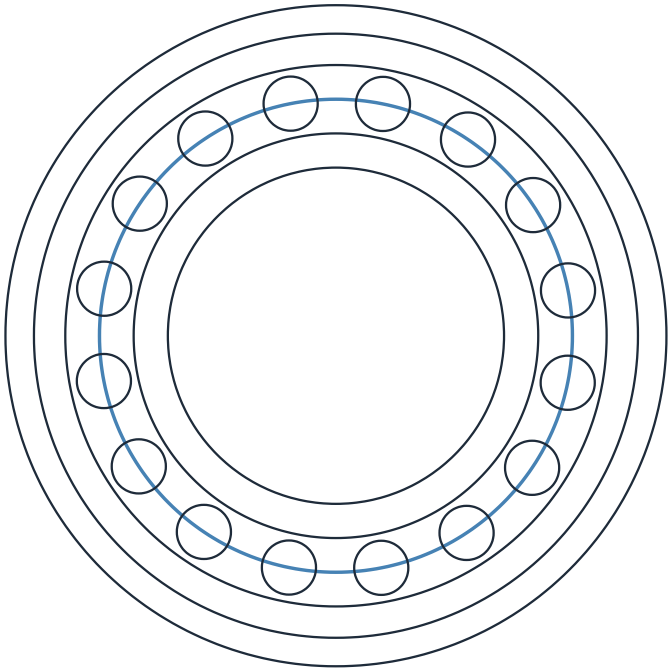


TIMKEN

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Cylindrical Roller Bearing Catalog

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TIMKEN CYLINDRICAL ROLLER 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, gear drives, automated lubrication systems, belts, chains, couplings and linear motion products along with rebuild and repair services. Timken 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.

To view more Timken catalogs, go to **www.timken.com/catalogs** for interactive versions, or to download our catalog app to your smart phone or mobile device.



CYLINDRICAL ROLLER BEARING CATALOG INDEX

TIMKEN OVERVIEW 1
CYLINDRICAL ROLLER BEARING INTRODUCTION 2
SHELF LIFE POLICY 4

ENGINEERING

Bearing Types and Cages 8
Metric System Tolerances 11
Mounting, Fitting, Setting and Installation Practices 14
Shaft and Housing Fits 18
Operating Temperatures 36
Heat Generation and Dissipation 39
Torque 40
Lubrication 41

CYLINDRICAL ROLLER BEARINGS

Introduction 51
Nomenclature 52
Single-Row Metric Series 54
Single-Row Standard Series 74
Full-Complement (NCF) 76
Two-Row 80
Four-Row 88
HJ Series 108
Inner Rings (IR) 112
5200, A5200 Metric Series 114

TIMKEN® CYLINDRICAL ROLLER BEARINGS

POLYMER CAGE, PREMIUM BRASS CAGE, STEEL CAGE AND FULL-COMPLEMENT DESIGNS FOR PROVEN, RELIABLE PERFORMANCE

For more than a century, original equipment manufacturers have trusted Timken to design roller bearings for long-lasting performance in harsh industrial applications. That same innovation and engineering expertise has been applied to our expanded line of cylindrical roller bearings.

Timken offers standard and specially designed cylindrical roller bearings in a wide range of configurations and series to meet your application requirements. This product offering includes single-, double- and four-row cylindrical roller bearings, as well as special configurations, in bore sizes ranging from 15 mm to 1,200 mm.

Timken cylindrical roller bearings can meet the challenges of applications with high radial loads, including:

- Gear drives
  - Helical industrial gearboxes
  - Planetary gearboxes
  - Geared motors
- Pumps
- Compressors
- Electric motors
- Centrifuges

ETP SERIES (POLYMER CAGE)

The ETP Series with polymer cage is the latest addition to Timken's broad cylindrical roller bearing portfolio. Available in 15-80 mm bore sizes, these bearings are a lightweight, low-noise solution for high-speed applications including pumps, geardrives and general industrial equipment.

EJ SERIES

Timken has expanded its cylindrical roller bearing product offering with our EJ series steel cage bearings, available in 65-150 mm bore sizes. Complementing our existing brass cage and full-complement cylindrical roller bearings, the new steel cage product line is available in configurations N, NJ and NU, and series 22, 23, 2 and 3.

EMA SERIES

Timken EMA series bearings offer a unique brass cage design, proprietary internal geometries and special surface textures that help optimize performance – making them an excellent choice for more demanding applications.

NCF SERIES

Timken's full-complement cylindrical roller bearings offer increased power density and radial load carrying capacity by maximizing the number of rollers in a given envelope. The optimized design of our NCF series bearings helps to provide a greater design life and reduce heat generation – an essential benefit in full complement designs.

PRODUCT ADVANTAGES:

- Available in polymer, brass cage, steel cage and full-complement designs
- Dimensionally interchangeable industry-standard mounted bearings from 15 mm to 1,200 mm
- High load carrying capacity resulting from proprietary profiles and optimized raceway surfaces
- Smooth surfaces reduce friction and lower operating temperatures to promote longer bearing life

MAXIMIZE YOUR INVESTMENT

Timken® cylindrical roller bearings are designed with lower cost of ownership in mind. By optimizing the design profiles of each bearing and using only premium materials, Timken bearings deliver long-lasting performance to help you reduce maintenance costs.

FOCUS ON THE FUTURE

At Timken, we are continuously expanding our product line to meet the size and configuration demands of our customers. Our heritage in roller bearings has given us the know-how to optimize and innovate across our lines of cylindrical, spherical and tapered roller bearings – as represented in our expanded line of cylindrical roller bearings.



HOW TO USE THIS CATALOG

We designed this catalog to help you find the Timken cylindrical roller bearings best suited to your equipment needs and specifications. Timken offers an extensive range of bearings and accessories in both imperial and metric sizes. For your convenience, size ranges are indicated in millimeters and inches. Contact your Timken engineer to learn more about our complete line for the special needs of your application.

This publication contains dimensions, tolerances and load ratings, as well as engineering sections describing mounting and fitting practices for shafts and housings, internal clearances, materials and other bearing features.

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.

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.

Never spin a bearing with compressed air. The components may be forcefully expelled.

Overheated bearings can ignite explosive atmospheres. Special care must be taken to properly select, install, maintain and lubricate housed unit bearings that are used in or near atmospheres that may contain explosive levels of combustible gases or accumulations of dust such as grain, coal, or other combustible materials. Consult your equipment designer or supplier for installation and maintenance instructions.

If hammer and bar are used for installation or removal of a part, use a mild steel bar (e.g., 1010 or 1020 grade). Mild steel bars are less likely to cause release of high speed fragments from the hammer or bar or the part being installed or removed.

Ungrounded bearings can create static electricity that can ignite in an explosive atmosphere such as combustible gases or accumulations of dust such as grain, coal, or other combustible materials. Proper dissipation of such potential static electricity discharge must be assured to prevent any such explosion.

Tensile stresses can be very high in tightly fitted bearing components. Attempting to remove such components by cutting the inner ring 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.

For additional Timken product warnings, visit www.timken.com/warnings.

CAUTION

Failure to observe the following cautions could 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.

NOTE

Do not use excessive force when mounting or dismounting the unit.

Follow all tolerance, fit, and torque recommendations.

Always follow the Original Equipment Manufacturer's installation and maintenance guidelines.

Ensure proper alignment.

Do not heat components with an open flame.

Do not operate at bearing temperatures above 121° C (250° F).

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, you must validate the suitability and feasibility of all product selections.

Timken products are sold subject to Timken terms and conditions of sale, which include our limited warranty and remedy. You can find these at https://www.timken.com/legal-notices/termsandconditionsofsale/.

Please consult with your Timken 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.



ENGINEERING

The following topics are covered within this engineering section:

- Cylindrical roller bearing design types.
- Cage design types.
- Fitting practice and mounting.
- Lubrication.

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

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



RADIAL CYLINDRICAL ROLLER BEARING TYPES AND CAGES

Radial cylindrical roller bearings can offer higher radial load capacity than other bearing designs. Timken offers a wide range of one -, two -, and four-row designs to meet various application requirements.

SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

STANDARD STYLES

Timken® cylindrical roller bearings consist of an inner and outer ring, a roller-retaining cage, and a complement of controlled-contour cylindrical rollers. Depending on the type of bearing, either the inner or the outer ring has two roller-guiding ribs. The other ring is separable from the assembly and has one rib or none. The ring with two ribs axially locates the position of the roller assembly. The ground diameters of these ribs may be used to support the roller cage. One of the ribs may be used to carry light thrust loads when an opposing rib is provided.

The decision as to which ring should be double ribbed is normally determined by considering assembly and mounting procedures in the application.

Type NU has double-ribbed outer and straight inner rings. Type N has double-ribbed inner and straight outer rings. The use of either type at one position on a shaft is ideal for accommodating shaft expansion or contraction. The relative axial displacement of one ring to the other occurs with minimum friction while the bearing is rotating. These bearings may be used in two positions for shaft support if other means of axial location are provided.

Type NJ has double-ribbed outer and single-ribbed inner rings. Type NF has double-ribbed inner and single-ribbed outer rings. Both types can support heavy radial loads, as well as light unidirectional thrust loads. The thrust load is transmitted between the diagonally opposed rib faces in a sliding action. When limiting thrust conditions are approached, lubrication can become critical. Your Timken engineer should be consulted for assistance in such applications. When thrust loads are very light, these bearings may be used in an opposed mounting to locate the shaft. In such cases, shaft endplay should be adjusted at time of assembly.

Type NUP has double-ribbed outer and single-ribbed inner ring with a loose rib that allows the bearing to provide axial location in both directions. Type NP has a double-ribbed inner ring and a single-ribbed outer ring with a loose rib. Both types can carry heavy radial loads and light thrust loads in both directions. Factors governing the thrust capacity are the same as for types NJ and NF bearings.

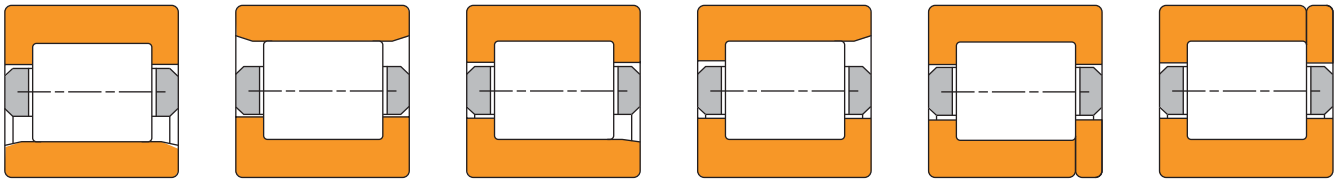
A type NUP or NP bearing may be used in conjunction with type N or NU bearings for applications where axial shaft expansion is anticipated. In such cases, the N or NU bearing accommodates the shaft expansion. The NUP or NP bearing is considered the fixed bearing because the ribs restrict the axial movement of the rolling element. The fixed bearing is usually placed nearest the drive end of the shaft to minimize alignment variations in the drive. Shaft endplay, or float, is determined by the axial clearance in the fixed bearing.

Types NU, N, NJ, NF, NUP and NP conform to ISO and DIN standards for loose rib rings (thrust collars) and typical industry diameters over or under roller.

The cylindrical roller bearing part numbers are in accordance with ISO 15. They are composed of four digits, the first two digits identify the dimensional series and the last two digits of the part number are the bore size divided by 5. In the dimensional series, the first digit is the width series and the second is the diameter (outer) series. The width series increase width in the sequence 8 0 1 2 3 4 5 6 7. The diameter series increase radial section in the sequence 7 8 9 0 1 2 3 4.

Types having an R prefix are similar in construction to their N counterparts. However, they were designed to conform to ABMA standards.

Inch-size bearings are identified by the letter I in the part number. RIU, for example, indicates an inch bearing while RU indicates the equivalent style in metric dimensions.



NU, RIU, RU | N, RIN, RN | NJ, RIJ, RJ | NF, RIF, RF | NUP, RIT, RT | NP, RIP, RP

Fig. 1. Radial cylindrical roller bearings.

EMA SERIES

The Timken® single-row EMA series cylindrical roller bearings incorporate a unique cage design, proprietary internal geometry and special surface textures. These features help to improve bearing performance and can help to improve uptime and reduce maintenance costs.

The cage is a one-piece brass design with full-milled pockets. It is a land-riding cage which, unlike traditional roller-riding cages, minimizes drag on the roller elements. This reduces heat generation and improves bearing life. The high cage rigidity allows for more rollers than possible with other brass cage configurations.

Proprietary profiles on the rings and/or rollers increase the ability to handle heavier loads than competing designs.

Engineered processes for rings and rollers provide enhanced surface textures, resulting in lower friction, lower operating temperatures and longer bearing life.

EMA series bearings are available in types N, NU, NJ and NUP.

EJ SERIES

The Timken® EJ series bearings include a single-piece roller-riding stamped-steel cage design. This style of cage is widely accepted in the industry for its durability and performance. It can operate in lubrication situations such as grease where good lubrication of the cage guides could prove to be challenging.

Steel cage assemblies utilize the same inner and outer rings as their brass cage counterparts. These cage assemblies are made to the same specifications for performance and quality as brass cage assemblies. Steel cage assemblies maintain the same roller count and ratings as brass cage assembly counterparts. Roller retention is accomplished by a "tab in" feature of the cage into a roller end recess, replacing a pin used by brass cage assembly.

ETP SERIES

The Timken® ETP series is available in smaller bore sizes (up to ~80mm). This series uses enhanced internal geometry with stress-reducing profiles and finely superfinished contact surfaces. The cage is roller guided, constructed of glass fiber reinforced polyamide 6/6. The rollers are snap-retained in the cage. This cage style can be used in a wide range of applications with both oil and grease lubrication. Its strength and thermal properties make it suitable across a broad range of speeds. The cage is compatible with most lubricants however attention must be given to aggressive additives when using polyamide cages.

FULL-COMPLEMENT (NCF)

The full-complement (NCF) single-row bearings include integral flanges on the inner and outer rings. These bearings also can manage axial loads in one direction and permit small axial displacements.

5200 METRIC SERIES

This series features enhanced radial load ratings due to its internal design proportions. In this series, the outer ring is double-ribbed and the inner ring is full-width with a cylindrical O.D. The bearing also can be furnished without an inner ring for applications where radial space is limited. When so used, the shaft journal must be hardened to HRC 58 minimum, and the surface finished to 15 RMS maximum. The W designation in the suffix indicates the outer ring is provided. The inner ring also can be furnished separately. The A prefix indicates that the inner ring is furnished either separately or as part of the assembly.

The bearing is usually provided with a rugged stamped-steel cage (S designation) and is land-riding on the outer ring ribs. The cage features depressed bars, which not only space rollers evenly, but retain them as a complete assembly with the outer ring. Cages of machined brass (M designation) are available for applications where reversing loads or high speeds might indicate their need. Outer rings are made from bearing quality alloy steel. The inner rings are deep-case hardened to accommodate the hoop stresses resulting from heavy press fits.

The standard bearing is produced with radial internal clearances designated as R6. Other internal clearances can be supplied upon request. Proper roller guidance is assured by integral ribs and roller end clearance control.

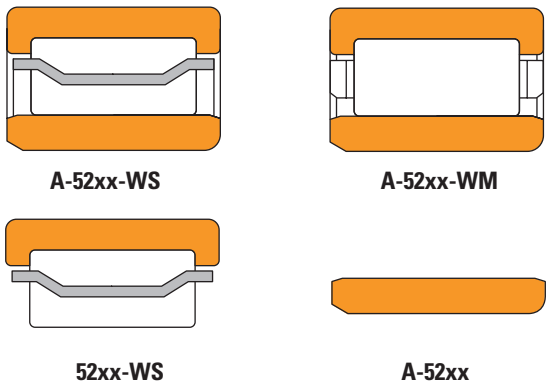


Fig. 2. 5200 metric series bearings.

TWO-ROW BEARINGS

Two-row, or double-row, cylindrical bearings offer added radial capacity over tradition single-row types. These bearing types are interchangeable so the dimensions and diameter under the rollers (NNU style) and diameter over the rollers (NN style) are held to an ISO/DIN standard. The standard cage design is a drilled pocket, finger-style retainer.

FOUR-ROW BEARINGS

Four-row cylindrical bearings have an extremely high radial load capacity, but no thrust capacity. This bearing type is mostly used in roll neck and work roll applications in the metal rolling industry. Straight and tapered bore designs are available.

CYLINDRICAL ROLLER BEARING CAGES

TP CAGES

The TP cage is constructed of glass fiber reinforced polyamide PA66 which, has an extensive history in a variety of bearing types and applications due to its favorable strength and thermal properties. The material is suitable for a wide range of lubricant types however chemistry compatibility must be considered with certain additives. This cage features contact surfaces that provide radial cage support from the rollers.



STAMPED-STEEL CAGES

Stamped-steel cages for cylindrical roller bearings consist of low-carbon steel and are manufactured using a series of cutting,forming, and punching operations. These cages are made in a variety of different designs and are suitable for most general purpose cylindrical roller bearing applications. One specific type is the J-type roller riding single piece design. Roller retention is accomplished by a “tab in” feature of the cage into a roller end recess. This cage style is offered on many ISO series part numbers in addition to a brass cage option offered on an identical series/bore part number. This cage also is used with our EJ series bearings.

Another specific type is the S-type design for the 5200 series cylindrical roller bearing, which is a land-riding cage piloted on the outer ring ribs. This design has depressed cage bridges which evenly space the rolling elements and retain them on the outer ring. Stamped steel cages are easily mass produced and can be used in high temperature and harsh-lubricant environments.

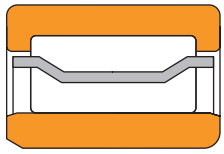


Fig. 3. S-type cage.

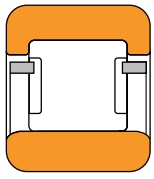


Fig. 4. J-type cage.

MACHINED CAGES

Machined cages are an option for smaller cylindrical bearing sizes, and are typically made from brass. Machined cage designs for cylindrical roller bearings offer increased strength for more demanding applications.

Designs can be one-piece or two-piece cages. One-piece designs can be either a finger-type as shown in fig. 5 or a standard cage configuration having fully milled pockets. The one-piece finger type and the two-piece design with cage ring (fig. 6) are more common in standard cylindrical roller bearings. They also are roller-guided designs.

The one-piece version with fully milled roller pockets (fig. 7) is our premium cage. This cage is used with our EMA series bearings. Unlike traditional roller-riding cages, it is a land-riding cage which minimizes drag on the roller elements. This reduces heat generation, resulting in improved bearing life. Compared to a two-piece design, this one-piece cage also reduces heat and wear by enhancing lubrication flow.

PIN-TYPE CAGES

Pin-type cages for cylindrical roller bearings consist of two rings and a series of pins running through the center of the rolling elements. These cages are used for large diameter cylindrical roller bearings where machined brass cages are not available. With this design, additional rollers can typically be added, resulting in increased load capacity.

Fig. 9. Pin-type cage.

