TIMKEN

TIMKEN® DEEP GROOVE BALL BEARING CATALOG

ABOUT THE TIMKEN COMPANY

As a global leader in bearings and power transmission systems, Timken focuses on precise solution design, materials and craftsmanship to deliver reliable and efficient performance that improves productivity and uptime. Timken offers a full range of bearings, belts, chains, couplings, gears and lubricants, along with rebuild and repair services.

Timken (NYSE; TKR; www.timken.com) applies its proven expertise in metallurgy, tribology and mechanical power transmission to create innovative approaches to customers' complex needs. Global availability of products and engineering talent, combined with exceptional service delivery across markets, makes Timken a preferred choice worldwide.

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TIMKEN® DEEP GROOVE BALL BEARINGS

All-Around Timken Reliability: Our deep groove ball bearings deliver reliable performance in a wide range of applications and conditions. With super-finished raceways and controlled geometries, our premium design helps ensure consistent quality.

Extended Product Offering: Our portfolio includes standard, thin-section, narrow, wide and miniature and extra-small deep groove ball bearings that span 3 mm to 400 mm bore sizes. The extended product line includes a complete offering of open, shields, seals and snap ring combinations.

Easy Interchange: Designed as metric bearings, our deep groove ball bearings follow ISO standards and are dimensionally interchangeable with competitor metric products.

Premium Lubricants: For reduced torque and a quieter operation, Mobil Polyrex™ EM premium lubricant comes standard on all Timken sealed and shielded deep groove ball bearings. This electric motor bearing grease has a wide operating temperature range from -29° C to 177° C.

Brass Cage Availability: Deep groove ball bearings with brass cages (available in select sizes) can deliver extra strength and durability in the most unrelenting conditions:

- Extreme shock loads
- High vibrations
- High forces due to acceleration

Quiet Running for Electric Motor Quality: Deep groove ball bearings are frequently used in electric motor applications to minimize vibration and noise. To meet our longstanding electric motor quality guidelines for deep groove ball bearings we designed in:

- Super finishing on raceways to reduce friction
- Preferred clearance designation (C3)
- Premium grease for high performance, low torque and less noise

Timken deep groove ball bearings have lower vibration levels than competitors during independent electric motor application testing.

Mobil and Polyrex™ lubricant are trademarks of Exxon Mobil Corporation.

HOW TO USE THIS CATALOG

We designed this catalog to help you find the Timken bearings best suited to your equipment needs and specifications.

This publication contains dimensions, tolerances and load ratings, as well as engineering sections describing fitting practices for shafts and housings, internal clearances and other bearing features. For mounting information, please use the Timken Engineering Manual (order no. 10424). It provides valuable assistance in the initial consideration of the type and characteristics of the bearings that may best suit your particular needs.

SHELF LIFE AND STORAGE OF GREASE-LUBRICATED BEARINGS AND COMPONENTS

To help you get the most value from our products, Timken provides guidelines for the shelf life of grease-lubricated ball and roller bearings, components and assemblies. Shelf life information is based on Timken and industry test data and experience.

SHELF LIFE

Shelf life should be distinguished from lubricated bearing/component design life as follows:

Shelf life of the grease-lubricated bearing/component represents the period of time prior to use or installation.

The shelf life is a portion of the anticipated aggregate design life. It is impossible to accurately predict design life due to variations in lubricant bleed rates, oil migration, operating conditions, installation conditions, temperature, humidity and extended storage.

TIMKEN IS NOT RESPONSIBLE FOR THE SHELF LIFE OF ANY BEARING/COMPONENT LUBRICATED BY ANOTHER PARTY.

European REACH compliance

Timken lubricants, greases and similar products sold in standalone containers or delivery systems are subject to the European REACH (Registration, Evaluation, Authorization and Restriction of CHemicals) directive. For import into the European Union, Timken can sell and provide only those lubricants and greases that are registered with ECHA (European CHemical Agency). For further information, please contact your Timken engineer.

STORAGE

Timken suggests the following storage guidelines for our finished products (bearings, components and assemblies, referred to as "products"):

- Unless directed otherwise by Timken, products should be kept in their original packaging until they are ready to be placed into service.
- Do not remove or alter any labels or stencil markings on the packaging.
- Products should be stored in such a way that the packaging is not pierced, crushed or otherwise damaged.
- After a product is removed from its packaging, it should be placed into service as soon as possible.
- When removing a product that is not individually packaged from a bulk pack container, the container should be resealed immediately after the product is removed.
- The storage area temperature should be maintained between 0° C and 40° C; temperature fluctuations should be minimized.
- The relative humidity should be maintained below 60 percent and the surfaces should be dry.
- The storage area should be kept free from airborne contaminants such as, but not limited to, dust, dirt, harmful vapors, etc.
- The storage area should be isolated from undue vibration.
- Extreme conditions of any kind should be avoided.

Due to the fact that Timken is not familiar with your particular storage conditions, we strongly suggest following these guidelines. However, you may be required by circumstances or applicable government requirements to adhere to stricter storage requirements.

Most bearing components typically ship protected with a corrosion-preventive compound that is not a lubricant. These components may be used in oil-lubricated applications without removal of the corrosion-preventive compound. When using some specialized grease lubrications, we advise you to remove the corrosion-preventive compound before packing the bearing components with suitable grease.

Be careful in selecting lubrication, however, since different lubricants are often incompatible.

When you receive a bearing shipment, do not remove products from their packaging until they are ready for mounting so they do not become corroded or contaminated.

Store bearings and bearing housings in an appropriate atmosphere so they remain protected for the intended period.

⚠ WARNING

Failure to observe the following warnings could create a risk of death or serious injury.

Proper maintenance and handling practices are critical. Always follow installation instructions and maintain proper lubrication.

Tensile stresses can be very high in tightly fitted bearing components. Attempting to remove such components by cutting the cone (inner race) may result in a sudden shattering of the component, causing fragments of metal to be forcefully expelled. Always use properly guarded presses or bearing pullers to remove bearings from shafts, and always use suitable personal protective equipment, including safety glasses.

CAUTION

Failure to follow these cautions may result in property damage.

The products cataloged are application-specific. Any use in applications other than those intended could lead to equipment failure or to reduced equipment life.

Use of improper bearing fits may cause damage to equipment.

Do not use damaged bearings. The use of a damaged bearing can result in equipment damage.

DISCLAIMER

This catalog is provided solely to give you analysis tools and data to assist you in your product selection. Product performance is affected by many factors beyond the control of Timken. Therefore, the suitability and feasibility of all product selection must be validated by you.

Timken products are sold subject to Timken's terms and conditions of sale, including its limited warranty and remedy, which may be found at http://www.timken.com/termsandconditionsofsale. Please consult with your Timken sales engineer for more information and assistance.

Every reasonable effort has been made to ensure the accuracy of the information in this writing, but no liability is accepted for errors, omissions or for any other reason.

COMPLIANCE

To view the complete engineering catalog, please visit www.timken.com. To order the catalog, please contact your Timken sales engineer and request a copy of the Timken Engineering Manual (order number 10424).

European REACH compliance *Timken-branded lubricants, greases and similar products sold in stand-alone containers or delivery systems are subject to the European REACH (**R**egistration, **E**valuation, **A**uthorization and Restriction of **CH**emicals) directive. For import into the European Union, Timken can sell and provide only those lubricants and greases that are registered with ECHA (**E**uropean **CH**emical **A**gency). For further information, please contact your Timken sales engineer.*

The Timken Company products shown in this catalog may be directly or indirectly subject to a number of regulatory standards and directives originating from authorities in the USA, European Union and around the world including: REACH (EC 1907/2006, RoHS (2011/65/EU), ATEX (94/9/EC), 'CE' MARKING (93/68/EEC), CONFLICT MINERALS (Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act).

For any questions or concerns regarding the compliancy or applicability of Timken products to these or other unspecified standards, please contact your Timken sales engineer or customer services representative.

Updates are made periodically to this catalog. Visit www.timken.com for the most recent version of the Timken® Deep Groove Ball Bearing Catalog.

ENGINEERING

This engineering section is not intended to be comprehensive, but does serve as a useful guide in bearing selection.

To view the complete engineering catalog and other Timken catalogs, go to www.timken.com/catalogs for interactive versions, or to download a catalog app for your smart phone or mobile device scan the QR code or go to timkencatalogs.squawqr.com.

SIZE RANGE

Deep groove ball bearings are available in a variety of sizes and are the most popular of the rolling bearings. This type of bearing supports radial load and a small degree of axial load in both directions simultaneously. Deep groove ball bearings are popular due to their versatility, affordability, and capability to run at high speeds.

Timken offers deep groove ball bearings in a wide range of sizes and configurations. Offered sizes range from 3 mm to 400 mm bore, and maximum outside diameter (O.D.) of 600 mm. Timken continues to expand the offering of deep groove ball bearings with larger sizes to be introduced. Contact your Timken sales representative for questions and new opportunities.

TYPES

There are several series of deep groove ball bearings that have been standardized by bearing manufacturers. The boundary dimensions for standard metric bearings are contained in the general plans as specified in ISO (International Organization for Standardization) standard 15:2011 for radial rolling bearings.

The Timken offering includes standard, thin-section, narrow, wide, miniature and extra-small constructions. The offering includes:

- Open basic design
- With shields
- With contact seals
- With non-contact seals
- With a snap ring groove on the outer ring O.D.
- With a snap ring on the outer ring O.D.

CONFIGURATIONS

Variations may differ based on bearing size and/or series.

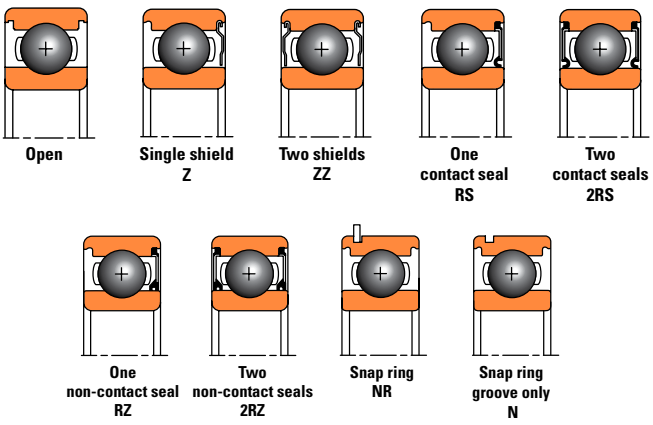


Fig. 1. Deep groove ball bearing configurations.

CAGES

Cages (also referred to as retainers) make a vital contribution to overall bearing performance. They maintain uniform ball spacing in the bearing as the balls pass into and out of the load zone.

Cages can impact several bearing operational characteristics such as:

- Maximum rotational speed
- Torque characteristics
- Temperature limits
- Lubricant flow

There are a number of different cage types that are commonly used in deep groove ball bearings, the most popular being the riveted steel cage. Table 1 describes the most common cage types.

