216	140	26	66500	58800	2600	3500	1.450
85	7217	150	28	76400	66400	2500	3300	1.850
90	7218	160	30	86400	77200	2300	3100	2.300
95	7219	170	32	99200	86400	2200	3000	2.700
100	7220	180	34	108000	97600	2100	2800	3.300
105	7221	190	36	118400	109600	1900	2600	3.950
110	7222	200	38	130400	122400	1800	2500	4.600
120	7224	215	40	132000	130400	1500	2200	6.100
130	7226	230	40	148800	154400	1300	1900	6.950
140	7228	250	42	145600	156800	1200	1800	8.850
150	7230	270	45	156000	179200	1100	1600	11.500
160	7232	290	48	159200	188800	1100	1500	14.000
170	7234	310	52	176800	216000	1100	1500	17.500
180	7236	320	52	200800	256000	1000	1400	18.000
190	7238	340	55	220800	284000	900	1300	22.000
220	7244	400	65	255200	372000	700	1100	37.000
240	7248	440	72	291200	432000	700	1000	49.000

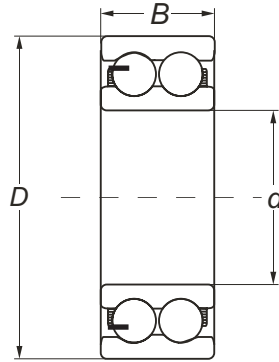


Inner bore d mm	Bearing number	Principal dimensions		Basic load ratings		Max runout speed		Mass kg
		D mm	B mm	dynamic C N	static C_0 N	grease oil	r/min	
12	7301	37	12	8400	4000	11900	16800	0.06
15	7302	42	13	10400	5300	10500	14000	0.08
17	7303	47	14	12700	6600	9100	12600	0.11
20	7304	52	15	15200	8300	7700	11200	0.14
25	7305	62	17	20800	12400	6300	9100	0.23
30	7306	72	19	27600	16900	5600	7700	0.34
35	7307	80	21	31200	19600	5200	7000	0.45
40	7308	90	23	39500	26800	4600	6300	0.63
45	7309	100	25	48400	33200	4200	5600	0.85
50	7310	110	27	59200	40800	3700	4900	1.10
66	7311	120	29	68100	48000	3300	4400	1.40
60	7312	130	31	76400	55600	3100	4200	1.75
65	7313	140	33	86400	64000	3000	3900	2.15
70	7314	150	35	95200	72000	2600	3500	2.65
75	7315	160	37	106400	84800	2500	3300	3.20
80	7316	170	39	114400	94400	2300	3100	3.80
85	7317	180	41	122400	105600	2200	3000	4.45
90	7318	190	43	132000	116800	2100	2800	5.20
95	7319	200	45	142400	130400	1900	2600	6.05
100	7320	215	47	162400	152000	1800	2500	7.50
105	7321	225	49	169600	166400	1600	2300	8.55
110	7322	240	50	180000	179200	1500	2200	10.00
120	7324	260	55	190400	200000	1300	1900	14.50
130	7326	280	58	200800	216000	1200	1800	17.50
140	7328	300	62	220800	248000	1100	1600	21.50
150	7330	320	65	241600	292000	1100	1500	26.00
170	7334	360	72	286400	364000	900	1300	36.00
180	7336	380	75	296800	392000	900	1200	42.00
190	7338	400	78	328000	448000	800	1100	48.50



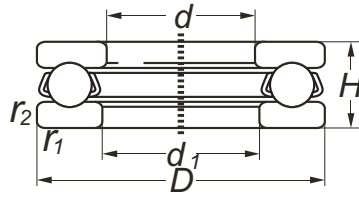
Inner bore d mm	Bearing number			Principal dimensions		Basic load ratings		Max runout speed r/min	Mass kg
	open	with shields	with seals	D mm	B	dynamic C N	static Co		
10	5200	5200-ZZ	5200-2RS	30	14.3	5700	4300	13000	0.051
12	5201	5201-ZZ	5201-2RS	32	15.9	8000	5800	12000	0.058
15	5202	5202-ZZ	5202-2RS	35	15.9	8900	6500	10000	0.066
17	5203	5203-ZZ	5203-2RS	40	17.5	15200	8000	9500	0.096
20	5204	5204-ZZ	5204-2RS	47	20.6	14800	10600	8500	0.160
25	5205	5205-ZZ	5205-2RS	52	20.6	17200	13000	7400	0.180
30	5206	5206-ZZ	5206-2RS	62	23.8	24000	17000	6000	0.290
35	5207	5207-ZZ	5207-2RS	72	27.0	29600	22000	5500	0.440
40	5208	5208-ZZ	5208-2RS	80	30.2	35000	28000	5000	0.580
45	5209	5209-ZZ	5209-2RS	85	30.2	39000	32000	4500	0.630
50	5210	5210-ZZ	5210-2RS	90	30.2	41000	34000	4100	0.660
55	5211	5211-ZZ	5211-2RS	100	33.3	52000	44000	3800	0.960
60	5212	5212-ZZ	5212-2RS	110	36.5	62000	55000	3500	1.360
65	5213	5213-ZZ	5213-2RS	120	38.1	69000	63000	3200	1.660
70	5214	5214-ZZ	5214-2RS	125	39.7	76000	70000	3100	1.810

*Load rating and limiting speed based on sealed bearing

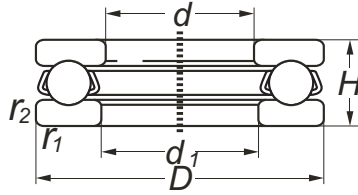


Inner bore <i>d</i> mm	Bearing number			Principal dimensions		Basic load ratings		Max runout speed r/min	Mass kg
	open	with shields	with seals	<i>D</i> mm	<i>B</i>	dynamic C N	static Co		
15	5302	5302 -ZZ	5302 -2RS	42	19.0	11500	8000	10000	0.13
17	5303	5303 -ZZ	5303 -2RS	47	22.2	15000	11000	9000	0.18
20	5304	5304 -ZZ	5304 -2RS	52	22.2	19600	12000	8000	0.22
25	5305	5305 -ZZ	5305 -2RS	62	25.4	26000	17000	6600	0.35
30	5306	5306 -ZZ	5306 -2RS	72	30.2	33000	24000	5500	0.53
35	5307	5307 -ZZ	5307 -2RS	80	34.9	44000	30000	5000	0.73
40	5308	5308 -ZZ	5308 -2RS	90	36.5	47300	35000	4400	0.95
45	5309	5309 -ZZ	5309 -2RS	100	39.7	68000	51000	4100	1.42
50	5310	5310 -ZZ	5310 -2RS	110	44.4	88500	67000	3600	1.93
55	5311	5311 -ZZ	5311 -2RS	120	49.2	95000	85000	3300	2.30
60	5312	5312 -ZZ	5312 -2RS	130	54.0	110000	98000	3100	3.16
65	5313	5313 -ZZ	5313 -2RS	140	58.7	142000	113000	2900	3.91
70	5314	5314 -ZZ	5314 -2RS	150	63.5	160000	129000	2700	4.89
75	5315	5315 -ZZ	5315 -2RS	160	68.3	174000	147000	2500	5.97

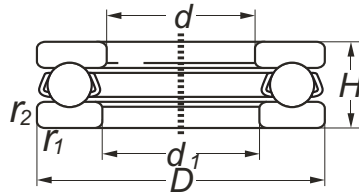
*Load rating and limiting speed based on sealed bearing



Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm				Basic load ratings		Fatigue load limit Pu N	Max runout speed		Mass kg
		<i>D</i>	<i>H</i>	<i>d</i> ₁	<i>r</i> _{1,2} <i>min</i>	dynamic C N	static Co		grease	oil	
10	51100	24	9	11	0.3	7900	11200	1.00	4900	6600	0.020
12	51101	26	9	13	0.3	8300	12200	0.81	4600	6300	0.022
15	51102	28	9	16	0.3	7400	11200	1.00	4400	5900	0.023
17	51103	30	9	18	0.3	7800	12200	1.20	4400	5900	0.025
20	51104	35	10	21	0.3	10100	16600	2.20	3900	5200	0.038
25	51105	42	11	26	0.6	12700	23200	4.40	3300	4400	0.056
30	51106	47	11	32	0.6	13400	26800	5.80	3100	4200	0.063
35	51107	52	12	37	0.6	13900	30000	7.30	3000	3900	0.080
40	51108	60	13	42	0.6	18700	40000	13.00	2600	3500	0.120
45	51109	65	14	47	0.6	19300	45600	16.00	2300	3100	0.140
50	51110	70	14	52	0.6	20400	50400	20.00	2200	3000	0.160
55	51111	78	16	57	0.6	24500	62400	31.00	1900	2600	0.230
60	51112	85	17	62	1.0	28600	72000	42.00	1800	2500	0.200
65	51113	90	18	67	1.0	29600	78400	49.00	1600	2300	0.330
70	51114	95	18	72	1.0	30100	83200	56.00	1600	2300	0.350
75	51115	100	19	77	1.0	35300	109600	97.00	1500	2200	0.400
80	51116	105	19	82	1.0	35900	112000	100.00	1400	2100	0.420
85	51117	110	19	87	1.0	36900	120000	120.00	1400	2100	0.440
90	51118	120	22	92	1.0	47300	152000	190.00	1200	1800	0.670
100	51120	135	25	102	1.0	68100	216000	380.00	1100	1600	0.970
110	51122	145	25	112	1.0	69600	232000	440.00	1100	1500	1.050
120	51124	155	25	122	1.0	70700	248000	500.00	1100	1500	1.150
130	51126	170	30	132	1.0	88800	312000	790.00	900	1300	1.850
140	51128	180	31	142	1.0	88800	320000	830.00	900	1200	2.050
150	51130	190	31	152	1.0	88800	320000	830.00	800	1100	2.200
160	51132	200	31	162	1.0	89600	340000	940.00	800	1100	2.350
170	51134	215	34	172	1.1	106400	400000	1300.00	7000	1100	3.300
180	51136	225	34	183	1.1	108000	424000	1500.00	700	1000	3.500
190	51138	240	37	193	1.1	137600	524000	2200.00	600	900	4.050
200	51140	250	37	203	1.1	134400	524000	2200.00	600	900	4.250
220	51144	270	37	223	1.1	142400	588000	2800.00	600	900	4.600
240	51148	300	45	243	1.5	187200	772000	4800.00	500	700	7.550
260	51152	320	45	263	1.5	190400	816000	5400.00	500	700	8.100
280	51156	350	53	283	1.5	255200	1072000	9300.00	400	600	12.000

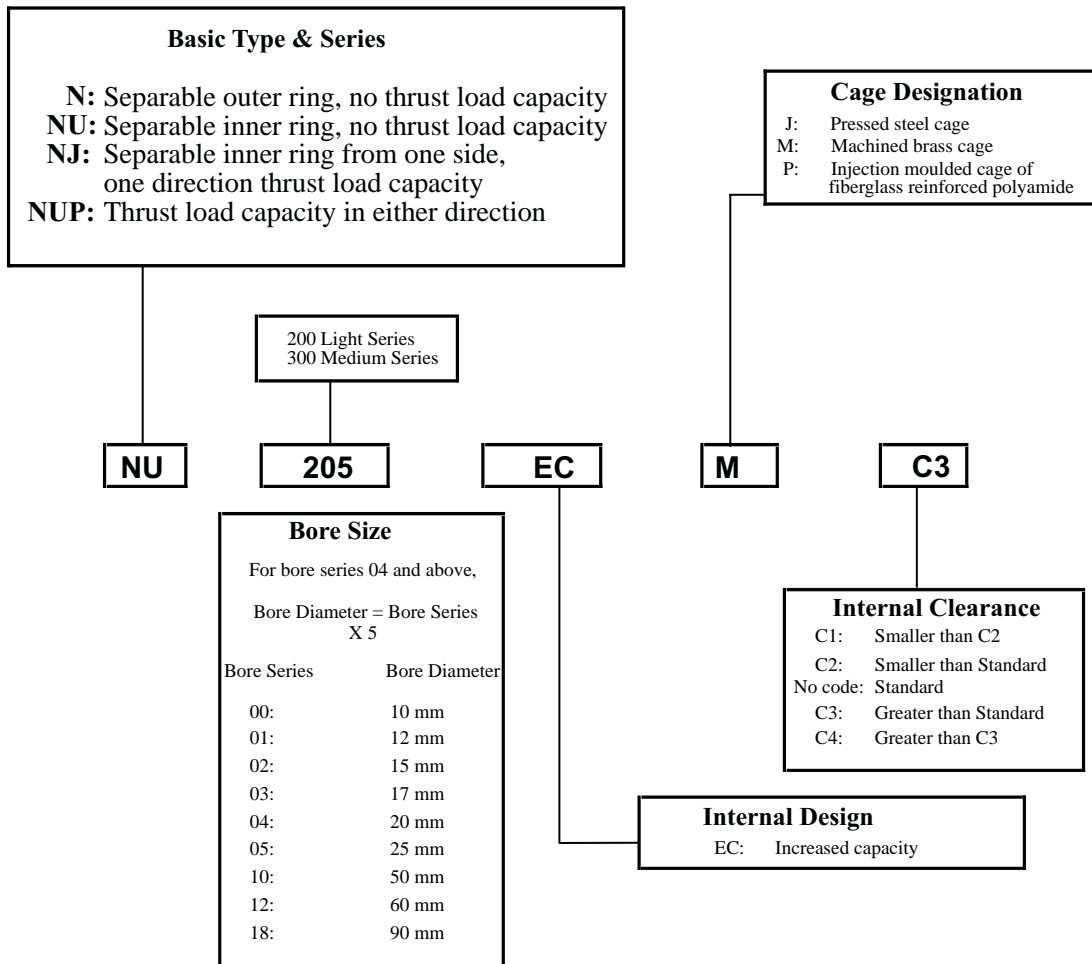


Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm				Basic load ratings		Fatigue load limit Pu N	Max runout speed		Mass kg
		<i>D</i>	<i>H</i>	<i>d</i> ₁	<i>r</i> _{1,2} <i>min</i>	dynamic C N	static Co		grease	oil	
								r/min			
10	51200	26	11	12	0.6	10100	13600	1.5	4200	5600	0.031
12	51201	28	11	14	0.6	10600	15200	1.9	4200	5600	0.034
15	51202	32	12	17	0.3	13200	20000	3.3	3700	4900	0.046
17	51203	35	12	19	0.6	13700	22000	3.9	3500	4600	0.053
20	51204	40	14	22	0.6	18000	30000	7.3	3100	4200	0.083
25	51205	47	15	27	0.6	22000	40000	13	2800	3700	0.110
30	51206	52	16	32	0.6	20400	38000	11	2500	3300	0.130
35	51207	62	18	37	1.0	28000	53600	23	2100	2800	0.220
40	51208	68	19	42	1.0	37400	78400	49	1900	2600	0.280
45	51209	73	20	47	1.0	31200	64000	33	1800	2500	0.300
50	51210	78	22	52	1.0	39500	84800	58	1600	2300	0.370
55	51211	90	25	57	1.0	49400	107200	93	1300	1900	0.590
60	51212	95	26	62	1.0	49900	112000	100	1300	1900	0.650
65	51213	100	27	67	1.0	50900	120000	120	1200	1800	0.780
70	51214	105	27	72	1.0	52000	128000	130	1200	1800	0.790
75	51215	110	27	77	1.0	54000	136000	150	1100	1600	0.830
80	51216	115	28	82	1.0	60800	152000	190	1100	1600	0.910
85	51217	125	31	88	1.0	78000	200000	330	1100	1500	1.200
90	51218	135	35	93	1.1	95200	240000	470	1000	1400	1.700
100	51220	150	38	103	1.1	99200	256000	530	900	1200	2.200
110	51222	160	38	113	1.1	104000	288000	670	800	1100	2.400
120	51224	170	39	123	1.1	112000	320000	830	700	1100	2.650
130	51226	190	45	133	1.5	148800	432000	1500	600	900	4.000
140	51228	200	46	143	1.5	152000	456000	1700	600	900	4.350
150	51230	215	50	153	1.5	190400	588000	2800	600	900	6.100
160	51231	225	51	163	1.5	193600	624000	3200	500	800	6.550
170	51234	240	55	173	1.5	228800	744000	4500	500	700	8.150
180	51236	250	56	183	1.5	236800	800000	5200	500	700	8.600
190	51238	270	62	194	2.0	265600	928000	7000	500	7000	12.000
200	51240	280	62	204	2.0	270400	976000	7700	500	7000	12.000
220	51244	300	63	224	2.0	280800	105600	9100	400	600	13.000
240	51248	340	78	244	2.1	369600	1488000	18000	400	500	23.000
260	51252	360	79	264	2.1	380000	1600000	21000	300	500	25.000
280	51256	380	80	284	2.1	395200	1728000	24000	300	500	26.500