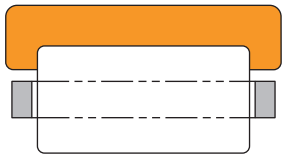




Fig. 5. One-piece finger-type cage.



Fig. 6. Two-piece brass cage.



Fig. 7. One-piece brass cage (Type EMA).

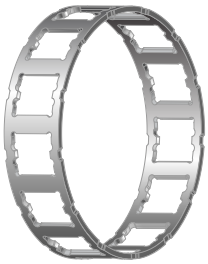


Fig. 8. EJ steel cage.

METRIC SYSTEM TOLERANCES
CYLINDRICAL ROLLER BEARINGS

Cylindrical roller bearings are manufactured to a number of specifications with each having classes that define tolerances on dimensions such as bore, O.D., width and runout. Metric bearings have been manufactured to corresponding standard negative tolerances.

Boundary dimension tolerances for cylindrical roller bearing usage are listed in the following tables. These tolerances are provided for use in selecting bearings for general applications in conjunction with the bearing mounting and fitting practices offered in later sections.

The following table summarizes the different specifications and classes for cylindrical roller bearings.

TABLE 2. BEARING SPECIFICATIONS AND CLASSES

System	Specification	Bearing Type	Standard Bearing Class		Precision Bearing Class			
Metric	Timken	Tapered Roller Bearings	K	N	C	B	A	AA
	ISO/DIN	All Bearing Types	P0	P6	P5	P4	P2	-
	ABMA	Cylindrical, Spherical	RBEC 1	RBEC 3	RBEC 5	RBEC 7	RBEC 9	-
		Ball Bearings	ABEC 1	ABEC 3	ABEC 5	ABEC 7	ABEC 9	-
		Tapered Roller Bearings	K	N	C	B	A	-
Inch	Timken	Tapered Roller Bearings	4	2	3	0	00	000
	ABMA	Tapered Roller Bearings	4	2	3	0	00	-

Standard Timken radial cylindrical roller bearings maintain normal tolerances according to ISO 492. Tables 3 and 4 list the critical tolerances for these radial cylindrical roller bearings. 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 nominal dimension is at a +0 mm (0 in.) tolerance. The deviation is the tolerance range for the listed parameter. Variation is defined as the difference between the largest and smallest measurements of a given parameter for an individual ring.

TABLE 3. CYLINDRICAL ROLLER BEARING TOLERANCES – INNER RING (Metric)[1]

Bearing Bore		Bore Deviation[2] Δ_{dmp}			Width Variation V_{BS}			Radial Runout K_{ia}			Face Runout with Bore S_d	Axial Runout S_{ia}	Width Deviation Inner and Outer Rings[2] Δ_{Bs} and Δ_{Cs}	
Over	Incl.	P0	P6	P5	P0	P6	P5	P0	P6	P5	P5	P5	P0, P6	P5
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
2.5000 0.0984	**10.000** 0.3937	**-0.008** -0.0003	**-0.007** -0.0003	**-0.005** -0.0002	**0.015** 0.0006	**0.015** 0.0006	**0.005** 0.0002	**0.010** 0.0004	**0.006** 0.0002	**0.004** 0.0002	**0.007** 0.0003	**0.007** 0.0003	**-0.120** -0.0047	**-0.040** -0.0157
10.000 0.3937	**18.000** 0.7087	**-0.008** -0.0003	**-0.007** -0.0003	**-0.005** -0.0002	**0.020** 0.0008	**0.020** 0.0008	**0.005** 0.0002	**0.010** 0.0004	**0.007** 0.0003	**0.004** 0.0002	**0.007** 0.0003	**0.007** 0.0003	**-0.120** -0.0047	**-0.080** -0.0031
18.000 0.7087	**30.000** 1.1811	**-0.010** -0.0004	**-0.008** -0.0003	**-0.006** -0.0002	**0.020** 0.0008	**0.020** 0.0008	**0.005** 0.0002	**0.013** 0.0005	**0.008** 0.0003	**0.004** 0.0002	**0.008** 0.0003	**0.008** 0.0003	**-0.120** -0.0047	**-0.120** -0.0047
30.000 1.1811	**50.000** 1.9685	**-0.012** -0.0005	**-0.010** -0.0004	**-0.008** -0.0003	**0.020** 0.0008	**0.020** 0.0008	**0.005** 0.0002	**0.015** 0.0006	**0.010** 0.0004	**0.005** 0.0002	**0.008** 0.0003	**0.008** 0.0003	**-0.120** -0.0047	**-0.120** -0.0047
50.000 1.9685	**80.000** 3.1496	**-0.015** -0.0006	**-0.012** -0.0005	**-0.009** -0.0004	**0.025** 0.0010	**0.025** 0.0010	**0.006** 0.0002	**0.020** 0.0008	**0.010** 0.0004	**0.005** 0.0002	**0.008** 0.0003	**0.008** 0.0003	**-0.150** -0.0059	**-0.150** -0.0059
80.000 3.1496	**120.000** 4.7244	**-0.020** -0.0008	**-0.015** -0.0006	**-0.010** -0.0004	**0.025** 0.0010	**0.025** 0.0010	**0.007** 0.0003	**0.025** 0.0010	**0.013** 0.0005	**0.006** 0.0002	**0.009** 0.0004	**0.009** 0.0004	**-0.200** -0.0079	**-0.200** -0.0079
120.000 4.7244	**150.000** 5.9055	**-0.025** -0.0010	**-0.018** -0.0007	**-0.013** -0.0005	**0.030** 0.0012	**0.030** 0.0012	**0.008** 0.0003	**0.030** 0.0012	**0.018** 0.0007	**0.008** 0.0003	**0.010** 0.0004	**0.010** 0.0004	**-0.250** -0.0098	**-0.250** -0.0098
150.000 5.9055	**180.000** 7.0866	**-0.025** -0.0010	**-0.018** -0.0007	**-0.013** -0.0005	**0.030** 0.0012	**0.030** 0.0012	**0.008** 0.0003	**0.030** 0.0012	**0.018** 0.0007	**0.008** 0.0003	**0.010** 0.0004	**0.010** 0.0004	**-0.250** -0.0098	**-0.250** -0.0098
180.000 7.0866	**250.000** 9.8425	**-0.030** -0.0012	**-0.022** -0.0009	**-0.015** -0.0006	**0.030** 0.0012	**0.030** 0.0012	**0.010** 0.0004	**0.040** 0.0016	**0.020** 0.0008	**0.010** 0.0004	**0.011** 0.0004	**0.013** 0.0005	**-0.300** -0.0018	**-0.300** -0.0018
250.000 9.8425	**315.000** 12.4016	**-0.035** -0.0014	**-0.025** -0.0010	**-0.018** -0.0007	**0.035** 0.0014	**0.035** 0.0014	**0.013** 0.0005	**0.050** 0.0020	**0.025** 0.0010	**0.013** 0.0005	**0.013** 0.0005	**0.015** 0.0006	**-0.350** -0.0138	**-0.350** -0.0138
315.000 12.4016	**400.000** 15.7480	**-0.040** -0.0016	**-0.030** -0.0012	**-0.023** -0.0009	**0.040** 0.0016	**0.040** 0.0016	**0.015** 0.0006	**0.060** 0.0024	**0.030** 0.0012	**0.015** 0.0006	**0.015** 0.0006	**0.020** 0.0008	**-0.400** -0.0157	**-0.400** -0.0157
400.000 15.7480	**500.000** 19.6850	**-0.045** -0.0018	**-0.035** -0.0014	– –	**0.050** 0.0020	**0.045** 0.0018	– –	**0.065** 0.0026	**0.035** 0.0014	– –	– –	– –	**-0.450** -0.0177	– –
500.000 19.6850	**630.000** 24.8031	**-0.050** -0.0020	**-0.040** -0.0016	– –	**0.060** 0.0024	**0.050** 0.0020	– –	**0.070** 0.0028	**0.040** 0.0016	– –	– –	– –	**-0.500** -0.0197	– –
630.000 24.8031	**800.000** 31.4961	**-0.075** -0.0030	– –	– –	**0.070** 0.0028	– –	– –	**0.080** 0.0031	– –	– –	– –	– –	**-0.750** -0.0295	– –

[1]Symbol definitions are found on pages 32-33 of the Timken Engineering Manual (order no. 10424).
[2]Tolerance range is from +0 to value listed.

TABLE 4. CYLINDRICAL ROLLER BEARING TOLERANCES – OUTER RING (Metric)[1]

Bearing O.D.		Outside Deviation[2] Δ_{Dmp}			Width Variation V_{cs}		Radial Runout K_{ea}			Axial Runout S_{ea}	Outside Diameter Runout With Face S_D
Over	Incl.	P0	P6	P5	P0	P6	P0	P6	P5	P5	P5
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
0.000 0.0000	**18.000** 0.7087	**-0.008** -0.0003	**-0.007** -0.0003	**-0.005** -0.0002	**0.015** 0.0006	**0.005** 0.0002	**0.015** 0.0006	**0.008** 0.0003	**0.005** 0.0002	**0.008** 0.0003	**0.008** 0.0003
18.000 0.7087	**30.000** 1.1811	**-0.009** -0.0004	**-0.008** -0.0003	**-0.006** -0.00024	**0.020** 0.0008	**0.005** 0.0002	**0.015** 0.0006	**0.009** 0.0004	**0.006** 0.00024	**0.008** 0.0003	**0.008** 0.0003
30.000 1.1811	**50.000** 1.9685	**-0.011** -0.0004	**-0.009** -0.0004	**-0.007** -0.0003	**0.020** 0.0008	**0.005** 0.0002	**0.020** 0.0008	**0.010** 0.0004	**0.007** 0.0003	**0.008** 0.0003	**0.008** 0.0003
50.000 1.9685	**80.000** 3.1496	**-0.013** -0.0005	**-0.011** -0.0004	**-0.009** -0.0004	**0.025** 0.0010	**0.006** 0.00024	**0.025** 0.0010	**0.013** 0.0005	**0.008** 0.0003	**0.010** 0.0004	**0.008** 0.0003
80.000 3.1496	**120.000** 4.7244	**-0.015** -0.0006	**-0.013** -0.0005	**-0.010** -0.0004	**0.025** 0.0010	**0.008** 0.0003	**0.035** 0.0014	**0.018** 0.0007	**0.010** 0.0004	**0.011** 0.0004	**0.009** 0.0004
120.000 4.7244	**150.000** 5.9055	**-0.018** -0.0007	**-0.015** -0.0006	**-0.011** -0.0004	**0.030** 0.0012	**0.008** 0.0003	**0.040** 0.0016	**0.020** 0.0008	**0.011** 0.0004	**0.013** 0.0005	**0.010** 0.0004
150.000 5.9055	**180.000** 7.0866	**-0.025** -0.0010	**-0.018** -0.0007	**-0.013** -0.0005	**0.030** 0.0012	**0.008** 0.0003	**0.045** 0.0018	**0.023** 0.0009	**0.013** 0.0005	**0.014** 0.0006	**0.010** 0.0004
180.000 7.0866	**250.000** 9.8425	**-0.030** -0.0012	**-0.020** -0.0008	**-0.015** -0.0006	**0.030** 0.0012	**0.010** 0.0004	**0.050** 0.0020	**0.025** 0.0010	**0.015** 0.0006	**0.015** 0.0006	**0.011** 0.0004
250.000 9.8425	**315.000** 12.4016	**-0.035** -0.0014	**-0.025** -0.0010	**-0.018** -0.0007	**0.035** 0.0014	**0.011** 0.0004	**0.060** 0.0024	**0.030** 0.0012	**0.018** 0.0007	**0.018** 0.0007	**0.013** 0.0005
315.000 12.4016	**400.000** 15.7480	**-0.040** -0.0016	**-0.028** -0.0011	**-0.020** -0.0008	**0.040** 0.0016	**0.013** 0.0005	**0.070** 0.0028	**0.035** 0.0014	**0.020** 0.0008	**0.020** 0.0008	**0.013** 0.0005
400.000 15.7480	**500.000** 19.6850	**-0.045** -0.0018	**-0.033** -0.0013	**-0.023** -0.0009	**0.045** 0.0018	**0.015** 0.0006	**0.080** 0.0031	**0.040** 0.0016	**0.023** 0.0009	**0.023** 0.0009	**0.015** 0.0006
500.000 19.6850	**630.000** 24.8031	**-0.050** -0.0020	**-0.038** -0.0015	**-0.028** -0.0011	**0.050** 0.0020	**0.018** 0.0007	**0.100** 0.0039	**0.050** 0.0020	**0.025** 0.0010	**0.025** 0.0010	**0.018** 0.0007
630.000 24.8031	**800.000** 31.4961	**-0.075** -0.0030	**-0.045** -0.0018	**-0.035** -0.0014	**–** –	**0.020** 0.0008	**0.120** 0.0047	**0.060** 0.0024	**0.030** 0.0012	**0.030** 0.0012	**0.020** 0.0008
800.000 31.4961	**1000.000** 39.3701	**-0.100** -0.0040	**-0.060** -0.0024	– –	– –	– –	**0.140** 0.0055	**0.075** 0.0030	– –	– –	– –
1000.000 39.3701	**1250.000** 49.2126	**-0.125** -0.0050	– –	– –	– –	– –	**0.160** 0.0063	– –	– –	– –	– –

[1]Symbol definitions are found on pages 32-33 of the Timken Engineering Manual (order no. 10424).
[2]Tolerance range is from +0 to value listed.

CYLINDRICAL ROLLER BEARING MOUNTING, FITTING, SETTING AND INSTALLATION

MOUNTING

Cylindrical roller bearings can be mounted individually, but most often are mounted in combination with another cylindrical roller, a spherical roller or a tapered roller bearing.

Fig. 10 shows a pulverizer wheel assembly where a spherical roller bearing is mounted in combination with a cylindrical roller bearing. In this application, the cylindrical roller bearing allows the shaft to float relative to the housing.

Fig. 11 shows a single-reduction gear reducer with herringbone gears. A double-row tapered roller bearing is mounted in combination with a cylindrical roller bearing on the upper shaft, and two cylindrical bearings are mounted on the lower shaft.

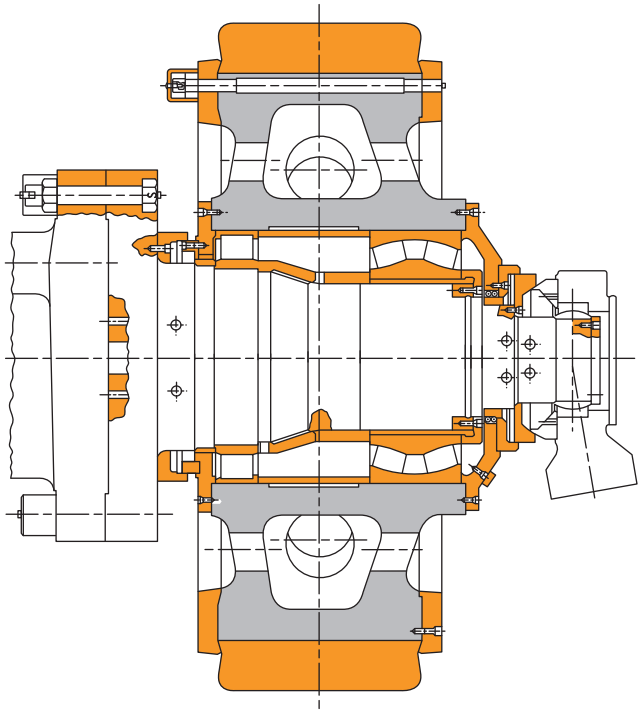


Fig. 10. Pulverizer wheel assembly.

FITTING PRACTICE

Tables 6-18 on pages 20-35 list the recommended fitting practice for cylindrical roller bearings. The tables assume:

- The bearing is of normal precision.
- The housing is thick and made from steel or cast iron.
- The shaft is solid and made from steel.
- The bearing seats are ground or accurately turned to less than approximately 1.6 µm Ra finish.

The suggested fit symbols are in accordance with ISO 286. For help with recommended fitting practices, contact your Timken representative.

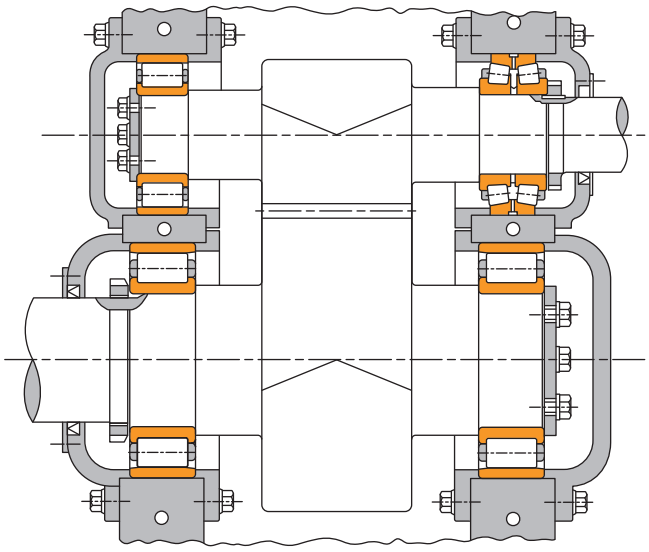


Fig. 11. Single-reduction gear reducer.

As a general guideline, rotating inner rings should be applied with an interference fit. Loose fits may permit the inner rings to creep or turn and wear the shaft and the backing shoulder. This wear may result in excessive bearing looseness and possible bearing and shaft damage. Additionally, abrasive metal particles resulting from creep or turning may enter into the bearing and cause damage and vibration.

Stationary inner-ring fitting practice depends on the loading of the application. The load conditions and bearing envelope dimensions should be used to select the suggested shaft fit from the tables.

Similarly, rotating outer-ring applications should use an interference fit between the outer ring and housing.

Stationary outer rings are generally mounted with loose fits to permit assembly and disassembly.

Thin-walled housings, light-alloy housings or hollow shafts must use press fits tighter than required for thick-walled housings, steel or cast iron housings or solid shafts. Tighter fits also are required when mounting the bearing on relatively rough, or unground surfaces.

SETTING

To achieve appropriate operation clearance, attention must be paid to the effects fitting practice and thermal gradients have within the bearing.

FITTING PRACTICE

- An interference fit between the inner ring and a solid steel shaft will reduce the radial clearance within the bearing by approximately 85 percent of the fit.
- Interference fits between the outer ring and steel or cast iron housing will reduce radial clearance by approximately 60 percent.

THERMAL GRADIENTS

- Thermal gradients within the bearing are primarily a function of the bearing rotational speed. As speed increases, thermal gradients increase, thermal growth occurs and the radial clearance is reduced.
- As a rule of thumb, radial clearance should be increased for speeds in excess of 70 percent of the speed rating.

For help selecting the correct radial internal clearance for your application, consult with your Timken representative.

Radial internal clearance tolerances are listed in table 5.