TABLE 1. COMMON CAGE TYPES

Type	Two-Piece Riveted Steel Cage	One-Piece Stainless Steel Crown-Type Cage	One-Piece Polymer Crown-Type Cage	Machined-Brass Cage
Design				
Construction	Two pressed-steel half cages are fixed together with rivets; ball-piloted cage provides good uniformity of ball-to-pocket clearance.	Pressed stainless-steel cage guided by inner ring.	One-piece molded snap-in 6/6 nylon cage.	Two identical half cages made from solid brass, fixed together with rivets.
Advantages	Designed to reduce frictional torque; high rigidity and strength, making it the cage of choice for most applications.	Best performance in low-speed applications where low torque is preferred.	Tough and flexible especially in situations of misalignment; resistant to most solvents, oils and greases.	Superior strength enables this cage to be used in heavily loaded and high-speed applications.

BEARING SHIELDS AND SEALS

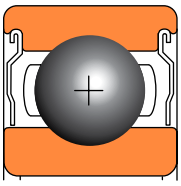
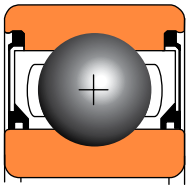
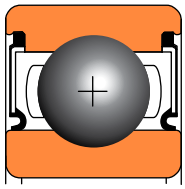
Bearing shields and seals help keep lubricant in and dust, water and other contaminants out.

Timken shielded deep groove ball bearings are available with one or two shields for coarse debris. Single shielded bearings allow for re-lubrication from the open side.

Sealed ball bearings are available with one or two seals for improved protection in harsh environments. Offered in contact or non-contact configurations, Timken seals use high-performance Nitrile Buna Rubber with reinforced low-carbon steel case for standard operating temperatures.

The following table summarizes the main characteristics of shields and seals.

TABLE 2. CHARACTERISTICS OF SHIELDS AND SEALS

Type	Shields One = Z Two = ZZ	Non-Contact Seals One = RZ Two = 2RZ	Contact Seals One = RS Two = 2RS
Construction			
Material	Low-carbon pressed steel	Nitrile Buna Rubber with steel case	Nitrile Buna Rubber with steel case
Speed Capability	High speed	High speed	Less than shield(s) and non-contact seal(s) due to seal lip contact
Operating Temperature	-50° C to +120° C	-40° C to +120° C	-40° C to +120° C
Grease Retention	Good	Better than shield(s)	Excellent
Dust Resistance	Good	Better than shield(s)	Excellent
Torque	Low	Low	Greater than shield(s) and non-contact seal(s) due to seal lip contact

NOTE: The above operating temperature ranges are for standard shielded and sealed bearings. If higher temperature capability is needed, alternative bearing, grease or seal materials may be considered. Please contact your Timken sales engineer for such requirements.

BEARING LUBRICATION

Bearings must be lubricated to minimize friction between balls and raceways, as well as between balls and cages. Lubricants also help to protect the bearings from corrosion and, in some cases, to dissipate heat.

Timken open ball bearings, as well as single-sealed/shielded bearings, are supplied with rust preventive (RP) covering all bearing surfaces. For such bearings, the end user selects and applies the desired lubrication type and quantity as required by the application.

Timken double-sealed and double-shielded deep groove ball bearings are factory pre-lubricated with water-resistant grease chosen for chemical and mechanical stability. The standard grease preferred by Timken for deep groove ball bearings is Mobil Polyrex EM. This is a mineral-oil based, advanced polyurea-thickened grease that maintains proper lubrication for a wide range of operating temperatures from -29° C to 177° C. Mobil Polyrex EM provides protection against rust and corrosion, and additional protection under mild salt-water wash conditions. This grease also is widely preferred in electric motor applications.

The standard factory grease fill is 30 to 50 percent for most Timken double-sealed/shielded ball bearings. This accommodates most applications. The type and amount of grease needed varies depending on operating conditions and bearing series. Most bearings can be filled with customer-specified greases upon request to meet specific application needs. Aside from Mobil Polyrex EM grease, Timken also offers a range of other proven and popular greases suitable for a wide range of applications.

Table 3 is an overview of the common characteristics for the grease used in this product.

TABLE 3. LUBRICATION

Product Name	Brand Name	Min. Temp	Max. Temp	Base Oil Type	Thickener	Color	Characteristics and Application
Mobil Polyrex™ EM	Mobil	-29° C	177° C	Mineral Oil	Polyurea	Blue	Electric motor grease; very good resistance to water/salt water

NOTE: For other grease options consult your Timken sales engineer.

BEARING LIFE

The selection of the appropriate bearing for a given application is dependent on several performance criteria. These include bearing fatigue life, rotating precision, power requirement, temperature limits, speed capabilities and sound requirements. This section deals primarily with bearing life as related to material-associated fatigue.

Bearing life is defined as the length of time, or number of revolutions, until a fatigue spall of 6 mm^2 develops. Since fatigue is a statistical phenomenon, the life of an individual bearing is impossible to predetermine precisely. Bearings that may appear to be identical can exhibit considerable life scatter when tested under identical conditions. Thus, it is necessary to base life predictions on a statistical evaluation of a large number of bearings operating under similar conditions. The Weibull distribution function is the accepted standard for predicting the life of a population of bearings at any given reliability level.

RATING LIFE

Rating life (L_{10}) is the life that 90 percent of a group of apparently identical bearings will complete or exceed before a fatigue spall develops. The L_{10} life also is associated with 90 percent reliability for a single bearing under a certain load.

DYNAMIC LOAD RATING

Published dynamic load ratings for deep groove ball bearings are based on the industry standard procedure outlined in ISO 281:2007. This rating, designated as C_r, is defined as the radial load under which a population of bearings will achieve a L_{10} life of one million revolutions. Radial load is assumed to be constant in magnitude and direction for radial ball bearings.

STATIC LOAD RATING

The basic static load rating for Timken bearings (designated as C_{0r}) as defined in ISO 76:2006 is based on a maximum contact stress within a non-rotating bearing of 4200 MPa at the center of the most heavily loaded rolling element and raceway contact.

Such stress levels may cause visible light Brinell marks on the bearing raceways. This degree of marking will not have a measurable effect on fatigue life when the bearing is subsequently rotated under a lower application load. If sound, vibration or torque are critical or if a pronounced shock load is present, a lower load limit should be applied. For more information on selecting a bearing for static load conditions, consult your Timken sales engineer.

SPEED RATING

THERMAL REFERENCE SPEED

The thermal reference speed is the bearing thermal equilibrium speed based on industry standard reference conditions outlined in ISO 15312: 2003. Thermal equilibrium balances the heat generated by the bearing, with heat conduction through the housing and shaft. This standard applies to both bath oil lubricated and 30 percent grease fill packed bearings. It excludes any heat removed by a circulating lubricant. This standard also excludes the outer ring rotating application and heat generated by contact seals.

The ISO 15312 thermal reference speed rating calculations are based on the following assumptions:

- The bearing ambient temperature is 20° C.
- The tolerable bearing/housing interface temperature is 70° C.
- Oil and grease lubricants are considered.
  - For radial bearings with oil lubrication: ISO VG 32 oil.
  - For radial bearings with grease lubrication: ISO VG 150 grease.
- The radial loads assume a normal clearance (C0 or CN).
- For radial bearings, the applied load is 5 percent of the static load rating (C_{0r}).

Thermal reference speed ratings assume the bearing has been sufficiently broken in. During the break-in process, temperatures may exceed the tolerable limit. Break-in commonly takes between 10 to 36 hours.

Standard bearing materials and lubricants can generally withstand temperatures up to and beyond 100° C. For this reason, a permissible temperature of 100° C was assumed for the thermal speed rating calculation. Contact your Timken sales engineer if your application requires speeds above the Timken published values.

LIMITING SPEED

For certain ball bearing types and sizes, cage behavior becomes the limiting factor to bearing operating speed. For such bearings, the thermal speed rating per ISO 15312:2003 is not shown. Instead, Timken publishes limiting speeds for those bearings, as is the case for thin-section and extra-small deep groove ball bearings.

For bearings with contact seals, the speed rating also is impacted by the speed of the seal. In general, bearings with contact seals have speed ratings that are 50 percent to 60 percent of the published speed rating of the equivalent open bearing.

RADIAL INTERNAL CLEARANCE

In the manufacturing of deep groove ball bearings, it is standard practice to assemble rings and rolling elements with a specified internal clearance. This characteristic is necessary to absorb the loss of clearance due to press fitting the bearing rings at mounting or due to expansion of bearings, shafts and housings. Internal clearance in an application is an important factor that has a significant influence on bearing performance.

The radial internal clearance (RIC) in a deep groove ball bearing can be defined as the average outer-ring raceway diameter minus the average inner-ring raceway diameter minus twice the ball diameter.

Internal clearance reduces due to press fitting the bearing rings on the shaft or in the housing. This reduced internal clearance in the bearings at mounted condition is called mounted radial internal clearance.

RIC OF MINIATURE AND EXTRA-SMALL DEEP GROOVE BALL BEARINGS

The RIC symbols for miniature and extra-small deep groove ball bearings are as follows:

- MC1 – Extra tight
- MC2 – Tight
- MC3 – Normal or regular
- MC4 – Loose
- MC5 – Extra loose
- MC6 – Extra-extra loose

Table 4 provides the selection of RIC for miniature and extra-small deep groove ball bearings.

TABLE 4. RIC – MINIATURE AND EXTRA-SMALL DEEP GROOVE BALL BEARINGS

Radial Internal Clearance											
MC1		MC2		MC3		MC4		MC5		MC6	
Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
µm		µm		µm		µm		µm		µm	
0	5	3	8	5	10	8	13	13	20	20	28

Standard miniature and extra-small deep groove ball bearings with no clearance designation in the part number are made with the MC3 normal clearance.

RIC OF STANDARD DEEP GROOVE BALL BEARINGS

The RIC designations for standard deep groove ball bearings are as follows:

- C2 – Tight
- CN or C0 – Normal or regular
- C3 – Loose
- C4 – Extra loose
- C5 – Extra-extra loose

Table 5 below provides the selection of bearing internal clearances for standard deep groove ball bearings.

TABLE 5. RIC – STANDARD DEEP GROOVE BALL BEARINGS

Bore Diameter (d)		Radial Internal Clearance									
		C2		CN or C0		C3		C4		C5	
Over	Incl.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
mm		µm		µm		µm		µm		µm	
2.5	6	0	7	2	13	8	23	-	-	-	-
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	2	35	25	85	75	140	125	195	175	265
225	250	2	40	30	95	85	160	145	225	205	300
250	280	2	45	35	105	90	170	155	245	225	340
280	315	2	55	40	115	100	190	175	270	245	370
315	355	3	60	45	125	110	210	195	300	275	410
355	400	3	70	55	145	130	240	225	340	315	460

BEARING TOLERANCES

Ball bearings are manufactured to a number of specifications, with each having classes that define tolerances on dimensions such as bore, outer diameter, width and runout.

Standard Timken deep groove ball bearings maintain normal tolerances (P0) according to the current ISO 492 standard. For applications where running tolerance is critical, P6 or P5 tolerances are recommended.

The term "deviation" is defined as the difference between a single ring dimension and the nominal dimension. For metric tolerances, the normal dimension is at a +0 mm tolerance. The deviation is the tolerance range for the listed parameter. Variation is defined as the difference between the largest and smallest measurement of a given parameter for an individual ring.

Tables 6 and 7 provide tolerances for deep groove ball bearing inner and outer rings respectively.