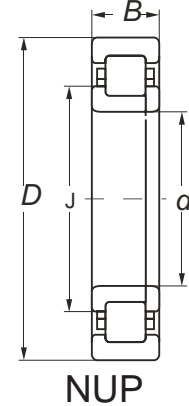
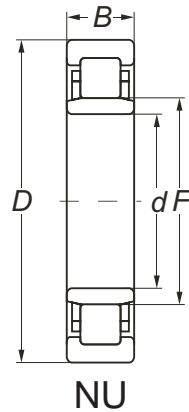
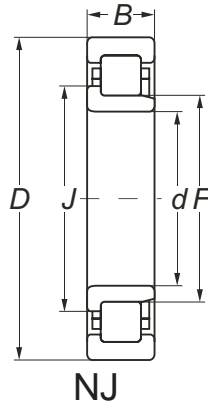
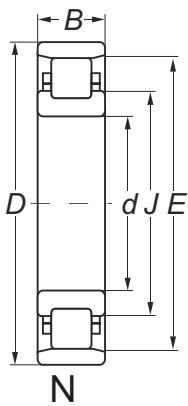
Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm				Basic load ratings		Fatigue load limit Pu N	Max runout speed		Mass kg
		<i>D</i>	<i>H</i>	<i>d</i> ₁	<i>r</i> _{1,2} <i>min</i>	C N	C ₀		grease	oil	
25	51305	52	18	27	1.0	27600	44000	15	2300	4500	0.17
30	51306	60	21	32	1.0	30100	52400	22	1900	3800	0.26
35	51307	68	24	37	1.0	39500	70400	40	1600	3400	0.38
40	51308	78	26	42	1.0	49400	89600	65	1400	3000	0.53
45	51309	85	28	47	1.0	60800	112000	100	1300	2800	0.66
50	51310	95	31	52	1.1	70700	138400	160	1200	2600	0.94
55	51311	105	35	57	1.1	83200	166400	220	1100	2200	1.30
60	51312	110	35	62	1.1	80800	166400	220	1100	2200	1.35
65	51313	115	36	67	1.1	84800	176000	250	1000	2000	1.50
70	51314	125	40	72	1.1	108000	240000	470	900	1900	2.00
75	51315	135	44	77	1.5	130400	288000	670	800	1700	2.60
80	51316	140	44	82	1.5	127200	288000	670	800	1700	2.70
85	51317	150	49	88	1.5	152000	340000	940	700	1600	3.55
90	51318	155	50	93	1.5	156000	372000	1100	700	1500	3.80
100	51320	170	55	103	1.5	183200	448000	1600	600	1400	4.95
110	51322	190	63	113	2.0	220800	576000	2700	500	1200	7.85
120	51324	210	70	123	2.1	260000	732000	4400	500	1100	11.00
130	51326	225	75	134	2.1	286400	848000	5800	500	1000	13.00
140	51328	240	80	144	2.1	317600	960000	7700	400	950	15.50
150	51330	250	80	154	2.1	328000	1032000	8700	400	900	16.50
160	51332	270	87	164	3.0	359200	1200000	12000	400	850	21.00
170	51334	280	87	174	3.0	374400	1280000	13000	400	800	22.00
180	51336	300	95	184	3.0	416000	1464000	17000	300	750	28.50
200	51340	340	110	205	4.0	499200	1920000	30000	300	630	44.50

Cylindrical Roller Bearings



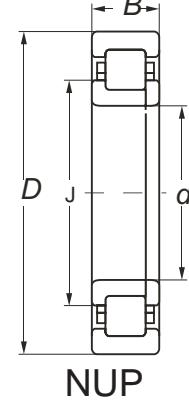
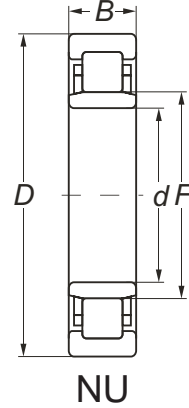
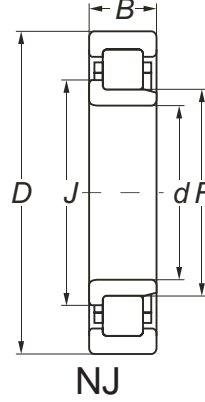
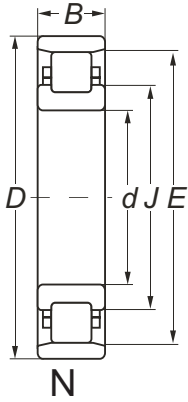
CYLINDRICAL ROLLER BEARINGS SINGLE ROW

N, NJ, NU and NUP 1000 SERIES



Inner bore <i>d</i> mm	Bearing number	Principal dimensions					Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>B</i>	<i>F</i>	<i>J</i>	<i>E</i>	dynamic <i>C</i>	static <i>C₀</i>	grease	oil	
		mm					N		r/min		
25	1005	47	12	30.5	32.7	41.5	11300	10500	10500	12600	0.084
30	1006	55	13	36.5	39.8	48.5	14300	13800	8400	10500	0.120
35	1007	62	14	42.0	46.6	55.0	28600	30400	7000	9100	0.160
40	1008	68	15	47.0	49.8	61.0	20000	20800	6600	8400	0.220
45	1009	75	16	52.5	55.5	67.5	35600	41600	6300	7700	0.260
50	1010	80	16	57.5	60.5	72.5	24600	27600	5900	7000	0.310
55	1011	90	18	64.5	67.7	80.5	45700	55600	4900	5900	0.400
60	1012	95	18	69.5	72.7	85.5	29920	35200	4600	5600	0.480
65	1012	100	18	74.5	77.7	90.5	30400	37200	4400	5200	0.510
70	1014	110	20	80.0	84.0	100.0	44800	53760	4200	4900	0.700
75	1015	115	20	85.0	89.0	105.0	46600	56800	3900	4600	0.740
80	1016	125	22	91.5	95.9	113.5	52800	65200	3700	4400	0.990
80	1017	130	22	96.5	100.9	118.5	54500	69200	3500	4200	1.050
90	1018	140	24	103.0	107.8	127.0	64700	83200	3300	3900	1.350
95	1019	145	24	108.0	112.8	132.0	67300	88000	3100	3700	1.400
100	1020	150	24	113.0	117.8	137.0	68600	91200	30100	3500	1.450
105	1021	160	26	119.5	124.7	145.5	80800	109600	2800	3300	1.850
110	1022	170	28	125.0	131.0	155.0	102400	132800	2600	3100	2.300
120	1024	180	28	135.0	141.0	165.0	107200	146400	2300	2800	2.450
130	1026	200	33	148.0	154.8	182.0	132000	179200	2200	2600	3.750
140	1028	210	33	158.0	164.8	192.0	137600	196000	2100	2500	4.000
150	1030	225	35	169.5	176.7	205.5	155200	220000	1800	2200	4.850
160	1032	240	38	180.0	188.0	220.0	183200	260000	1600	2100	5.950
170	1034	260	42	193.0	201.8	237.0	220000	320000	1500	1900	4.900
180	1036	280	46	205.0	215.0	255.0	268800	380000	1400	1800	10.500
190	1038	290	46	215.0	225.0	265.0	277600	400000	1400	1800	10.000
200	1040	310	51	229.0	239.4	281.0	304000	456000	1300	1600	14.000
220	1044	340	56	250.0	262.0	310.0	396000	588000	1200	1500	18.500
240	1048	360	56	270.0	282.0	330.0	418400	640000	1100	1400	20.000
260	1052	400	65	296.0	309.6	364.0	501600	772000	1000	1200	29.000
280	1056	420	65	316.0	329.6	384.0	528000	848000	900	1100	32.500
300	1060	460	74	340.0	356.0	420.0	686400	1096000	800	1000	44.000
320	1064	480	74	360.0	376.0	440.0	704000	1144000	700	900	48.500
340	1068	520	82	385.0	403.0	475.0	864000	1408000	700	900	65.000

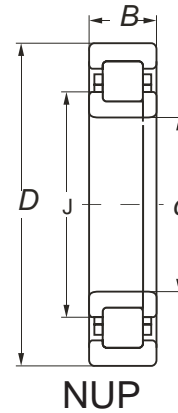
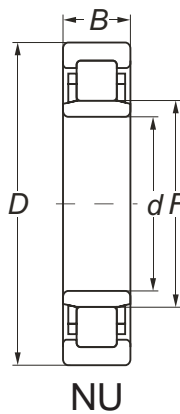
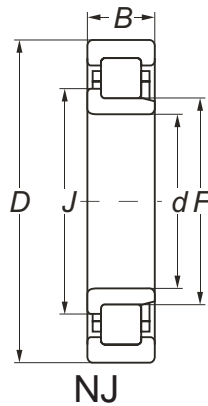
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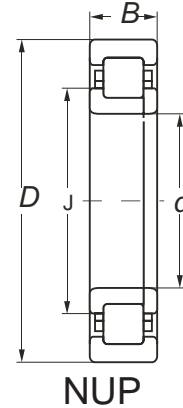
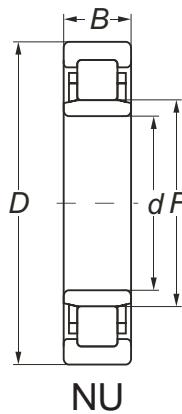
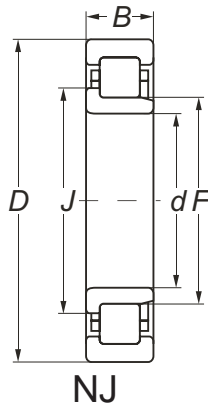
Inner bore <i>d</i> mm	Bearing number	Principal dimensions					Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>B</i>	<i>F</i>	<i>J</i>	<i>E</i>	dynamic C	static Co	grease	oil	
				mm				N		r/min	
15	202	35	11	19.3	21.9	N/A	10000	8100	12600	15400	0.047
17	203	40	12	22.1	25.0	35.1	13700	11400	11200	13300	0.068
20	204	47	14	26.5	29.7	41.5	20000	17600	9100	11200	0.110
25	205	52	15	31.5	34.7	46.5	22800	21600	7700	9800	0.130
30	206	62	16	37.5	41.2	55.5	30400	29200	6600	8400	0.200
35	207	72	17	44.0	48.1	64.0	38700	38400	5900	7000	0.300
40	208	80	18	49.5	54.0	71.5	43100	42400	5200	6300	0.370
45	209	85	19	54.5	59.0	76.5	48400	51200	4600	5600	0.430
50	210	90	20	59.5	64.0	81.5	51500	55600	4400	5200	0.480
55	211	100	21	66.0	70.8	90.0	67300	76000	4200	4900	0.660
60	212	110	22	72.0	77.5	100.0	74800	81600	3700	4400	0.810
65	213	120	23	78.5	84.4	108.5	84800	94400	3300	3900	1.050
70	214	125	24	83.5	89.4	113.5	95200	109600	3100	3700	1.150
75	215	130	25	88.5	94.3	118.5	104000	124800	3100	3700	1.250
80	216	140	26	95.3	101.0	127.3	110400	132800	2800	3300	1.500
85	217	150	28	100.5	107.0	136.5	132000	160000	2600	3100	1.900
90	218	160	30	107.0	114.0	145.0	146400	176000	2500	2600	2.350
95	219	170	34	112.5	120.0	154.5	200800	244000	2200	2500	3.450
100	220	180	36	119.0	127.0	163.0	211200	252000	2100	2300	3.850
105	221	190	38	125.0	134.0	173.0	233600	292000	1900	2100	4.000
110	222	200	40	132.5	141.0	180.5	272800	344000	1600	1900	4.800
120	224	215	40	143.5	153.0	195.5	286400	364000	1500	1800	5.750
130	226	230	42	153.5	164.0	209.5	312800	408000	1400	1600	6.450
140	228	250	45	169.0	179.0	221.0	356800	480000	1300	1500	8.300
150	230	270	48	182.0	193.0	238.0	400800	544000	1200	1500	10.500
160	232	290	52	195.0	206.0	259.0	492800	652000	1200	1400	15.000
170	234	310	52	207.0	220.0	279.0	501600	680000	1100	1300	19.000
180	236	320	55	217.0	230.0	289.0	554400	772000	1100	3000	19.500
190	238	340	32	230.0	224.0	306.0	716000	212000	2300	2800	23.500
200	240	360	58	243.0	258.0	323.0	612000	848000	1000	1200	28.500
200	244	400	65	270.0	286.0	350.0	612000	864000	1000	1200	38.500
240	248	440	72	295.0	313.0	385.0	761600	1096000	900	1100	51.000
260	252	480	80	320.0	340.0	420.0	936000	1360000	700	900	68.500
280	256	500	80	340.0	360.0	449.0	912000	1360000	700	900	71.500