Cylindrical roller bearings are ordered with a specified standard or non-standard radial internal clearance value. The standard radial internal clearances are designated as C2, C0 (normal), C3, C4 or C5 and are in accordance with ISO 5753. C2 represents the minimum clearance and C5 represents the maximum clearance. Non-standardized values also are available by special request.

The clearance required for a given application depends on the desired operating precision, the rotational speed of the bearing, and the fitting practice used. Most applications use a normal or C3 clearance. Typically, larger clearance reduces the operating load zone of the bearing, increases the maximum roller load and reduces the bearing's expected life. However, a cylindrical roller bearing that has been put into a preload condition can experience premature bearing damage caused by excessive heat generation and/or material fatigue. As a general guideline, cylindrical roller bearings should not operate in a preloaded condition.

TABLE 5. RADIAL INTERNAL CLEARANCE LIMITS – CYLINDRICAL ROLLER BEARINGS – CYLINDRICAL BORE

Bore (Nominal)		C2		C0		C3		C4		C5	
Over	Incl.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
– –	**10** 0.3937	**0.000** 0.0000	**0.025** 0.0010	**0.020** 0.0008	**0.045** 0.0018	**0.035** 0.0014	**0.060** 0.0024	**0.050** 0.0020	**0.075** 0.0030	– –	– –
10 0.3937	**24** 0.9449	**0.000** 0.0000	**0.025** 0.0010	**0.020** 0.0008	**0.045** 0.0018	**0.035** 0.0014	**0.060** 0.0024	**0.050** 0.0020	**0.075** 0.0030	**0.065** 0.0026	**0.090** 0.0035
24 0.9449	**30** 1.1811	**0.000** 0.0000	**0.025** 0.0010	**0.020** 0.0008	**0.045** 0.0018	**0.035** 0.0014	**0.060** 0.0024	**0.050** 0.0020	**0.075** 0.0030	**0.070** 0.0028	**0.095** 0.0037
30 1.1811	**40** 1.5748	**0.005** 0.0002	**0.030** 0.0012	**0.025** 0.0010	**0.050** 0.0020	**0.0045** 0.0018	**0.070** 0.0028	**0.060** 0.0024	**0.085** 0.0033	**0.080** 0.0031	**0.105** 0.0041
40 1.5748	**50** 1.9685	**0.005** 0.0002	**0.035** 0.0014	**0.030** 0.0012	**0.060** 0.0024	**0.050** 0.0020	**0.080** 0.0031	**0.070** 0.0028	**0.100** 0.0039	**0.095** 0.0037	**0.125** 0.0049
50 1.9685	**65** 2.5591	**0.010** 0.0004	**0.040** 0.0016	**0.040** 0.0016	**0.070** 0.0028	**0.060** 0.0024	**0.090** 0.0035	**0.080** 0.0031	**0.110** 0.0043	**0.110** 0.0043	**0.140** 0.0055
65 2.5591	**80** 3.1496	**0.010** 0.0004	**0.045** 0.0018	**0.040** 0.0016	**0.075** 0.0030	**0.065** 0.0026	**0.100** 0.0039	**0.090** 0.0035	**0.125** 0.0049	**0.130** 0.0051	**0.165** 0.0065
80 3.1496	**100** 3.9370	**0.015** 0.0006	**0.050** 0.0020	**0.050** 0.0020	**0.085** 0.0033	**0.075** 0.0030	**0.110** 0.0043	**0.105** 0.0041	**0.140** 0.0055	**0.155** 0.0061	**0.190** 0.0075
100 3.9370	**120** 4.7244	**0.015** 0.0006	**0.055** 0.0022	**0.050** 0.0020	**0.090** 0.0035	**0.085** 0.0033	**0.125** 0.0049	**0.125** 0.0049	**0.165** 0.0065	**0.180** 0.0071	**0.220** 0.0087
120 4.7244	**140** 5.5118	**0.015** 0.0006	**0.060** 0.0024	**0.060** 0.0024	**0.105** 0.0041	**0.100** 0.0039	**0.145** 0.0057	**0.145** 0.0057	**0.190** 0.0075	**0.200** 0.0079	**0.245** 0.0096
140 5.5118	**160** 6.2992	**0.020** 0.0008	**0.070** 0.0028	**0.070** 0.0028	**0.120** 0.0047	**0.115** 0.0045	**0.165** 0.0065	**0.165** 0.0065	**0.215** 0.0085	**0.225** 0.0089	**0.275** 0.0108
160 6.2992	**180** 7.0866	**0.025** 0.0010	**0.075** 0.0030	**0.075** 0.0030	**0.125** 0.0049	**0.120** 0.0047	**0.170** 0.0067	**0.170** 0.0067	**0.220** 0.0087	**0.250** 0.0098	**0.300** 0.0118
180 7.0866	**200** 7.8740	**0.035** 0.0014	**0.090** 0.0035	**0.090** 0.0035	**0.145** 0.0057	**0.140** 0.0055	**0.195** 0.0077	**0.195** 0.0077	**0.250** 0.0098	**0.275** 0.0108	**0.330** 0.0130
200 7.8740	**225** 8.8583	**0.045** 0.0018	**0.105** 0.0041	**0.105** 0.0041	**0.165** 0.0065	**0.160** 0.0063	**0.220** 0.0087	**0.220** 0.0087	**0.280** 0.0110	**0.305** 0.0120	**0.365** 0.0144
225 8.8583	**250** 9.8425	**0.045** 0.0018	**0.110** 0.0043	**0.110** 0.0043	**0.175** 0.0069	**0.170** 0.0067	**0.235** 0.0093	**0.235** 0.0093	**0.300** 0.0118	**0.330** 0.0130	**0.395** 0.0156
250 9.8425	**280** 11.0236	**0.055** 0.0022	**0.125** 0.0049	**0.125** 0.0049	**0.195** 0.0077	**0.190** 0.0075	**0.260** 0.0102	**0.260** 0.0102	**0.330** 0.0130	**0.370** 0.0146	**0.440** 0.0173
280 11.0236	**315** 12.4016	**0.055** 0.0022	**0.130** 0.0051	**0.130** 0.0051	**0.205** 0.0081	**0.200** 0.0079	**0.275** 0.0108	**0.275** 0.0108	**0.350** 0.0138	**0.410** 0.0161	**0.485** 0.0191
315 12.4016	**355** 13.9764	**0.065** 0.0026	**0.145** 0.0057	**0.145** 0.0057	**0.225** 0.0089	**0.225** 0.0089	**0.305** 0.0120	**0.305** 0.0120	**0.385** 0.0152	**0.455** 0.0179	**0.535** 0.0211
355 13.9764	**400** 15.7480	**0.100** 0.0039	**0.190** 0.0075	**0.190** 0.0075	**0.280** 0.0110	**0.280** 0.0110	**0.370** 0.0146	**0.370** 0.0146	**0.460** 0.0181	**0.510** 0.0201	**0.600** 0.0236
400 15.7480	**450** 17.7165	**0.110** 0.0043	**0.210** 0.0083	**0.210** 0.0083	**0.310** 0.0122	**0.310** 0.0122	**0.410** 0.0161	**0.410** 0.0161	**0.510** 0.0201	**0.565** 0.0222	**0.665** 0.0262
450 17.7165	**500** 19.6850	**0.110** 0.0043	**0.220** 0.0087	**0.220** 0.0087	**0.330** 0.0130	**0.330** 0.0130	**0.440** 0.0173	**0.440** 0.0173	**0.550** 0.0217	**0.625** 0.0246	**0.735** 0.0289
500 19.6850	**560** 22.0472	**0.120** 0.0047	**0.240** 0.0095	**0.240** 0.0095	**0.360** 0.0142	**0.360** 0.0142	**0.480** 0.0189	**0.480** 0.0189	**0.600** 0.0236	**0.690** 0.0272	**0.810** 0.0319
560 22.0472	**630** 24.8031	**0.140** 0.0055	**0.260** 0.0102	**0.260** 0.0102	**0.380** 0.0150	**0.380** 0.0150	**0.500** 0.0197	**0.500** 0.0197	**0.620** 0.0244	**0.780** 0.0307	**0.900** 0.0354
630 24.8031	**710** 27.9528	**0.145** 0.0057	**0.285** 0.0112	**0.285** 0.0112	**0.425** 0.0167	**0.425** 0.0167	**0.565** 0.0222	**0.565** 0.0222	**0.705** 0.0278	**0.865** 0.0341	**1.005** 0.0396
710 27.9528	**800** 31.4961	**0.150** 0.0059	**0.310** 0.0122	**0.310** 0.0122	**0.470** 0.0185	**0.470** 0.0185	**0.630** 0.0248	**0.630** 0.0248	**0.790** 0.0311	**0.975** 0.0384	**1.135** 0.0447
800 31.4961	**900** 35.4331	**0.180** 0.0071	**0.350** 0.0138	**0.350** 0.0138	**0.520** 0.0205	**0.520** 0.0205	**0.690** 0.0272	**0.690** 0.0272	**0.860** 0.0339	**1.095** 0.0431	**1.265** 0.0498
900 35.4331	**1000** 39.3701	**0.200** 0.0079	**0.390** 0.0154	**0.390** 0.0154	**0.580** 0.0228	**0.580** 0.0228	**0.770** 0.0303	**0.770** 0.0303	**0.960** 0.0378	**1.215** 0.0478	**1.405** 0.0553

Shaft fit radial internal clearance (RIC) reductions and clearance:

For a 150 mm nominal bore at C3, the RIC will be 0.115 to 0.165 mm (0.0045 to 0.0065 in.). Recalculating shaft fit RIC reduction and clearance:

max. clearance = max. RIC - min. fit reduction
= 0.165 - 0.034 = 0.131 mm (0.0052 in.)

min. clearance = min. RIC - max. fit reduction
= 0.115 - 0.074 = 0.041 mm (0.0016 in.)

Since the minimum mounted clearance is less than the minimum suggested RIC of 0.056 mm (0.0022 in.), the C3 RIC clearance limit needs to be reevaluated.

INSTALLATION

When using a tight-fit inner ring, the method of assembly will depend on whether the bearing has a cylindrical or tapered bore.

Mounting cylindrical bore bearings

Heat expansion method

- Most applications require a tight interference fit on the shaft.
- Mounting is simplified by heating the bearing to expand it sufficiently to slide easily onto the shaft.
- Two methods of heating are commonly used:
  - Induction heating.
  - Tank of heated oil.
- Induction heating:
  - The induction heating process can be used for mounting bearings.
  - Care must be taken to prevent bearing temperature from exceeding 121° C (250° F).
  - Trial runs with the unit and bearing are usually necessary to obtain proper timing.
  - Thermal crayons melted at predetermined temperatures can be used to check the bearing temperature.



Fig. 12. Induction heater.

  - While the bearing is hot, it should be positioned squarely against the shoulder.
  - Lockwashers and locknuts or clamping plates are then installed to hold the bearing against the shoulder of the shaft.
  - As the bearing cools, the locknut or clamping plate should be tightened.
  - In cases of outer ring rotation, where the outer ring is a tight fit in the housing, the housing member can be expanded by heating.
  - Fig. 12 shows a Timken induction heater.
- Oil bath:
  - This is accomplished by heating the bearing in a tank of oil that has a high flash point.
  - The oil temperature should not be allowed to exceed 121° C (250° F). The bearing should be heated for 20 or 30 minutes, or until it is expanded sufficiently to slide onto the shaft easily.
  - The bearing should not be in direct contact with the heat source.
  - The usual arrangement is to have a screen several inches from the bottom of the tank. Small support blocks separate the bearing from the screen.
  - It is important to keep the bearing away from any localized high-heat source that may raise its temperature excessively, resulting in ring hardness reduction.
  - Flame-type burners are commonly used. An automatic device for temperature control is desirable.
  - If safety regulations prevent the use of an open heated oil bath, a mixture of 15 percent soluble-oil water may be used. This mixture may be heated to a maximum of 121° C (250° F) without being flammable.

NOTE

Never use steam or hot water when cleaning the bearings because these methods can create rust or corrosion.

NOTE

Never expose any surface of a bearing to the flame of a torch.

NOTE

Do not heat bearing beyond 121° C (250° F).

⚠WARNING

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

Remove oil or rust inhibitor from parts before heating, to avoid fire and fumes.

SHAFT AND HOUSING FITS
CYLINDRICAL ROLLER BEARINGS

TABLE 6. CYLINDRICAL ROLLER BEARINGS SHAFT FITS (EXCEPT 5200 SERIES AND FOUR-ROW CYLINDRICALS)

Load Limit		Shaft Diameter		Shaft Tolerance
Lower	Upper	**mm** in.	**mm** in.	Symbol[1]
INNER RING STATIONARY				
0	C[2]	All	All	g6
0	C	All	All	h6
INNER RING ROTATION OR INDETERMINATE				
		Over	Incl.	
0	0.08C	**0** 0	**40** 1.57	k6[3]
		40 1.57	**140** 5.51	m6[4]
		140 5.51	**320** 12.60	n6
		320 12.60	**500** 19.68	p6
		500 19.68	– –	–
0.08C	0.18C	**0** 0	**40** 1.57	k5
		40 1.57	**100** 3.94	m5
		100 3.94	**140** 5.51	m6
		140 5.51	**320** 12.60	n6
		320 12.60	**500** 19.68	p6
		500 19.68	– –	r6
0.18C	C	**0** 0	**40** 1.57	m5[5]
		40 1.57	**65** 2.56	m6[5]
		65 2.56	**140** 5.51	n6[5]
		140 5.51	**320** 12.60	p6[5]
		320 12.60	**500** 19.68	r6[5]
		500 19.68	– –	r7[5]
THRUST LOADS				

Not suggested, consult your Timken engineer.

[1]For solid shaft. See pages 20-25 for tolerance values.
[2]C = dynamic load rating.
[3]Use k5 for high-precision applications.
[4]Use m5 for high-precision applications.
[5]Bearings with greater than nominal clearance must be used.

TABLE 7. FOUR-ROW CYLINDRICAL ROLLER BEARING SHAFTS

Load Limit		Shaft Diameter		Shaft Tolerance
Lower	Upper	**mm** in.	**mm** in.	Symbol[1]
All		**100** 3.93	**120** 4.72	n6
		120 4.72	**225** 8.85	p6
		225 8.85	**400** 15.75	r6
		400 15.75		s6

[1]For solid shaft. See pages 20-25 for tolerance values.

TABLE 8. CYLINDRICAL ROLLER BEARING HOUSING FITS

	Operating Conditions	Examples	Housing Tolerance Symbol[1]	Outer Ring Displaceable Axially
	OUTER RING ROTATING			
	Heavy loads with thin-walled housing	Crane support wheels Wheel hubs (roller bearings) Crank bearings	P6	No
	Normal to heavy loads	Wheel hubs (ball bearings) Crank bearings	N6	No
	Light loads	Conveyor rollers Rope sheaves Tension pulleys	M6	No
	INDETERMINATE LOAD DIRECTION			
	Heavy shock loads	Electric traction motors	M7	No
	Normal to heavy loads, axial displacement of outer ring not required.	Electric motors Pumps Crankshaft main bearings	K6	No, normally
Below this line, housing can either be one piece or split. Above this line, a split housing is not suggested.	Light to normal loads, axial displacement of outer ring desired.	Electric motors Pumps Crankshaft main bearings	J6	Yes, normally
	OUTER RING STATIONARY			
	Shock loads, temporary complete unloading	Heavy rail vehicles	J6	Yes, normally
	All — One-piece housing	General applications Heavy rail vehicles	H6	Easily
	All — Radially split housing	Transmission drives	H7	Easily
	Heat supplied through shaft	Dryer cylinders	G7	Easily

[1]Cast iron steel housing. See pages 26-35 for numerical values. Where wider tolerances are permissible, P7, N7, M7, K7, J7 and H7 values may be used in place of P6, N6, M6, K6, J6 and H6 values, respectively.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