TABLE 6. INNER RING – TOLERANCES

Bearing Bore		Bore Deviation	Width Variation	Radial Runout	Face Runout with Bore	Axial Runout	Width Deviation Inner and Outer Rings	
d		Δd_{mp}	V_{BS}	K_{ia}	S_d	S_{ia}	ΔBs and ΔCs	
over	incl.	P0	P0, P6	P0	P5	P5	P0, P6	P5
mm	**mm**	µm	µm	µm	µm	µm	µm	µm
2.5	**10**	-8	15	10	7	7	-120	-40
10	**18**	-8	20	10	7	7	-120	-80
18	**30**	-10	20	13	8	8	-120	-120
30	**50**	-12	20	15	8	8	-120	-120
50	**80**	-15	25	20	8	8	-150	-150
80	**120**	-20	25	25	9	9	-200	-200
120	**150**	-25	30	30	10	10	-250	-250
150	**180**	-25	30	30	10	10	-250	-250
180	**250**	-30	30	40	11	13	-300	-300
250	**315**	-35	35	50	13	15	-350	-350
315	**400**	-40	40	60	15	20	-400	-400

TABLE 7. OUTER RING – TOLERANCES

Bearing O.D.		Outside Deviation	Width Variation	Radial Runout	Axial Runout	Outside Diameter Runout With Face
D		ΔD_{mp}	V_{CS}	K_{ea}	S_{ea}	S_D
over	incl.	P0	P0	P0	P5	P5
mm	**mm**	µm	µm	µm	µm	µm
6	**18**	-8	15	15	8	8
18	**30**	-9	15	15	8	8
30	**50**	-11	20	20	8	8
50	**80**	-13	25	25	10	8
80	**120**	-15	25	35	11	9
120	**150**	-18	30	40	13	10
150	**180**	-25	30	45	14	10
180	**250**	-30	30	50	15	11
250	**315**	-35	35	60	18	13
315	**400**	-40	40	70	20	13
400	**500**	-45	45	80	23	15
500	**630**	-50	50	100	25	18

FITTING PRACTICE

As a general guideline, bearing rings mounted on a rotating member should have an interference fit. Loose fits may permit the ring to creep or turn, and wear the mating surface and backing shoulder. This wear can result in excessive bearing looseness and damage the bearing, shaft or housing.

The choice of fitting practices will mainly depend upon the following parameters:

- Precision class of the bearing.
- Rotating or stationary ring.
- Type of layout (single- or double-row bearings).
- Type and direction of load (continuous/alternate rotating).
- Particular running conditions like shocks, vibrations, over-loading or high speed.
- Capability for machining the bearing seats (grinding, turning or boring).
- Shaft and housing section and material.
- Mounting and setting conditions.

Fig. 2 is a graphical representation of bearing shaft and housing fit selection that conforms to accepted industry standards and practices. The bars designated g6, h6, etc., represent shaft/housing diameter and tolerance ranges to achieve various loose and interference fits required for various load and ring rotation conditions.

Tables 8 and 9, on the following pages, provide the resultant fits based on standard ISO tolerances for shaft and housing.

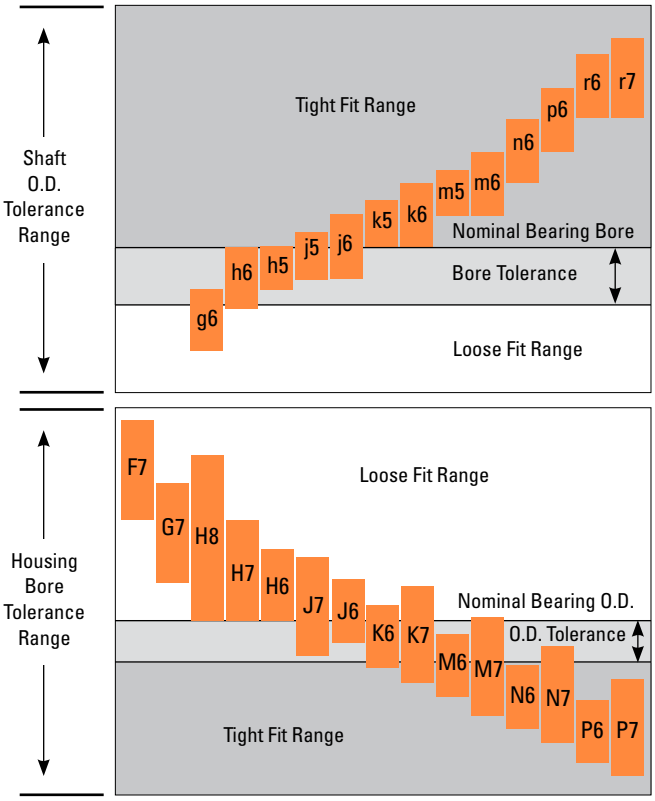


Fig. 2. Shaft and housing fit selection.

SHAFT TOLERANCES: DEEP GROOVE BALL BEARINGS

TABLE 8. SHAFT TOLERANCES: DEEP GROOVE BALL BEARINGS

Bearing Bore				g6			h5			h6			j5			js5			js6			j6		
Nominal (Max.)		Tolerance		Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit
Over	Incl.	Max.	Min.	Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm		µm		µm			µm			µm			µm			µm			µm			µm		
–	3	0	-8	-2	-8	8L 6T	0	-4	4L 8T	0	-6	6L 8T	2	-2	2L 10T	2	-2	2L 10T	3	-3	3L 11T	4	-2	2L 12T
3	6	0	-8	-4	-12	12L 4T	0	-5	5L 8T	0	-8	8L 8T	3	-2	2L 11T	2.5	-2.5	2.5L 10.5T	4	-4	4L 12T	6	-2	2L 14T
6	10	0	-8	-5	-14	14L 3T	0	-6	6L 8T	0	-9	9L 8T	4	-2	2L 12T	3	-3	3L 11T	4.5	-4.5	4.5L 12.5T	7	-2	2L 15T
10	18	0	-8	-6	-17	17L 2T	0	-8	8L 8T	0	-11	11L 8T	5	-3	3L 13T	4	-4	4L 12T	5.5	-5.5	5.5L 13.5T	8	-3	3L 16T
18	30	0	-10	-7	-20	20L 3T	0	-9	9L 10T	0	-13	13L 10T	5	-4	4L 15T	4.5	-4.5	4.5L 14.5T	6.5	-6.5	6.5L 16.5T	9	-4	4L 19T
30	50	0	-12	-9	-25	25L 3T	0	-11	11L 12T	0	-16	16L 12T	6	-5	5L 18T	5.5	-5.5	5.5L 17.5T	8	-8	8L 20T	11	-5	5L 23T
50	80	0	-15	-10	-29	29L 5T	0	-13	13L 15T	0	-19	19L 15T	6	-7	7L 21T	6.5	-6.5	6.5L 21.5T	9.5	-9.5	9.5L 24.5T	12	-7	7L 27T
80	120	0	-20	-12	-34	34L 8T	0	-15	15L 20T	0	-22	22L 20T	6	-9	9L 26T	7.5	-7.5	7.5L 27.5T	11	-11	11L 31T	13	-9	9L 33T
120	180	0	-25	-14	-39	39L 11T	0	-18	18L 25T	0	-25	25L 25T	7	-11	11L 32T	9	-9	9L 34T	12.5	-12.5	12.5L 37.5T	14	-11	11L 39T
180	200	0	-30	-15	-44	44L 15T	0	-20	20L 30T	0	-29	29L 30T	7	-13	13L 37T	10	-10	10L 40T	14.5	-14.5	14.5L 44.5T	16	-13	13L 46T
200	225	0	-30	-15	-44	44L 15T	0	-20	20L 30T	0	-29	29L 30T	7	-13	13L 37T	10	-10	10L 40T	14.5	-14.5	14.5L 44.5T	16	-13	13L 46T
225	250	0	-30	-15	-44	44L 15T	0	-20	20L 30T	0	-29	29L 30T	7	-13	13L 37T	10	-10	10L 40T	14.5	-14.5	14.5L 44.5T	16	-13	13L 46T
250	280	0	-35	-17	-49	49L 18T	0	-23	23L 35T	0	-32	32L 35T	7	-16	16L 42T	11.5	-11.5	11.5L 46.5T	16	-16	16L 51T	16	-16	16L 51T
280	315	0	-35	-17	-49	49L 18T	0	-23	23L 35T	0	-32	32L 35T	7	-16	16L 42T	11.5	-11.5	11.5L 46.T	16	-16	16L 51T	16	-16	16L 51T
315	355	0	-40	-18	-54	54L 22T	0	-25	25L 40T	0	-36	36L 40T	7	-18	18L 47T	12.5	-12.5	12.5L 52.5T	18	-18	18L 58T	18	-18	18L 58T
355	400	0	-40	-18	-54	54L 22T	0	-25	25L 40T	0	-36	36L 40T	7	-18	18L 47T	12.5	-12.5	12.5L 52.5T	18	-18	18L 58T	18	-18	18L 58T
400	450	0	-45	-20	-60	60L 25T	0	-27	27L 45T	0	-40	40L 45T	7	-20	20L 52T	13.5	-13.5	13.5L 58.5T	20	-20	20L 65T	20	-20	20L 65T
450	500	0	-45	-20	-60	60L 25T	0	-27	27L 45T	0	-40	40L 45T	7	-20	20L 52T	13.5	-13.5	13.5L 58.5T	20	-20	20L 65T	20	-20	20L 65T
500	560	0	-50	-22	-66	66L 28T	0	-28	28L 50T	0	-44	44L 50T	8	-22	22L 58T	14	-14	14L 64T	22	-22	22L 72T	-22	-22	22L 72T
560	630	0	-50	-22	-66	66L 28T	0	-28	28L 50T	0	-44	44L 50T	8	-22	22L 58T	14	-14	14L 64T	22	-22	22L 72T	-22	-22	22L 72T
630	710	0	-75	-24	-74	74L 51T	0	-32	32L 75T	0	-50	50L 75T	10	-25	25L 85T	16	-16	16L 91T	25	-25	25L 100T	25	-25	25L 100T
710	800	0	-75	-24	-74	74L 51T	0	-32	32L 75T	0	-50	50L 75T	10	-25	25L 85T	16	-16	16L 91T	25	-25	25L 100T	25	-25	25L 100T
800	900	0	-100	-26	-82	82L 74T	0	-36	36L 100T	0	-56	56L 100L	12	-28	28L 112T	18	-18	18L 118T	28	-28	28L 128T	28	-28	28L 128T
900	1000	0	-100	-26	-82	82L 74T	0	-36	36L 100T	0	-56	56L 100L	12	-28	28L 112T	18	-18	18L 118T	28	-28	28L 128T	28	-28	28L 128T
1000	1120	0	-125	-28	-94	94L 97T	0	-42	42L 125T	0	-66	66L 125T	13	-33	33L 138T	21	-21	21L 146T	33	-33	33L 158T	33	-33	33L 158T
1120	1250	0	-125	-28	-94	94L 97T	0	-42	42L 125T	0	-66	66L 125T	13	-33	33L 138T	21	-21	21L 146T	33	-33	33L 158T	33	-33	33L 158T