CYLINDRICAL ROLLER BEARINGS SINGLE ROW

NJ, NU and NUP 2200 SERIES



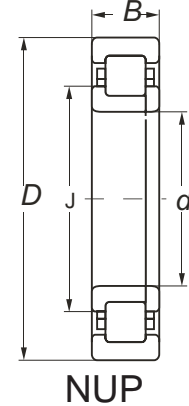
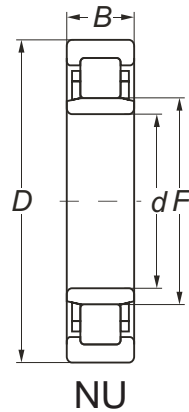
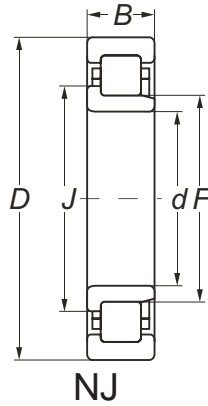
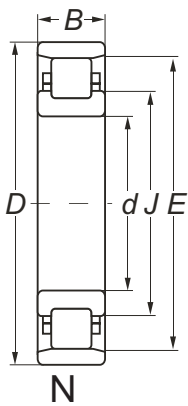
Inner bore <i>d</i> mm	Bearing number	Principal dimensions				Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>B</i> mm	<i>F</i>	<i>J</i>	dynamic <i>C</i>	static <i>C₀</i> N	grease oil	r/min	
20	2204	47	18	26.5	29.7	23700	22000	9100	11200	0.14
25	2205	52	18	31.5	34.7	27200	27200	7700	9800	0.16
30	2206	62	20	37.5	41.2	38700	39200	6600	8400	0.26
35	2207	72	23	44.0	48.1	47500	50400	5900	7000	0.40
40	2208	80	23	49.5	54.0	56300	60000	5200	6300	0.49
45	2209	85	23	54.5	59.0	58900	65200	4600	5600	0.52
50	2210	90	23	59.5	64.0	62400	70400	4400	5200	0.56
55	2211	100	25	66.0	70.8	79200	94400	4200	4900	0.79
60	2212	110	28	72.0	77.5	102400	122400	3700	4400	1.10
65	2213	120	31	78.5	84.4	117600	144000	3300	3900	1.40
70	2214	125	31	83.5	89.4	123200	154400	3100	3700	1.50
75	2215	130	31	88.5	94.3	128800	166400	3100	3700	1.60
80	2216	140	33	95.3	101.0	149600	196000	2800	3300	2.00
85	2217	150	36	100.5	107.0	172800	224000	2600	3100	2.45
90	2218	160	40	107.0	114.0	193600	252000	2500	3000	3.15
95	2219	170	43	112.5	120.0	228800	300000	2300	2800	4.00
100	2220	180	46	119.0	134.0	268800	360000	2200	2600	4.75
110	2222	200	53	132.5	127.0	304000	416000	1900	2300	6.70
120	2224	215	58	143.5	141.0	365600	504000	1600	2100	8.30
130	2226	230	64	153.5	153.0	422400	588000	1500	1900	10.50
140	2228	250	68	169.0	164.0	457600	664000	1400	1800	13.50
150	2230	270	73	182.0	179.0	501600	744000	1300	1600	19.00
160	2232	290	80	193.0	194.0	647200	960000	1200	1500	24.00
170	2234	310	86	205.0	205.0	774400	1144000	1200	1500	30.00
180	2236	320	86	215.0	229.0	808000	1200000	1100	1400	31.50
190	2238	340	92	228.0	242.7	880000	1328000	1100	1300	39.00
200	2240	360	98	241.0	256.3	984000	1520000	1000	1200	46.00
220	2244	400	108	259.0	279.4	1256000	1824000	800	1100	62.50
240	2248	440	120	295.0	N/A	1160000	1888000	800	1000	84.00
260	2252	480	130	327.0	N/A	1432000	2400000	700	900	110.00
280	2256	500	130	364.0	N/A	1760000	2600000	600	800	115.00
300	2260	540	140	390.0	N/A	1672000	2760000	600	800	145.00
320	2264	580	150	416.0	N/A	1904000	3200000	600	700	180.00
340	2268	620	165	437.0	N/A	2112000	3600000	500	700	225.00



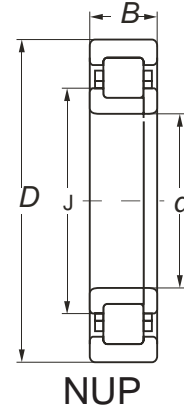
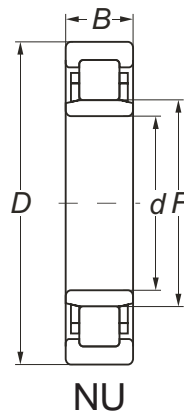
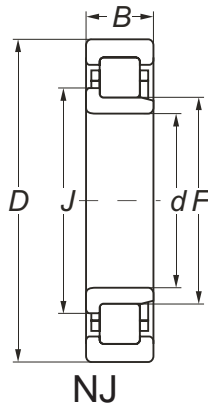
Inner bore <i>d</i> mm	Bearing number	Principal dimensions				Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>B</i> mm	<i>F</i>	<i>J</i>	dynamic C	static Co N	grease oil	r/min	
20	2304	52	21	27.5	31.2	33000	30400	7700	9800	0.21
25	2305	62	24	34.0	38.1	44800	44000	6300	7700	0.35
30	2306	72	27	40.5	45.0	58900	60000	5600	6600	0.53
35	2307	80	31	46.2	51.0	73000	78400	4900	5900	0.72
40	2308	90	33	52.0	57.5	89600	96000	4400	5200	0.94
45	2309	100	36	58.5	64.4	110400	122400	3900	4600	1.30
50	2310	110	40	65.0	71.2	128800	148800	3500	4200	1.70
55	2311	120	43	70.5	77.5	160800	185600	3300	3900	2.20
60	2312	130	46	77.0	84.3	179200	212000	3000	3500	2.75
65	2313	140	48	82.5	90.5	200800	232000	2800	3300	3.30
70	2314	150	35	89.0	97.3	164000	182400	2500	3000	2.85
70	2314	150	51	89.0	97.3	220000	260000	2500	3000	4.00
75	2315	160	55	95.0	104.0	264000	320000	2300	2800	4.90
80	2316	170	58	101.0	110.0	286400	352000	2200	2600	5.85
85	2317	180	60	108.0	117.0	316800	392000	2100	2500	6.85
90	2318	190	64	113.5	124.0	352000	432000	1900	2300	8.00
95	2319	200	67	121.5	132.0	374400	468000	1800	2200	9.35
100	2320	215	73	127.5	139.0	466400	588000	1600	2100	12.00
110	2322	240	80	143.0	155.0	545600	720000	1400	1800	17.00
120	2324	260	86	154.0	168.0	633600	832000	1300	1600	24.00
130	2326	280	93	167.0	181.0	748000	1000000	1200	1500	30.00
140	2328	300	102	180.0	195.0	840000	1144000	1200	1500	37.00
150	2330	320	108	193.0	209.0	952000	1304000	1100	1400	45.00
160	2332	340	114	204.0	221.6	1056000	1488000	1000	1200	53.00
170	2334	360	120	220.0	235.7	984000	1440000	900	1100	63.00
180	2336	380	126	232.0	248.0	1120000	1632000	900	1100	73.00
190	2338	400	132	240.0	262.5	1464000	2040000	800	1000	82.50
200	2340	420	138	247.0	276.1	1640000	2280000	800	1000	96.00
220	2344	460	145	275.0	302.2	1864000	2600000	700	900	120.00
240	2348	500	155	310.0	N/A	1696000	2600000	600	800	155.00
280	2356	580	175	362.0	N/A	2160000	3440000	500	700	230.00

CYLINDRICAL ROLLER BEARINGS SINGLE ROW

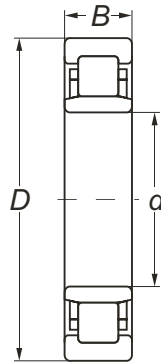
N, NJ, NU and NUP 300 SERIES



Inner bore <i>d</i> mm	Bearing number	Principal dimensions					Basic load ratings		Max runout speed		Mass kg
		<i>D</i>	<i>B</i>	<i>F</i>	<i>J</i>	<i>E</i>	dynamic <i>C</i>	static <i>C₀</i>	grease	oil	
				mm			N		r/min		
15	302	42	13	21.0	24.3	N/A	15500	12200	11200	13300	0.086
20	304	52	15	27.5	27.7	45.5	24600	20800	8400	10500	0.150
25	305	62	17	34.0	31.2	54.0	32100	29200	6600	8400	0.240
30	306	72	19	40.5	38.1	62.5	40900	38400	6300	7700	0.360
35	307	80	21	46.2	45.0	70.2	51500	50400	5600	6600	0.480
40	308	90	23	52.0	51.0	80.0	64700	62400	4600	5600	0.650
45	309	100	25	58.5	57.5	88.5	79200	80000	4400	5200	0.900
50	310	110	27	65.0	64.4	97.0	88000	89600	3500	4200	1.150
55	311	120	29	70.5	71.2	106.5	110400	114400	3300	3900	1.450
60	312	130	31	77.0	77.5	115.0	120800	128000	3000	3500	1.800
65	313	140	33	82.5	84.3	124.5	146400	156800	2800	3300	2.250
70	314	150	35	89.0	90.5	133.0	164000	182400	2500	3000	2.750
75	315	160	37	95.0	97.3	143.0	193600	212000	2300	2800	3.300
80	316	170	39	101.0	104.0	151.0	208000	232000	2200	2600	3.950
85	317	180	41	108.0	110.0	160.0	237600	268000	2100	2500	4.700
90	318	190	43	113.5	117.0	169.5	255200	288000	1900	2300	5.450
95	319	200	45	121.5	124.0	177.5	272800	312000	1800	2200	6.250
100	320	215	47	127.5	132.0	191.5	312800	352000	1600	2100	7.600
105	321	225	49	133.0	139.0	201.0	352000	400000	1500	1900	8.800
110	322	240	50	143.0	145.0	211.0	374400	432000	1400	1800	10.500
120	324	260	55	154.0	155.0	230.0	431200	496000	1300	1600	13.500
130	326	280	58	167.0	168.0	247.0	501600	600000	1200	1500	18.500
140	328	300	62	180.0	181.0	260.0	545600	664000	1200	1500	22.500
150	330	320	65	193.0	195.0	283.0	624800	772000	1100	1400	27.500
160	332	340	68	204.0	209.0	300.0	704000	864000	1000	1200	32.500
170	334	360	72	220.0	N/A	318.0	647200	832000	1100	1300	38.500
180	336	380	75	232.0	N/A	335.0	730400	944000	1000	1200	42.500
190	338	400	79	245.0	N/A	353.0	912000	1200000	800	1000	50.000
200	340	420	80	260.0	N/A	370.0	792000	1056000	900	1100	56.000
220	344	460	88	284.0	N/A	406.0	968000	1304000	800	1000	72.500
240	348	500	95	310.0	N/A	442.0	1160000	1600000	700	900	94.500



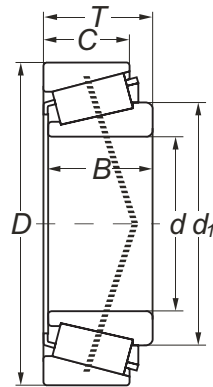
Inner bore d mm	Bearing number	Principal dimensions				Basic load ratings		Max runout speed		Mass kg
		D	B mm	F	J	dynamic C	static Co N	grease oil	r/min	
30	406	90	23	45.0	50.5	48400	42400	5200	6300	0.75
35	407	100	25	53.0	59.0	61200	55600	4600	5600	1.00
40	408	110	27	58.0	64.8	77400	72000	4200	4900	1.30
45	409	120	29	64.5	71.8	84800	81600	3900	4600	1.65
50	410	130	31	70.8	78.8	104000	101600	3500	4200	2.00
55	411	140	33	77.2	85.2	113600	112000	3300	3900	2.50
60	412	150	35	83.0	91.8	134400	138400	3000	3500	3.00
65	NJ 413	160	37	89.3	98.5	146400	152000	2800	3300	3.60
70	NU 414	180	42	100.0	110.0	183200	192000	2500	3000	5.25
75	NUP 415	190	45	104.5	116.0	211200	224000	2300	2800	6.25
80	416	200	48	110.0	122.0	242400	256000	2200	2600	7.30
85	417	210	52	113.0	126.0	255200	268000	2100	2500	8.70
90	418	225	54	123.5	137.0	304000	332000	1900	2300	10.50
95	419	240	55	133.5	147.0	330400	364000	1800	2200	13.50
100	420	250	58	139.0	153.0	343200	380000	1600	2100	14.00
105	421	260	60	144.5	159.0	400800	456000	1500	1900	19.00
110	422	280	65	155.0	171.0	418400	468000	1400	1800	20.00
120	424	310	72	170.0	188.0	515200	588000	1300	1600	28.00



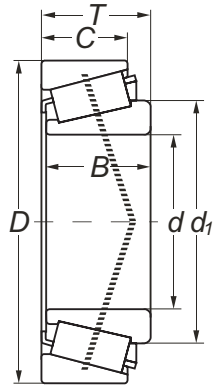
Inner bore <i>d</i> mm	Bearing number	Principal dimensions		Basic load ratings		Max runout speed		Mass kg
		<i>D</i> mm	<i>B</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease oil	r/min	
40	NU 5208 M	80	30.16	86686	104000	7500	8900	0.736
45	NU 5209 M	85	30.16	89760	111000	6700	7900	0.795
50	NU 5210 M	90	30.16	92600	128000	6300	7500	0.877
55	NU 5211 M	100	33.34	119000	178000	5600	6700	1.200
60	NU 5212 M	110	36.50	150000	211000	5300	6300	1.590
65	NU 5213 M	120	38.10	139000	196000	4700	5600	1.880
70	NU 5214 M	125	39.69	178000	261000	4700	5600	2.220
75	NU 5215 M	130	41.28	196000	299000	4500	5300	2.410
80	NU 5216 M	140	44.45	185000	282000	4200	5000	2.910
85	NU 5217 M	150	49.21	211000	316000	3800	4500	3.690
90	NU 5218 M	160	52.40	237000	355000	3500	4200	4.480
95	NU 5219 M	170	55.56	335000	511000	3300	4000	5.650
100	NU 5220 M	180	60.32	304000	473000	3200	3800	6.490
105	NU 5221 M	190	65.10	362000	573000	3000	3500	7.940
110	NU 5222 M	200	69.85	464000	736000	3000	3500	10.000
120	NU 5224 M	215	76.20	482000	794000	2700	3200	11.800
130	NU 5226 M	230	79.38	511000	841000	2500	3000	13.800
140	NU 5228 M	250	82.55	596000	981000	2200	2700	17.100
150	NU 5230 M	270	88.90	736000	1260000	2000	2400	22.900
160	NU 5232 M	290	98.42	764000	1310000	1900	2200	28.900
170	NU 5234 M	310	104.77	891000	1470000	1800	2100	35.500
180	NU 5236 M	320	107.95	1058000	1713000	1600	1900	37.900
190	NU 5238 M	340	114.30	1115000	1820000	1700	2100	44.900
200	NU 5240 M	360	120.65	1306000	2110000	1450	1800	54.250

Tapered sets and Interchanges

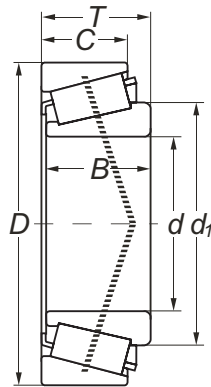
RBL	RBL PART NUMBER		GR BEARING	BCA	L+S	TIMKEN	KOYO
	CONE	CUP					
A1	LM11749	LM11710	BR1	A1	S1	SET1	K1
A2	LM11949	LM11910	BR2	A2	S2	SET2	K2
A3	M12649	M12610	BR3	A3	S3	SET3	K3
A4	L44649	L44610	BR4	A4	S4	SET4	K4
A5	LM48548	LM48510	BR5	A5	S5	SET5	K5
A6	LM67048	LM67010	BR6	A6	S6	SET6	K6
A7	Not sold separately		BR7	A7	S7	SET7	K7
A9	Not sold separately		BR9	A9	S9	SET9	K9
A10	Not sold separately		BR10	A10	S10	SET10	K10
A12	LM12749	LM12710	BR12	A12	S12	SET12	K12
A13	L68149	L68110	BR13	A13	S13	SET13	K13
A14	L44643	L44610	BR14	A14	S14	SET14	K14
A15	L45449	L45410	BR15	A15	S15	SET15	K15
A16	LM12749	LM12711	BR16	A16	S16	SET16	K16
A17	L68149	L68111	BR17	A17	S17	SET17	K17
A18	JL69349	JL69310	BR18	A18	S18	SET18	K18
A20	Not sold separately		BR20	A20	S20	SET20	K20
A29	LM67049A	LM67010	BR22	A29	S29	SET22	K29
A31	JL68145	JL68111 Z	BR24	A31	S31	SET24	K31
A34	LM12748F	LM12710	BR34	A34	S34	SET34	K34
A35	LM501349	LM501310	BR35	A35	S35	SET35	K35
A36	LM603049	LM603012	BR36	A36	S36	SET36	K36
A37	LM603049	LM603011	BR37	A37	S37	SET37	K37
A38	LM104949	LM104911	BR38	A38	S38	SET38	K38
A39	JL26749	JL26710	BR39	A39	S39	SET39	K39
A41	57410LFT	LM29710	BR41	A41	S41	SET41	K41