CYLINDRICAL ROLLER BEARINGS

SHAFT TOLERANCES

TABLE 9. CYLINDRICAL ROLLER BEARING SHAFT TOLERANCES

Bearing Bore			g6			h6			h5			j5		
Nominal (Max.)		Tolerance[1]	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit
Over	Incl.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
3.000 0.1181	**6.000** 0.2362	**-0.008** -0.003	**-0.004** -0.0002	**-0.012** -0.0005	**0.012L 0.004T** 0.0005L 0.0001T	**0.000** 0.0000	**-0.008** -0.003	**0.008L 0.008T** 0.0003L 0.0003T	**0.000** 0.0000	**-0.005** -0.0002	**0.005L 0.008T** 0.0002L 0.0003T	**+0.003** +0.0001	**-0.002** -0.0001	**0.002L 0.011T** 0.0001L 0.0004T
6.000 0.2362	**10.000** 0.3937	**-0.008** -0.003	**-0.005** -0.0002	**-0.014** -0.0006	**0.014L 0.003T** 0.0006L 0.0001T	**0.000** 0.0000	**-0.009** -0.0004	**0.009L 0.008T** 0.0004L 0.0003T	**0.000** 0.0000	**-0.006** -0.0002	**0.006L 0.008T** 0.0002L 0.0003T	**+0.004** +0.0002	**-0.002** -0.0001	**0.002L 0.012T** 0.0001L -0.0005T
10.000 0.3937	**18.000** 0.7087	**-0.008** -0.003	**-0.006** -0.0002	**-0.017** -0.0007	**0.017L 0.002T** 0.0007L -0.0001T	**0.000** 0.0000	**-0.011** -0.0004	**0.011L 0.008T** 0.0004L 0.0003T	**0.000** 0.0000	**-0.008** -0.0003	**0.008L 0.008T** 0.0003L 0.0003T	**+0.005** +0.0002	**-0.003** -0.0001	**0.003L 0.013T** 0.0001L 0.0005T
18.000 0.7087	**30.000** 1.1811	**-0.010** -0.0004	**-0.007** -0.0003	**-0.020** -0.0008	**0.020L 0.003T** 0.0008L 0.0001T	**0.000** 0.0000	**-0.013** -0.0005	**0.013L 0.010T** 0.0005L 0.0004T	–	–	–	**+0.005** +0.0002	**-0.004** -0.0002	**0.004L 0.015T** 0.0002L 0.0006T
30.000 1.1811	**50.000** 1.9685	**-0.012** -0.0005	**-0.009** -0.0004	**-0.025** -0.0010	**0.025L 0.003T** 0.0010L 0.0001T	**0.000** 0.0000	**-0.016** -0.0006	**0.016L 0.012T** 0.0006L 0.0005T	–	–	–	**+0.006** +0.0002	**-0.005** -0.0002	**0.005L 0.018T** 0.0002L 0.0007T
50.000 1.9685	**80.000** 3.1496	**-0.015** -0.0006	**-0.010** -0.0004	**-0.029** -0.0011	**0.029L 0.005T** 0.0011L 0.0002T	**0.000** 0.0000	**-0.019** -0.0007	**0.019L 0.015T** 0.0007L 0.0006T	–	–	–	**+0.006** +0.0002	**-0.007** -0.0003	**0.007L 0.021T** 0.0003L 0.0008T
80.000 3.1496	**120.000** 4.7244	**-0.020** -0.0008	**-0.012** -0.0005	**-0.034** -0.0013	**0.034L 0.008T** 0.0013L 0.0003T	**0.000** 0.0000	**-0.022** -0.0009	**0.022L 0.020T** 0.0009L 0.0008T	–	–	–	**+0.006** +0.0002	**-0.009** -0.0004	**0.009L 0.026T** 0.0004L 0.0010T
120.000 4.7244	**180.000** 7.0866	**-0.025** -0.0010	**-0.014** -0.0006	**-0.039** -0.0015	**0.039L 0.011T** 0.0015L 0.0004T	**0.000** 0.0000	**-0.025** -0.0010	**0.025L 0.025T** 0.0010L 0.0010T	–	–	–	**+0.007** +0.0003	**-0.011** -0.0004	**0.011L 0.032T** 0.0004L 0.0013T
180.000 7.0866	**200.000** 7.8740	**-0.030** -0.0012	**-0.015** -0.0006	**-0.044** -0.0017	**0.044T 0.015T** 0.0017L 0.0006T	**0.000** 0.0000	**-0.029** -0.0011	**0.029L 0.030T** 0.0011L 0.0012T	–	–	–	**+0.007** +0.0003	**-0.013** -0.0005	**0.013L 0.037T** 0.0005L 0.0015T
200.000 7.8740	**225.000** 8.8583	**-0.030** -0.0012	**-0.015** -0.0006	**-0.044** -0.0017	**0.044T 0.015T** 0.0017L 0.0006T	**0.000** 0.0000	**-0.029** -0.0011	**0.029L 0.030T** 0.0011L 0.0012T	–	–	–	**+0.007** +0.0003	**-0.013** -0.0005	**0.013L 0.037T** 0.0005L 0.0015T
225.000 8.8583	**250.000** 9.8425	**-0.030** -0.0012	**-0.015** -0.0006	**-0.044** -0.0017	**0.044T 0.015T** 0.0017L 0.0006T	**0.000** 0.0000	**-0.029** -0.0011	**0.029L 0.030T** 0.0011L 0.0012T	–	–	–	**+0.007** +0.0003	**-0.013** -0.0005	**0.013L 0.037T** 0.0005L 0.0015T
250.000 9.8425	**280.000** 11.0236	**-0.035** -0.0014	**-0.017** -0.0007	**-0.049** -0.0019	**0.049L 0.018T** 0.0019L 0.0007T	**0.000** 0.0000	**-0.032** -0.0013	**0.032L 0.035T** 0.0013L 0.0014T	–	–	–	**+0.007** +0.0003	**-0.016** -0.0006	**0.016L 0.042T** 0.0006L 0.0017T
280.000 11.0236	**315.000** 12.4016	**-0.035** -0.0014	**-0.017** -0.0007	**-0.049** -0.0019	**0.049L 0.018T** 0.0019L 0.0007T	**0.000** 0.0000	**-0.032** -0.0013	**0.032L 0.035T** 0.0013L 0.0014T	–	–	–	**+0.007** +0.0003	**-0.016** -0.0006	**0.016L 0.042T** 0.0006L 0.0017T

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing bore.
[1]Tolerance range is from +0 to value listed.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

j6			k5			k6			m5		
Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit
Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
+0.006 +0.0002	**-0.002** -0.0001	**0.002L** **0.014T** 0.0001L 0.0005T	**+0.006** +0.0002	**+0.001** +0.0000	**0.001T** **0.014T** 0.0000T 0.0005T	–	–	–	**+0.009** +0.0004	**+0.004** +0.0002	**0.004T** **0.017T** 0.0002T 0.0007T
+0.007 +0.0003	**-0.002** -0.0001	**0.002L** **0.015T** 0.0001L 0.0006T	**+0.007** +0.0003	**+0.001** +0.0000	**0.001T** **0.015T** 0.0000T 0.0006T	–	–	–	**+0.012** +0.0005	**+0.006** +0.0002	**0.006T** **0.020T** 0.0002T 0.0008T
+0.008 +0.0003	**-0.003** -0.0001	**0.003L** **0.016T** 0.0001L 0.0006T	**+0.009** +0.0004	**+0.001** +0.0000	**0.001T** **0.017T** 0.0000T 0.0007T	–	–	–	**+0.015** +0.0006	**+0.007** +0.0003	**0.007T** **0.023T** 0.0003T 0.0009T
+0.009 +0.0004	**-0.004** -0.0002	**0.004L** **0.019T** 0.0002L 0.0008T	**+0.011** +0.0004	**+0.002** +0.0001	**0.002T** **0.021T** 0.0001T 0.0008T	–	–	–	**+0.017** +0.0007	**+0.008** +0.0003	**0.008T** **0.027T** 0.0003T 0.0011T
+0.011 +0.0004	**-0.005** -0.0002	**0.005L** **0.023T** 0.0002L 0.00085T	**+0.013** +0.0005	**+0.002** +0.0001	**0.002T** **0.025T** 0.0001T 0.0010T	**+0.018** +0.0007	**+0.002** +0.0001	**0.002T** **0.030T** 0.0001T 0.0012T	**+0.020** +0.0008	**+0.009** +0.0004	**0.009T** **0.032T** 0.0004T 0.00125T
+0.012 +0.0005	**-0.007** -0.0003	**0.007L** **0.027T** 0.0003L 0.0011T	**+0.015** +0.0006	**+0.002** +0.0001	**0.002T** **0.030T** 0.0001T 0.0012T	**+0.021** +0.0008	**+0.002** +0.0001	**0.002T** **0.036T** 0.0001T 0.0014T	**+0.024** +0.0009	**+0.011** +0.0004	**0.011T** **0.039T** 0.0004T 0.0015T
+0.013 +0.0005	**-0.009** -0.0004	**0.009L** **0.033T** 0.0004L 0.0013T	**+0.018** +0.0007	**+0.003** +0.0001	**0.003T** **0.038T** 0.0001T 0.0015T	**+0.025** +0.0010	**+0.003** +0.0001	**0.003T** **0.045T** 0.0001T 0.0018T	**+0.028** +0.0011	**+0.013** +0.0005	**0.013T** **0.048T** 0.0005T 0.0019T
+0.014 +0.0006	**-0.011** -0.0004	**0.011L** **0.039T** 0.0004L 0.0016T	**+0.021** +0.0008	**+0.003** +0.0001	**0.003T** **0.046T** 0.0001T 0.0018T	**+0.028** +0.0011	**+0.003** +0.0001	**0.003T** **0.053T** 0.0001T 0.0021T	**+0.033** +0.0013	**+0.015** +0.0006	**0.015T** **0.058T** 0.0006T 0.0023T
+0.016 +0.0006	**-0.013** -0.0005	**0.013L** **0.046T** 0.0005L 0.0018T	**+0.024** +0.0009	**+0.004** +0.0002	**0.004T** **0.054T** 0.0002T 0.0021T	–	–	–	**+0.037** +0.0015	**+0.017** +0.0007	**0.017T** **0.067T** 0.0007T 0.0027T
+0.016 +0.0006	**-0.013** -0.0005	**0.013L** **0.046T** 0.0005L 0.0018T	**+0.024** +0.0009	**+0.004** +0.0002	**0.004T** **0.054T** 0.0002T 0.0021T	–	–	–	**+0.037** +0.0015	**+0.017** +0.0007	**0.017T** **0.067T** 0.0007T 0.0027T
+0.016 +0.0006	**-0.013** -0.0005	**0.013L** **0.046T** 0.0005L 0.0018T	**+0.024** +0.0009	**+0.004** +0.0002	**0.004T** **0.054T** 0.0002T 0.0021T	–	–	–	**+0.037** +0.0015	**+0.017** +0.0007	**0.017T** **0.067T** 0.0007T 0.0027T
+0.016 +0.0006	**-0.016** -0.0006	**0.016L** **0.051T** 0.0006L 0.0020T	**+0.027** +0.0011	**+0.004** +0.0002	**0.004T** **0.062T** 0.0002T 0.0025T	–	–	–	**+0.043** +0.0017	**+0.020** +0.0008	**0.020T** **0.078T** 0.0008T 0.0031T
+0.016 +0.0006	**-0.016** -0.0006	**0.016L** **0.051T** 0.0006L 0.0020T	**+0.027** +0.0011	**+0.004** +0.0002	**0.004T** **0.062T** 0.0002T 0.0025T	–	–	–	**+0.043** +0.0017	**+0.020** +0.0008	**0.020T** **0.078T** 0.0008T 0.0031T

Continued on next page.

SHAFT AND HOUSING FITS

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

Table 9 continued.

Bearing Bore			g6			h6			h5			j5		
Nominal (Max.)		Tolerance[1]	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit
Over	Incl.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
315.000 12.4016	**355.000** 13.9764	**-0.040** -0.0016	**-0.018** -0.0007	**-0.054** -0.0021	**0.054L 0.022T** 0.0021L 0.0009T	**0.000** 0.0000	**-0.036** -0.0014	**0.036L 0.040T** 0.0014L 0.0016T	–	–	–	**+0.007** +0.0003	**-0.018** -0.0007	**0.018L 0.047T** 0.0007L 0.0019T
355.000 13.9764	**400.000** 15.7480	**-0.040** -0.0016	**-0.018** -0.0007	**-0.054** -0.0021	**0.054L 0.022T** 0.0021L 0.0009T	**0.000** 0.0000	**-0.036** -0.0014	**0.036L 0.040T** 0.0014L 0.0016T	–	–	–	**+0.007** +0.0003	**-0.018** -0.0007	**0.018L 0.047T** 0.0007L 0.0019T
400.000 15.7480	**450.000** 17.7165	**-0.045** -0.0018	**-0.020** -0.0008	**-0.060** -0.0024	**0.060L 0.025T** 0.0024L 0.0010T	**0.000** 0.0000	**-0.040** -0.0016	**0.040L 0.045T** 0.0016L 0.0018T	–	–	–	**+0.007** +0.0003	**-0.020** -0.0008	**0.020L 0.052T** 0.0008L 0.0021T
450.000 17.7165	**500.000** 19.6850	**-0.045** -0.0018	**-0.020** -0.0008	**-0.060** -0.0024	**0.060L 0.025T** 0.0024L 0.0010T	**0.000** 0.0000	**-0.040** -0.0016	**0.040L 0.045T** 0.0016L 0.0018T	–	–	–	**+0.007** +0.0003	**-0.020** -0.0008	**0.020L 0.052T** 0.0008L 0.0020T
500.000 19.6850	**560.000** 22.0472	**-0.050** -0.0020	**-0.022** -0.0009	**-0.066** -0.0026	**0.066L 0.028T** 0.0026L 0.0011T	**0.000** 0.0000	**-0.044** -0.0017	**0.044L 0.050T** 0.0017L 0.0020T	–	–	–	**+0.008** 0.0003	**-0.022** -0.0009	**0.022L 0.058T** 0.0009L 0.0023T
560.000 22.0472	**630.000** 24.8032	**-0.050** -0.0020	**-0.022** -0.0009	**-0.066** -0.0026	**0.066L 0.028T** 0.0026L 0.0011T	**0.000** 0.0000	**-0.044** -0.0017	**0.044L 0.050T** 0.0017L 0.0020T	–	–	–	**+0.008** +0.0003	**-0.022** -0.0009	**0.022L 0.058T** 0.0009L 0.0023T
630.000 24.8032	**710.000** 27.9528	**-0.075** -0.0030	**-0.024** -0.0009	**-0.074** -0.0029	**0.074L 0.051T** 0.0029L 0.0021T	**0.000** 0.0000	**-0.050** -0.0020	**0.050L 0.075T** 0.0020L 0.0030T	–	–	–	**+0.010** +0.0004	**-0.025** -0.0010	**0.025L 0.085T** 0.0010L 0.0035T
710.000 27.9528	**800.000** 31.4961	**-0.075** -0.0030	**-0.024** -0.0009	**-0.074** -0.0029	**0.074L 0.051T** 0.0029L 0.0021T	**0.000** 0.0000	**-0.050** -0.0020	**0.050L 0.075T** 0.0020L 0.0030T	–	–	–	**+0.010** +0.0004	**-0.025** -0.0010	**0.025L 0.085T** 0.0010L 0.0035T
800.000 31.4961	**900.000** 35.4331	**-0.100** -0.0039	**-0.026** -0.0010	**-0.082** 0.0032	**0.082L 0.074T** 0.0032L 0.0029T	**0.000** 0.0000	**-0.056** -0.0022	**0.056L 0.100T** 0.0022L 0.0039T	–	–	–	**+0.012** +0.0005	**-0.028** -0.0011	**0.028L 0.112T** 0.0011L 0.0044T
900.000 35.4331	**1000.000** 39.3701	**-0.100** -0.0039	**-0.026** -0.0010	**-0.082** 0.0032	**0.082L 0.074T** 0.0032L 0.0029T	**0.000** 0.0000	**-0.056** -0.0022	**0.056L 0.100T** 0.0022L 0.0039T	–	–	–	**+0.012** +0.0005	**-0.028** -0.0011	**0.028L 0.112T** 0.0011L 0.0044T
1000.000 39.3701	**1120.000** 44.0945	**-0.125** -0.0049	**-0.028** -0.0011	**-0.094** -0.0037	**0.094L 0.097T** 0.0037L 0.0038T	**0.000** 0.0000	**-0.066** -0.0026	**0.066L 0.125T** 0.0022L 0.0039T	–	–	–	**+0.013** +0.0005	**-0.033** -0.0013	**0.033L 0.138T** 0.0013L 0.0054T
1120.000 44.0945	**1250.000** 49.2126	**-0.125** -0.0049	**-0.028** -0.0011	**-0.094** -0.0037	**0.094L 0.097T** 0.0037L 0.0038T	**0.000** 0.0000	**-0.066** -0.0026	**0.066L 0.125T** 0.0022L 0.0039T	–	–	–	**+0.013** +0.0005	**-0.033** -0.0013	**0.033L 0.138T** 0.0013L 0.0054T

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing bore.
[1]Tolerance range is from +0 to value listed.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

j6			k5			k6			m5		
Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit	Shaft Diameter		Fit
Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
+0.018 +0.0007	**-0.018** -0.0007	**0.018L 0.058T** 0.0007L 0.0023T	**+0.029** +0.0011	**+0.046** +0.0002	**0.004T 0.069T** 0.0002T 0.0027T	–	–	–	**+0.046** +0.0018	**+0.021** +0.0008	**0.021T 0.086T** 0.0008T 0.0034T
+0.018 +0.0007	**-0.018** -0.0007	**0.018L 0.058T** 0.0007L 0.0023T	**+0.029** +0.0011	**+0.004** +0.0002	**0.004T 0.069T** 0.0002T 0.0027T	–	–	–	**+0.046** +0.0018	**+0.021** +0.0008	**0.021T 0.086T** 0.0008T 0.0034T
+0.020 +0.0008	**-0.020** -0.0008	**0.020L 0.065T** 0.0008L 0.0026T	**+0.032** +0.0013	**+0.005** +0.0002	**0.005T 0.077T** 0.0002T 0.0031T	–	–	–	**+0.050** +0.0020	**+0.023** +0.0009	**0.023T 0.095T** 0.0009T 0.0037T
+0.020 +0.0008	**-0.020** -0.0008	**0.020L 0.065T** 0.0008L 0.0026T	**+0.032** +0.0013	**+0.005** +0.0002	**0.005T 0.077T** 0.0002T 0.0031T	–	–	–	**+0.050** +0.0020	**+0.023** +0.0009	**0.023T 0.095T** 0.0009T 0.0037T
+0.022 +0.0009	**-0.022** -0.0009	**0.022L 0.072T** 0.0009L 0.0029T	**+0.030** +0.0012	**0.000** 0.0000	**0.00T 0.080T** 0.0000T 0.0032T	–	–	–	**+0.056** +0.0022	**+0.026** +0.0010	**0.026T 0.106T** 0.0010T 0.0042T
+0.022 +0.0009	**-0.022** -0.0009	**0.022L 0.072T** 0.0009L 0.0029T	**+0.030** +0.0012	**0.000** 0.0000	**0.00T 0.080T** 0.0000T 0.0032T	–	–	–	**+0.056** +0.0022	**+0.026** +0.0010	**0.026T 0.106T** 0.0010T 0.0042T
+0.025 +0.0010	**-0.025** -0.0010	**0.025L 0.100T** 0.0010L 0.0040T	**+0.035** +0.0014	**0.000** 0.0000	**0.000T 0.110T** 0.0000T 0.0044T	–	–	–	**+0.065** +0.0026	**+0.030** +0.0012	**0.030T 0.140T** 0.0012T 0.0056T
+0.025 +0.0010	**-0.025** -0.0010	**0.025L 0.100T** 0.0010L 0.0040T	**+0.035** +0.0014	**0.000** 0.0000	**0.000T 0.110T** 0.0000T 0.0044T	–	–	–	**+0.065** +0.0026	**+0.030** +0.0012	**0.030T 0.140T** 0.0012T 0.0056T
+0.025 +0.0010	**-0.025** -0.0010	**0.028L 0.128T** 0.0011L 0.0050L	**+0.040** +0.0016	**0.000** 0.0000	**0.000T 0.140T** 0.0000T 0.0055T	–	–	–	**+0.074** +0.0029	**+0.0030** +0.0012	**0.034T 0.174T** 0.0012T 0.0056T
+0.028 +0.0011	**-0.028** -0.0011	**0.028L 0.128T** 0.0011L 0.0050T	**+0.040** +0.0016	**0.000** 0.0000	**0.000T 0.140T** 0.0000T 0.0055T	–	–	–	**+0.074** +0.0029	**+0.034** +0.0013	**0.034T 0.174T** 0.0013T 0.0068T
+0.028 +0.0011	**-0.028** -0.0011	**0.033L 0.158T** 0.0013L 0.0062T	**+0.046** +0.0018	**0.000** 0.0000	**0.000T 0.171T** 0.0000T 0.0067T	–	–	–	**+0.086** +0.0034	**+0.040** +0.0016	**0.040T 0.211T** 0.0016T 0.0083T
+0.033 +0.0013	**-0.033** -0.0013	**0.033L 0.158T** 0.0013L 0.0062T	**+0.046** +0.0018	**0.000** 0.0000	**0.000T 0.171T** 0.0000T 0.0067T	–	–	–	**+0.086** +0.0034	**+0.040** +0.0016	**0.040T 0.211T** 0.0016T 0.0083T