k5			k6			m5			m6			n6			p6			r6			r7		
Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit
Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
µm			µm			µm			µm			µm			µm			µm			µm		
4	0	0T 12T	6	0	0T 14T	6	2	2T 14T	8	2	2T 16T	–			–			–			–		
6	1	1T 14T	9	1	1T 17T	9	4	4T 17T	12	4	4T 20T	16	8	8T 24T	20	12	12T 28T	23	15	15T 31T	27	15	15T 35T
7	1	1T 15T	10	1	1T 18T	12	6	6T 20T	15	6	6T 23T	19	10	10T 27T	24	15	15T 32T	28	19	19T 36T	34	19	19T 42T
9	1	1T 17T	12	1	1T 20T	15	7	7T 23T	18	7	7T 26T	23	12	12T 31T	29	18	18T 37T	34	23	23T 42T	41	23	23T 49T
11	2	2T 21T	15	2	2T 25T	17	8	8T 27T	21	8	8T 31T	28	15	15T 38T	35	22	22T 45T	41	28	28T 49T	49	28	28T 59T
13	2	2T 25T	18	2	2T 30T	20	9	9T 32T	25	9	9T 37T	33	17	17T 45T	42	26	26T 54T	50	34	34T 62T	59	34	34T 71T
15	2	2T 30T	21	2	2T 36T	24	11	11T 39T	30	11	11T 45T	39	20	20T 54T	51	32	32T 66T	62	41	41T –77T	73	41	41T 88T
18	3	3T 38T	25	3	3T 45T	28	13	13T 48T	35	13	13T 55T	45	23	23T 65T	59	37	37T 79T	76	51	51T 96T	89	51	51T 109T
21	3	3T 46T	28	3	3T 53T	33	15	15T 58T	40	15	15T 65T	52	27	27T 77T	68	43	43T 93T	90	65	65T 115T	105	65	65T 130T
24	4	4T 54T	33	4	4T 63T	37	17	17T 67T	46	17	17T 76T	60	31	31T 90T	79	50	50T 109T	106	77	77T 136T	123	77	77T 153T
24	4	4T 54T	33	4	4T 63T	37	17	17T 67T	46	17	17T 76T	60	31	31T 90T	79	50	50T 109T	109	80	80T 139T	126	80	80T 156T
24	4	4T 54T	33	4	4T 63T	37	17	17T 67T	46	17	17T 76T	60	31	31T 90T	79	50	50T 109T	113	84	84T 143T	130	84	84T 160T
27	4	4T 62T	36	4	4T 71T	43	20	20T 78T	52	20	20T 87T	66	34	34T 101T	88	56	56T 123T	126	94	94T 161T	146	94	94T 181T
27	4	4T 62T	36	4	4T 71T	43	20	20T 78T	52	20	20T 87T	66	34	34T 101T	88	56	56T 123T	130	98	98T 165T	150	98	98T 185T
29	4	4T 69T	40	4	4T 80T	46	21	21T 86T	57	21	21T 97T	73	37	37T 113T	98	62	62T 138T	144	108	108T 184T	165	108	108T 205T
29	4	4T 69T	40	4	4T 80T	46	21	21T 86T	57	21	21T 97T	73	37	37T 113T	98	62	62T 138T	150	114	114T 190T	171	114	114T 211T
32	5	5T 77T	45	5	5T 90T	50	23	23T 95T	63	23	23T 108T	80	40	40T 125T	108	68	68T 153T	166	126	126T 211T	189	126	126T 234T
32	5	5T 77T	45	5	5T 90T	50	23	23T 95T	63	23	23T 108T	80	40	40T 125T	108	68	68T 153T	172	132	132T 217T	195	132	132T 240T
29	0	0T 79T	44	0	0T 94T	56	26	26T 105T	70	26	26T 120T	88	44	44T 138T	122	78	78T 172T	194	150	150T 244T	220	150	150T 270T
29	0	0T 79T	44	0	0T 94T	56	26	26T 105T	70	26	26T 120T	88	44	44T 138T	122	78	78T 172T	199	155	155T 249T	225	155	155T 275T
32	0	0T 107T	50	0	0T 125T	62	30	30T 137T	80	30	30T 155T	100	50	50T 175T	138	88	88T 213T	225	175	175T 300T	255	175	175T 330T
32	0	0T 107T	50	0	0T 125T	62	30	30T 137T	80	30	30T 155T	100	50	50T 175T	138	88	88T 213T	235	185	185T 310T	265	185	185T 340T
36	0	0T 136T	56	0	0T 156T	70	34	34T 170T	90	34	34T 190T	112	56	56T 212T	156	100	100T 256T	266	210	210T 366T	300	210	210T 400T
36	0	0T 136T	56	0	0T 156T	70	34	34T 170T	90	34	34T 190T	112	56	56T 212T	156	100	100T 256T	276	220	220T 376T	310	220	220T 410T
42	0	0T 167T	66	0	0T 191T	82	40	40T 207T	106	40	40T 231T	132	66	66T 257T	186	120	120T 311T	316	250	250T 441T	355	250	250T 480T
42	0	0T 167T	66	0	0T 191T	82	40	40T 207T	106	40	40T 231T	132	66	66T 257T	186	120	120T 311T	326	260	260T 451T	365	260	260T 490T

HOUSING TOLERANCES: DEEP GROOVE BALL BEARINGS

TABLE 9. HOUSING TOLERANCES: DEEP GROOVE BALL BEARINGS

Bearing O.D.				F7			G7			H6			H7			H8			J6			J7		
Nominal (Max.)		Tolerance		Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit
Over	Incl.	Max.	Min.	Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm		µm		µm			µm			µm			µm			µm			µm			µm		
6	10	0	-8	28	13	13L 32L	20	5	5L 28L	9	0	0L 17L	15	0	0L 23L	22	0	0L 30L	5	-4	4T 13L	8	-7	7T 16L
10	18	0	-8	34	16	16L 42L	24	6	6L 32L	11	0	0L 19L	18	0	0L 26L	27	0	0L 35L	6	-5	5T 14L	10	-8	8T 18L
18	30	0	-9	41	20	20L 50L	28	7	7L 37L	13	0	0L 22L	21	0	0L 30L	33	0	0L 42L	8	-5	5T 10 17L	12	-9	9T 21L
30	50	0	-11	50	25	25L 61L	34	9	9L 45L	16	0	0L 27L	25	0	0L 36L	39	0	0L 50L	10	-6	6T 21L	14	-11	11T 25L
50	80	0	-13	60	30	30L 73L	40	10	10L 53L	19	0	0L 32L	30	0	0L 43L	46	0	0L 59L	13	-6	6T 26L	18	-12	12T 31L
80	120	0	-15	71	36	36L 86L	47	12	12L 62L	22	0	0L 37L	35	0	0L 50L	54	0	0L 69L	16	-6	6T 31L	22	-13	13T 37L
120	150	0	-18	83	43	43L 101L	54	14	14L 72L	25	0	0L 43L	40	0	0L 58L	63	0	0L 81L	18	-7	7T 36L	26	-14	14T 44L
150	180	0	-25	83	43	43L 108L	54	14	14L 79L	25	0	0L 50L	40	0	0L 65L	63	0	0L 88L	18	-7	7T 43L	26	-14	14T 51L
180	250	0	-30	96	50	50L 126L	61	15	15L 91L	29	0	0L 59L	46	0	0L 76L	72	0	0L 102L	22	-7	7T 52L	30	-16	16T 60L
250	315	0	-35	108	56	56L 143L	69	17	17L 104L	32	0	0L 67L	52	0	0L 87L	81	0	0L 116L	25	-7	7T 60L	36	-16	16T 71L
315	400	0	-40	119	62	62L 159L	75	18	18L 115L	36	0	0L 76L	57	0	0L 97L	89	0	0L 129L	29	-7	7T 69L	39	-18	18T 79L
400	500	0	-45	131	68	68L 176L	83	20	20L 128L	40	0	0L 85L	63	0	0L 108L	97	0	0L 142L	33	-7	7T 78L	43	-20	20T 88L
500	630	0	-50	146	76	76L 196L	92	22	22L 142L	44	0	0L 94L	70	0	0L 120L	110	0	0L 160L	37	-7	7T 87L	48	-22	22T 98L
630	800	0	-75	160	80	80L 235L	104	24	24L 179L	50	0	0L 125L	80	0	0L 155L	125	0	0L 200L	40	-10	10T 115L	56	-24	24T 131L
800	1000	0	-100	176	86	86L 276L	116	26	26L 216L	56	0	0L 156L	90	0	0L 190L	140	0	0L 240L	46	-10	10T 146L	64	-26	26T 164L
1000	1250	0	-125	203	98	98L 328L	133	28	28L 258L	66	0	0L 191L	105	0	0L 230L	165	0	0L 290L	56	-10	10T 181L	77	-28	28T 202L
1250	1600	0	-160	235	110	110L 395L	155	30	30L 315L	78	0	0L 238L	125	0	0L 285L	195	0	0L 355L	68	-10	10T 228L	95	-30	30T 255L
1600	2000	0	-200	270	120	120L 470L	182	32	32L 382L	92	0	0L 292L	150	0	0L 350L	230	0	0L 430L	82	-10	10T 282L	118	-32	32T 318L
2000	2500	0	-250	305	130	130L 555L	209	34	34L 459L	110	0	0L 360L	175	0	0L 425L	280	0	0L 530L	100	-10	10T 350L	141	-34	34T 391L