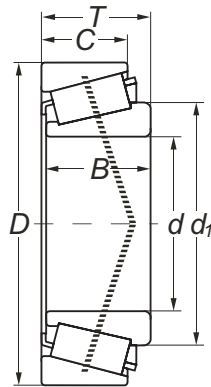
Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		<i>D</i>	<i>T</i>	<i>d</i> ₁	<i>B</i>	<i>C</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease r/min	oil	
17	30203	40	13.25	28.0	12	11	15200	14800	6300	9100	0.075
20	30204	47	15.25	33.2	14	12	22000	22400	5600	7700	0.120
25	30205	52	16.25	37.4	15	13	24600	26800	5200	7000	0.150
30	30206	62	17.25	44.6	16	14	32100	35200	4400	5900	0.230
35	30207	72	18.25	51.8	17	15	40900	44800	3700	4900	0.320
40	30208	80	19.75	57.5	18	16	49200	54400	3300	4400	0.420
45	30209	85	20.75	63.0	19	16	52800	61200	3100	4200	0.480
50	30210	90	21.75	67.9	20	17	61200	73200	3000	3900	0.540
55	30211	100	22.75	74.6	21	18	71700	84800	2600	3500	0.700
60	30212	110	23.75	81.5	22	19	79200	91200	2300	3100	0.880
65	30213	120	24.75	89.0	23	20	91200	107200	2100	2800	1.150
70	30214	125	26.25	93.9	24	21	100000	124800	2100	2800	1.250
75	30215	130	27.25	99.2	25	22	112000	140800	1900	2600	1.400
80	30216	140	28.25	105.0	26	22	120800	146400	1600	2300	1.600
85	30217	150	30.50	112.0	28	24	140800	176000	1500	2200	2.050
90	30218	160	32.50	118.0	30	26	155200	196000	1400	2100	2.550
95	30219	170	34.50	126.0	32	27	172800	220000	1300	1900	3.000
100	30220	180	37.00	133.0	34	29	196800	256000	1300	1900	3.650
105	30221	190	39.00	141.0	36	30	216000	284000	1200	1800	4.250
110	30222	200	41.00	148.0	38	32	246400	324000	1100	1600	5.100
120	30224	215	43.50	161.0	40	34	272800	372000	1100	1500	6.150
130	30226	230	43.75	173.0	40	34	295200	392000	1000	1400	7.600
140	30228	250	45.75	186.0	42	36	334400	456000	900	1300	8.650
150	30230	270	49.00	200.0	45	38	343200	448000	900	1200	11.000
160	30232	290	52.00	214.0	48	40	422400	588000	700	1100	13.000
170	30234	310	57.00	230.0	52	43	492800	692000	700	1000	19.000
180	30236	320	57.00	239.0	52	43	466400	652000	700	1000	20.000
190	30238	340	60.00	254.0	55	46	576800	800000	600	900	24.000
200	30240	360	64.00	268.0	58	48	633600	896000	600	900	25.000
220	30244	400	72.00	294.0	65	54	792000	1120000	500	800	40.000



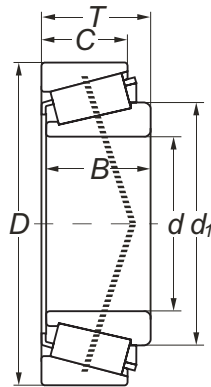
Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		<i>D</i>	<i>T</i>	<i>d</i> ₁ ≈	<i>B</i>	<i>C</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease r/min	oil r/min	
15	30302	42	14.25	27.3	13.0	11	17900	16000	6300	9100	0.095
17	30303	47	15.25	30.4	14.0	12	22400	20000	5900	8400	0.130
20	30304	52	16.25	34.3	15.0	13	27200	26000	5600	7700	0.170
25	30305	62	18.25	41.5	17.0	15	35600	34400	4600	6300	0.260
30	30306	72	20.75	48.4	19.0	16	44800	44800	3900	5200	0.390
35	30307	80	22.75	54.5	21.0	18	57600	58800	3500	4600	0.520
40	30308	90	25.25	61.2	32.5	28	68600	76000	3100	4200	0.720
45	30309	100	27.25	70.1	25.0	22	86400	96000	2800	3700	0.970
50	30310	110	29.25	77.2	27.0	23	100000	112000	2500	3300	1.250
55	30311	120	31.50	84.0	29.0	25	113600	130400	2200	3000	1.550
60	30312	130	33.50	91.9	31.0	26	134400	156800	2100	2800	1.950
65	30313	140	36.00	98.6	33.0	28	155200	182400	1800	2500	2.400
70	30314	150	38.00	105.0	35.0	30	176000	208000	1600	2300	2.900
75	30315	160	40.00	112.0	37.0	31	196800	232000	1500	2200	3.450
80	30316	170	42.50	120.0	39.0	33	216000	256000	1400	2100	4.100
85	30317	180	44.50	126.0	41.0	34	242400	292000	1300	1900	4.850
90	30318	190	46.50	132.0	43.0	36	264000	320000	1200	1800	5.650
95	30319	200	49.50	139.0	45.0	38	264000	312000	1200	1800	6.700
100	30320	215	51.50	148.0	47.0	39	321600	392000	1100	1600	8.050
105	30321	225	53.50	155.0	49.0	41	343200	424000	1100	1500	9.150
110	30322	240	54.50	165.0	50.0	42	378400	468000	4600	1500	11.000
120	30324	260	59.50	178.0	55.0	46	448800	568000	1000	1400	14.000
130	30326	280	63.75	196.0	58.0	49	501600	640000	900	1200	17.000
140	30328	300	67.75	205.0	62.0	53	589600	760000	800	1100	21.000
150	30330	320	72.00	220.0	65.0	55	660000	848000	700	1100	28.500
160	30332	340	75.00	233.0	68.0	58	730400	944000	700	1000	29.000
170	30334	360	80.00	248.0	72.0	62	816000	1072000	600	900	35.000
260	30352	540	113.00	376.0	102.0	85	1696000	2440000	400	600	110.000



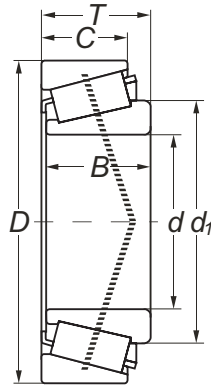
Inner bore d mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		D	T	d_1 \approx	B	C	dynamic C N	static C_0	grease r/min	oil r/min	
25	31305	62	18.25	45.8	17	13	30400	32000	3900	5200	0.26
30	31306	72	20.75	52.7	19	14	37800	40000	3500	4600	0.39
35	31307	80	22.75	59.6	21	15	49200	53600	3100	4200	0.52
40	31308	90	25.25	62.5	23	20	58900	65200	2800	3700	0.72
45	31309	100	27.25	74.7	25	18	73000	81600	2300	3100	0.95
50	31310	110	29.25	81.5	27	19	84800	96000	2200	3000	1.20
55	31311	120	31.50	88.4	29	21	96800	109600	1900	2600	1.55
60	31312	130	33.50	95.9	31	22	116000	132800	1800	2500	1.90
65	31313	140	36.00	103	33	23	132000	154400	1500	2200	2.35
70	31314	150	38.00	110.0	35	25	149600	176000	1400	2100	2.95
75	31315	160	40.00	116.0	37	26	167200	196000	1300	1900	3.50
80	31316	170	42.50	124.0	39	27	179200	212000	1300	1900	4.05
85	31317	180	44.50	131.0	41	28	193600	228000	1200	1800	4.60
90	31318	190	46.50	138.0	43	30	211200	252000	1100	1600	5.90
95	31319	200	49.50	145.0	45	32	233600	284000	1100	1600	6.95
100	31320 X	215	56.50	158.0	51	35	299200	372000	1100	1500	8.60
105	31321 X	225	58.00	165.0	53	36	321600	400000	1000	1400	9.65
110	31322 X	240	63.00	176.0	57	38	365600	468000	900	1300	12.00
120	31324 X	260	68.00	190.0	62	42	431200	556000	800	1100	15.50
130	31326 X	280	72.00	204.0	66	44	484000	624000	700	1100	18.50
140	31328 X	300	77.00	219.0	70	47	554400	720000	700	1000	24.50
150	31330 X	320	82.00	234.0	75	50	624800	816000	600	900	29.50



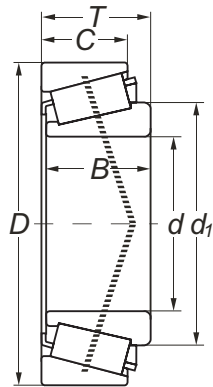
Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		<i>D</i>	<i>T</i>	<i>d</i> ₁ ≈	<i>B</i>	<i>C</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease r/min	oil r/min	
20	32004 X	42	15	31.1	15	12.0	19300	21600	5900	8400	0.097
22	320/22 X	44	15	33.4	15	11.5	20000	23200	5600	7700	0.100
25	32005X	47	15	36.5	15	11.5	21600	26000	5600	7700	0.110
28	320/28 X	52	16	40.3	16	12.0	25500	30400	4900	6600	0.150
30	32006 X	55	17	43.0	17	13.0	28600	35200	4600	6300	0.170
32	320/32 X	58	17	45.6	17	13.0	29500	37200	4400	5900	0.190
35	32007 X	62	18	49.2	18	14.0	34300	43200	4200	5600	0.220
40	32008 X	68	19	54.2	19	14.5	42200	56800	3700	4900	0.270
45	32009 X	75	20	60.4	20	15.5	46600	64000	3300	4400	0.340
50	32010 X	80	20	65.6	20	15.5	48400	70400	3100	4200	0.370
55	32011 X	90	23	73.2	23	17.5	64700	92800	2800	3700	0.550
60	32012 X	95	23	77.8	23	17.5	66000	97600	2600	3500	0.590
65	32013 X	100	23	83.3	23	17.5	67300	101600	2300	3100	0.630
70	32014 X	110	25	89.8	25	19.0	80800	122400	2200	3000	0.840
75	32015 X	115	25	95.1	25	19.0	84800	130400	2100	2800	0.900
80	32016 X	125	29	103.0	29	22.0	110400	172800	1800	2500	1.300
85	32017 X	130	29	108.0	29	22.0	112000	179200	1600	2300	1.350
90	32018 X	140	32	115.0	32	24.0	134400	216000	1500	2200	1.750
95	32019 X	145	32	120.0	32	24.0	134400	216000	1500	2200	1.800
100	32020 X	150	32	125.0	32	24.0	137600	224000	1400	2100	1.900
105	32021 X	160	35	132.0	35	26.0	160800	268000	1300	1900	2.400
110	32022 X	170	38	140.0	38	29.0	186400	312000	1200	1800	3.050
120	32024 X	180	38	150.0	38	29.0	193600	332000	1100	1600	3.250
130	32026 X	200	45	165.0	45	34.0	251200	432000	1100	1500	4.950
140	32028 X	210	45	175.0	45	34.0	264000	468000	1100	1500	5.250
150	32030 X	225	48	187.0	48	36.0	295200	524000	1000	1400	6.350
160	32032 X	240	51	200.0	51	38.0	343200	624000	900	1200	7.750
170	32034 X	260	57	214.0	57	43.0	409600	732000	800	1100	10.500
180	32036 X	280	64	229.0	64	48.0	515200	928000	700	1100	14.500
190	32038 X	290	64	240.0	64	48.0	528000	960000	700	1000	15.000
200	32040 X	310	70	254.0	70	53.0	598400	1096000	600	900	19.500
220	32044 X	340	76	279.0	76	57.0	717600	1328000	600	900	25.500
240	32048 X	360	76	299.0	76	57.0	748000	1440000	500	800	27.500
260	32052 X	400	87	328.0	87	65.0	936000	1760000	500	700	40.000



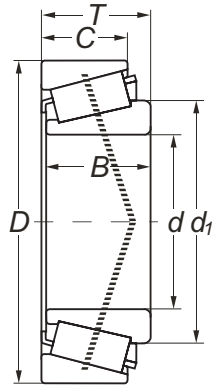
Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		<i>D</i>	<i>T</i>	<i>d</i> ₁ ≈	<i>B</i>	<i>C</i>	C N	Co	grease r/min	oil	
25	32205 B	52	19.25	40.2	18	15	28600	35200	4900	6600	0.19
28	322/28 B	58	20.25	43.9	19	16	33400	40000	4400	5900	0.25
30	32206 B	62	21.25	47.3	20	17	39600	46800	4200	5600	0.30
30	32206	62	21.25	45.2	20	17	40000	45600	4400	5900	0.28
35	32207 B	72	24.25	55.1	23	19	48400	60000	3700	4900	0.44
35	32207	72	24.25	52.4	23	19	52800	62400	3700	4900	0.43
40	32208	80	24.75	58.4	23	19	59800	69200	3300	4400	0.53
45	32209 B	85	24.75	66.7	23	19	58900	74400	3000	3900	0.60
45	32209	85	24.75	64.0	23	19	64700	78400	3100	4200	0.58
50	32210 B	90	24.75	70.8	23	18	66000	83200	2800	3700	0.65
50	32210	90	24.75	68.5	23	19	66000	80000	3000	3900	0.61
55	32211 B	100	26.75	78.0	25	19	80800	101600	2500	3300	0.87
55	32211	100	26.75	75.2	25	21	84800	103200	2600	3500	0.83
60	32212	110	29.75	81.9	28	24	100000	128000	2300	3100	1.15
65	32213	120	32.75	90.3	31	27	120800	154400	2100	2800	1.50
70	32214	125	33.25	95.0	31	27	125600	166400	1900	2600	1.60
75	32215	130	33.25	100.0	31	27	128800	169600	1800	2500	1.70
80	32216	140	35.25	106.0	33	28	149600	196000	1600	2300	2.05
85	32217	150	38.50	113.0	36	30	169600	228000	1500	2200	2.60
90	32218	160	42.50	121.0	40	34	200800	272000	1400	2100	3.35
95	32219	170	45.50	128.0	43	37	224800	312000	1300	1900	4.05
100	32220	180	49.00	135.0	46	39	255200	352000	1200	1800	4.90
105	32221	190	53.00	143.0	50	43	286400	408000	1200	1800	6.00
110	32222	200	56.00	151.0	53	46	321600	456000	1100	1600	7.10
120	32224	215	61.50	163.0	58	50	374400	556000	1100	1500	9.15
130	32226	230	67.75	176.0	64	54	440000	664000	1000	1400	11.50
140	32228	250	71.75	191.0	68	58	515200	800000	900	1300	14.50
150	32230	270	77.00	205.0	73	60	589600	912000	800	1100	17.50
160	32232	290	84.00	221.0	80	67	704000	1120000	700	1100	25.50
170	32234	310	91.00	237.0	86	71	808000	1304000	700	1000	28.50
180	32236	320	91.00	247.0	86	71	808000	1304000	600	900	29.50
190	32238	340	97.00	261.0	92	75	952000	1544000	600	900	36.00
200	32240	360	104.00	274.0	98	82	968000	1600000	600	900	42.50
220	32244	400	114.00	306.0	108	90	1288000	2160000	500	700	60.00