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

TABLE 10. CYLINDRICAL ROLLER BEARING SHAFT TOLERANCES

Bearing Bore			m6			n6			p6			r6			r7		
Nominal (Max.)		Tolerance[1]	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.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
3.000 0.1181	**6.000** 0.2362	**-0.008** -0.0003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6.000 0.2362	**10.000** 0.3937	**-0.008** -0.0003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
10.000 0.3937	**18.000** 0.7087	**-0.008** -0.0003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
18.000 0.7087	**30.000** 1.1811	**-0.010** -0.0004	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
30.000 1.1811	**50.000** 1.9685	**-0.012** -0.0005	**+0.025** +0.0010	**+0.009** +0.0004	**0.009T** **0.037T** 0.0004T 0.0145T	–	–	–	–	–	–	–	–	–	–	–	–
50.000 1.9685	**80.000** 3.1496	**-0.015** -0.0006	**+0.030** +0.0012	**+0.011** +0.0004	**0.011T** **0.045T** 0.0004T 0.0018T	**+0.039** +0.0015	**+0.020** +0.0008	**0.020T** **0.054T** 0.0008T 0.0021T	–	–	–	–	–	–	–	–	–
80.000 3.1496	**120.000** 4.7244	**-0.020** -0.0008	**+0.035** +0.0014	**+0.013** +0.0005	**0.013T** **0.055T** 0.0005T 0.0022T	**+0.045** +0.0018	**+0.023** +0.0009	**0.023T** **0.065T** 0.0009T 0.0026T	**+0.059** +0.0023	**+0.037** +0.0015	**0.037T** **0.079T** 0.0015T 0.0031T	–	–	–	–	–	–
120.000 4.7244	**180.000** 7.0866	**-0.025** -0.0010	**+0.040** +0.0016	**+0.015** +0.0006	**0.015T** **0.065T** 0.0006T 0.0026T	**+0.052** +0.0020	**+0.027** +0.0011	**0.027T** **0.077T** 0.0011T 0.0030T	**+0.068** +0.0027	**+0.043** +0.0017	**0.043T** **0.093T** 0.0017T 0.0037T	**+0.090** +0.0035	**+0.065** +0.0026	**0.065T** **0.115T** 0.0026T 0.0045T	–	–	–
180.000 7.0866	**200.000** 7.8740	**-0.030** -0.0012	**+0.046** +0.0018	**+0.017** +0.0007	**0.017T** **0.076T** 0.0007T 0.0030T	**+0.060** +0.0024	**+0.031** +0.0012	**0.031L** **0.090T** 0.0012L 0.0036T	**+0.079** +0.0031	**+0.050** +0.0020	**0.050T** **0.109T** 0.0020T 0.0043T	**+0.106** +0.0042	**+0.077** +0.0030	**0.077T** **0.136T** 0.0030T 0.0054T	–	–	–
200.000 7.8740	**225.000** 8.8583	**-0.030** -0.0012	**+0.046** +0.0018	**+0.017** +0.0007	**0.017T** **0.076T** 0.0007T 0.0030T	**+0.060** +0.0024	**+0.031** +0.0012	**0.031L** **0.090T** 0.0012L 0.0036T	**+0.079** +0.0031	**+0.050** +0.0020	**0.050T** **0.109T** 0.0020T 0.0043T	**+0.109** +0.0043	**+0.080** +0.0031	**0.080T** **0.139T** 0.0031T 0.0055T	**+0.126** +0.0050	**+0.080** +0.0031	**0.080T** **0.156T** 0.0031T 0.0062T
225.000 8.8583	**250.000** 9.8425	**-0.030** -0.0012	**+0.046** +0.0018	**+0.017** +0.0007	**0.017T** **0.076T** 0.0007T 0.0030T	**+0.060** +0.0024	**+0.031** +0.0012	**0.031L** **0.090T** 0.0012L 0.0036T	**+0.079** +0.0031	**+0.050** +0.0020	**0.050T** **0.109T** 0.0020T 0.0043T	**+0.113** +0.0044	**+0.084** +0.0033	**0.084T** **0.143T** 0.0033T 0.0056T	**+0.130** +0.0051	**+0.084** +0.0033	**0.084T** **0.160T** 0.0033T 0.0063T
250.000 9.8425	**280.000** 11.0236	**-0.035** -0.0014	**+0.052** +0.0020	**+0.020** +0.0008	**0.020T** **0.087T** 0.0008T 0.0034T	**+0.066** +0.0026	**+0.034** +0.0013	**0.034T** **0.101T** 0.0013T 0.0040T	**+0.088** +0.0035	**+0.056** +0.0022	**0.056T** **0.123T** 0.0022T 0.0049T	**+0.126** +0.0050	**+0.094** +0.0037	**0.094T** **0.161T** 0.0037T 0.0064T	**+0.146** +0.0057	**+0.094** +0.0037	**0.094T** **0.181T** 0.0037T 0.0071T
280.000 11.0236	**315.000** 12.4016	**-0.035** -0.0014	**+0.052** +0.0020	**+0.020** +0.0008	**0.020T** **0.087T** 0.0008T 0.0034T	**+0.066** +0.0026	**+0.034** +0.0013	**0.034T** **0.101T** 0.0013T 0.0040T	**+0.088** +0.0035	**+0.056** +0.0022	**0.056T** **0.123T** 0.0022T 0.0049T	**+0.130** +0.0051	**+0.098** +0.0039	**0.098T** **0.165T** 0.0039T 0.0065T	**+0.150** +0.0059	**+0.098** +0.0039	**0.098T** **0.185T** 0.0039T 0.0073T

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing bore.

[1]Tolerance range is from +0 to value listed.

Continued on next page.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

Table 10 continued.

Bearing Bore			m6			n6			p6			r6			r7		
Nominal (Max.)		Tolerance[1]	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.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
315.000 12.4016	**355.000** 13.9764	**-0.040** -0.0016	**+0.057** +0.0022	**+0.021** +0.0008	**0.021T** **0.097T** 0.0008T 0.0038T	**+0.073** +0.0029	**+0.037** +0.0015	**0.037T** **0.113T** 0.0015T 0.0045T	**+0.098** +0.0039	**+0.062** +0.0024	**0.062T** **0.138T** 0.0024T 0.0055T	**+0.144** +0.0057	**+0.108** +0.0043	**0.108T** **0.184T** 0.0043T 0.0073T	**+0.165** +0.0065	**+0.108** +0.0043	**0.108T** **0.205T** 0.0043T 0.0081T
355.000 13.9764	**400.000** 15.7480	**-0.040** -0.0016	–	–	–	**+0.073** +0.0029	**+0.037** +0.0015	**0.037T** **0.113T** 0.0015T 0.0045T	**+0.098** +0.0039	**+0.062** +0.0024	**0.062T** **0.138T** 0.0024T 0.0055T	**+0.150** +0.0059	**+0.114** +0.0045	**0.114T** **0.190T** 0.0045T 0.0075T	**+0.171** +0.0067	**+0.114** +0.0045	**0.114T** **0.211T** 0.0045T 0.0083T
400.000 15.7480	**450.000** 17.7165	**-0.045** -0.0018	–	–	–	**+0.080** +0.0031	**+0.040** +0.0016	**0.040T** **0.125T** 0.0016T 0.0049T	**+0.108** +0.0043	**+0.068** +0.0027	**0.068T** **0.153T** 0.0027T 0.0061T	**+0.166** +0.0065	**+0.126** +0.0050	**0.126T** **0.211T** 0.0050T 0.0083T	**+0.189** +0.0074	**+0.126** +0.0050	**0.126T** **0.234T** 0.0050T 0.0092T
450.000 17.7165	**500.000** 19.6850	**-0.045** -0.0018	–	–	–	**+0.080** +0.0031	**+0.040** +0.0016	**0.040T** **0.125T** 0.0016T 0.0049T	**+0.108** +0.0043	**+0.068** +0.0027	**0.068T** **0.153T** 0.0027T 0.0061T	**+0.172** +0.0068	**+0.132** +0.0052	**0.132T** **0.217T** 0.0052T 0.0086T	**+0.195** +0.0077	**+0.132** +0.0052	**0.132T** **0.240T** 0.0052T 0.0095T
500.000 19.6850	**560.000** 22.0472	**-0.050** -0.0020	–	–	–	–	–	–	**+0.122** +0.0048	**+0.078** +0.0031	**0.078T** **0.172T** 0.0031T 0.0068T	**+0.194** +0.0076	**+0.150** +0.0059	**0.150T** **0.244T** 0.0059T 0.0096T	**+0.220** +0.0087	**+0.150** +0.0059	**0.150T** **0.270T** 0.0059T 0.0107T
560.000 22.0472	**630.000** 24.8032	**-0.050** -0.0020	–	–	–	–	–	–	**+0.122** +0.0048	**+0.078** +0.0031	**0.078T** **0.172T** 0.0031T 0.0068T	**+0.199** +0.0078	**+0.155** +0.0061	**0.155T** **0.249T** 0.0061T 0.0098T	**+0.225** +0.0089	**+0.155** +0.0061	**0.155T** **0.275T** 0.0061T 0.0109T
630.000 24.8032	**710.000** 27.9528	**-0.075** -0.0030	–	–	–	–	–	–	**+0.138** +0.0054	**+0.088** +0.0035	**0.088T** **0.213T** 0.0035T 0.0084T	**+0.225** +0.0089	**+0.175** +0.0069	**0.175T** **0.300T** 0.0069T 0.0119T	**+0.255** +0.0100	**+0.175** +0.0069	**0.175T** **0.330T** 0.0069T 0.0130T
710.000 27.9528	**800.000** 31.4961	**-0.075** -0.0030	–	–	–	–	–	–	**+0.138** +0.0054	**+0.088** +0.0035	**0.088T** **0.213T** 0.0035T 0.0084T	**+0.235** +0.0093	**+0.185** +0.0073	**0.185T** **0.310T** 0.0073T 0.0123T	**+0.265** +0.0104	**+0.185** +0.0073	**0.185T** **0.340T** 0.0073T 0.0134T
800.000 31.4961	**900.000** 35.4331	**-0.100** -0.0039	–	–	–	–	–	–	**+0.156** +0.0061	**+0.100** +0.0039	**0.100T** **0.256T** 0.0039T 0.0100T	**+0.266** +0.0105	**+0.210** +0.0083	**0.210T** **0.366T** 0.0083T 0.0144T	**+0.300** +0.0118	**+0.210** +0.0083	**0.210T** **0.400T** 0.0083T 0.0157T
900.000 35.4331	**1000.000** 39.3701	**-0.100** -0.0039	–	–	–	–	–	–	**+0.156** +0.0061	**+0.100** +0.0039	**0.100T** **0.256T** 0.0039T 0.0100T	**+0.276** +0.0109	**+0.220** +0.0087	**0.220T** **0.366T** 0.0087T 0.0148T	**+0.0310** +0.0122	**+0.220** +0.0087	**0.220T** **0.410T** 0.0087T 0.0161T
1000.000 39.3701	**1120.000** 44.0945	**-0.125** -0.0049	–	–	–	–	–	–	**+0.186** +0.0073	**+0.120** +0.0047	**0.120T** **0.311T** 0.0047T 0.0122T	**+0.316** +0.0124	**+0.250** +0.0098	**0.250T** **0.441T** 0.0098T 0.0173T	**+0.355** +0.0140	**+0.250** +0.0098	**0.250T** **0.480T** 0.0098T 0.0189T
1120.000 44.0945	**1250.000** 49.2126	**-0.125** -0.0049	–	–	–	–	–	–	**+0.186** +0.0073	**+0.120** +0.0047	**0.120T** **0.311T** 0.0047T 0.0122T	**+0.326** +0.0128	**+0.260** +0.0102	**0.260T** **0.451T** 0.0102T 0.0177T	**+0.365** +0.0144	**+0.260** +0.0102	**0.260T** **0.490T** 0.0102T 0.0193T

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

HOUSING TOLERANCES

TABLE 11. CYLINDRICAL ROLLER BEARING HOUSING TOLERANCES

Bearing O.D.			F7			G7			H6			H7		
Nominal (Max.)			Housing Bore			Housing Bore			Housing Bore			Housing Bore		
Over	Incl.	Tolerance[1]	Max.	Min.	Fit	Max.	Min.	Fit	Max.	Min.	Fit	Max.	Min.	Fit
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
10.000 0.3937	**18.000** 0.7087	**-0.008** -0.0003	**+0.034** +0.0013	**+0.016** +0.0006	**0.016L** **0.042L** 0.0006L 0.0016L	**+0.024** +0.0009	**+0.002** +0.0002	**0.006L** **0.032L** 0.0002L 0.0012L	**+0.011** +0.0004	**0.000** 0.0000	**0.000L** **0.019L** 0.0000L 0.0007L	**+0.018** +0.0007	**0.000** 0.0000	**0.000L** **0.026L** 0.0000L 0.0010L
18.000 0.7087	**30.000** 1.1811	**-0.009** -0.0035	**+0.041** +0.0016	**+0.020** +0.0008	**0.020L** **0.050L** 0.0008L 0.00195L	**+0.028** +0.0011	**+0.007** +0.0003	**0.007L** **0.037L** 0.0003L 0.00145L	**+0.013** +0.0005	**0.000** 0.0000	**0.000L** **0.022L** 0.0000L 0.00085L	**+0.021** +0.0008	**0.000** 0.0000	**0.000L** **0.030L** 0.0000L 0.00125L
30.000 1.1811	**50.000** 1.9685	**-0.011** -0.00045	**+0.050** +0.0020	**+0.025** +0.0010	**0.025L** **0.061L** 0.0010L 0.00245L	**+0.034** +0.0013	**+0.009** +0.0004	**0.009L** **0.045L** 0.0004L 0.00175L	**+0.016** +0.0006	**0.000** 0.0000	**0.000L** **0.027L** 0.0000L 0.00105L	**+0.025** +0.0010	**0.000** 0.0000	**0.000L** **0.036L** 0.0000L 0.00145L
50.000 1.9685	**80.000** 3.1496	**-0.013** -0.0005	**+0.060** +0.0024	**+0.030** +0.0012	**0.030L** **0.073L** 0.0012L 0.0029L	**+0.040** +0.0016	**+0.010** +0.0004	**0.010L** **0.053L** 0.0004L 0.0021L	**+0.019** +0.0007	**0.000** 0.0000	**0.000L** **0.032L** 0.0000L 0.0012L	**+0.030** +0.0012	**0.000** 0.0000	**0.000L** **0.059L** 0.0000L 0.0017L
80.000 3.1496	**120.000** 4.7244	**-0.015** -0.0006	**+0.071** +0.0028	**+0.036** +0.0014	**0.036L** **0.086L** 0.0014L 0.0034L	**+0.047** +0.0019	**+0.012** +0.0005	**0.012L** **0.062L** 0.0005L 0.0025L	**+0.022** +0.0009	**0.000** 0.0000	**0.000L** **0.037L** 0.0000L 0.0015L	**+0.035** +0.0014	**0.000** 0.0000	**0.000L** **0.050L** 0.0000L 0.0020L
120.000 4.7244	**150.000** 5.9055	**-0.018** -0.0007	**+0.083** +0.0033	**+0.043** +0.0017	**0.043L** **0.101L** 0.0017L 0.0040L	**+0.054** +0.0021	**+0.014** +0.0006	**0.014L** **0.072L** 0.0006L 0.0028L	**+0.025** +0.0010	**0.000** 0.0000	**0.000L** **0.043L** 0.0000L 0.0017L	**+0.040** +0.0016	**0.000** 0.0000	**0.000L** **0.058L** 0.0000L 0.0023L
150.000 5.9055	**180.000** 7.0866	**-0.025** -0.0010	**+0.083** +0.0033	**+0.043** +0.0017	**0.043L** **0.108L** 0.0017L 0.0043L	**+0.054** +0.0021	**+0.014** +0.0006	**0.014L** **0.079L** 0.0006L 0.0031L	**+0.025** +0.0010	**0.000** 0.0000	**0.000L** **0.050L** 0.0000L 0.0020L	**+0.040** +0.0016	**0.000** 0.0000	**0.000L** **0.065L** 0.0000L 0.0026L
180.000 7.0866	**250.000** 9.8425	**-0.030** -0.0012	**+0.096** +0.0038	**+0.050** +0.0020	**0.050L** **0.126L** 0.0020L 0.0050L	**+0.061** +0.0024	**+0.015** +0.0006	**0.015L** **0.091L** 0.0006L 0.0036L	**+0.029** +0.0011	**0.000** 0.0000	**0.000L** **0.059L** 0.0000L 0.0023L	**+0.046** +0.0018	**0.000** 0.0000	**0.000L** **0.076L** 0.0000L 0.0030L
250.000 9.8425	**315.000** 12.4016	**-0.035** -0.0014	**+0.108** +0.0043	**+0.056** +0.0022	**0.056L** **0.143L** 0.0022L 0.0057L	**+0.069** +0.0027	**+0.017** +0.0007	**0.017L** **0.104L** 0.0007L 0.0041L	**+0.032** +0.0013	**0.000** 0.0000	**0.000L** **0.067L** 0.0000L 0.0027L	**+0.052** +0.0020	**0.000** 0.0000	**0.000L** **0.087L** 0.0000L 0.0034L
315.000 12.4016	**400.000** 15.7480	**-0.040** -0.0016	**+0.119** +0.0047	**+0.062** +0.0024	**0.063L** **0.159L** 0.0024L 0.0063L	**+0.075** +0.0030	**+0.018** +0.0007	**0.018L** **0.115L** 0.0007L 0.0046L	**+0.089** +0.0014	**0.000** 0.0000	**0.000L** **0.129L** 0.0000L 0.0030L	**+0.057** +0.0022	**0.000** 0.0000	**0.000L** **0.097L** 0.0000L 0.0038L
400.000 15.7480	**500.000** 19.6850	**-0.045** -0.0018	**+0.131** +0.0052	**+0.068** +0.0027	**0.068L** **0.176L** 0.0027L 0.0070L	**+0.083** +0.0033	**+0.020** +0.0008	**0.020L** **0.128L** 0.0008L 0.0051L	**+0.097** +0.0016	**0.000** 0.0000	**0.000L** **0.142L** 0.0000L 0.0034L	**+0.063** +0.0025	**0.000** 0.0000	**0.000L** **0.108L** 0.0000L 0.0043L
500.000 19.6850	**630.000** 24.8032	**-0.050** -0.0020	**+0.146** +0.0057	**+0.076** +0.0030	**0.076L** **0.196L** 0.0030L 0.0077L	**+0.092** +0.0036	**+0.022** +0.0009	**0.022L** **0.142L** 0.0009L 0.0056L	**+0.110** +0.0017	**0.000** 0.0000	**0.000L** **0.160L** 0.0000L 0.0037L	**+0.070** +0.0028	**0.000** 0.0000	**0.000L** **0.120L** 0.0000L 0.0048L

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing O.D.
[1]Tolerance range is from +0 to value listed.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