JS6			K6			K7			M6			M7			N6			N7			P6			P7		
Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit
Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
µm			µm			µm			µm			µm			µm			µm			µm			µm		
4.5	-4.5	4.5T 12.5L	2	-7	7T 10L	5	-10	10T 13L	-3	-12	12T 5L	0	-15	15T 8L	-7	-16	16T 1L	-4	-19	19T 4L	-12	-21	21T 4T	-9	-24	24T 1T
5.5	-5.5	5.5T 13.5L	2	-9	9T 10L	6	-12	12T 14L	-4	-15	15T 4L	0	-18	18T 8L	-9	-20	20T 1T	-5	-23	23T 3L	-15	-26	26T 7T	-11	-29	29T 3T
6.5	-6.5	6.5T 15.5L	2	-11	11T 11L	6	-15	15T 15L	-4	-17	17T 5L	0	-21	21T 9L	-11	-24	24T 2T	-7	-28	28T 2L	-18	-31	31T 9T	-14	-35	35T 5T
8	-8	8T 19L	3	-13	13T 14L	7	-18	18T 18L	-4	-20	20T 7L	0	-25	25T 11L	-12	-28	28T 1T	-8	-33	33T 3L	-21	-37	37T 10T	-17	-42	42T 6T
9.5	-9.5	9.5T 22.5L	4	-15	15T 17L	9	-21	21T 22L	-5	-24	24T 8L	0	-30	30T 13L	-14	-33	33T 1T	-9	-39	39T 4L	-26	-45	45T 13T	-21	-51	51T 8T
11	-11	11T 26L	4	-18	18T 19L	10	-25	25T 25L	-6	-28	28T 9L	0	-35	35T 15L	-16	-38	38T 1T	-10	-45	45T 5L	-30	-52	52T 15T	-24	-59	59T 9T
12.5	-12.5	12.5T 30.5L	4	-21	21T 22L	12	-28	28T 30L	-8	-33	33T 10L	0	-40	40T 18L	-20	-45	45T 2T	-12	-52	52T 6L	-36	-61	61T 18T	-28	-68	68T 10T
12.5	-12.5	12.5T 37.5L	4	-21	21T 29L	12	-28	28T 37L	-8	-33	33T 17L	0	-40	40T 25L	-20	-45	45T 5L	-12	-52	52T 13L	-36	-61	61T 11T	-28	-68	68T 3T
14.5	-14.5	14.5T 44.5L	5	-24	24T 35L	13	-33	33T 43L	-8	-37	37T 22L	0	-46	46T 30L	-22	-51	51T 8L	-14	-60	60T 16L	-41	-70	70T 11T	-33	-79	79T 3T
16	-16	16T 51L	5	-27	27T 40L	16	-36	36T 51L	-9	-41	41T 26L	0	-52	52T 35L	-25	-57	57T 10L	-14	-66	66T 21L	-47	-79	79T 12T	-36	-88	88T 1T
18	-18	18T 58L	7	-29	29T 47L	17	-40	40T 57L	-10	-46	46T 30L	0	-57	57T 40L	-26	-62	62T 14L	-16	-73	73T 24L	-51	-87	87T 11T	-41	-98	98T 1T
20	-20	20T 65L	8	-32	32T 53L	18	-45	45T 63L	-10	-50	50T 35L	0	-63	63T 45L	-27	-67	67T 18L	-17	-80	80T 28L	-55	-95	95T 10T	-45	-108	108T 0T
22	-22	22T 72L	0	-44	44T 50L	0	-70	70T 50L	-26	-70	70T 24L	-26	-96	96T 24L	-44	-88	88T 6L	-44	-114	114T 6L	-78	-122	122T 28T	-78	-148	148T 28T
25	-25	25T 100L	0	-50	50T 75L	0	-80	80T 75L	-30	-80	80T 45L	-30	-110	110T 45L	-50	-100	100T 25L	-50	-130	130T 25L	-88	-138	138T 13T	-88	-168	168T 13T
28	-28	28T 128L	0	-56	56T 100L	0	-90	90T 100L	-34	-90	90T 66L	-34	-124	124T 66L	-56	-112	112T 44L	-56	-146	146T 44L	-100	-156	156T 0T	-100	-190	190T 0T
33	-33	33T 158L	0	-66	66T 125L	0	-105	105T 125L	-40	-106	106T 85L	-40	-145	145T 85L	-66	-132	132T 59L	-66	-171	171T 59L	-120	-186	186T 5L	-120	-225	225T 5L
39	-39	39T 199L	0	-78	78T 160L	0	-125	125T 160L	-48	-126	126T 112L	-48	-173	173T 112L	-78	-156	156T 82L	-78	-203	203T 82L	-140	-218	218T 20L	-140	-265	265T 20L
46	-46	46T 246L	0	-92	92T 200L	0	-150	150T 200L	-58	-150	150T 142L	-58	-208	208T 142L	-92	-184	184T 108L	-92	-242	242T 108L	-170	-262	262T 30L	-170	-320	320T 30L
55	-55	55T 305L	0	-110	110T 250L	0	-175	175T 250L	-68	-178	178T 182L	-68	-243	243T 182L	-110	-220	220T 140L	-110	-285	285T 140L	-195	-305	305T 55L	-195	-370	370T 55L

DEEP GROOVE BALL BEARINGS

NOMENCLATURE

62 05 M - ZZ - C3 - FSxxx or Axxxx

Series Code
6 – extra-small
618 – extra-ultra-light
619 – ultra-light
161 – extra-extra-light
60 – extra-light
62 – light
63 – medium
64 – heavy
160 – extra-light thin-type
620 – light wide-type
630 – medium wide-type

Bore Code
00 – 10 mm
01 – 12 mm
02 – 15 mm
03 – 17 mm
04 and up: bore (mm) = code x 5

Common Suffixes
M – brass cage
TN1 – polymer cage
H – stainless steel bearing

Closures & Features
Z – one shield
ZZ – two shields
RS – one contact seal
2RS – two contact seals
RZ – one non-contact seal
2RZ – two non-contact seals
NR – snap ring
N – snap ring groove

Internal Clearance
C2 – tight
C0/blank – normal
C3 – loose
C4 – extra loose
C5 – extra-extra loose

Special Code
e.g. special grease or non-standard geometry features

Fig. 3. Deep groove ball bearing nomenclature.

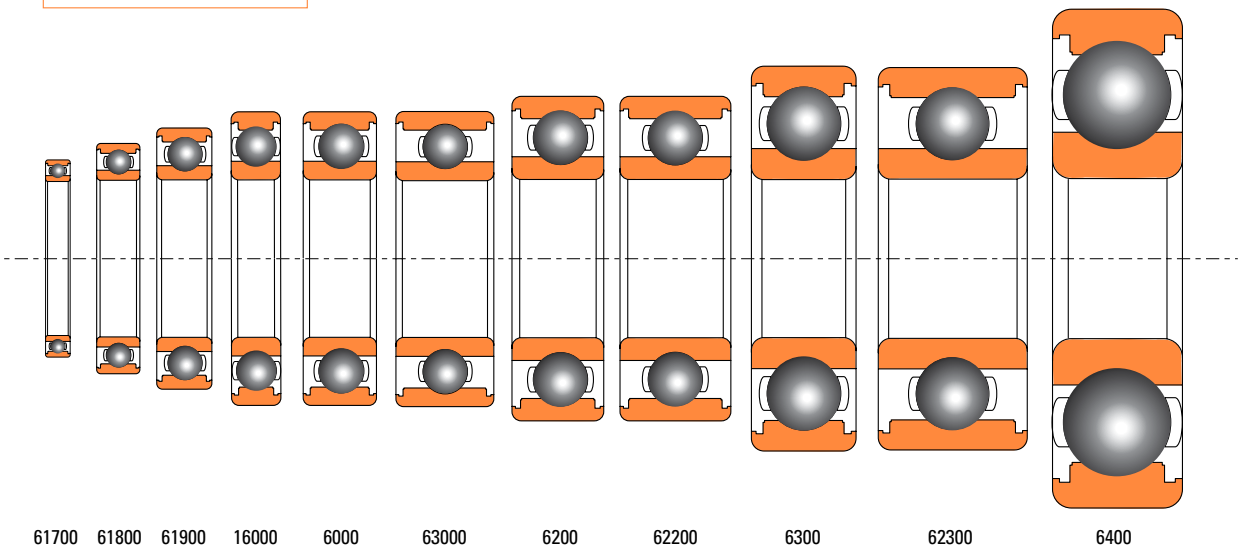


Fig. 4. Timken deep groove ball bearing series.

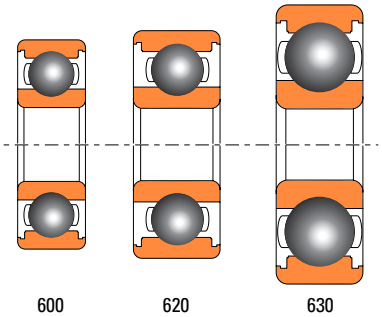
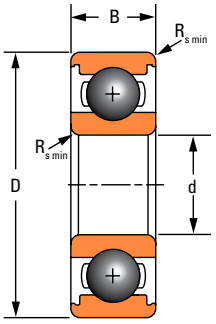
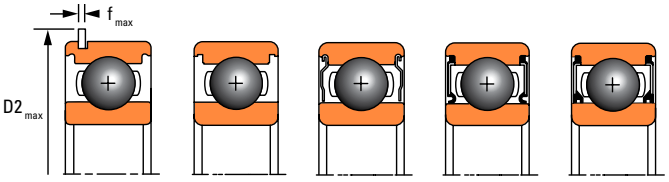


Fig. 5. Timken miniature and extra-small deep groove ball bearing series.

STANDARD 6000 SERIES





SNAP RING NR | OPEN | SHIELDS One = Z Two = ZZ | CONTACT SEALS One = RS Two = 2RS | NON-CONTACT SEALS Two = 2RZ

TABLE 10. STANDARD 6000 SERIES

Bearing No.	Features						Boundary Dimensions						Load Ratings		Reference Speed		Weight
Description							Bore d	O.D. D	Width B	Radius $R_{s\ min}$	$D2_{max}$	f_{max}	Dynamic C_r	Static C_{0r}	Grease	Oil	
	Z	ZZ	RS	2RS	2RZ	NR	mm	mm	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
6000	•	•	•	•	•	•	10	26	8	0.3	29.2	0.70	4.60	2.00	26000	38000	0.020
6200	•	•	•	•		•	10	30	9	0.6	34.7	1.12	5.10	2.40	22000	32000	0.030
6300	•	•	•	•		•	10	35	11	0.6	39.7	1.12	8.10	3.50	20000	29000	0.050
6001	•	•	•	•		•	12	28	8	0.3	30.8	0.85	5.10	2.40	23000	33000	0.020
6201	•	•	•	•	•	•	12	32	10	0.6	36.7	1.12	6.80	3.00	21000	30000	0.040
6301	•	•	•	•		•	12	37	12	1.0	41.3	1.12	9.70	4.20	19000	27000	0.060
6002	•	•	•	•		•	15	32	9	0.3	36.7	1.12	5.60	2.80	20000	30000	0.030
6202	•	•	•	•	•	•	15	35	11	0.6	39.7	1.12	7.60	3.70	19000	28000	0.050
6302	•	•	•	•	•	•	15	42	13	1.0	46.3	1.12	11.40	5.40	16000	24000	0.080
6003	•	•	•	•		•	17	35	10	0.3	39.7	1.12	6.00	3.30	19000	28000	0.040
6203	•	•	•	•	•	•	17	40	12	0.6	44.6	1.12	9.60	4.80	17000	25000	0.070
6303	•	•	•	•	•	•	17	47	14	1.0	52.7	1.12	13.60	6.60	15000	22000	0.120
6004	•	•	•	•	•	•	20	42	12	0.6	46.3	1.12	9.40	5.00	17000	25000	0.070
6204	•	•	•	•	•	•	20	47	14	1.0	52.7	1.12	12.80	6.60	15000	22000	0.100
6304	•	•	•	•	•	•	20	52	15	1.1	57.9	1.12	15.90	7.80	13000	20000	0.140
6005	•	•	•	•	•	•	25	47	12	0.6	52.7	1.12	10.10	5.80	14000	21000	0.080
6205	•	•	•	•	•	•	25	52	15	1.0	57.9	1.12	14.00	7.90	14000	20000	0.130
6305	•	•	•	•		•	25	62	17	1.1	67.7	1.70	20.60	11.20	12000	17000	0.220
6405						•	25	80	21	1.5	86.6	1.70	36.10	18.80	10000	15000	0.530
6006	•	•	•	•	•	•	30	55	13	1.0	60.7	1.12	13.20	8.30	12000	18000	0.110
6206	•	•	•	•	•	•	30	62	16	1.0	67.7	1.70	19.50	11.30	11000	16000	0.200
6306	•	•	•	•	•	•	30	72	19	1.1	78.6	1.70	26.60	15.00	10000	15000	0.350
6406						•	30	90	23	1.5	96.5	2.46	47.30	24.50	9300	13000	0.740
6007	•	•	•	•	•	•	35	62	14	1.0	67.7	1.70	15.90	10.30	11000	16000	0.150
6207	•	•	•	•	•	•	35	72	17	1.1	78.6	1.70	25.70	15.30	10000	14000	0.290
6307	•	•	•	•	•	•	35	80	21	1.5	86.6	1.70	33.40	19.20	9300	13000	0.450
6307M							35	80	21	1.5	–	–	33.40	19.20	9300	13000	0.550
6407							35	100	25	1.5	–	–	55.50	29.40	8500	12000	0.950
6008	•	•	•	•	•	•	40	68	15	1.0	74.6	1.70	16.80	11.50	10000	15000	0.190
6208	•	•	•	•	•	•	40	80	18	1.1	86.6	1.70	29.50	18.10	8800	13000	0.370
6308	•	•	•	•	•	•	40	90	23	1.5	96.5	2.46	40.70	24.00	8500	12000	0.640
6408						•	40	110	27	2.0	116.6	2.46	63.70	34.60	7800	11000	1.250
6009	•	•	•	•	•	•	45	75	16	1.0	81.6	1.70	19.90	14.00	9200	13000	0.230
6209	•	•	•	•		•	45	85	19	1.1	91.6	1.70	31.20	20.30	8200	12000	0.420
6309	•	•	•	•	•	•	45	100	25	1.5	106.5	2.46	48.80	29.30	7800	11000	0.840
6309M				•			45	100	25	1.5	–	–	48.80	29.30	7800	11000	1.025
6409						•	45	120	29	2.0	129.7	2.82	77.20	45.20	7200	10000	1.550
6010	•	•	•	•	•	•	50	80	16	1.0	86.6	1.70	21.80	16.50	8300	12000	0.250
6210	•	•	•	•	•	•	50	90	20	1.1	96.5	2.46	35.00	23.20	7700	11000	0.460
6310	•	•	•	•		•	50	110	27	2.0	116.6	2.46	57.50	35.30	7200	10000	1.050
6310M							50	110	27	2.0	–	–	57.50	35.30	7200	10000	1.260
6410							50	130	31	2.1	–	–	83.10	49.40	6800	9700	1.900
6011	•	•	•	•		•	55	90	18	1.1	96.5	2.46	28.30	22.40	7800	11000	0.360