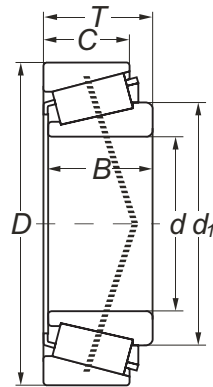
Inner bore d mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		D	T	d_1 ≈	B	C	dynamic C N	static Co	grease r/min	oil r/min	
17	32303	47	20.25	30.7	19	13	27700	26800	5600	7700	0.17
20	32304	52	22.50	34.5	21	18	35200	36400	5200	7000	0.23
25	32305	62	25.25	41.7	24	20	48400	50400	4200	5600	0.36
30	32306	72	28.75	48.7	27	23	61200	68000	3700	4900	0.55
35	32307 B	80	32.75	59.3	31	25	74800	91200	3100	4200	0.80
35	32307	80	32.75	54.8	31	25	76100	84800	3300	4400	0.73
40	32308 B	90	35.25	62.9	33	27	86400	112000	2800	3700	1.10
40	32308	90	35.25	67.1	23	17	93600	112000	2800	3700	1.00
45	32309 B	100	38.25	74.8	36	30	107200	140800	2500	3300	1.45
45	32309	100	38.25	70.4	36	30	112000	136000	2500	3300	1.35
50	32310 B	110	42.25	82.9	40	33	128800	172800	2200	3000	1.85
50	32310	110	42.25	77.7	40	33	137600	169600	2200	3000	1.80
55	32311	120	45.50	84.6	43	35	158400	200000	2100	2800	2.30
55	32311 B	120	45.50	90.5	43	35	152000	208000	1900	2600	2.50
60	32312	130	48.50	91.7	46	37	183200	232000	1800	2500	2.85
60	32312 B	130	48.50	98.1	46	37	176000	244000	1800	2500	2.80
65	32313	140	51.00	99.2	48	39	211200	268000	1600	2300	3.45
65	32313 B	140	51.00	105.0	48	39	196800	276000	1500	2200	3.35
70	32314	150	54.00	106.0	51	42	237600	304000	1500	2200	4.30
70	32314 B	150	54.00	113.0	51	42	224800	320000	1400	2100	4.25
75	32315	160	58.00	113.0	55	45	268800	352000	1400	2100	5.20
75	32315 B	160	58.00	120.0	55	45	268800	380000	1300	1900	5.55
80	32316	170	61.50	120.0	58	48	304000	400000	1300	1900	6.20
80	32316 B	170	61.50	128.0	58	48	286400	416000	1200	1800	5.70
85	32317	180	63.50	126.0	60	49	321600	424000	1200	1800	6.85
85	32317 B	180	63.50	135.0	60	49	312800	448000	1200	1800	7.50
90	32318	190	67.50	133.0	64	53	365600	488000	1100	1600	8.40
95	32319	200	71.50	141.0	67	55	400800	536000	1100	1600	11.00
100	32320	215	77.50	151.0	73	60	457600	624000	1100	1500	12.50
105	32321	225	81.50	158.0	77	63	484000	652000	1000	1400	14.50
110	32322	240	84.50	168.0	80	65	501600	664000	900	1300	17.00
120	32324	260	90.50	181.0	86	69	633600	896000	900	1200	21.50
130	32326	280	98.75	196.0	93	78	686400	944000	700	1100	30.50
150	32330	320	114.00	226.0	108	90	936000	1328000	600	900	46.00



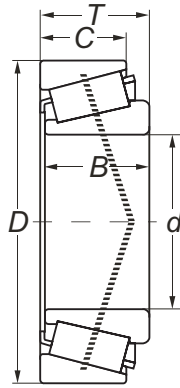
Inner bore d mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		D	T	d_1 ≈	B	C	dynamic C N	static Co	grease r/min	oil	
50	33010	80	24	64.9	24	19.0	55400	81600	3100	4200	0.45
55	33011	90	27	72.9	27	21.0	71700	109600	2800	3700	0.67
60	33012	95	27	77.1	27	21.0	73000	114400	2600	3500	0.71
65	33013	100	27	82.5	27	21.0	77400	124800	2300	3100	0.78
70	33014	110	31	88.8	31	25.5	104000	156800	2200	3000	1.10
75	33015	115	31	95.0	31	25.5	107200	182400	2100	2800	1.15
80	33016	125	36	102.0	36	29.5	134400	228000	1800	2500	1.65
85	33017	130	36	107.0	36	29.5	146400	248000	1800	2500	1.75
90	33018	140	39	113.0	39	32.5	172800	284000	1500	2200	2.20
95	33019	145	39	118.0	39	32.5	176000	300000	1500	2200	2.30
100	33020	150	39	122.0	39	32.5	179200	312000	1400	2100	2.40
105	33021	160	43	131.0	43	34.0	196800	344000	1300	1900	3.05
110	33022	170	47	139.0	47	37.0	224800	400000	1200	1800	3.85
120	33024	180	48	149.0	48	38.0	233600	432000	1200	1800	4.20
150	33030	225	59	188.0	59	46.0	365600	692000	1000	1400	8.15



Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		<i>D</i>	<i>T</i>	<i>d</i> ₁ ≈	<i>B</i>	<i>C</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease r/min	oil r/min	
40	33108	75	26	57.5	26	20.5	63300	83200	3500	4600	0.51
45	33109	80	26	62.7	26	20.5	67300	91200	3100	4200	0.56
50	33110	85	26	67.9	26	20.0	68600	97600	3000	3900	0.59
55	33111	95	30	75.1	30	23.0	88000	124800	2600	3500	0.86
60	33112	100	30	80.4	30	23.0	93600	136000	2500	3300	0.92
65	33113	110	34	87.9	34	26.5	113600	166400	2200	3000	1.30
70	33114	120	37	94.8	37	29.0	137600	200000	2100	2800	1.70
75	33115	125	37	100.0	37	29.0	140800	212000	1900	2600	1.80
80	33116	130	37	105.0	37	29.0	143200	224000	1800	2500	1.90
85	33117	140	41	112.0	41	32.0	176000	272000	1600	2300	2.45
90	33118	150	45	120.0	45	35.0	200800	312000	1400	2100	3.10
110	33122	180	56	146.0	56	43.0	295200	504000	1200	1800	5.55



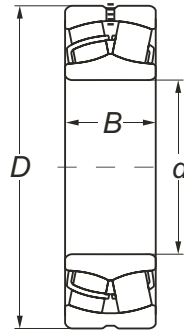
Inner bore <i>d</i> mm	Bearing number	Principal dimensions mm					Basic load ratings		Speed ratings lubrication		Mass kg
		<i>D</i>	<i>T</i>	<i>d</i> ₁ ≈	<i>B</i>	<i>C</i>	dynamic <i>C</i> N	static <i>C</i> ₀	grease r/min	oil r/min	
25	33205	52	22	38.6	22	18.0	37800	44800	4600	6300	0.23
30	33206	62	25	45.8	25	19.5	51500	61200	3900	5200	0.37
35	33207	72	28	53.4	28	22.0	67300	84800	3300	4400	0.56
40	33208	80	32	59.7	32	25.0	84000	105600	3000	3900	0.77
45	33209	85	32	65.2	32	25.0	86400	114400	2800	3700	0.82
50	33210	90	32	70.7	32	24.5	91200	128000	2600	3500	0.90
55	33211	100	35	77.6	35	27.0	110400	152000	2300	3100	1.20
60	33212	110	38	85.3	38	29.0	134400	188800	2100	2800	1.60
65	33213	120	41	92.1	41	32.0	155200	216000	1900	2600	2.05
70	33214	125	41	97.2	41	32.0	160800	228000	1800	2500	2.10
75	33215	130	41	102.0	41	31.0	167200	240000	1600	2300	2.25
80	33216	140	46	110.0	46	35.0	200800	300000	1500	2200	2.90
85	33217	150	49	117.0	49	37.0	228800	344000	1400	2100	3.70
100	33220	180	63	139.0	63	48.0	343200	524000	1100	1600	6.95



Inner bore <i>d</i> inch	Bearing number		Principal dimensions inch				Basic load ratings		Speed ratings lubrication		Mass lbs
	Cone	Cup	<i>D</i>	<i>T</i>	<i>B</i>	<i>C</i>	C N	Co	grease r/min	oil r/min	
0.6875	LM11749	LM11710	1.5700	0.5450	0.5750	0.4200	5350	5450	10000	13000	0.185
0.7500	LM11949	LM11910	1.7810	0.6100	0.6550	0.4750	6350	6450	8900	12000	0.269
0.8437	M12649	M12610	1.9687	0.6900	0.7200	0.5500	8500	8750	8000	11000	0.401
0.8653	LM12749	LM12710	1.7810	0.6100	0.6550	0.4750	6650	7600	8400	11000	0.271
0.8653	LM12749	LM12711	1.8100	0.6100	0.6550	0.4750	6650	7600	8400	11000	0.271
1.0000	L44643	L44610	1.9800	0.5600	0.5800	0.4200	6500	7600	7400	9900	0.287
1.0625	L44649	L44610	1.9800	0.5600	0.5800	0.4200	6500	7600	7400	9900	0.265
1.1417	L45449	L45410	1.9800	0.5600	0.5800	0.4200	6300	8000	6200	8200	0.895
1.2500	15123	15245	2.4409	0.7150	0.7500	0.5625	10500	12200	6100	8200	0.538
1.2500	LM67048	LM67010	2.3280	0.6250	0.6600	0.4650	7750	9200	6300	8400	0.401
1.2500	14125A	14276	2.7170	0.7813	0.7710	0.6250	10800	13000	5600	7400	0.785
1.3750	LM48548	LM48510	2.5625	0.7100	0.7200	0.5500	10500	12600	5700	7600	0.549
1.3750	25877	25820	2.8750	0.9375	0.9688	0.7500	15900	19200	5300	7100	1.040
1.3775	L68149	L68110	2.3280	0.6250	0.6600	0.4700	7950	10700	6100	8100	0.395
1.3775	L68149	L68111	2.3612	0.6250	0.6600	0.4700	7950	10700	6100	8100	0.397
1.4961	JL69349	JL69310	2.4803	0.6693	0.6693	0.5315	8700	11800	5700	7600	0.437
1.5000	LM29749	LM29710	2.5625	0.7100	0.7200	0.5500	9750	12800	5500	7400	0.518
1.6250	LM501349	LM501310	2.8910	0.7700	0.7800	0.5800	12600	15700	5000	6600	0.739
1.6250	LM501349	LM501314	2.8910	0.8437	0.7800	0.6537	12600	15700	5000	6600	0.783
1.6250	24780	24720	3.0000	0.8750	0.9063	0.6875	14600	18100	4900	6500	0.952
1.7500	25580	25520	3.2650	0.9375	1.0000	0.7500	17100	22000	4500	6000	1.240
1.7500	3782	3720	3.6718	1.1875	1.1930	0.9375	22900	30000	4000	5300	2.120
1.7500	45280	45220	4.1250	1.1875	1.2188	0.9375	29200	38000	3500	4700	2.980
1.7812	LM102949	LM102910	2.8910	0.7700	0.7800	0.6200	12200	17100	4800	6400	0.667
1.7812	LM603049	LM603011	3.0625	0.7812	0.7812	0.5937	12900	16600	4600	6200	0.820
1.7812	LM603049	LM603012	3.0625	0.8437	0.7812	0.6562	12900	16600	4600	6200	0.862
1.7960	25590	25520	3.2650	0.9375	1.0000	0.7500	17100	22000	4500	6000	1.200
1.7960	25590	25523	3.2650	1.0625	1.0000	0.8750	17100	22000	4500	6000	1.300
1.9685	JLM104948	JLM104910	3.2283	0.8465	0.8465	0.6693	15700	21100	4300	5700	0.926
2.0000	LM104949	LM104911	3.2500	0.8500	0.8750	0.6500	15700	21100	4300	5700	0.924
2.0000	LM104949	LM104912	3.2650	0.8500	0.8750	0.6500	15700	21100	4300	5700	0.937
2.1654	JLM506849	JLM506810	3.5433	0.9055	0.9055	0.7283	17400	24400	3900	5300	1.230
2.6250	HM212049	HM212011	4.8125	1.5000	1.5100	1.1700	42000	55000	3100	4100	4.080

SPHERICAL ROLLER BEARINGS

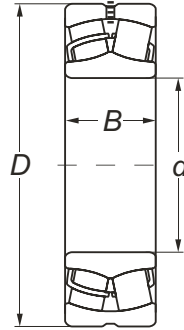
222 / 223 / 230 / 240 / 241 SERIES



Inner bore <i>d</i> mm	Bearing number	Principal dimensions		Basic load ratings		Max runout speed		Mass kg
		<i>D</i> mm	<i>B</i> mm	dynamic <i>C</i> N	static <i>C</i> ₀	grease oil	r/min	
25	22205 CAC/W33	52	18	28500	28500	5900	7700	0.18
30	22206 CAC/W33	62	20	52300	49700	6300	8000	0.28
35	22207 CAC/W33	72	23	67900	75100	5300	6700	0.43
40	22208 CAC/W33	80	23	78500	90800	5000	6000	0.52
40	22308 CAC/W33	90	33	120000	138000	4000	5000	1.00
50	22210 CAC/W33	90	23	83700	102200	4000	5000	0.60
50	22310 CAC/W33	110	40	175000	210000	3400	4300	1.85
55	22211 CAC/W33	100	25	103000	126000	3600	4500	0.82
55	22311 CAC/W33	120	43	207900	248500	3000	3800	2.35
60	22212 CAC/W33	110	28	123000	154000	3200	4000	1.10
60	22312 CAC/W33	130	46	238000	285000	2800	3600	2.95
65	22213 CAC/W33	120	31	151000	194000	2800	3300	1.45
65	22313 CAC/W33	140	48	235400	276800	2400	3200	3.55
70	22214 CAC/W33	125	31	154800	193500	2600	3400	1.55
70	22314 CAC/W33	150	51	313000	396000	2200	3000	4.30
75	22215 CAC/W33	130	31	161000	204500	2400	3200	1.65
75	22315 CAC/W33	160	55	348000	447000	1500	2100	5.25
80	22216 CAC/W33	140	33	174100	225500	2200	3000	2.05
80	22316 CAC/W33	170	58	376800	482300	1900	2600	6.20
85	22217 CAC/W33	150	36	210000	278000	2000	2800	2.55
85	22317 CAC/W33	180	60	420000	540000	1800	2400	7.25
90	22218 CAC/W33	160	40	249000	337000	1900	2600	3.40
90	22318 CAC/W33	190	64	475000	622000	1800	2400	8.60
95	22219 CAC/W33	170	43	278000	380000	1900	2600	4.00
95	22319 CAC/W33	200	67	520000	688000	1600	2000	10.0
100	22220 CAC/W33	180	46	313000	435000	1800	2400	4.85
100	22320 CAC/W33	215	73	617000	833000	1400	1800	13.0
110	23022 CAC/W33	170	45	269800	431000	1400	1800	3.75
110	24122 CAC/W33	180	69	458000	775000	1300	1700	6.85
110	22222 CAC/W33	200	53	400000	550000	1700	2200	7.00
110	22322 CAC/W33	240	80	720500	947300	1500	1900	18.0

For 1:12 tapered bore add suffix K example: 22322 CACK/W33

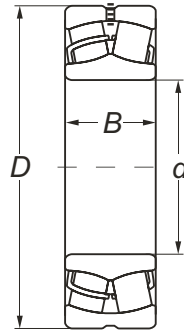
For 1:30 tapered bore add suffix K30 example: 22322 CACK30/W33