H8			J6			J7			K6			K7		
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.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
+0.027 +0.0011	**0.000** 0.0000	**0.000L 0.035L** 0.0000L 0.0014L	**+0.006** +0.0002	**-0.005** -0.0002	**0.005T 0.014L** 0.0002T 0.0005L	**+0.10** +0.004	**-0.008** -0.0003	**0.008T 0.018L** 0.0003T 0.0007L	**+0.002** +0.0001	**-0.009** -0.0004	**0.009T 0.010L** 0.0004T 0.0004L	**+0.006** +0.0002	**-0.012** -0.0005	**0.012T 0.014L** 0.0005T 0.0005L
+0.033 +0.0013	**0.000** 0.0000	**0.000L 0.030L** 0.0000L 0.00165L	**+0.008** +0.0003	**-0.005** -0.0002	**0.005T 0.017L** 0.0002T 0.00065L	**+0.012** +0.0005	**-0.009** -0.0004	**0.009T 0.021L** 0.0004T 0.00085L	**+0.002** +0.0001	**-0.011** -0.0004	**0.011T 0.011L** 0.0004T 0.00045L	**+0.006** +0.0002	**-0.015** -0.0006	**0.015T 0.015L** 0.0006T 0.00055L
+0.039 +0.0015	**0.000** 0.0000	**0.000L 0.050L** 0.0000L 0.00195L	**+0.010** +0.0002	**-0.006** -0.0002	**0.006T 0.021L** 0.0002T 0.00085L	**+0.014** +0.0006	**-0.011** -0.0004	**0.011T 0.025L** 0.0004T 0.00105L	**+0.003** +0.0001	**-0.014** -0.0005	**0.013T 0.014L** 0.0005T 0.00055L	**+0.007** +0.0003	**-0.018** -0.0007	**0.018T 0.018L** 0.0007T 0.00065L
+0.046 +0.0018	**0.000** 0.0000	**0.000L 0.059L** 0.0000L 0.0023L	**+0.013** +0.0005	**-0.006** -0.0002	**0.006T 0.026L** 0.0002T 0.0010L	**+0.018** +0.0007	**-0.012** -0.0005	**0.012T 0.031L** 0.0005T 0.0012L	**+0.004** +0.0002	**-0.015** -0.0006	**0.015T 0.017L** 0.0006T 0.0007L	**+0.009** +0.0004	**-0.021** -0.0008	**0.021T 0.022L** 0.0008T 0.0009L
+0.054 +0.054 +0.0021	**0.000 0.000** 0.0000	**0.000L 0.069L** 0.0000L 0.0027L	**+0.016** +0.0006	**-0.006** -0.0002	**0.006T 0.031L** 0.0002T 0.0012L	**+0.022** +0.0009	**-0.013** -0.0005	**0.013T 0.037L** 0.0005T 0.0015L	**+0.004** +0.0002	**-0.018** -0.0007	**0.018T 0.019L** 0.0007T 0.0008L	**+0.010** +0.0004	**-0.025** -0.0010	**0.025T 0.025L** 0.0010T 0.0010L
+0.063 +0.0025	**0.000** 0.0000	**0.000L 0.081L** 0.0000L 0.0032L	**+0.018** +0.0007	**-0.007** -0.0003	**0.007T 0.036L** 0.0003T 0.0014L	**+0.026** +0.0010	**-0.014** -0.0006	**0.014T 0.044L** 0.0006T 0.0017L	**+0.004** +0.0002	**-0.021** -0.0008	**0.021T 0.022L** 0.0008T 0.0009L	**+0.012** +0.0005	**-0.028** -0.0011	**0.028T 0.030L** 0.0011T 0.0012L
+0.063 +0.0025	**0.000** 0.0000	**0.000L 0.088L** 0.0000L 0.0035L	**+0.018** +0.0007	**-0.007** -0.0003	**0.007T 0.043L** 0.0003T 0.0017L	**+0.026** +0.0010	**-0.014** -0.0006	**0.014T 0.051L** 0.0006T 0.0020L	**+0.004** +0.0002	**-0.021** -0.0008	**0.021T 0.029L** 0.008T 0.0012L	**+0.012** +0.0005	**-0.033** -0.028	**0.028T 0.037L** 0.0011T 0.0015L
+0.072 +0.0028	**0.000** 0.0000	**0.000L 0.102L** 0.0000L 0.0040L	**+0.022** +0.0007	**-0.007** -0.0003	**0.007T 0.052L** 0.0003T 0.0021L	**+0.030** +0.0012	**-0.016** -0.0006	**0.016T 0.060L** 0.0006T 0.0024L	**+0.005** +0.0002	**-0.024** -0.0009	**0.024T 0.035L** 0.0009T 0.0014L	**+0.013** +0.0005	**-0.0011** -0.0013	**0.033T 0.043L** 0.0013T 0.0017L
+0.081 +0.0032	**0.000** 0.0000	**0.000L 0.116L** 0.0000L 0.0046L	**+0.025** +0.0010	**-0.007** -0.0003	**0.007T 0.060L** 0.0003T 0.0024L	**+0.036** +0.0014	**-0.016** -0.0006	**0.016T 0.071L** 0.0006T 0.0028L	**+0.005** +0.0002	**-0.027** -0.0011	**0.027T 0.040L** 0.0011T 0.0016L	**+0.016** +0.0006	**-0.036** -0.0014	**0.036T 0.051L** 0.0014T 0.0020L
+0.036 +0.035	**0.000** 0.0000	**0.000L 0.076L** 0.0000L 0.0051L	**+0.029** +0.0011	**-0.007** -0.0003	**0.007T 0.069L** 0.0003T 0.0027L	**+0.039** +0.0015	**-0.018** -0.0007	**0.018T 0.079L** 0.0007T 0.0031L	**+0.007** +0.0003	**-0.029** -0.0011	**0.029T 0.047L** 0.0011T 0.0019L	**+0.017** +0.0007	**-0.040** -0.0016	**0.040T 0.057L** 0.0016T 0.0023L
+0.040 +0.0038	**0.000** 0.0000	**0.000L 0.085** 0.0000L 0.0056L	**+0.033** +0.0013	**-0.007** -0.0003	**0.007T 0.078L** 0.0003T 0.0031L	**+0.043** +0.0017	**-0.020** -0.0008	**0.020T 0.088L** 0.0008T 0.0035L	**+0.008** +0.0003	**-0.032** -0.0013	**0.032T 0.053L** 0.0013T 0.0021L	**+0.018** +0.0007	**-0.045** -0.0018	**0.045T 0.063L** 0.0018T 0.0025L
+0.044 +0.0043	**0.000** 0.0000	**0.000L 0.094L** 0.0000L 0.0063L	**+0.037** +0.0015	**-0.007** -0.0003	**0.022T 0.098L** 0.0003T 0.0035L	**+0.048** +0.0019	**-0.022** -0.0009	**0.022T 0.098L** 0.0009T 0.0039L	**0.000** 0.0000	**-0.044** -0.0017	**0.044T 0.050L** 0.0017T 0.0020L	**0.000** 0.0000	**-0.070** -0.0028	**0.070T 0.050L** 0.0028T 0.0020L

Continued on next page.

SHAFT AND HOUSING FITS

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

Table 11 continued.

Bearing O.D.			F7			G7			H6			H7		
Nominal (Max.)		Tolerance[1]	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit
Over	Incl.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
630.000 24.8032	**800.000** 31.4961	**-0.075** -0.0030	**+0.160** +0.0063	**+0.080** +0.0031	**0.080L** **0.235L** 0.0031L 0.0093L	**+0.104** +0.0041	**+0.024** +0.0009	**0.024L** **0.179L** 0.0009L 0.0071L	**+0.125** +0.0020	**0.000** 0.0000	**0.000L** **0.200L** 0.0000L 0.0030L	**+0.080** +0.0031	**0.000** 0.0000	**0.000L** **0.155L** 0.0000L 0.0061L
800.000 31.4961	**1000.000** 39.3701	**-0.100** -0.0039	**+0.179** +0.0063	**+0.086** +0.0034	**0.086L** **0.276L** 0.0034L 0.0108L	**+0.116** +0.0046	**+0.026** +0.0010	**0.026L** **0.216L** 0.0010L 0.0085L	**+0.140** +0.0022	**0.000** 0.0000	**0.000L** **0.240L** 0.0000L 0.0061L	**+0.090** +0.0035	**0.000** 0.0000	**0.000L** **0.190L** 0.0000L 0.0074L
1000.000 39.3701	**1250.000** 49.2126	**-0.125** -0.0049	**+0.203** +0.0080	**+0.098** +0.0039	**0.098L** **0.328L** 0.0039L 0.0129L	**+0.133** +0.0052	**+0.028** +0.0011	**0.028L** **0.258L** 0.0011L 0.0101L	**+0.165** +0.0026	**0.000** 0.0000	**0.000L** **0.290L** 0.0000L 0.0075L	**+0.105** +0.0041	**0.000** 0.0000	**0.000L** **0.230L** 0.0000L 0.0090L
1250.000 49.2126	**1600.000** 62.9921	**-0.160** -0.0063	**+0.155** +0.0093	**+0.030** +0.0043	**0.110L** **0.395L** 0.0043L 0.0156L	**+0.155** +0.0061	**+0.030** +0.0012	**0.030L** **0.315L** 0.0012L 0.0124L	**+0.195** +0.0031	**0.000** 0.0000	**0.000L** **0.355L** 0.0000L 0.0094L	**+0.125** +0.0049	**0.000** 0.0000	**0.000L** **0.355L** 0.0000L 0.0112L
1600.000 62.9921	**2000.000** 78.7402	**-0.200** -0.0079	**+0.270** +0.0106	**+0.120** +0.0047	**0.120L** **0.470L** 0.0047L 0.0185L	**+0.182** +0.0072	**+0.032** +0.0013	**0.032L** **0.382L** 0.0013L 0.0151L	**+0.230** +0.0036	**0.000** 0.0000	**0.000L** **0.430L** 0.0000L 0.0115L	**+0.150** +0.0059	**0.000** 0.0000	**0.000L** **0.350L** 0.0000L 0.0138L
2000.000 78.7402	**2500.000** 98.4252	**-0.250** -0.0098	**+0.305** 0.0120	**+0.0130** +0.0051	**0.130L** **0.555L** 0.0051L 0.0218L	**+0.209** +0.0082	**+0.034** +0.0013	**0.034L** **0.459L** 0.0013L 0.0180L	**+0.280** +0.043	**0.000** 0.0000	**0.000L** **0.530L** 0.0000L 0.0141L	**+0.175** +0.0069	**0.000** 0.0000	**0.000L** **0.425L** 0.0000L 0.0167L

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing O.D.
[1]Tolerance range is from +0 to value listed.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

H8			J6			J7			K6			K7		
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.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
+0.050 +0.0049	**0.000** 0.0000	**0.000L** **0.125L** 0.0000L 0.0079L	**+0.040** +0.0016	**-0.010** -0.0004	**0.010T** **0.115L** 0.0004T 0.0046L	**+0.056** +0.0022	**-0.024** -0.0009	**0.024T** **0.131L** 0.0009T 0.0052L	**0.000** 0.0000	**-0.050** -0.0020	**0.050T** **0.075L** 0.0020T 0.0030L	**0.000** 0.0000	**-0.080** -0.0031	**0.080T** **0.075L** 0.0031T 0.0030L
+0.056 +0.0055	**0.000** 0.0000	**0.000L** **0.156L** 0.0000L 0.0094L	**+0.046** +0.0018	**-0.010** -0.0004	**0.010T** **0.146L** 0.0004T 0.0057L	**+0.064** +0.0025	**-0.026** -0.0010	**0.026T** **0.164L** 0.0010T 0.0064L	**0.000** 0.0000	**-0.056** -0.0022	**0.056T** **0.100L** 0.0022T 0.0039L	**0.000** 0.0000	**-0.090** -0.0035	**0.090T** **0.100L** 0.0035T 0.0039L
+0.066 +0.0065	**0.000** 0.0000	**0.000L** **0.191L** 0.0000L 0.0114L	**+0.056** +0.0022	**-0.010** -0.0004	**0.010T** **0.181L** 0.0004T 0.0071L	**+0.077** +0.0030	**-0.028** -0.0011	**0.028T** **0.202L** 0.0011T 0.0079L	**0.000** 0.0000	**-0.066** -0.0026	**0.066T** **0.125L** 0.0026T 0.0049L	**0.000** 0.0000	**-0.105** -0.0041	**0.105T** **0.125L** 0.0041T 0.0049L
+0.078 +0.0077	**0.000** 0.0000	**0.000L** **0.238L** 0.0000L 0.0104L	**+0.068** +0.0027	**-0.010** -0.0004	**0.010T** **0.228L** 0.0004T 0.0090L	**+0.095** +0.0037	**-0.030** -0.0012	**0.030T** **0.255L** 0.0012T 0.0100L	**0.000** 0.0000	**-0.078** -0.0031	**0.078T** **0.160L** 0.0031T 0.0063L	**0.000** 0.0000	**-0.125** -0.0049	**0.125T** **0.160L** 0.0049T 0.0063L
+0.092 +0.0091	**0.000** 0.0000	**0.000L** **0.292L** 0.0000L 0.0170L	**+0.082** +0.0032	**-0.010** -0.0004	**0.110T** **0.282L** 0.0004T 0.0111L	**+0.118** +0.0046	**-0.032** -0.0013	**0.032T** **0.318L** 0.0013T 0.0125L	**0.000** 0.0000	**-0.092** -0.0036	**0.092T** **0.200L** 0.0036T 0.0079L	**0.000** 0.0000	**-0.150** -0.0059	**0.150T** **0.200L** 0.0059T 0.0079L
+0.110 +0.0110	**0.000** 0.0000	**0.000L** **0.360L** 0.0000L 0.0208L	**+0.100** +0.0039	**-0.010** -0.0004	**0.010T** **0.350L** 0.0004T 0.0137L	**+0.141** +0.0056	**-0.034** -0.0013	**0.034T** **0.391L** 0.0013T 0.0154L	**0.000** 0.0000	**-0.110** -0.0043	**0.110T** **0.250L** 0.0043T 0.0098L	**0.000** 0.0000	**-0.175** -0.0069	**0.175T** **0.250L** 0.0069T 0.0098L

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

TABLE 12. CYLINDRICAL ROLLER BEARING HOUSING TOLERANCES

Bearing O.D.			M6			M7			N6			N7		
Nominal (Max.)		Tolerance[1]	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit
Over	Incl.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
10.000 0.3937	**18.000** 0.7087	**-0.008** -0.0003	**-0.004** -0.0002	**-0.015** -0.0006	**0.015T 0.004L** 0.0006T 0.0001L	**0.000** 0.0000	**-0.018** -0.0007	**0.018T 0.008L** 0.0007T 0.0003L	**-0.009** -0.0004	**-0.020** -0.0008	**0.020T 0.001T** 0.0008T 0.0001T	**-0.005** -0.0002	**-0.023** -0.0009	**0.023T 0.003L** 0.0009T 0.0001L
18.000 0.7087	**30.000** 1.1811	**-0.009** -0.0035	**-0.004** -0.0002	**-0.017** -0.0007	**0.017T 0.005L** 0.0007T 0.00015L	**0.000** 0.0000	**-0.021** -0.0008	**0.021T 0.009L** 0.0008T 0.0035L	**-0.007** -0.0004	**-0.028** -0.0009	**0.024T 0.002T** 0.0009T 0.00005T	**-0.007** -0.0003	**-0.028** -0.0011	**0.028T 0.002L** 0.0011T 0.00005L
30.000 1.1811	**50.000** 1.9685	**-0.011** -0.0045	**-0.004** -0.0002	**-0.020** -0.0008	**0.020T 0.007L** 0.0008T 0.00025L	**0.000** 0.0000	**-0.025** -0.0010	**0.025T 0.011L** 0.0010T 0.00045L	**-0.012** -0.0005	**-0.028** -0.0011	**0.028T 0.001T** 0.0011T 0.00005T	**-0.008** -0.0003	**-0.033** -0.0013	**0.033T 0.003L** 0.0013T 0.00015L
50.000 1.9685	**80.000** 3.1496	**-0.013** -0.0005	**-0.005** -0.0002	**-0.024** -0.0009	**0.024T 0.008L** 0.0009T 0.0003L	**0.000** 0.0000	**-0.030** -0.0012	**0.030T 0.013L** 0.0012T 0.0005L	**-0.014** -0.0006	**-0.033** -0.0013	**0.033T 0.001T** 0.0013T 0.0001T	**-0.009** -0.0004	**-0.039** -0.0015	**0.039T 0.004L** 0.0015T 0.0001L
80.000 3.1496	**120.000** 4.7244	**-0.015** -0.0006	**-0.006** -0.0002	**-0.028** -0.0011	**0.028T 0.009L** 0.0011T 0.0004L	**0.000** 0.0000	**-0.035** -0.0014	**0.035T 0.015L** 0.0014T 0.0006L	**-0.016** -0.0006	**-0.038** -0.0015	**0.038T 0.001T** 0.0015T 0.0000T	**-0.010** -0.0004	**-0.045** -0.0018	**0.045T 0.005L** 0.0018T 0.0002L
120.000 4.7244	**150.000** 5.9055	**-0.018** -0.0007	**-0.008** -0.0003	**-0.033** -0.0013	**0.033T 0.010L** 0.0013T 0.0004L	**0.000** 0.0000	**-0.040** -0.0016	**0.040T 0.018L** 0.0016T 0.0007L	**-0.020** -0.0008	**-0.045** -0.0018	**0.045T 0.002T** 0.0018T 0.0001T	**-0.012** -0.0005	**-0.052** -0.0020	**0.061T 0.018L** 0.0020T 0.0002L
150.000 5.9055	**180.000** 7.0866	**-0.025** -0.0010	**-0.008** -0.0003	**-0.033** -0.0013	**0.033T 0.017L** 0.0013T 0.0007L	**0.000** 0.0000	**-0.040** -0.0016	**0.040T 0.025L** 0.0016T 0.0010L	**-0.020** -0.0008	**-0.045** -0.0018	**0.045T 0.005T** 0.0018T 0.0002T	**-0.012** -0.0005	**-0.052** -0.0020	**0.052T 0.013L** 0.0020T 0.0005L
180.000 7.0866	**250.000** 9.8425	**-0.030** -0.0012	**-0.008** -0.0003	**-0.037** -0.0015	**0.037T 0.022L** 0.0015T 0.0009L	**0.000** 0.0000	**-0.046** -0.0018	**0.046T 0.030L** 0.0018T 0.0012L	**-0.022** -0.0009	**-0.051** -0.0020	**0.051T 0.008T** 0.0020T 0.0003T	**-0.014** -0.0006	**-0.060** -0.0024	**0.060T 0.016L** 0.0024T 0.0006L
250.000 9.8425	**315.000** 12.4016	**-0.035** -0.0014	**-0.009** -0.0004	**-0.041** -0.0016	**0.041T 0.026L** 0.0016T 0.0010L	**0.000** 0.0000	**-0.052** -0.0020	**0.052T 0.035L** 0.0020T 030014L	**-0.025** -0.0010	**-0.057** -0.0022	**0.057T 0.010T** 0.0022T 0.0004T	**-0.014** -0.0006	**-0.066** -0.0026	**0.066T 0.021L** 0.0025T 0.0008L
315.000 12.4016	**400.000** 15.7480	**-0.040** -0.0016	**-0.010** -0.0004	**-0.046** -0.0018	**0.046T 0.030L** 0.0018T 0.0012L	**0.000** 0.0000	**-0.057** -0.0022	**0.057T 0.040L** 0.0022T 0.0016L	**-0.026** -0.0006	**-0.062** -0.0029	**0.062T 0.014T** 0.0024T 0.0006T	**-0.016** -0.0006	**-0.073** -0.0029	**0.073T 0.024L** 0.0029T 0.0010L
400.000 15.7480	**500.000** 19.6850	**-0.045** -0.0018	**-0.010** -0.0004	**-0.050** -0.0020	**0.050T 0.035L** 0.0020T 0.0014L	**0.000** 0.0000	**-0.063** -0.0025	**0.063T 0.045L** 0.0025T 0.0018L	**-0.027** -0.0011	**-0.067** -0.0026	**0.067T 0.018T** 0.0026T 0.0007T	**-0.017** -0.0007	**-0.080** -0.0031	**0.080T 0.028L** 0.0031T 0.0011L
500.000 19.6850	**630.000** 24.8032	**-0.050** -0.0020	**-0.026** -0.0010	**-0.070** -0.0028	**0.070T 0.024L** 0.0028T 0.0010L	**-0.026** -0.0010	**-0.096** -0.0038	**0.096T 0.024L** 0.0038T 0.0010L	**-0.044** -0.0017	**-0.088** -0.0035	**0.088T 0.006T** 0.0035T 0.0003T	**-0.044** -0.0017	**-0.114** -0.0045	**0.114T 0.006L** 0.0045T 0.0003L