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

Continued on next page.

STANDARD 6000 SERIES

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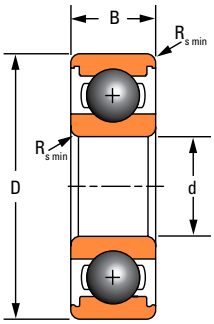

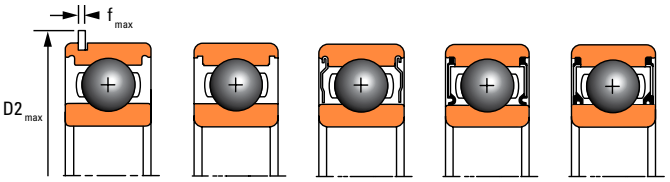

SNAP RING NR | OPEN | SHIELDS One = Z Two = ZZ | CONTACT SEALS One = RS Two = 2RS | NON-CONTACT SEALS Two = 2RZ

Continued from Table 10.

Bearing No.	Features						Boundary Dimensions						Load Ratings		Reference Speed		Weight
Description							Bore d	O.D. D	Width B	Radius $R_{s\,min}$	$D2_{max}$	f_{max}	Dynamic C_r	Static C_{0r}	Grease	Oil	
	Z	ZZ	RS	2RS	2RZ	NR	mm	mm	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
6211	•	•	•	•		•	55	100	21	1.5	106.5	2.46	43.40	29.20	7000	10000	0.610
6211M							55	100	21	1.5	–	–	43.40	29.20	7000	10000	0.724
6311	•	•	•	•	•	•	55	120	29	2.0	129.7	2.82	71.50	44.60	6700	10000	1.350
6311M							55	120	29	2.0	–	–	71.50	44.60	6700	10000	1.642
6411						•	55	140	33	2.1	149.7	2.82	100.70	62.40	6300	9100	2.300
6012	•	•	•	•	•	•	60	95	18	1.1	101.6	2.46	29.50	22.70	7200	10000	0.390
6212	•	•	•	•		•	60	110	22	1.5	116.6	2.46	47.80	32.90	6500	9300	0.780
6212M							60	110	22	1.5	–	–	47.80	32.90	6500	9300	0.932
6312	•	•	•	•		•	60	130	31	2.1	139.7	2.82	81.80	51.80	6400	9100	1.700
6312M							60	130	31	2.1	–	–	81.80	51.80	6400	9100	2.141
6412			•				60	150	35	2.1	–	–	109.00	70.10	6000	8600	2.730
6013	•	•	•	•		•	65	100	18	1.1	106.5	2.46	30.50	23.50	6700	9700	0.430
6213	•	•	•	•		•	65	120	23	1.5	129.7	2.82	57.20	40.00	6000	8600	0.990
6213M							65	120	23	1.5	–	–	57.20	40.00	6000	8600	1.218
6313	•	•	•	•		•	65	140	33	2.1	149.7	2.82	92.60	59.70	6000	8600	2.100
6313M							65	140	33	2.1	–	–	92.60	59.70	6000	8600	2.539
6413							65	160	37	2.1	–	–	118.00	78.60	5700	8200	3.300
6014	•	•	•	•	•	•	70	110	20	1.1	116.6	2.46	38.60	30.40	6400	9300	0.570
6214	•	•	•	•		•	70	125	24	1.5	134.7	2.82	60.80	44.00	5700	8300	1.100
6314	•	•	•	•		•	70	150	35	2.1	159.7	2.82	104.00	68.00	5700	8200	2.500
6314M							70	150	35	2.1	–	–	104.00	68.00	5700	8200	3.172
6015	•	•	•	•		•	75	115	20	1.1	121.6	2.46	40.10	33.10	6000	8700	0.600
6015M							75	115	20	1.1	–	–	40.10	33.10	6000	8700	0.636
6215	•	•	•	•		•	75	130	25	1.5	139.7	2.82	66.10	49.30	5500	7900	1.200
6315	•	•	•	•		•	75	160	37	2.1	169.7	2.82	113.40	76.50	5400	7800	3.000
6016	•	•	•	•	•	•	80	125	22	1.1	134.7	2.82	47.50	39.80	5800	8400	0.820
6016M							80	125	22	1.1	–	–	47.50	39.80	5800	8400	0.999
6216	•	•	•	•		•	80	140	26	2.0	149.7	2.82	72.70	53.00	5200	7500	1.400
6216M							80	140	26	2.0	–	–	72.70	53.00	5200	7500	1.678
6316	•	•	•	•			80	170	39	2.1	–	–	123.00	86.50	5200	7500	3.600
6316M				•			80	170	39	2.1	–	–	123.00	86.50	5200	7500	4.480
6017	•	•	•	•		•	85	130	22	1.1	139.7	2.82	52.80	44.50	5400	7900	0.850
6017M							85	130	22	1.1	–	–	52.80	44.50	5400	7900	1.064
6217	•	•	•	•			85	150	28	2.0	–	–	83.20	63.80	5000	7200	1.800
6217M							85	150	28	2.0	–	–	83.20	63.80	5000	7200	2.175
6317	•	•	•	•		•	85	180	41	3.0	192.9	3.10	132.70	96.50	5000	7200	4.250
6317M				•			85	180	41	3.0	–	–	132.70	96.50	5000	7200	5.298
6018	•	•	•	•		•	90	140	24	1.5	149.7	2.82	58.00	50.60	5300	7600	1.120
6218	•	•	•	•		•	90	160	30	2.0	169.7	2.82	96.00	71.50	4800	6900	2.150
6218M							90	160	30	2.0	–	–	96.00	71.50	4800	6900	2.230
6318	•	•	•	•			90	190	43	3.0	–	–	142.60	107.20	4800	6900	4.900
6318M							90	190	43	3.0	–	–	142.60	107.20	4800	6900	6.129

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

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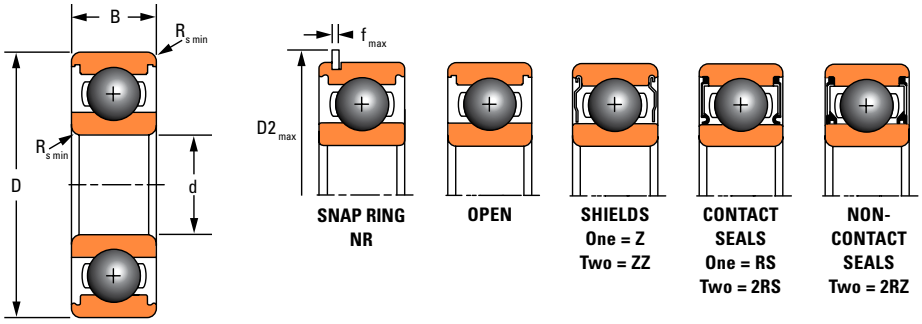

Continued from Table 10.

Bearing No.	Features						Boundary Dimensions						Load Ratings		Reference Speed		Weight
Description							Bore d	O.D. D	Width B	Radius $R_{s\ min}$	$D2_{max}$	f_{max}	Dynamic C_r	Static C_{0r}	Grease	Oil	
	Z	ZZ	RS	2RS	2RZ	NR	mm	mm	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
6019	•	•	•	•			95	145	24	1.5	–	–	60.50	51.00	5000	7300	1.180
6219	•	•	•	•			95	170	32	2.1	–	–	109.00	82.00	4700	6700	2.600
6219M							95	170	32	2.1	–	–	109.00	82.00	4700	6700	3.167
6319	•	•	•	•			95	200	45	3.0	–	–	152.70	118.00	4600	6600	5.750
6319M							95	200	45	3.0	–	–	152.70	118.00	4600	6600	7.106
6020	•	•	•	•		•	100	150	24	1.5	159.7	2.82	60.20	54.20	4800	6900	1.250
6020M							100	150	24	1.5	–	–	60.20	54.20	4800	6900	1.466
6220	•	•	•	•			100	180	34	2.1	–	–	122.00	92.70	4500	6500	3.200
6220M							100	180	34	2.1	–	–	122.00	92.70	4500	6500	3.915
6320	•	•	•	•			100	215	47	3.0	–	–	173.00	140.20	4400	6200	6.980
6320M							100	215	47	3.0	–	–	173.00	140.20	4400	6200	8.540
6021	•	•		•			105	160	26	2.0	–	–	69.20	61.20	4700	6700	1.600
6021M							105	160	26	2.0	–	–	69.20	61.20	4700	6700	1.908
6221		•				•	105	190	36	2.1	202.9	3.10	133.00	105.00	4400	6300	3.710
6321							105	225	49	3.0	–	–	183.70	153.10	4200	6000	8.110
6321M							105	225	49	3.0	–	–	183.70	153.10	4200	6000	9.983
6022	•	•		•		•	110	170	28	2.0	182.9	3.10	82.00	73.00	4600	6600	1.930
6222	•	•	•	•			110	200	38	2.1	–	–	144.00	117.00	4300	6100	4.440
6222M							110	200	38	2.1	–	–	144.00	117.00	4300	6100	5.333
6322		•	•				110	240	50	3.0	–	–	205.00	178.30	3900	5500	9.480
6322M							110	240	50	3.0	–	–	205.00	178.30	3900	5500	11.815
6024	•	•	•	•		•	120	180	28	2.0	192.9	3.10	88.10	79.30	4200	6100	2.030
6024M							120	180	28	2.0	–	–	88.10	79.30	4200	6100	2.500
6224		•	•	•			120	215	40	2.1	–	–	155.30	131.10	4000	5700	5.160
6224M							120	215	40	2.1	–	–	155.30	131.10	4000	5700	6.615
6324							120	260	55	3.0	–	–	227.60	207.40	3600	5100	12.400
6324M							120	260	55	3.0	–	–	227.60	207.40	3600	5100	12.960
6026		•		•		•	130	200	33	2.0	212.9	3.10	250.90	96.80	4100	5900	3.150
6026M							130	200	33	2.0	–	–	250.90	96.80	4100	5900	3.799
6226		•	•	•			130	230	40	3.0	–	–	165.00	148.00	3700	5200	5.850
6226M							130	230	40	3.0	–	–	165.00	148.00	3700	5200	7.540
6326							130	280	58	4.0	–	–	250.90	238.70	3300	4600	15.300
6326M							130	280	58	4.0	–	–	250.90	238.70	3300	4600	18.150
6028		•		•			140	210	33	2.0	–	–	274.00	101.80	3800	5600	3.500
6028M							140	210	33	2.0	–	–	274.00	101.80	3800	5600	4.275
6228			•				140	250	42	3.0	–	–	166.00	150.00	3400	4900	7.450
6228M							140	250	42	3.0	–	–	166.00	150.00	3400	4900	8.460
6328							140	300	62	4.0	–	–	253.00	254.00	3100	4300	18.500
6328M							140	300	62	4.0	–	–	253.00	254.00	3100	4300	22.980
6030		•		•			150	225	35	2.1	–	–	131.70	124.50	3600	5200	4.900
6030M							150	225	35	2.1	–	–	131.70	124.50	3600	5200	4.960
6230							150	270	45	3.0	–	–	176.00	168.00	3200	4500	9.400