Inner bore <i>d</i> mm	Bearing number	Principal dimensions		Basic load ratings		Max runout speed		Mass kg
		<i>D</i> mm	<i>B</i> mm	dynamic C N	static Co	grease oil	r/min	
120	23024 CAC/W33	180	46	318800	459800	1400	1800	4.20
120	24024 CAC/W33	180	60	380000	675000	1500	2000	5.40
120	24124 CAC/W33	200	80	548000	939000	1300	1700	10.00
120	22224 CAC/W33	215	58	456800	650400	1600	2000	8.70
120	22324 CAC/W33	260	86	853000	1134000	1300	1700	22.00
130	23026 CAC/W33	200	52	372000	625000	1200	1600	6.10
130	24026 CAC/W33	200	69	499000	837000	1200	1600	7.95
130	24126 CAC/W33	210	80	586000	1031000	1300	1700	11.00
130	22226 CAC/W33	230	64	542600	796000	1400	1800	11.00
130	22326 CAC/W33	280	93	965000	1341000	1200	1600	28.50
140	23028 CAC/W33	210	53	370000	629000	1100	1500	6.55
140	24028 CAC/W33	210	69	495400	844500	1100	1500	8.45
140	24128 CAC/W33	225	85	586000	1031000	1100	1500	13.00
140	22228 CAC/W33	250	68	605000	891400	1300	1700	14.00
140	22328 CAC/W33	300	102	1133000	1614000	1100	1500	34.50
150	23030 CAC/W33	225	56	409400	703600	1100	1400	7.95
150	24030 CAC/W33	225	75	570000	1002000	1100	1400	10.50
150	24130 CAC/W33	250	100	837500	1459000	1000	1300	19.50
150	22230 CAC/W33	270	73	750000	1131000	1200	1600	18.00
150	22330 CAC/W33	320	108	1133000	1614000	750	950	41.50
160	23032 CAC/W33	240	60	483000	841000	1000	1300	9.70
160	24032 CAC/W33	240	80	686300	1216000	1000	1300	13.00
160	24132 CAC/W33	270	109	1040000	1880000	900	1200	25.00
160	22232 CAC/W33	290	80	848000	1294000	1400	1000	22.50
160	22332 CAC/W33	340	114	1133000	1614000	750	950	50.00
170	23034 CAC/W33	260	67	616000	1101000	900	1200	13.00
170	24034 CAC/W33	260	90	686300	1216000	800	1000	17.50
170	24134 CAC/W33	280	109	1040000	1880000	400	500	26.50
170	22234 CAC/W33	310	86	974000	1501000	850	1100	28.50
170	22334 CAC/W33	360	120	1540000	2160000	750	950	58.50

For 1:12 tapered bore add suffix K example: 22322 CACK/W33

For 1:30 tapered bore add suffix K30 example: 22322 CACK30/W33

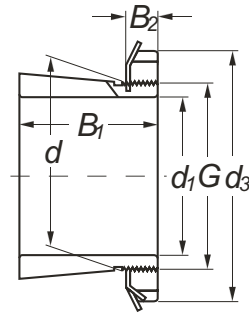


Inner bore <i>d</i> mm	Bearing number	Principal dimensions		Basic load ratings		Max runout speed		Mass kg
		<i>D</i> mm	<i>B</i> mm	dynamic C N	static C ₀	grease oil	r/min	
180	23036 CAC/W33	280	74	717000	1305000	800	1000	17.00
180	24036 CAC/W33	280	100	918200	1801000	800	1000	23.00
180	24136 CAC/W33	300	118	976000	1728000	400	500	33.50
180	22236 CAC/W33	320	86	1006000	1592000	800	1000	29.50
190	23038 CAC/W33	290	75	733800	1327500	800	1000	18.00
190	24038 CAC/W33	290	100	782400	1440000	600	900	24.00
190	24138 CAC/W33	320	128	1120000	2000000	400	500	42.00
190	22238 CAC/W33	340	92	818000	1510000	750	950	36.50
200	23040 CAC/W33	310	82	905600	1627600	670	850	23.00
200	24040 CAC/W33	310	109	904000	1696000	600	800	30.50
200	24140 CAC/W33	340	140	1264000	2240000	300	400	52.00
200	22240 CAC/W33	360	98	1016000	1544000	700	1000	43.50
220	23044 CAC/W33	340	90	840000	1488000	700	1000	30.50
240	23048 CAC/W33	360	92	904000	1664000	700	900	33.50
260	23052 CAC/W33	400	104	1120000	2040000	600	800	48.50

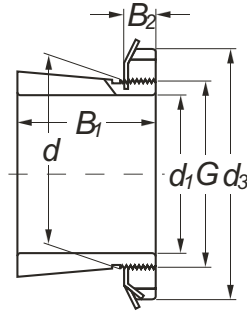
For 1:12 tapered bore add suffix K example: 22322 CACK/W33

For 1:30 tapered bore add suffix K30 example: 22322 CACK30/W33

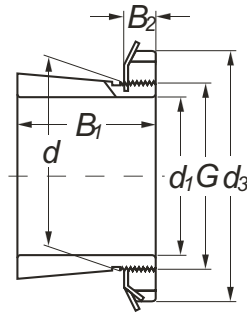
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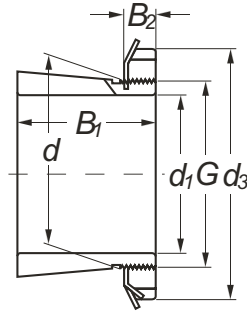
Inner bore d_1 mm	Bearing number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
20	H 205	25	38	26	8	M 25 X 1.5	KM 5	MB 5	0.070
25	H 206	30	45	27	8	M 30 X 1.5	KM 6	MB 6	0.099
30	H 207	35	52	29	9	M 35 X 1.5	KM 7	MB 7	0.125
35	H 208	40	58	31	10	M 40 X 1.5	KM 8	MB 8	0.174
40	H 209	45	65	33	11	M 45 X 1.5	KM 9	MB 9	0.226
45	H 210	50	70	35	12	M 50 X 1.5	KM 10	MB 10	0.274
50	H 211	55	75	37	12	M 55 X 2.0	KM 11	MB 11	0.308
55	H 212	60	80	38	13	M 60 X 2.0	KM 12	MB 12	0.346
60	H 213	65	85	40	14	M 65 X 2.0	KM 13	MB 13	0.401
65	H 215	75	98	43	15	M 75 X 2.0	KM 15	MB 15	0.708
70	H 216	80	105	46	17	M 80 X 2.0	KM 16	MB 16	0.881
75	H 217	85	110	50	18	M 85 X 2.0	KM 17	MB 17	1.020
80	H 218	90	120	52	18	M 90 X 2.0	KM 18	MB 18	1.180
100	H 222	110	145	63	21	M 110X2.0	KM 22	MB 22	1.930



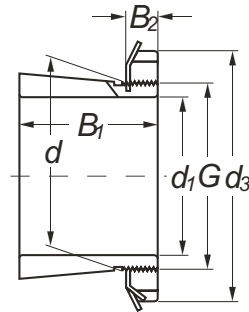
Inner bore d_1 mm	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
20	H 2305	25	38	35	8	M 25 X 1.5	KM 5	MB 5	0.087
25	H 2306	30	45	38	8	M 30 X 1.5	KM 6	MB 6	0.126
30	H 2307	35	52	43	8	M 35 X 1.5	KM 7	MB 7	0.165
35	H 2308	40	58	46	9	M 40 X 1.5	KM 8	MB 8	0.224
40	H 2309	45	65	50	10	M 45 X 1.5	KM 9	MB 9	0.280
45	H 2310	50	70	55	11	M 50 X 1.5	KM 10	MB 10	0.362
50	H 2311	55	75	59	12	M 55 X 2.0	KM 11	MB 11	0.420
55	H 2312	60	80	62	12	M 60 X 2.0	KM 12	MB 12	0.481
60	H 2313	65	85	65	13	M 65 X 2.0	KM 13	MB 13	0.557
60	H 2314	70	92	68	14	M 70 X 2.0	KM 14	MB 14	0.897
65	H 2315	75	98	73	14	M 75 X 2.0	KM 15	MB 15	1.050
70	H 2316	80	105	78	15	M 80 X 2.0	KM 16	MB 16	1.280
75	H 2317	85	110	82	17	M 85 X 2.0	KM 17	MB 17	1.450
80	H 2318	90	120	86	18	M 90 X 2.0	KM 18	MB 18	1.690
85	H 2319	95	125	90	18	M 95 X 2.0	KM 19	MB 19	1.920
90	H 2320	100	130	97	19	M 100X2.0	KM 20	MB 20	2.150
100	H 2322	110	145	105	20	M 110X2.0	KM 22	MB 22	2.740
110	H 2324	120	155	112	21	M 120X2.0	KM 24	MB 24	3.190
115	H 2326	130	165	121	22	M 130X2.0	KM 26	MB 26	4.600
125	H 2328	140	180	131	23	M 140X2.0	KM 28	MB 28	5.550
135	H 2330	150	195	139	24	M 150X2.0	KM 30	MB 30	6.630
140	H 2332	160	210	147	26	M 160X3.0	KM 32	MB 32	9.140
170	H 2338	190	240	169	30	M 190X3.0	KM 38	MB 38	12.600
220	H 2344	220	280	183	32	M 220X4.0	KM 44		16.700



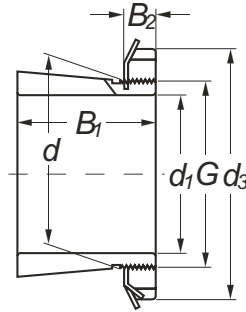
Inner bore d_1 mm	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
20	H 305	25	38	29	8	M 25 X 1.5	KM 5	MB 5	0.075
25	H 306	30	45	31	8	M 30 X 1.5	KM 6	MB 6	0.109
30	H 307	35	52	35	9	M 35 X 1.5	KM 7	MB 7	0.142
35	H 308	40	58	36	10	M 40 X 1.5	KM 8	MB 8	0.189
40	H 309	45	65	39	11	M 45 X 1.5	KM 9	MB 9	0.248
45	H 310	50	70	42	12	M 50 X 1.5	KM 10	MB 10	0.302
50	H 311	55	75	45	12	M 55 X 2.0	KM 11	MB 11	0.345
55	H 312	60	80	47	13	M 60 X 2.0	KM 12	MB 12	0.393
60	H 313	65	85	50	14	M 65 X 2.0	KM 13	MB 13	0.459
60	H 314	70	92	52	14	M 70 X 2.0	KM 14	MB 14	0.723
65	H 315	75	98	55	15	M 75 X 2.0	KM 15	MB 15	0.830
70	H 316	80	105	59	17	M 80 X 2.0	KM 16	MB 16	1.000
75	H 317	85	110	63	18	M 85 X 2.0	KM 17	MB 17	1.180
80	H 318	90	120	65	18	M 90 X 2.0	KM 18	MB 18	1.370
85	H 319	95	125	68	19	M 95 X 2.0	KM 19	MB 19	1.560
90	H 320	100	130	71	20	M 100X2.0	KM 20	MB 20	1.690
100	H 222	110	145	77	21	M 110X2.0	KM 22	MB 22	2.180



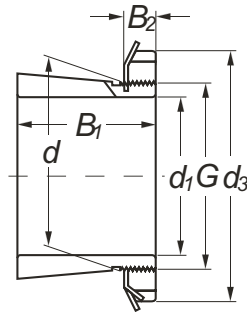
Inner bore d_1 mm	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
100	H 3122	110	145	81	21	M 110 X 2	KM 22	MB 22	2.250
110	H 3124	120	155	88	22	M 120 X 2	KM 24	MB 24	2.650
115	H 3126	130	165	92	23	M 130 X 2	KM 26	MB 26	3.650
125	H 3128	140	180	97	24	M 140 X 2	KM 28	MB 28	4.350
135	H 3130	150	195	111	26	M 150 X 2	KM 30	MB 30	5.500
140	H 3132	160	210	119	28	M 160 X 3	KM 32	MB 32	7.650
150	H 3134	170	220	122	29	M 170 X 2	KM 34	MB 34	8.400
160	H 3136	180	230	131	30	M 180 X 2	KM 36	MB 36	9.500
170	H 3138	190	240	141	31	M 190 X 2	KM 38	MB 38	11.000
180	H 3140	200	250	150	32	M 200 X 2	KM 40	MB 40	12.000
200	H 3144	220	280	158	32	M 220 X 2	KM 44		14.500
220	H 3148	240	300	169	34	M 240 X 2	KM 48		17.500
240	H 3152	260	330	187	36	M 260 X 2	KM 52		22.000
260	H 3156	280	350	192	38	M 280 X 2	KM 56		24.500
280	H 3160	300	380	208	40	M 300 X 2	KM 60		30.000



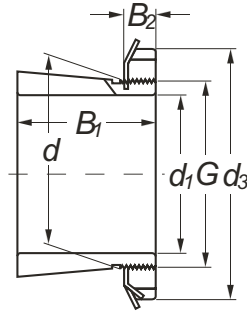
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
13/16	HA 205	25	38	26	8	M 25 X 1.5	KM 5	MB 5	0.070
15/16	HA 206	30	45	27	8	M 30 X 1.5	KM 6	MB 6	0.099
1 3/16	HA 207	35	52	29	9	M 35 X 1.5	KM 7	MB 7	0.125
1 5/16	HA 208	40	58	31	10	M 40 X 1.5	KM 8	MB 8	0.174
1 7/16	HA 209	45	65	33	11	M 45 X 1.5	KM 9	MB 9	0.226
1 11/16	HA 210	50	70	35	12	M 50 X 1.5	KM 10	MB 10	0.274
1 15/16	HA 211	55	75	37	12	M 55 X 2.0	KM 11	MB 11	0.308
2 1/16	HA 212	60	80	38	13	M 60 X 2.0	KM 12	MB 12	0.346
2 3/16	HA 213	65	85	40	14	M 65 X 2.0	KM 13	MB 13	0.401
2 7/16	HA 215	75	98	43	15	M 75 X 2.0	KM 15	MB 15	0.708
2 11/16	HA 216	80	105	46	17	M 80 X 2.0	KM 16	MB 16	0.881
2 15/16	HA 217	85	110	50	18	M 85 X 2.0	KM 17	MB 17	1.020
3 3/16	HA 218	90	120	52	18	M 90 X 2.0	KM 18	MB 18	1.180
3 15/16	HA 222	110	145	63	21	M 110X2.0	KM 22	MB 22	1.930