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing O.D.
[1]Tolerance range is from +0 to value listed.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

P6			P7		
Housing Bore		Fit	Housing Bore		Fit
Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
-0.015 -0.0006	**-0.026** -0.0010	**0.026T** **0.007T** 0.0010T 0.0003T	**-0.011** -0.0004	**-0.029** -0.0011	**0.029T** **0.003T** 0.0011T 0.0001T
-0.018 -0.0007	**-0.031** -0.0012	**0.031T** **0.009T** 0.0012T 0.00035T	**-0.014** -0.0006	**-0.035** -0.0014	**0.035T** **0.005T** 0.0014T 0.0025T
-0.021 -0.0008	**-0.037** -0.0015	**0.037T** **0.010T** 0.0015T 0.00035T	**-0.017** -0.0007	**-0.042** -0.0017	**0.042T** **0.006T** 0.0017T 0.0025T
-0.026 -0.0010	**-0.045** -0.0018	**0.045T** **0.013T** 0.0018T 0.0005T	**-0.021** -0.0008	**-0.051** -0.0020	**0.051T** **0.008T** 0.0020T 0.0003T
-0.030 -0.0012	**-0.052** -0.0020	**0.052T** **0.015T** 0.0020T 0.0006T	**-0.024** -0.0009	**-0.059** -0.0023	**0.059T** **0.009T** 0.0023T 0.0003T
-0.036 -0.0014	**-0.061** -0.0024	**0.061T** **0.018T** 0.0024T 0.0007T	**-0.028** -0.0011	**-0.068** -0.0027	**0.068T** **0.010T** 0.0027T 0.0004T
-0.036 -0.0014	**-0.061** -0.0024	**0.061T** **0.011T** 0.0024T 0.0004T	**-0.028** -0.0011	**-0.068** -0.0027	**0.068T** **0.003T** 0.0027T 0.0001T
-0.041 -0.0016	**-0.070** -0.0028	**0.070T** **0.011T** 0.0028T 0.0004T	**-0.033** -0.0013	**-0.079** -0.0031	**0.079T** **0.003T** 0.0031T 0.0001T
-0.047 -0.0019	**-0.079** -0.0031	**0.079T** **0.012T** 0.0031T 0.0005T	**-0.036** -0.0014	**-0.088** -0.0035	**0.088T** **0.001T** 0.0035T 0.0000T
-0.051 -0.0020	**-0.087** -0.0034	**0.087T** **0.011T** 0.0034T 0.0004T	**-0.041** -0.0016	**-0.098** -0.0039	**0.098T** **0.001T** 0.0039T 0.0000T
-0.055 -0.0022	**-0.095** -0.0037	**0.095T** **0.010T** 0.0037T 0.0004T	**-0.045** -0.0018	**-0.108** -0.0043	**0.108T** **0.000T** 0.0043T 0.0000T
-0.078 -0.0031	**-0.122** -0.0048	**0.122T** **0.028T** 0.0048T 0.0011T	**-0.078** -0.0031	**-0.148** -0.0058	**0.148T** **0.028T** 0.0058T 0.0011T

Continued on next page.

SHAFT AND HOUSING FITS

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

Table 12 continued.

Bearing O.D.			M6			M7			N6			N7		
Nominal (Max.)		Tolerance[1]	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit	Housing Bore		Fit
Over	Incl.		Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
630.000 24.8032	**800.000** 31.4961	**-0.075** -0.0030	**-0.030** -0.0012	**-0.080** -0.0031	**0.080T** **0.045L** 0.0031T 0.0018L	**-0.030** -0.0012	**-0.110** -0.0043	**0.110T** **0.045L** 0.0043T 0.0018L	**-0.050** -0.0020	**-0.100** -0.0039	**0.100T** **0.025T** 0.0039T 0.0010T	**-0.050** -0.0020	**-0.130** -0.0051	**0.130T** **0.025L** 00051T 0.0010L
800.000 31.4961	**1000.000** 39.3701	**-0.100** -0.0039	**-0.034** -0.0013	**-0.090** -0.0035	**0.090T** **0.066L** 0.0035T 0.0026L	**-0.034** -0.0013	**-0.124** -0.0049	**0.124T** **0.066L** 0.0049T 0.0026L	**-0.056** -0.0022	**-0.112** -0.0044	**0.112T** **0.044T** 0.0044T 0.0017T	**-0.056** -0.0022	**-0.146** -0.0057	**0.146T** **0.044L** 0.0057T 0.0017L
1000.000 39.3701	**1250.000** 49.2126	**-0.125** -0.0049	**-0.040** -0.0016	**-0.106** -0.0042	**0.106T** **0.085L** 0.0042T 0.0033L	**-0.040** -0.0016	**-0.145** -0.0057	**0.145T** **0.085L** 0.0057T 0.0033L	**-0.066** -0.0026	**-0.132** -0.0052	**0.132T** **0.059T** 0.0052T 0.0023T	**-0.066** -0.0026	**-0.171** -0.0067	**0.171T** **0.059L** 0.0067T 0.0023L
1250.000 49.2126	**1600.000** 62.9921	**-0.160** -0.0063	**-0.048** -0.0019	**-0.126** -0.0050	**0.126T** **0.112L** 0.0050T 0.0044L	**-0.048** -0.0019	**-0.173** -0.0068	**0.173T** **0.112L** 0.0068T 0.0044L	**-0.078** -0.0031	**-0.156** -0.0061	**0.156T** **0.082T** 0.0061T 0.0032T	**-0.078** -0.0031	**-0.203** -0.0080	**0.203T** **0.082L** 0.0080T 0.0023L
1600.000 62.9921	**2000.000** 78.7402	**-0.200** -0.0079	**-0.058** -0.0023	**-0.150** -0.0059	**0.150T** **0.142L** 0.0059T 0.0056L	**-0.058** -0.0023	**-0.208** -0.0082	**0.208T** **0.142L** 0.0082T 0.0056L	**-0.092** -0.0036	**-0.184** -0.0072	**0.184T** **0.108T** 0.0072T 0.0043T	**-0.092** -0.0036	**-0.242** -0.0095	**0.242T** **0.108L** 0.0095T 0.0043L
2000.000 78.7402	**2500.000** 98.4252	**-0.250** -0.0098	**-0.068** -0.0027	**-0.178** -0.0070	**0.178T** **0.182L** 0.0070T 0.0071L	**-0.068** -0.0027	**-0.243** -0.0096	**0.243** **0.182L** 0.0096T 0.0071L	**-0.110** -0.0043	**-0.220** -0.0087	**0.285T** **0.140T** 0.112T 0.055T	**-0.110** -0.0043	**-0.285** -0.0112	**0.285T** **0.140L** 0.0112T 0.0055L

NOTE: Tolerance and shaft diameters are shown in the table as variances from nominal bearing O.D.
[1]Tolerance range is from +0 to value listed.

These charts are guidelines for specifying shaft and housing fits related to particular operating conditions. Please contact your Timken engineer for more information.

P6			P7		
Housing Bore		Fit	Housing Bore		Fit
Max.	Min.		Max.	Min.	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
-0.088 -0.0035	**-0.138** -0.0054	**0.138T** **0.013T** 0.0054T 0.0005T	**-0.088** -0.0035	**-0.168** -0.0066	**0.168T** **0.013T** 0.0066T 0.0005T
-0.100 -0.0039	**-0.156** -0.0061	**0.156T** **0.000T** 0.0061T 0.0000T	**-0.100** -0.0039	**-0.190** -0.0075	**0.190T** **0.000T** 0.0075T 0.0000T
-0.120 -0.0047	**-0.186** -0.0073	**0.186T** **0.005L** 0.0073T 0.0002L	**-0.120** -0.0047	**-0.225** -0.0089	**0.225T** **0.005T** 0.0089T 0.0002T
-0.140 -0.0055	**-0.218** -0.0086	**0.218T** **0.020L** 0.0086T 0.0008L	**-0.140** -0.0055	**-0.265** -0.0104	**0.265T** **0.020L** 0.0104T 0.0008L
-0.170 -0.0067	**-0.262** -0.0103	**0.262T** **0.030L** 0.0103T 0.0012L	**-0.170** -0.0067	**-0.320** -0.0126	**0.320T** **0.030L** 0.0126T 0.0012L
-0.195 -0.0077	**-0.305** -0.0120	**0.305T** **0.055L** 0.0120T 0.0021L	**-0.195** -0.0077	**-0.370** -0.0146	**0.370T** **0.055L** 0.0146T 0.0021L

5200, A5200 METRIC SERIES SHAFT AND HOUSING FITS AND TOLERANCES

TABLE 13. SHAFT FITS[1]

Bearing Bore		Bore Tolerance[2]	Press Fit Rotating Inner Ring				Slip Fit Stationary Inner Ring			
			Shaft Diameter		Fit		Shaft Diameter		Fit	
Over	Incl.		Max.	Min.			Max.	Min.		
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
80 3.1496	**120** 4.7236	**-0.020** -0.0008	**+0.048** +0.0019	**+0.025** +0.0010	**0.025T** 0.0010T	**0.069T** 0.0027T	**0.000** 0.0000	**-0.023** -0.0009	**0.023L** 0.0009L	**0.020T** 0.0008T
120 4.7236	**140** 5.5108	**-0.025** -0.0010	**+0.056** +0.0022	**+0.030** +0.0012	**0.030T** 0.0012T	**0.081T** 0.0032T	**0.000** 0.0000	**-0.025** -0.0010	**0.025L** 0.0010L	**0.025T** 0.0010T
140 5.5108	**180** 7.0856	**-0.025** -0.0010	**+0.071** +0.0028	**+0.046** +0.0018	**0.046T** 0.0018T	**0.097T** 0.0038T	**0.000** 0.0000	**-0.025** -0.0010	**0.025L** 0.0010L	**0.025T** 0.0010T
180 7.0856	**240** 9.4476	**-0.030** -0.0012	**+0.081** +0.0032	**+0.051** +0.0020	**0.051T** 0.0020T	**0.112T** 0.0044T	**0.000** 0.0000	**-0.030** -0.0012	**0.030L** 0.0012L	**0.030T** 0.0012T

[1] When shaft is used as ring surface, hardness to be Rc58 minimum and surface finish to be 15 RMS.
[2] Tolerance range is from +0 to value listed.

TABLE 14. HOUSING FITS

Bearing O.D.		O.D. Tolerance[1]	Slip Fit Stationary Outer Ring				Press Fit Rotating Outer Ring			
			Housing Diameter		Fit		Housing Diameter		Fit	
Over	Incl.		Max.	Min.			Max.	Min.		
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
– –	**180** 7.0866	**-0.025** -0.0010	**+0.022** +0.0008	**-0.015** -0.0006	**0.015T** 0.0006T	**0.046L** 0.0018L	**-0.025** -0.0010	**-0.056** -0.0022	**0.056T** 0.0022T	**0.000L** 0.0000L
180 7.0866	**200** 7.8740	**-0.030** -0.0012	**+0.018** +0.0007	**-0.018** -0.0007	**0.018T** 0.0007T	**0.048L** 0.0019L	**-0.030** -0.0012	**-0.066** -0.0026	**0.066T** 0.0026T	**0.000L** 0.0000L
200 7.874	**230** 9.0551	**-0.030** -0.0012	**+0.023** +0.0009	**-0.018** -0.0007	**0.018T** 0.0007T	**0.053L** 0.0021L	**-0.030** -0.0012	**-0.066** -0.0026	**0.066T** 0.0026T	**0.000L** 0.0000L
230 9.0551	**250** 9.8425	**-0.030** -0.0012	**+0.028** +0.0011	**-0.018** -0.0007	**0.018T** 0.0007T	**0.058L** 0.0023L	**-0.030** -0.0012	**-0.066** -0.0026	**0.066T** 0.0026T	**0.000L** 0.0000L
250 9.8425	**270** 10.6299	**-0.036** -0.0014	**+0.028** +0.0011	**-0.018** -0.0007	**0.018T** 0.0007T	**0.064L** 0.0025L	**-0.030** -0.0012	**-0.071** -0.0028	**0.071T** 0.0028T	**0.005L** 0.0002L
270 10.6299	**310** 12.2047	**-0.036** -0.0014	**+0.033** +0.0013	**-0.018** -0.0007	**0.018T** 0.0007T	**0.069L** 0.0027L	**-0.036** -0.0014	**-0.071** -0.0028	**0.071T** 0.0028T	**0.005L** 0.0002L
310 12.2047	**400** 15.7480	**-0.041** -0.0016	**+0.038** +0.0015	**-0.018** -0.0007	**0.018T** 0.0007T	**0.079L** 0.0031L	**-0.036** -0.0014	**-0.076** -0.0030	**0.079T** 0.0030T	**0.005L** 0.0002L
400 15.748	**440** 17.3228	**-0.046** -0.0018	**+0.041** +0.0016	**-0.023** -0.0009	**0.023T** 0.0009T	**0.086L** 0.0034L	**-0.036** -0.0014	**-0.086** -0.0034	**0.086T** 0.0034T	**0.010L** 0.0004L

[1] Tolerance range is from +0 to value listed.

TABLE 15. 5200 METRIC SERIES RADIAL INTERNAL CLEARANCE (R6)

Bearing Bore		Radial Internal Clearance	
Over	Incl.	Max.	Min.
mm in.	**mm** in.	**mm** in.	**mm** in.
– –	**100** 3.937	**0.183** 0.0072	**0.127** 0.005
100 3.937	**120** 4.7244	**0.188** 0.0074	**0.127** 0.005
120 4.7244	**140** 5.5118	**0.208** 0.0082	**0.142** 0.0056
140 5.5118	**170** 6.6929	**0.224** 0.0088	**0.152** 0.006
170 6.6929	**180** 7.0866	**0.229** 0.009	**0.152** 0.006
180 7.0866	**220** 8.6614	**0.254** 0.01	**0.173** 0.0068
220 8.6614	**240** 9.4488	**0.269** 0.0106	**0.183** 0.0072

TABLE 16. 5200 METRIC SERIES INNER RING TOLERANCES

Bearing Bore		Bore & Inner O.D.[1]	Width
Over	Incl.		+0
mm in.	**mm** in.	**mm** in.	**mm** in.
80 3.1496	**120** 4.7244	**-0.020** -0.0008	**-0.203** -0.0080
120 4.7244	**80** 7.0866	**-0.025** -0.0010	**-0.254** -0.0100
180 7.0866	**250** 9.8425	**-0.030** -0.0012	**-0.305** -0.0120

[1]Tolerance range is from +0 to value listed.

TABLE 17. 5200 METRIC SERIES OUTER RING TOLERANCES

Bearing Bore		O.D.[1]	Width
Over	Incl.		+0
mm in.	**mm** in.	**mm** in.	**mm** in.
150 5.9055	**180** 7.0866	**-0.025** -0.0010	**+0.036** +0.0014
180 7.0866	**250** 9.8425	**-0.030** -0.0012	**+0.041** +0.0016
250 9.8425	**315** 12.4016	**-0.036** -0.0014	**+0.046** +0.0018
315 12.4016	**400** 15.748	**-0.041** -0.0016	**+0.051** +0.0020
400 15.748	**500** 19.685	**-0.046** -0.0018	**+0.056** +0.0022

[1]Tolerance range is from +0 to value listed.

TABLE 18. 5200 BEARINGS WITHOUT INNER RING SHAFT DIMENSIONS

Bearing Number	Slip Fit Housing[1]		Press Fit Housing[1]	
	Max.	Min.	Max.	Min.
	mm in.	**mm** in.	**mm** in.	**mm** in.
5220 WS	**121.064** 4.7663	**121.044** 4.7655	**121.036** 4.7652	**121.016** 4.7644
5222 WS	**133.007** 5.2365	**132.987** 5.2357	**132.969** 5.235	**132.949** 5.2343
5224 WS	**145.194** 5.7163	**145.174** 5.7155	**145.156** 5.7148	**145.136** 5.714
5226 WS	**155.042** 6.104	**155.016** 6.103	**155.004** 6.1025	**154.978** 6.1015
5228 WS	**168.529** 6.635	**168.504** 6.634	**168.491** 6.6335	**168.466** 6.6325
5230 WS	**181.623** 7.1505	**181.597** 7.1495	**181.587** 7.149	**181.559** 7.148
5232 WS	**193.713** 7.6265	**193.688** 7.6255	**193.675** 7.625	**193.65** 7.624
5234 WS	**205.562** 8.093	**205.537** 8.092	**205.524** 8.0915	**205.499** 8.0905
5236 WS	**216.37** 8.5185	**216.344** 8.5175	**216.319** 8.5165	**216.294** 8.5155
5238 WS	**229.032** 9.017	**229.001** 9.0158	**228.994** 9.0155	**228.963** 9.0143
5240 WS	**242.296** 9.5392	**242.265** 9.538	**242.245** 9.5372	**242.214** 9.536
5244 WM	**266.02** 10.4725	**265.971** 10.4713	**265.951** 10.4705	**265.92** 10.4693
5248WM	**291.292** 11.4682	**291.262** 11.467	**291.241** 11.4662	**291.211** 11.465

[1]All shaft diameters are based on a housing bore to housing O.D. ratio of 0.7.

OPERATING TEMPERATURES

Bearings operate in a wide range of applications and environments. In most cases, bearing operating temperature is not an issue. Some applications, however, operate at extreme speeds or in extreme temperature environments. In these cases, care must be taken not to exceed the temperature limits of the bearing. Minimum temperature limits are primarily based on lubricant capability. Maximum temperature limits are most often based on material and/or lubricant constraints, but also may be based on accuracy requirements of the equipment that the bearings are built into. These constraints/limitations are discussed below.