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

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STANDARD 6000 SERIES

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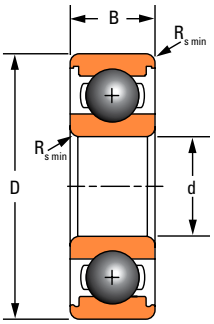

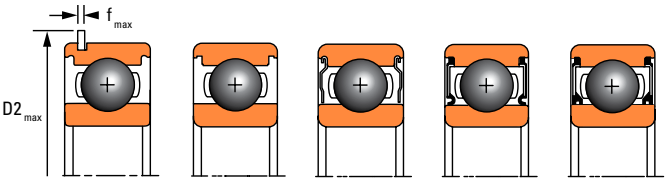

SNAP RING NR | OPEN | SHIELDS One = Z Two = ZZ | CONTACT SEALS One = RS Two = 2RS | NON-CONTACT SEALS Two = 2RZ

Continued from Table 10.

Bearing No.	Features						Boundary Dimensions						Load Ratings		Reference Speed		Weight
Description							Bore d	O.D. D	Width B	Radius $R_{s\,min}$	$D2_{max}$	f_{max}	Dynamic C_r	Static C_{0r}	Grease	Oil	
	Z	ZZ	RS	2RS	2RZ	NR	mm	mm	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
6230M							150	270	45	3.0	–	–	176.00	168.00	3200	4500	11.900
6330							150	320	65	4.0	–	–	274.00	270.00	2800	4000	22.000
6330M							150	320	65	4.0	–	–	274.00	270.00	2800	4000	28.200
6032		•		•			160	240	38	2.1	–	–	136.60	135.40	3500	5100	5.150
6032M							160	240	38	2.1	–	–	136.60	135.40	3500	5100	6.230
6232							160	290	48	3.0	–	–	185.00	186.00	2900	4200	11.700
6232M							160	290	48	3.0	–	–	185.00	186.00	2900	4200	15.300
6332							160	340	68	4.0	–	–	301.00	317.00	2600	3700	26.000
6332M							160	340	68	4.0	–	–	301.00	317.00	2600	3700	32.900
6034							170	260	42	2.1	–	–	168.00	172.00	3300	4800	6.700
6034M							170	260	42	2.1	–	–	168.00	172.00	3300	4800	8.320
6234							170	310	52	4.0	–	–	212.00	223.00	2700	3900	14.500
6234M							170	310	52	4.0	–	–	212.00	223.00	2700	3900	19.140
6334							170	360	72	4.0	–	–	335.50	378.10	2400	3400	30.700
6334M							170	360	72	4.0	–	–	335.50	378.10	2400	3400	38.800
6036							180	280	46	2.1	–	–	189.00	198.00	3100	4500	8.800
6036M							180	280	46	2.1	–	–	189.00	198.00	3100	4500	10.692
6236							180	320	52	4.0	–	–	227.00	241.00	2600	3700	15.100
6236M							180	320	52	4.0	–	–	227.00	241.00	2600	3700	21.386
6336							180	380	75	4.0	–	–	355.00	405.00	2300	3200	35.600
6336M							180	380	75	4.0	–	–	355.00	405.00	2300	3200	45.770
6038							190	290	46	2.1	–	–	172.00	200.00	3000	4300	9.100
6038M							190	290	46	2.1	–	–	172.00	200.00	3000	4300	11.010
6238							190	340	55	4.0	–	–	378.00	439.00	2400	3400	18.200
6238M							190	340	55	4.0	–	–	378.00	439.00	2400	3400	23.600
6338							190	400	78	5.0	–	–	255.00	281.00	2200	3000	41.000
6338M							190	400	78	5.0	–	–	255.00	281.00	2200	3000	51.370
6040							200	310	51	2.1	–	–	218.00	243.00	2800	4000	11.900
6040M							200	310	51	2.1	–	–	218.00	243.00	2800	4000	14.540
6240							200	360	58	4.0	–	–	269.00	310.00	2300	3200	21.600
6240M							200	360	58	4.0	–	–	269.00	310.00	2300	3200	28.050
6340							200	420	80	5.0	–	–	380.00	445.00	2100	2900	46.300
6340M							200	420	80	5.0	–	–	380.00	445.00	2100	2900	46.450
6044M							220	340	56	3.0	–	–	247.00	290.00	2600	3600	17.750
6244M							220	400	65	4.0	–	–	296.00	365.00	2100	2900	3.700
6344M							220	460	88	5.0	–	–	410.00	520.00	1900	2600	72.700
6048M							240	360	56	3.0	–	–	255.00	315.00	2300	3300	17.900
6052M							260	400	65	4.0	–	–	291.00	375.00	2100	3000	30.480
6252M							260	480	80	5.0	–	–	390.00	530.00	1700	2400	666.000
6056M							280	420	65	4.0	–	–	302.00	405.00	2000	2800	31.000
6064M							320	480	74	4.0	–	–	371.00	540.00	1700	2400	46.000
6072M							360	540	82	5.0	–	–	460.00	720.00	1500	2100	69.000
6080M							400	600	90	5.0	–	–	520.00	865.00	1300	1900	85.800

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

THIN-SECTION 61000 SERIES

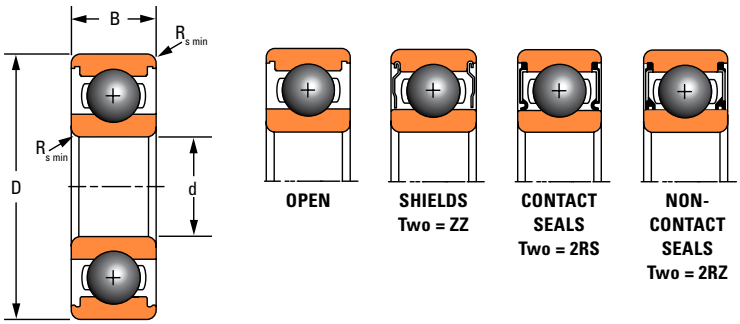

TABLE 11. THIN-SECTION 61000 SERIES

Bearing No.	Features			Boundary Dimensions				Load Ratings		Limiting Speed		Weight
Description				Bore d	O.D. D	Width B	Radius $R_{s\ min}$	Dynamic C_r	Static C_{0r}	Grease	Oil	
	ZZ	2RS	2RZ	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
61800		•		10	19	5	0.3	1.70	0.84	34000	40000	0.005
61900	•	•		10	22	6	0.3	2.70	1.30	31000	37000	0.009
61701				12	18	4	0.2	0.93	0.53	13000	15000	0.003
61801	•	•		12	21	5	0.3	1.90	1.00	30000	36000	0.005
61901	•	•		12	24	6	0.3	2.90	1.50	28000	33000	0.010
61702				15	21	4	0.2	0.94	0.58	11000	13000	0.003
61802	•	•		15	24	5	0.3	2.10	1.30	26000	31000	0.006
61902	•	•		15	28	7	0.3	4.30	2.30	24000	29000	0.015
61703				17	23	4	0.2	1.00	0.66	9500	11000	0.004
61803	•	•		17	26	5	0.3	2.20	1.50	24000	29000	0.007
61903	•	•		17	30	7	0.3	4.60	2.60	22000	26000	0.016
61704				20	27	4	0.2	1.00	0.72	8500	10000	0.005
61804	•	•		20	32	7	0.3	4.00	2.50	21000	25000	0.016
61904	•	•		20	37	9	0.3	6.40	3.70	19000	22000	0.033
61705				25	32	4	0.2	1.10	0.84	7000	8000	0.006
61805	•	•		25	37	7	0.3	4.30	2.90	18000	21000	0.020
61905	•	•		25	42	9	0.3	7.00	4.60	16000	19000	0.039
61706				30	37	4	0.2	1.10	0.95	5500	7000	0.007
61806	•	•		30	42	7	0.3	4.50	3.40	15000	18000	0.023
61906	•	•		30	47	9	0.3	7.20	5.00	14000	17000	0.044
61707				35	44	5	0.3	1.90	1.60	4900	6000	0.014
61807	•	•		35	47	7	0.3	4.70	3.80	13000	16000	0.027
61907	•		•	35	55	10	0.6	10.90	7.80	12000	14000	0.069
61708				40	50	6	0.3	2.50	2.20	4300	5000	0.021
61808	•	•		40	52	7	0.3	4.90	4.20	12000	14000	0.029
61908	•	•		40	62	12	0.6	13.70	9.90	11000	13000	0.101
61709				45	55	6	0.3	2.60	2.40	3900	4600	0.023
61809	•	•		45	58	7	0.3	6.20	5.40	11000	13000	0.034
61909	•	•		45	68	12	0.6	14.10	10.90	10000	11000	0.123
61710				50	62	6	0.3	2.70	2.70	3500	4100	0.034
61810	•	•		50	65	7	0.3	6.20	5.80	9500	11000	0.047
61910	•	•		50	72	12	0.6	14.50	11.70	9000	11000	0.123
61811	•	•		55	72	9	0.3	8.80	8.10	8600	10000	0.075
61911		•		55	80	13	1.0	16.60	14.10	8100	9600	0.168
61812	•	•		60	78	10	0.3	11.50	10.60	7900	9400	0.094
61912		•		60	85	13	1.0	20.20	17.30	7500	8900	0.180
61813	•	•		65	85	10	0.6	11.90	11.50	7300	8600	0.118
61913				65	90	13	1.0	17.30	16.00	7000	8300	0.198
61826		•		130	165	18	1.1	37.90	42.90	3400	5000	0.780
61830				150	190	20	1.1	49.10	57.10	3000	3700	1.170