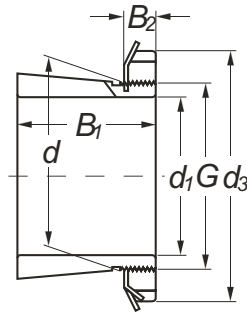
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
13/16	HA 2305	25	38	35	8	M 25 X 1.5	KM 5	MB 5	0.087
15/16	HA 2306	30	45	38	8	M 30 X 1.5	KM 6	MB 6	0.126
1 3/16	HA 2307	35	52	43	8	M 35 X 1.5	KM 7	MB 7	0.165
1 5/16	HA 2308	40	58	46	9	M 40 X 1.5	KM 8	MB 8	0.224
1 7/16	HA 2309	45	65	50	10	M 45 X 1.5	KM 9	MB 9	0.280
1 11/16	HA 2310	50	70	55	11	M 50 X 1.5	KM 10	MB 10	0.362
1 15/16	HA 2311	55	75	59	12	M 55 X 2.0	KM 11	MB 11	0.420
2 1/16	HA 2312	60	80	62	12	M 60 X 2.0	KM 12	MB 12	0.481
2 3/16	HA 2313	65	85	65	13	M 65 X 2.0	KM 13	MB 13	0.557
2 5/16	HA 2314	70	92	68	14	M 70 X 2.0	KM 14	MB 14	0.897
2 7/16	HA 2315	75	98	73	14	M 75 X 2.0	KM 15	MB 15	1.050
2 11/16	HA 2316	80	105	78	15	M 80 X 2.0	KM 16	MB 16	1.280
2 15/16	HA 2317	85	110	82	17	M 85 X 2.0	KM 17	MB 17	1.450
3 3/16	HA 2318	90	120	86	18	M 90 X 2.0	KM 18	MB 18	1.690
3 5/16	HA 2319	95	125	90	18	M 95 X 2.0	KM 19	MB 19	1.920
3 7/16	HA 2320	100	130	97	19	M 100X2.0	KM 20	MB 20	2.150
3 15/16	HA 2322	110	145	105	20	M 110X2.0	KM 22	MB 22	2.740
4 3/16	HA 2324	120	155	112	21	M 120X2.0	KM 24	MB 24	3.190
4 7/16	HA 2326	130	165	121	22	M 130X2.0	KM 26	MB 26	4.600
4 15/16	HA 2328	140	180	131	23	M 140X2.0	KM 28	MB 28	5.550
5 3/16	HA 2330	150	195	139	24	M 150X2.0	KM 30	MB 30	6.630
5 7/16	HA 2332	160	210	147	26	M 160X3.0	KM 32	MB 32	9.140
6 15/16	HA 2338	190	240	169	30	M 190X3.0	KM 38	MB 38	12.600
7 15/16	HA 2344	220	280	183	32	M 220X4.0	KM 44		16.700



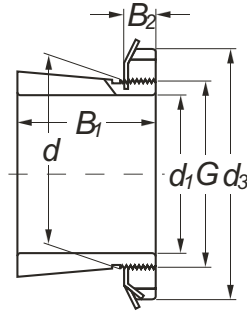
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
13/16	HA 305	25	38	29	8	M 25 X 1.5	KM 5	MB 5	0.075
15/16	HA 306	30	45	31	8	M 30 X 1.5	KM 6	MB 6	0.109
1 3/16	HA 307	35	52	35	9	M 35 X 1.5	KM 7	MB 7	0.142
1 5/16	HA 308	40	58	36	10	M 40 X 1.5	KM 8	MB 8	0.189
1 7/16	HA 309	45	65	39	11	M 45 X 1.5	KM 9	MB 9	0.248
1 11/16	HA 310	50	70	42	12	M 50 X 1.5	KM 10	MB 10	0.302
1 15/16	HA 311	55	75	45	12	M 55 X 2.0	KM 11	MB 11	0.345
2 1/16	HA 312	60	80	47	13	M 60 X 2.0	KM 12	MB 12	0.393
2 3/16	HA 313	65	85	50	14	M 65 X 2.0	KM 13	MB 13	0.459
2 5/16	HA 314	70	92	52	14	M 70 X 2.0	KM 14	MB 14	0.723
2 7/16	HA 315	75	98	55	15	M 75 X 2.0	KM 15	MB 15	0.830
2 11/16	HA 316	80	105	59	17	M 80 X 2.0	KM 16	MB 16	1.000
2 15/16	HA 317	85	110	63	18	M 85 X 2.0	KM 17	MB 17	1.180
3 3/16	HA 318	90	120	65	18	M 90 X 2.0	KM 18	MB 18	1.370
3 5/16	HA 319	95	125	68	19	M 95 X 2.0	KM 19	MB 19	1.560
3 7/16	HA 320	100	130	71	20	M 100X2.0	KM 20	MB 20	1.690
3 15/16	HA 322	110	145	77	21	M 110X2.0	KM 22	MB 22	2.180



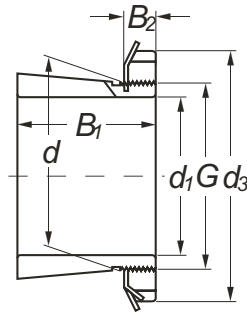
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
3 15/16	HA 3122	110	145	81	21	M 110 X 2	KM 22	MB 22	2.250
4 3/16	HA 3124	120	155	88	22	M 120 X 2	KM 24	MB 24	2.650
4 7/16	HA 3126	130	165	92	23	M 130 X 2	KM 26	MB 26	3.650
4 15/16	HA 3128	140	180	97	24	M 140 X 2	KM 28	MB 28	4.350
5 3/16	HA 3130	150	195	111	26	M 150 X 2	KM 30	MB 30	5.500
5 7/16	HA 3132	160	210	119	28	M 160 X 3	KM 32	MB 32	7.650
5 15/16	HA 3134	170	220	122	29	M 170 X 2	KM 34	MB 34	8.400
6 7/16	HA 3136	180	230	131	30	M 180 X 2	KM 36	MB 36	9.500
6 15/16	HA 3138	190	240	141	31	M 190 X 2	KM 38	MB 38	11.000
7 3/16	HA 3140	200	250	150	32	M 200 X 2	KM 40	MB 40	12.000
7 15/16	HA 3144	220	280	158	32	M 220 X 2	KM 44		14.500



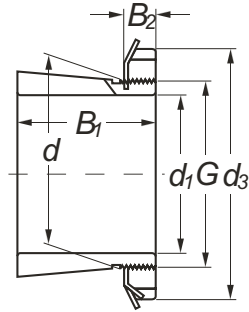
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
3/4	HE 205	25	38	26	8	M 25 X 1.5	KM 5	MB 5	0.070
1	HE 206	30	45	27	8	M 30 X 1.5	KM 6	MB 6	0.099
1 1/4	HE 207	35	52	29	9	M 35 X 1.5	KM 7	MB 7	0.125
1 1/4	HE 208	40	58	31	10	M 40 X 1.5	KM 8	MB 8	0.174
1 1/2	HE 209	45	65	33	11	M 45 X 1.5	KM 9	MB 9	0.226
1 3/4	HE 210	50	70	35	12	M 50 X 1.5	KM 10	MB 10	0.274
2	HE 211	55	75	37	12	M 55 X 2.0	KM 11	MB 11	0.308
2 1/4	HE 212	60	80	38	13	M 60 X 2.0	KM 12	MB 12	0.346
2 1/4	HE 213	65	85	40	14	M 65 X 2.0	KM 13	MB 13	0.401
2 1/2	HE 215	75	98	43	15	M 75 X 2.0	KM 15	MB 15	0.708
2 3/4	HE 216	80	105	46	17	M 80 X 2.0	KM 16	MB 16	0.881
3	HE 217	85	110	50	18	M 85 X 2.0	KM 17	MB 17	1.020
3 1/4	HE 218	90	120	52	18	M 90 X 2.0	KM 18	MB 18	1.180
4	HE 222	110	145	63	21	M 110X2.0	KM 22	MB 22	1.930



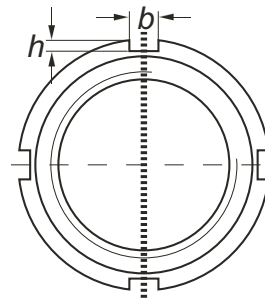
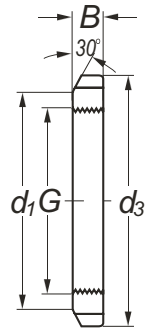
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
3/4	HE 2305	25	38	35	8	M 25 X 1.5	KM 5	MB 5	0.087
1	HE 2306	30	45	38	8	M 30 X 1.5	KM 6	MB 6	0.126
1 1/4	HE 2307	35	52	43	8	M 35 X 1.5	KM 7	MB 7	0.165
1 1/4	HE 2308	40	58	46	9	M 40 X 1.5	KM 8	MB 8	0.224
1 1/2	HE 2309	45	65	50	10	M 45 X 1.5	KM 9	MB 9	0.280
1 3/4	HE 2310	50	70	55	11	M 50 X 1.5	KM 10	MB 10	0.362
2	HE 2311	55	75	59	12	M 55 X 2.0	KM 11	MB 11	0.420
2 1/4	HE 2312	60	80	62	12	M 60 X 2.0	KM 12	MB 12	0.481
2 1/4	HE 2313	65	85	65	13	M 65 X 2.0	KM 13	MB 13	0.557
2 1/2	HE 2315	75	98	73	14	M 75 X 2.0	KM 15	MB 15	1.050
2 3/4	HE 2316	80	105	78	15	M 80 X 2.0	KM 16	MB 16	1.280
3	HE 2317	85	110	82	17	M 85 X 2.0	KM 17	MB 17	1.450
3 1/4	HE 2318	90	120	86	18	M 90 X 2.0	KM 18	MB 18	1.690
3 1/4	HE 2319	95	125	90	18	M 95 X 2.0	KM 19	MB 19	1.920
3 1/2	HE 2320	100	130	97	19	M 100X2.0	KM 20	MB 20	2.150
4	HE 2322	110	145	105	20	M 110X2.0	KM 22	MB 22	2.740
4 1/4	HE 2324	120	155	112	21	M 120X2.0	KM 24	MB 24	3.190
4 1/2	HE 2326	130	165	121	22	M 130X2.0	KM 26	MB 26	4.600
5	HE 2328	140	180	131	23	M 140X2.0	KM 28	MB 28	5.550
5 1/4	HE 2330	150	195	139	24	M 150X2.0	KM 30	MB 30	6.630
5 1/2	HE 2332	160	210	147	26	M 160X3.0	KM 32	MB 32	9.140
6 3/4	HE 2338	190	240	169	30	M 190X3.0	KM 38	MB 38	12.600



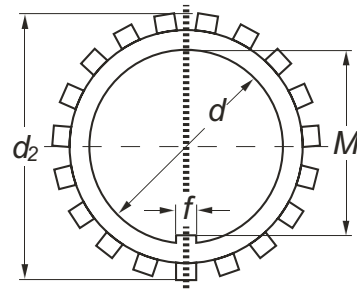
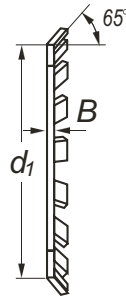
Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
3/4	HE 305	25	38	29	8	M 25 X 1.5	KM 5	MB 5	0.075
1	HE 306	30	45	31	8	M 30 X 1.5	KM 6	MB 6	0.109
1 1/4	HE 307	35	52	35	9	M 35 X 1.5	KM 7	MB 7	0.142
1 1/4	HE 308	40	58	36	10	M 40 X 1.5	KM 8	MB 8	0.189
1 1/2	HE 309	45	65	39	11	M 45 X 1.5	KM 9	MB 9	0.248
1 3/4	HE 310	50	70	42	12	M 50 X 1.5	KM 10	MB 10	0.302
2	HE 311	55	75	45	12	M 55 X 2.0	KM 11	MB 11	0.345
2 1/4	HE 312	60	80	47	13	M 60 X 2.0	KM 12	MB 12	0.393
2 1/4	HE 313	65	85	50	14	M 65 X 2.0	KM 13	MB 13	0.459
2 1/2	HE 315	75	98	55	15	M 75 X 2.0	KM 15	MB 15	0.830
2 3/4	HE 316	80	105	59	17	M 80 X 2.0	KM 16	MB 16	1.000
3	HE 317	85	110	63	18	M 85 X 2.0	KM 17	MB 17	1.180
3 1/4	HE 318	90	120	65	18	M 90 X 2.0	KM 18	MB 18	1.370
3 1/4	HE 319	95	125	68	19	M 95 X 2.0	KM 19	MB 19	1.560
3 1/2	HE 320	100	130	71	20	M 100X2.0	KM 20	MB 20	1.690
4	HE 322	110	145	77	21	M 110X2.0	KM 22	MB 22	2.180



Inner bore d_1 inch	Adapter number	Principal dimensions					Lock nut	Lock washer	Mass kg
		d	d_3	B_1 mm	B_2	G			
4	HE 3122	110	145	81	21	M 110 X 2	KM 22	MB 22	2.250
4 1/4	HE 3124	120	155	88	22	M 120 X 2	KM 24	MB 24	2.650
4 1/2	HE 3126	130	165	92	23	M 130 X 2	KM 26	MB 26	3.650
5	HE 3128	140	180	97	24	M 140 X 2	KM 28	MB 28	4.350
5 1/4	HE 3130	150	195	111	26	M 150 X 2	KM 30	MB 30	5.500
5 1/2	HE 3132	160	210	119	28	M 160 X 3	KM 32	MB 32	7.650
6	HE 3134	170	220	122	29	M 170 X 2	KM 34	MB 34	8.400
6 1/2	HE 3136	180	230	131	30	M 180 X 2	KM 36	MB 36	9.500
6 3/4	HE 3138	190	240	141	31	M 190 X 2	KM 38	MB 38	11.000
7	HE 3140	200	250	150	32	M 200 X 2	KM 40	MB 40	12.000



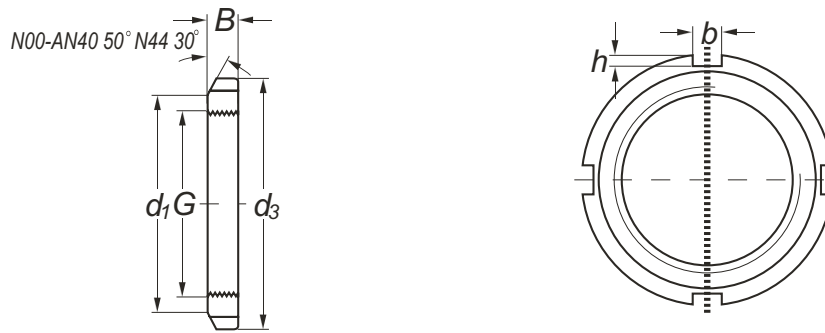
Inner bore G mm	Lock nut number	Principal dimensions					Lock washer	Mass kg
		d_1	d_3	B mm	b	h		
M 10 X 0.75	KM 00	13.5	18	4	3	2.0	MB 0	0.004
M 12 X 1.00	KM 01	17.0	22	4	3	2.0	MB 1	0.007
M 15 X 1.00	KM 02	21.0	25	5	4	2.0	MB 2	0.010
M 17 X 1.00	KM 03	24.0	28	5	4	2.0	MB 3	0.013
M 20 X 1.00	KM 04	26.0	32	6	4	2.0	MB 4	0.019
M 25 X 1.50	KM 05	32.0	38	7	5	2.0	MB 5	0.025
M 30 X 1.50	KM 06	38.0	45	7	5	2.0	MB 6	0.043
M 35 X 1.50	KM 07	44.0	52	8	5	2.0	MB 7	0.053
M 40 X 1.50	KM 08	50.0	58	9	6	2.5	MB 8	0.085
M 45 X 1.50	KM 09	56.0	65	10	6	2.5	MB 9	0.119
M 50 X 1.50	KM 10	61.0	70	11	6	2.5	MB 10	0.148
M 55 X 2.00	KM 11	67.0	75	11	7	3.0	MB 11	0.158
M 60 X 2.00	KM 12	73.0	80	11	7	3.0	MB 12	0.174
M 65 X 2.00	KM 13	79.0	85	12	7	3.0	MB 13	0.203
M 70 X 2.00	KM 14	85.0	92	12	8	3.5	MB 14	0.242
M 75 X 2.00	KM 15	90.0	98	13	8	3.5	MB 15	0.287
M 80 X 2.00	KM 16	95.0	105	15	8	3.5	MB 16	0.397
M 85 X 2.00	KM 17	102.0	110	16	8	3.5	MB 17	0.451
M 90 X 2.00	KM 18	108.0	120	16	10	4.0	MB 18	0.556
M 95 X 2.00	KM 19	113.0	125	17	10	4.0	MB 19	0.658
M 100X2.00	KM 20	120.0	130	18	10	4.0	MB 20	0.698
M 105X2.00	KM 21	126.0	140	18	12	5.0	MB 21	0.846
M 110X2.00	KM 22	133.0	145	19	12	5.0	MB 22	0.965
M 115X2.00	KM 23	137.0	150	19	12	5.0	MB 23	1.010
M 120X2.00	KM 24	138.0	155	20	12	5.0	MB 24	1.080
M 125X2.00	KM 25	148.0	160	21	12	5.0	MB 25	1.190
M 130X2.00	KM 26	149.0	165	21	12	5.0	MB 26	1.250
M 135X2.00	KM 27	160.0	175	22	14	6.0	MB 27	1.550
M 140X2.00	KM 28	160.0	180	22	14	6.0	MB 28	1.560
M 145X2.00	KM 29	171.0	190	24	14	6.0	MB 29	1.800
M 150X2.00	KM 30	171.0	195	24	14	6.0	MB 30	2.030



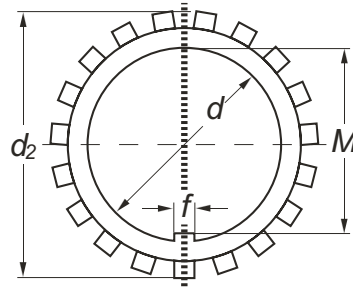
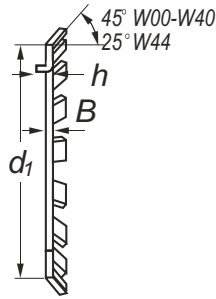
Inner bore d mm	Lock washer number	Principal dimensions					Lock nut	Mass g
		d_1	d_2	B mm	f	M		
10	MB 00	13.5	21	1.00	3	8.5	KM 0	1.31
12	MB 01	17.0	25	1.00	3	10.5	KM 1	1.92
15	MB 02	21.0	28	1.00	4	13.5	KM 2	2.53
17	MB 03	24.0	32	1.00	4	15.5	KM 3	3.13
20	MB 04	26.0	36	1.00	4	18.5	KM 4	3.50
25	MB 05	32.0	42	1.25	5	23.0	KM 5	6.40
30	MB 06	38.0	49	1.25	5	27.5	KM 6	7.80
35	MB 07	44.0	57	1.25	6	32.5	KM 7	10.40
40	MB 08	50.0	62	1.25	6	37.5	KM 8	12.30
45	MB 09	56.0	69	1.25	6	42.5	KM 9	15.20
50	MB 10	61.0	74	1.25	6	47.5	KM 10	16.00
55	MB 11	67.0	81	1.50	8	52.5	KM 11	19.60
60	MB 12	73.0	86	1.50	8	57.5	KM 12	25.30
65	MB 13	79.0	92	1.50	8	62.5	KM 13	29.00
70	MB 14	85.0	98	1.50	8	66.5	KM 14	33.40
75	MB 15	90.0	104	1.50	8	71.5	KM 15	35.60
80	MB 16	95.0	112	1.80	10	76.5	KM 16	46.40
85	MB 17	102.0	119	1.80	10	81.5	KM 17	52.40
90	MB 18	108.0	126	1.80	10	86.5	KM 18	42.30
95	MB 19	113.0	133	1.80	10	91.5	KM 19	67.00
100	MB 20	120.0	142	1.80	12	96.5	KM 20	76.50
105	MB 21	126.0	145	1.80	12	100.5	KM 21	82.60
110	MB 22	133.0	154	1.80	12	105.5	KM 22	94.00
115	MB 23	137.0	159	2.00	12	110.5	KM 23	103.00
120	MB 24	138.0	164	2.00	14	115.0	KM 24	105.00
125	MB 25	148.0	170	2.00	14	120.0	KM 25	118.00
130	MB 26	149.0	175	2.00	14	125.0	KM 26	113.00
135	MB 27	160.0	185	2.00	14	130.0	KM 27	144.00
140	MB 28	160.0	192	2.00	16	135.0	KM 28	142.00
145	MB 29	171.0	202	2.00	16	140.0	KM 29	168.00
150	MB 30	171.0	205	2.00	16	145.0	KM 30	155.00

LOCK NUTS

N / AN SERIES



Inner bore G	Lock nut number	Principal dimensions					Lock washer	Mass LB/C
		d_1	d_3	B inch	b	h		
.3937 32	N-00	.625	.755	.229	.120	.073	W 0	2.0
.4724 32	N-01	.719	.880	.323	.120	.073	W 1	3.3
.5906 32	N-02	.813	1.005	.323	.120	.104	W 2	3.5
.6693 32	N-03	.938	1.130	.354	.120	.104	W 3	5.3
.7874 32	N-04	1.125	1.380	.385	.178	.104	W 4	9.0
.9843 32	N-05	1.281	1.568	.416	.178	.104	W 5	11.5
1.1811 18	N-06	1.500	1.755	.416	.178	.104	W 6	13.0
1.3780 18	N-07	1.813	2.068	.448	.178	.104	W 7	21.0
1.5780 18	N-08	2.000	2.255	.448	.240	.104	W 8	22.5
1.7717 18	N-09	2.281	2.536	.448	.240	.104	W 9	29.0
1.9685 18	N-10	2.438	2.693	.510	.240	.104	W 10	34.0
2.1654 18	N-11	2.656	2.974	.510	.240	.135	W 11	42.0
2.3622 18	N-12	2.844	3.161	.541	.240	.135	W 12	47.0
2.5591 18	N-13	3.063	3.380	.573	.240	.135	W 13	55.0
2.7559 18	N-14	3.313	3.630	.573	.240	.135	W 14	63.8
2.9528 12	AN-15	3.563	3.880	.604	.360	.135	W 15	78.8
3.1496 12	AN-16	3.844	4.161	.604	.360	.135	W 16	92.5
3.3456 12	AN-17	4.031	4.411	.635	.360	.166	W 17	104.0
3.5433 12	AN-18	4.281	4.661	.698	.360	.166	W 18	130.0
3.7402 12	AN-19	4.563	4.943	.729	.360	.166	W 19	153.8
3.9370 12	AN-20	4.813	5.193	.760	.360	.166	W 20	178.8
4.1339 12	AN-21	5.000	5.443	.760	.485	.198	W 21	193.8
4.3307 12	AN-22	5.281	5.724	.791	.485	.198	W 22	223.0
4.7244 12	AN-24	5.688	6.130	.823	.485	.198	W 24	255.0
5.1181 12	AN-26	6.188	6.755	.885	.610	.260	W 26	317.0
5.5118 12	AN-28	6.531	7.099	.948	.610	.260	W 28	355.0
5.9055 12	AN-30	7.063	7.693	.979	.610	.291	W 30	475.0
6.2992 8	AN-32	7.438	8.068	1.041	.610	.291	W 32	525.0
6.6929 8	AN-34	8.031	8.661	1.073	.610	.291	W 34	662.5
7.0866 8	AN-36	8.375	9.068	1.104	.735	.323	W 36	665.0
7.4803 8	AN-38	8.781	9.474	1.135	.735	.323	W 38	775.0
7.8740 8	AN-40	9.156	9.849	1.198	.735	.323	W 40	850.0
8.6614 8	N-44	9.843	11.005	1.260	.980	.510	W 44	1050.0



Inner bore d inch	Lock washer number	Principal dimensions						Lock nut	Mass LB/C
		d_1	d_2	B	f	h	M		
.406	W 00	.625	.875	.032	.120	.062	.334	N-00	.5
.484	W 01	.719	1.016	.032	.120	.062	.412	N-01	.5
.601	W 02	.813	1.156	.032	.120	.062	.529	N-02	.5
.679	W 03	.938	1.328	.032	.120	.062	.607	N-03	.8
.801	W 04	1.125	1.531	.032	.176	.062	.729	N-04	1.3
.989	W 05	1.281	1.719	.040	.176	.094	.909	N-05	1.5
1.193	W 06	1.500	1.922	.040	.176	.094	1.093	N-06	1.5
1.396	W 07	1.813	2.250	.040	.176	.094	1.296	N-07	2.3
1.583	W 08	2.000	2.496	.048	.290	.094	1.475	N-08	3.3
1.792	W 09	2.281	2.734	.048	.290	.125	1.684	N-09	4.3
1.992	W 10	2.438	2.922	.048	.290	.125	1.884	N-10	4.5
2.182	W 11	2.656	3.109	.053	.290	.125	2.069	N-11	4.8
2.400	W 12	2.844	3.344	.053	.290	.125	2.267	N-12	4.8
2.588	W 13	3.063	3.578	.053	.290	.125	2.455	N-13	6.0
2.791	W 14	3.313	3.828	.053	.290	.187	2.658	N-14	6.5
2.973	W 15	3.563	4.109	.062	.290	.187	2.831	AN-15	10.0
3.177	W 16	3.844	4.375	.062	.353	.188	3.035	AN-16	11.5
3.395	W 17	4.031	4.625	.062	.353	.188	3.253	AN-17	12.0
3.582	W 18	4.281	4.938	.084	.353	.188	3.418	AN-18	16.9
3.800	W 19	4.563	5.219	.084	.353	.188	3.636	AN-19	19.5
3.988	W 20	4.813	5.500	.084	.353	.250	3.809	AN-20	20.5
4.192	W 21	5.000	5.703	.084	.353	.250	4.013	AN-21	23.8
4.395	W 22	5.281	6.063	.115	.353	.250	4.185	AN-22	34.5
4.801	W 24	5.688	6.469	.115	.353	.250	4.591	AN-24	39.0
5.191	W 26	6.188	7.031	.116	.435	.250	4.961	AN-26	43.0
5.582	W 28	6.531	7.438	.116	.590	.250	5.352	AN-28	46.5
5.983	W 30	7.063	8.063	.146	.590	.312	5.722	AN-30	71.0
6.389	W 32	7.438	8.438	.146	.590	.312	6.128	AN-32	73.5
6.764	W 34	8.031	9.063	.146	.715	.312	6.503	AN-34	90.5
7.171	W 36	8.375	9.438	.146	.715	.312	6.910	AN-36	93.5
7.577	W 38	8.781	9.875	.146	.715	.312	7.316	AN-38	105.0
7.982	W 40	9.165	10.313	.146	.840	.312	7.721	AN-40	111.0
8.701	W 44	9.875	11.438	.146	.940		8.327	N-44	118.0

Conversion Tables

(To convert from A to B, multiply by entry in table)

Length						
A \ B	in	ft	micron (μm)	mm	cm	m
in	1	0.0833	2.54×10^{-4}	25.4	2.54	0.0254
ft	12	1	3.048×10^{-5}	304.8	30.48	0.3048
micron (μm)	3.937×10^{-7}	3.281×10^{-6}	1	0.001	1.0×10^{-4}	1.0×10^{-6}
mm	0.03937	0.00328	1000	1	0.1	0.001
cm	0.3937	0.03281	1.0×10^{-4}	10	1	0.01
m	39.37	3.281	1.0×10^{-6}	1000	100	1

Mass						
A \ B	gm	kg	slug	lb(m)	oz(m)	
gm	1	.001	6.852×10^{-5}	2.205×10^{-3}	.03527	
kg	1000	1	6.852×10^{-2}	2.205	35.274	
slug	14590	14.59	1	32.2	514.72	
lb(m)	453.6	.45359	.0311	1	16	
oz(m)	28.35	.02835	1.94×10^{-3}	.0625	1	

Force						
A \ B	lb(f)	N	dyne	oz(f)	kg(f)	gm(f)
lb(f)	1	4.4482	4.448×10^{-5}	16	.45359	453.6
N	.22481	1	100.000	3.5967	.10197	ÑÑ
dyne	2.248×10^{-6}	.00001	1	3.59×10^{-5}	ÑÑ	980.6
oz(f)	.0625	.27801	2.78×10^{-4}	1	.02835	28.35
kg(f)	2.205	9.80665	ÑÑ	35.274	1	1000
gm(f)	2.205×10^{-3}	ÑÑ	1.02×10^{-3}	.03527	.001	1

Note: $lb(f) = 1 slug \times 1 ft/s^2$ $N = 1 kg \times 1 m/s^2$ $dyne = 1 gm \times 1 cm/s^2$

Inertia (Rotary)

A \ B	gm-cm ²	oz-in ²	gm-cm-s ²	kg-cm ²	lb-in ²	oz-in-s ²	lb-ft ²	kg-cm-s ²	lb-in-s ²	lb-ft-s ² or slug-ft-s ²
gm-cm ²	1	5.46x10 ⁻²	1.01x10 ⁻³	10 ⁻³	3.417x10 ⁻⁴	1.41x10 ⁻⁵	2.37x10 ⁻⁶	1.01x10 ⁻⁴	8.85x10 ⁻⁷	7.37x10 ⁻⁴
oz-in ²	182.9	1	.186	.182	.0625	2.59x10 ⁻³	4.34x10 ⁻⁴	1.86x10 ⁻⁴	1.61x10 ⁻⁴	1.34x10 ⁻⁵
gm-cm-s ²	980.6	5.36	1	.9806	.335	1.38x10 ⁻²	2.32x10 ⁻³	10 ⁻³	8.67x10 ⁻⁴	7.23x10 ⁻⁵
kg-cm ²	1000	5.46	1.019	1	.3417	1.41x10 ⁻²	2.37x10 ⁻³	1.019x10 ⁻³	8.85x10 ⁻⁴	7.37x10 ⁻⁵
lb-in ²	2.92x10 ³	16	2.984	2.925	1	4.14x10 ⁻²	6.94x10 ⁻³	2.96x10 ⁻³	2.59x10 ⁻³	2.15x10 ⁻⁴
oz-in-s ²	7.06x10 ⁴	386.08	72.0	70.615	24.13	1	.1675	7.20x10 ⁻²	6.25x10 ⁻²	5.20x10 ⁻³
lb-ft ²	4.21x10 ⁵	2304	429.71	421.40	144	5.967	1	.4297	.3729	3.10x10 ⁻²
kg-cm-s ²	9.8x10 ⁵	5.36x10 ³	1000	980.66	335.1	13.887	2.327	1	.8679	7.23x10 ⁻²
lb-in-s ²	1.129x10 ⁴	6.177x10 ³	1.152x10 ³	1.129x10 ³	386.08	16	2.681	1.152	1	8.33x10 ⁻²
lb-ft-s ² or slug-ft ²	1.355x10 ⁷	7.41x10 ⁴	1.38x10 ⁴	1.35x10 ⁴	4.63x10 ³	192	32.17	13.825	12	1

Abbreviated Terms

C	=	Celsius
cm	=	centimeter
F	=	Fahrenheit
ft	=	foot
g	=	gravity
gm	=	gram
gm(f)	=	gram force
HP	=	Horse Power
in	=	inch
kg	=	kilogram
kg(f)	=	kilogram force
KW	=	Kilowatt

lb(f)	=	pound force
lb(m)	=	pound mass
min	=	minute
mm	=	millimeter
m	=	meter
N	=	Newton
oz(f)	=	ounce force
oz(m)	=	ounce mass
rad	=	radians
rpm	=	revs per minute
rps	=	revs per second
s	=	seconds

Metric Prefixes

Name	Abbreviation	Multiple
Giga	G	10 ⁹
Mega	M	10 ⁶
Kilo	k	10 ³
Hecto	h	10 ²
deka	da	10 ¹
—	—	10 ⁰
deci	d	10 ⁻¹
centi	c	10 ⁻²
milli	m	10 ⁻³
micro	μ	10 ⁻⁶
nano	n	10 ⁻⁹



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