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

NARROW 16000 SERIES

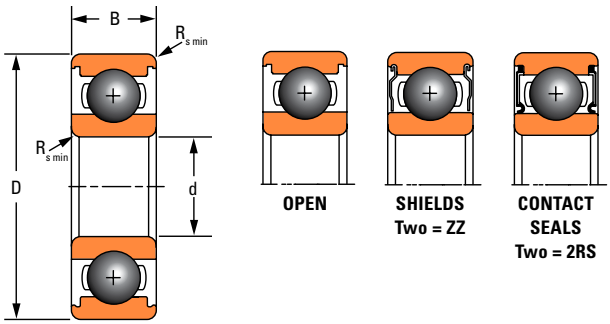

TABLE 12. NARROW 16000 SERIES

Bearing No.	Features		Boundary Dimensions				Load Ratings		Limiting Speed		Weight
Description			Bore d	O.D. D	Width B	Radius $R_{s\ min}$	Dynamic C_r	Static C_{0r}	Grease	Oil	
	ZZ	2RS	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
16100	•		10	28	8	0.3	4.60	2.00	25000	37000	0.022
16101	•	•	12	30	8	0.3	5.10	2.40	22000	33000	0.024
16002	•		15	32	8	0.3	5.60	2.80	19000	2600	0.027
16003	•		17	35	8	0.3	6.00	3.30	17000	24000	0.030
16004			20	42	8	0.3	6.30	3.80	13000	20000	0.050
16005	•		25	47	8	0.3	7.00	4.60	11000	16000	0.060
16006			30	55	9	0.3	9.20	6.30	10000	14000	0.080
16007			35	62	9	0.3	12.20	8.80	8400	12000	0.100
16008			40	68	9	0.3	12.60	9.70	7400	11000	0.130
16009			45	75	10	0.6	15.60	12.20	6900	10000	0.170
16010			50	80	10	0.6	16.10	13.10	6300	9100	0.180
16011			55	90	11	0.6	19.40	16.30	5800	8500	0.260
16012			60	95	11	0.6	19.90	17.50	5400	7800	0.220
16013			65	100	11	0.6	20.50	18.70	5000	7300	0.290
16014			70	110	13	0.6	26.80	23.60	5000	7100	0.430
16015			75	115	13	0.6	27.60	25.30	4600	6700	0.450
16016			80	125	14	0.6	31.90	29.60	4400	6200	0.590
16017			85	130	14	0.6	32.60	31.60	4200	6100	0.570
16018			90	140	16	1.0	39.90	37.00	4200	6100	0.670
16019			95	145	16	1.0	42.70	41.90	3900	5700	0.710
16020			100	150	16	1.0	43.80	44.30	3800	5400	0.740
16021			105	160	18	1.0	51.80	50.60	3800	5400	1.000
16022			110	170	19	1.0	57.40	56.70	3600	5300	1.300
16024			120	180	19	1.0	58.80	60.40	3300	4800	1.400
16026			130	200	22	1.1	79.70	79.20	3200	4700	1.900
16028			140	210	22	1.1	82.10	85.00	3000	4400	2.000
16030			150	225	24	1.1	91.90	98.50	2900	4200	2.600
16032			160	240	25	1.5	99.00	108.00	2800	4000	4.200

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

WIDE 62000-63000 SERIES

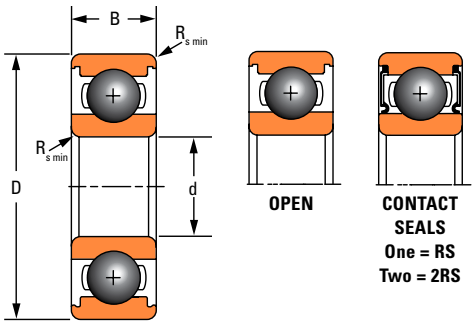

TABLE 13. WIDE 62000-63000 SERIES

Bearing No.	Features		Boundary Dimensions				Load Ratings		Limiting Speed		Weight
Description			Bore d	O.D. D	Width B	Radius $R_{s\ min}$	Dynamic C_r	Static C_{0r}	Grease	Oil	
	RS	2RS	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
62200		•	10	30	14	0.6	6.00	2.40	29000	42000	0.040
62300		•	10	35	17	0.6	8.10	3.40	26000	38000	0.070
63000		•	10	26	12	0.3	4.60	2.00	33000	49000	0.030
62201		•	12	32	14	0.6	6.90	3.10	26000	37000	0.050
62301		•	12	37	17	1.0	9.80	4.20	23000	34000	0.080
63001		•	12	28	12	0.3	5.10	2.40	29000	43000	0.030
62202		•	15	35	14	0.6	7.80	3.80	22000	32000	0.050
62302		•	15	42	17	1.0	11.40	5.40	19000	28000	0.100
63002		•	15	32	13	0.3	5.60	2.80	25000	37000	0.040
62203		•	17	40	16	0.6	9.60	4.80	20000	30000	0.080
62303		•	17	47	19	1.0	13.50	6.60	18000	26000	0.140
63003		•	17	35	14	0.3	6.00	3.30	23000	34000	0.050
62204		•	20	47	18	1.0	12.70	6.60	18000	26000	0.120
62304		•	20	52	21	1.1	15.90	7.80	17000	24000	0.140
63004		•	20	42	16	0.6	9.40	5.00	20000	30000	0.090
62205		•	25	52	18	1.0	14.00	7.80	15000	22000	0.150
62305		•	25	62	24	1.1	22.50	11.60	14000	21000	0.300
63005		•	25	47	16	0.6	10.10	5.80	17000	25000	0.100
62206		•	30	62	20	1.0	19.50	11.20	13000	19000	0.230
62306		•	30	72	27	1.1	28.10	16.00	13000	18000	0.470
63006		•	30	55	19	1.0	13.20	8.30	15000	23000	0.150
62207		•	35	72	23	1.1	25.50	15.30	12000	17000	0.370
62307		•	35	80	31	1.5	33.20	19.00	12000	17000	0.620
63007	•	•	35	62	20	1.0	16.00	10.30	14000	20000	0.200
62208		•	40	80	23	1.1	30.70	19.00	10000	15000	0.440
62308		•	40	90	33	1.5	41.00	24.00	11000	15000	0.850
63008		•	40	68	21	1.0	16.80	11.60	12000	18000	0.240
62209		•	45	85	23	1.1	33.20	21.60	9200	13000	0.460
62309		•	45	100	36	1.5	52.70	31.50	9700	14000	1.100
62210		•	50	90	23	1.1	35.10	23.20	8500	12000	0.470
62310		•	50	110	40	2.0	61.80	38.00	9200	13000	1.500
62211		•	55	100	25	1.5	43.60	29.00	7800	11000	0.680
62311			55	120	43	2.0	71.50	45.00	8600	12000	2.000
62212		•	60	110	28	1.5	52.70	36.00	7500	11000	1.000
62312			60	130	46	2.1	81.80	51.90	8100	12000	2.500
62213			65	120	31	1.5	55.90	40.50	7200	10000	1.300
62214			70	125	31	1.5	60.50	45.50	6700	9700	1.400

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.

MINIATURE AND EXTRA-SMALL 600 SERIES

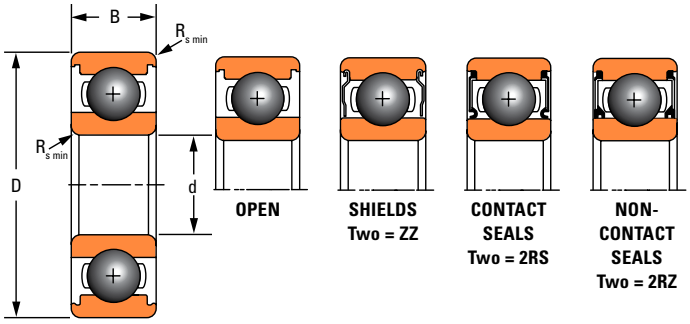

TABLE 14. MINIATURE AND EXTRA-SMALL 600 SERIES

Bearing No.	Features			Boundary Dimensions				Load Ratings		Limiting Speed		Weight
Description				Bore d	O.D. D	Width B	Radius $R_{s\ min}$	Dynamic C_r	Static C_{0r}	Grease	Oil	
	ZZ	2RS	2RZ	mm	mm	mm	mm	kN	kN	RPM	RPM	kg
618/3				3	7	2	0.10	0.31	0.11	74000	88000	0.0003
619/3				3	8	3	0.15	0.56	0.18	70000	82000	0.0006
603				3	9	3	0.15	0.57	0.19	66000	78000	0.0009
623	•	•		3	10	4	0.15	0.63	0.22	66000	78000	0.0016
633				3	13	5	0.20	1.30	0.49	51000	60000	0.0030
618/4				4	9	2.5	0.10	0.64	0.23	63000	75000	0.0006
619/4				4	11	4	0.15	1.00	0.35	57000	67000	0.0017
604	•			4	12	4	0.20	1.00	0.35	57000	67000	0.0020
624	•	•		4	13	5	0.20	1.30	0.49	51000	60000	0.0027
634	•	•		4	16	5	0.30	1.30	0.52	46000	54000	0.0050
618/5				5	11	3	0.15	0.72	0.28	54000	64000	0.0012
619/5				5	13	4	0.20	1.10	0.43	50000	59000	0.0021
605	•	•		5	14	5	0.20	1.30	0.51	48000	56000	0.0030
625	•	•		5	16	5	0.30	1.70	0.67	44000	52000	0.0040
635	•	•		5	19	6	0.30	2.30	0.89	38000	45000	0.0080
618/6				6	13	3.5	0.15	1.10	0.44	48000	56000	0.0019
619/6	•			6	15	5	0.20	1.30	0.52	46000	54000	0.0040
606	•	•		6	17	6	0.30	2.30	0.84	42000	49000	0.0050
626	•	•	•	6	19	6	0.30	2.30	0.89	38000	45000	0.0070
636				6	22	7	0.30	3.30	1.40	33000	39000	0.0120
618/7				7	14	3.5	0.15	1.20	0.51	44000	52000	0.0020
619/7				7	17	5	0.30	1.60	0.72	40000	47000	0.0050
607	•	•	•	7	19	6	0.30	2.30	0.89	38000	45000	0.0070
627	•	•	•	7	22	7	0.30	3.30	1.40	33000	39000	0.0120
637	•			7	26	9	0.30	4.60	2.00	28000	33000	0.0220
618/8				8	16	4	0.20	1.30	0.59	40000	47000	0.0032
619/8	•	•		8	19	6	0.30	2.20	0.91	37000	44000	0.0060
608	•	•	•	8	22	7	0.30	3.30	1.40	33000	39000	0.0110
628	•	•		8	24	8	0.30	3.30	1.40	31000	37000	0.0170
638	•			8	28	9	0.30	4.60	2.00	28000	33000	0.0270
618/9				9	17	4	0.20	1.30	0.66	37000	44000	0.0034
619/9	•			9	20	6	0.30	2.50	1.10	35000	42000	0.0070
609	•	•	•	9	24	7	0.30	3.40	1.40	30000	36000	0.0130
629	•	•	•	9	26	8	0.30	4.60	2.00	28000	33000	0.0180
639	•			9	30	10	0.60	5.10	2.40	25000	30000	0.0330

Speed ratings are for open bearings. Use 50 to 60 percent of the published speed ratings for bearings with contact seals.