BEARING MATERIAL LIMITATIONS

Standard bearing steels with a standard heat treatment cannot maintain a minimum hardness of 58 HRC much above 120° C (250° F).

Dimensional stability of Timken bearings is managed through the proper selection of an appropriate heat-treat process. Standard cylindrical roller bearings are stabilized up to 150° C (302° F). Upon request, these bearings can be ordered to higher levels of stability as listed below. These designations are in agreement with DIN Standard 623.

TABLE 19.

Stability Designation	Maximum Operating Temperature	
	°C	°F
S0	**150**	302
S1	**200**	392
S2	**250**	482
S3	**300**	572
S4	**350**	662

With dimensionally stabilized product, there still may be some changes in dimensions during service as a result of microstructural transformations. These transformations include the continued tempering of martensite and decomposition of retained austenite. The magnitude of change depends on the operating temperature, the time at temperature and the composition and heat-treatment of the steel.

Temperatures exceeding the limits shown in table 19 require special high-temperature steel. Consult your Timken engineer for availability of specific part numbers for non-standard heat stability or high-temperature steel grades.

Suggested materials for use in balls, rings and rollers at various operating temperatures are listed in table 20. Also listed are chemical composition recommendations, hardness recommendations and dimensional stability information.

Operating temperature affects lubricant film thickness and setting, both of which directly influence bearing life. Extremely high temperatures can result in a reduced film thickness that can lead to asperity contact between contacting surfaces.

Operating temperature also can affect performance of cages, seals and shields, which in turn can affect bearing performance. Materials for these components and their operating temperature ranges are shown in table 21.

LUBRICATION LIMITATIONS

Starting torque in grease-lubricated applications typically increases significantly at cold temperatures. Starting torque is not primarily a function of the consistency or channel properties of the grease. Most often, it is a function of the rheological properties of the grease.

The high-temperature limit for greases is generally a function of the thermal and oxidation stability of the base oil in the grease and the effectiveness of the oxidation inhibitors.

See the LUBRICATION AND SEALS section on page 41 for more information on lubrication limitations.

EQUIPMENT REQUIREMENTS

The equipment designer must evaluate the effects of temperature on the performance of the equipment being designed. Precision machine tool spindles, for example, can be very sensitive to thermal expansions. For some spindles, it is important that the temperature rise over ambient be held to 20° C to 35° C (36° F to 45° F).

Most industrial equipment can operate at considerably higher temperatures. Thermal ratings on gear drives, for example, are based on 93° C (200° F). Equipment such as gas turbines operates continuously at temperatures above 100° C (212° F). Running at high temperatures for extended periods of time, however, may affect shaft and housing fits, if the shaft and housing are not machined and heat-treated properly .

Although bearings can operate satisfactorily up to 120° C (250° F),

an upper temperature limit of 80° C to 95° C (176° F to 203° F) is more practical. Higher operating temperatures increase the risk of damage from transient temperature spikes. Prototype testing of the application can help define the operating temperature range and should be conducted if possible. It is the responsibility of the equipment designer to weigh all relevant factors and make the final determination of satisfactory operating temperature.

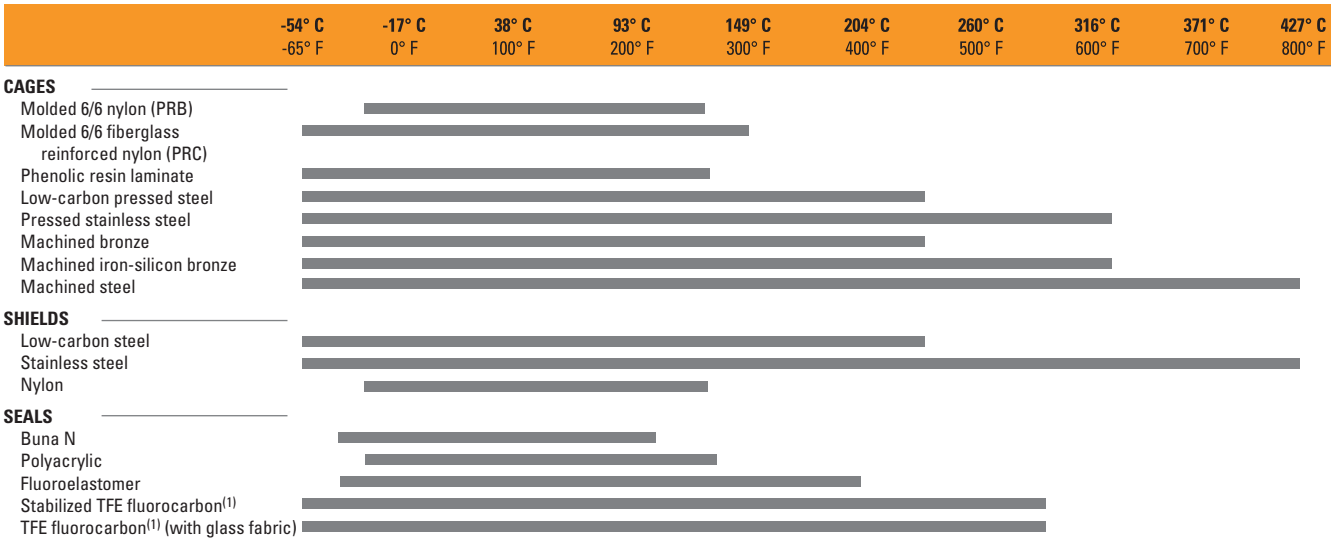
Tables 20 and 21 provide standard operating temperatures for common bearing component materials. They should be used for reference purposes only. Other bearing component materials are available on request. Contact your Timken engineer for more information.

TABLE 20. OPERATING TEMPERATURES FOR BEARING COMPONENT MATERIALS

Material	Approximate Chemical Analysis %	Temp. °F	Hardness HRC	-73° C -100° F	-54° C -65° F	-17° C 0° F	38° C 100° F	93° C 200° F	121° C 250° F	149° C 300° F	204° C 400° F	260° C 500° F	316° C 600° F	371° C 700° F	427° C 800° F
Low-alloy carbon-chromium bearing steels. 52100 and others per ASTM A295	1C 0.5–1.5Cr 0.35Mn	70	60	STANDARD DIMENSIONAL STABILIZATION <0.0001 in./in dimensional change in 2500 hours at 100° C (212° F). Good oxidation resistance.											
Low-alloy carbon-chromium bearing steels. 52100 and others per ASTM A295	1C 0.5–1.5Cr 0.35Mn	70 350 450	58 56 54	Heat stabilized per FS136, <0.0001in./in dimensional change in 2500 hours at 149° C (300° F). When given a stabilizing heat treatment, A295 steel is suitable for many applications in the 177°-232° C (350-450° F) range; however, it is not as dimensionally stable as it is at temperatures below 177° C (350° F). If utmost stability is required, use materials in the 316° C (600° F) group below.										
Deep-hardening steels for heavy sections per ASTM A485	1C 1–1.8Cr 1–1.5Mn .06Si	70 450 600	58 55 52	As heat-treated and tempered, it is stabilized, <0.0001 in./in dimensional change in 2500 hours at 149° C (300° F).											
Carburizing steels per ASTM A534 a) low alloy 4118, 8X19, 5019, 8620 (Ni-Moly grades) b) high nickel 3310	Ni-Moly: 0.2C, 0.4-2.0Mn, 0.3-0.8Cr, 0-2.0Ni, 0-0.3Mo .0.1C, 1.5Cr, 0.4Mn, 3.5Ni	70	58	Nickel-Moly grades of steel frequently used to achieve extra ductility in inner rings for locking device bearings. 3311 and others used for extra-thick-section rings.											
Corrosion-resistant 440C stainless steel per ASTM A756	1C 18Cr	70	58	Excellent corrosion resistance.											
Corrosion-resistant 440C stainless steel per ASTM A756	1C 18Cr	70 450 600	58 55 52	As heat stabilized for maximum hardness at high temperatures (FS238). Good oxidation resistance at higher temperatures. Note load capacity drops off more rapidly at higher temperatures than M50 shown below, which should be considered if loads are high, <0.0001 in./in dimensional change in 1200 hours.											
M-50 medium high speed	4Cr 4Mo 1V 0.8C	70 450 600	60 59 57	Suggested where stable high hardness at elevated temperature is required, <0.0001 in./in dimensional change in 1200 hours at 316° C (600° F).											

Note: Dimensional stability data shown above is the permanent metallurgical growth and/or shrinkage only. Thermal expansion effects are not included. For operating temperatures above 427° C (800° F), consult your Timken engineer.

TABLE 21. OPERATING TEMPERATURES FOR BEARING COMPONENT MATERIALS



(1)Limited life above these temperatures.

HEAT GENERATION AND DISSIPATION

Bearing operating temperature is dependent upon a number of factors, including heat generation of all contributing heat sources, heat flow rate between sources and the ability of the system to dissipate the heat. Heat sources include such things as bearings, seals, gears, clutches and oil supply. Heat dissipation is affected by many factors, including shaft and housing materials and designs, lubricant circulation and external environmental conditions. These and other factors are discussed in the following sections.

HEAT GENERATION

Under normal operating conditions, most of the torque and heat generated by the bearing is caused by the elastohydrodynamic losses at the roller/ring contacts.

Heat generation is the product of bearing torque and speed. The following equation is used to calculate the heat generated.

$$Q_{gen} = k_4 n M$$

If the bearing is a cylindrical roller bearing, the torque calculations are given in the subsequent sections.

HEAT DISSIPATION

The problem of determining the heat flow from a bearing in a specific application is rather complex. In general, it can be said that factors affecting the rate of heat dissipation include the following:

1. Temperature gradient from the bearing to the housing. This is affected by size configuration of the house and any external cooling such as fans, water cooling or fan action of the rotating components.
2. Temperature gradient from the bearing to the shaft. Any other heat sources, such as gears and additional bearings and their proximity to the bearing considered, will influence the temperature of the shaft.
3. The heat carried away by a circulating oil system.

To what extent nos. 1 and 2 can be controlled will depend on the application. The heat-dissipation modes include conduction through the system, convection along the inside and outside surfaces of the system, as well as radiation exchange to and from neighboring structures. In many applications, overall heat dissipation can be divided into two categories – heat removed by circulating oil and heat removed through the structure.

Heat dissipation by circulating oil

The amount of heat removed by the lubricant can be controlled more easily. In a splash lubrication system, cooling coils may be used to control the bulk oil temperature.

The amount of heat carried away in a circulating oil system by the lubricant can be approximated from the following equations.

$$Q_{oil} = k_6 C_p \rho f (\theta_o - \theta_i)$$

Where:

$k_6 = 1.67 \times 10^{-5}$ for Q_{oil} in W
$= 1.67 \times 10^{-2}$ for Q_{oil} in Btu/min

If the circulating lubricant is petroleum oil, the heat removed is further approximated by the following:

$$Q_{oil} = k_5 f (\theta_o - \theta_i)$$

The following factors apply to the heat generation and dissipation equations listed on this page.

Where:

$k_5 = 28$ for Q_{oil} in W when f in L/min and θ in °C
$= 0.42$ for Q_{oil} in Btu/min when f in U.S. pt/min and θ in °F

TORQUE

RUNNING TORQUE-M

The rotational resistance of a rolling bearing is dependent on load, speed, lubrication conditions and bearing internal characteristics.

The following formulas yield approximations to values of bearing running torque. The formulas apply to bearings lubricated by oil. For bearings lubricated by grease or oil mist, torque is usually lower, although for grease lubrication this depends on amount and consistency of the grease. The formulas also assume the bearing running torque has stabilized after an initial period referred to as running-in.

CYLINDRICAL ROLLER BEARINGS

The torque equations for cylindrical roller bearings are given as follows, where the coefficients are based on series and found in the following table:

$$M = \begin{cases} f_1 F_{\beta} dm + 10^{-7} f_0 (v \times n)^{2/3} dm^3 & \text{if } (v \times n) \geq 2000 \\ f_1 F_{\beta} dm + 160 \times 10^{-7} f_0 dm^3 & \text{if } (v \times n) < 2000 \end{cases}$$

Note that the viscosity is in units of centistokes. The load term (F_{β}) depends on the bearing type as follows:

Radial cylindrical roller: $F_{\beta} = \max \begin{pmatrix} 0.8F_a \cot \alpha \\ \text{or} \\ F_r \end{pmatrix}$

TABLE 22. COEFFICIENTS FOR THE TORQUE EQUATION

Bearing Type	Dimension Series	f_0	f_1
Single-row cylindrical roller bearings with cage	10	2	0.00020
	02	2	0.00030
	22	3	0.00040
	03	2	0.00035
	23	4	0.00040
	04	2	0.00040
Single-row cylindrical roller bearings full-complement	18	5	0.00055
	29	6	0.00055
	30	7	0.00055
	22	8	0.00055
	23	12	0.00055
Double-row cylindrical roller bearings full-complement	48	9	0.00055
	49	11	0.00055
	50	13	0.00055



LUBRICATION

To help maintain a bearing's antifriction characteristics, lubrication is needed to:

- Minimize rolling resistance due to deformation of the rolling elements and raceway under load by separating the mating surfaces.
- Minimize sliding friction occurring between rolling elements, raceways and cage.
- Transfer heat (with oil lubrication).
- Protect from corrosion and, with grease lubrication, from contaminant ingress.



LUBRICATION

The wide range of bearing types and operating conditions precludes any simple, all-inclusive statement or guideline allowing the selection of the proper lubricant. At the design level, the first consideration is whether oil or grease is best for the particular operation. The advantages of oil and grease are outlined in the table below. When heat must be carried away from the bearing, oil must be used. It is almost always preferred for very high-speed applications.

TABLE 23. ADVANTAGES OF OIL AND GREASE

Oil	Grease
Carries heat away from the bearings	Simplifies seal design and acts as a sealant
Carries away moisture and particulate matter	Permits prelubrication of sealed or shielded bearings
Easily controlled lubrication	Generally requires less frequent lubrication

OIL LUBRICATION

Oils used for bearing lubrication should be high-quality mineral oils or synthetic oils with similar properties. Selection of the proper type of oils depends on bearing speed, load, operating temperature and lubrication method. Some features and advantages of oil lubrication, in addition to the above are:

- Oil is a better lubricant for high speeds or high temperatures. It can be cooled to help reduce bearing temperature.
- It is easier to handle and control the amount of lubricant reaching the bearing. It is harder to retain in the bearing. Lubricant losses may be higher than with grease.
- Oil can be introduced to the bearing in many ways, such as drip-feed, wick-feed, pressurized circulating systems, oil bath or air-oil mist. Each is suited for certain types of applications.
- Oil is easier to keep clean for recirculating systems.

Oil may be introduced to the bearing housing in many ways. The most common systems are:

- **Oil bath.** The housing is designed to provide a sump through which the rolling elements of the bearing will pass. Generally, the oil level should be no higher than the center point of the lowest rolling element. If speed is high, lower oil levels should be used to reduce churning. Gages or controlled elevation drains are used to achieve and maintain the proper oil level.
- **Circulating system.** This system has the advantages of:
  - An adequate supply of oil for both cooling and lubrication.
  - Metered control of the quantity of oil delivered to each bearing.
  - Removal of contaminants and moisture from the bearing by flushing action.
  - Suitability for multiple bearing installations.
  - Large reservoir, which reduces deterioration. Increased lubricant life provides economical efficiency.
  - Incorporation of oil-filtering devices.
  - Positive control to deliver the lubricant where needed.
  - A typical circulating oil system consists of an oil reservoir, pump, piping and filter. A heat exchange may be required.
- **Oil-mist lubrication**. Oil-mist lubrication systems are used in high-speed, continuous-operation applications. This system permits close control of the amount of lubricant reaching the bearings. The oil may be metered, atomized by compressed air and mixed with air, or it may be picked up from a reservoir using a venturi effect. In either case, the air is filtered and supplied under sufficient pressure to assure adequate lubrication of the bearings. Control of this type of lubrication system is accomplished by monitoring the operating temperatures of the bearings being lubricated. The continuous passage of the pressurized air and oil through the labyrinth seals used in the system prevents the entrance of contaminants from the atmosphere to the system.

  The successful operation of this type of system is based upon the following factors:
  - Proper location of the lubricant entry ports in relation to the bearings being lubricated.
  - Avoidance of excessive pressure drops across void spaces within the system.
  - Proper air pressure and oil quantity ratio to suit the particular application.
  - Adequate exhaust of the air-oil mist after lubrication has been accomplished.

  To ensure “wetting” of the bearings, and to prevent possible damage to the rolling elements and rings, it is imperative that the oil-mist system be turned on for several minutes before the equipment is started. The importance of “wetting” the bearing before starting cannot be overstated, and it also has particular significance for equipment that has been idled for extended periods of time.

  Lubricating oils are commercially available in many forms for automotive, industrial, aircraft and other uses. Oils are classified as either petroleum types (refined from crude oil) or synthetic types (produced by chemical synthesis).

PETROLEUM OILS

Petroleum oils are made from a petroleum hydrocarbon derived from crude oil, with additives to improve certain properties. Petroleum oils are used for nearly all oil-lubricated applications of bearings.

SYNTHETIC OILS

Synthetic oils cover a broad range of categories and include polyalphaolefins, silicones, polyglycols and various esters. In general, synthetic oils are less prone to oxidation and can operate at extreme hot or cold temperatures. Physical properties, such as pressure-viscosity coefficients, tend to vary between oil types; use caution when making oil selections.

The polyalphaolefins (PAO) have a hydrocarbon chemistry that parallels petroleum oil both in chemical structures and pressure-viscosity coefficients. Therefore, PAO oil is mostly used in the oil-lubricated applications of bearings when severe temperature environments (hot and cold) are encountered or when extended lubricant life is required.

The silicone, ester and polyglycol oils have an oxygen-based chemistry that is structurally quite different from petroleum oils and PAO oils. This difference has a profound effect on its physical properties where pressure-viscosity coefficients can be lower compared to mineral and PAO oils. This means that these types of synthetic oils may actually generate a smaller elastohydrodynamic (EHD) film thickness than a mineral or PAO oil of equal viscosity at operating temperature. Reductions in bearing fatigue life and increases in bearing wear could result from this reduction of lubricant film thickness.

VISCOSITY

The selection of oil viscosity for any bearing application requires consideration of several factors: load, speed, bearing setting, type of oil and environmental factors. Since oil viscosity varies inversely with temperature, a viscosity value must always be stated with the temperature at which it was determined. High-viscosity oil is used for low-speed or high-ambient-temperature applications. Low-viscosity oil is used for high-speed or low-ambient-temperature applications.

There are several classifications of oils based on viscosity grades. The most familiar are the Society of Automotive Engineers (SAE) classifications for automotive engine and gear oils. The American Society for Testing and Materials (ASTM) and the International Organization for Standardization (ISO) have adopted standard viscosity grades for industrial fluids. Fig. 13 shows the viscosity comparisons of ISO/ASTM with SAE classification systems at 40° C (104° F).

VISCOSITY CLASSIFICATION COMPARISON

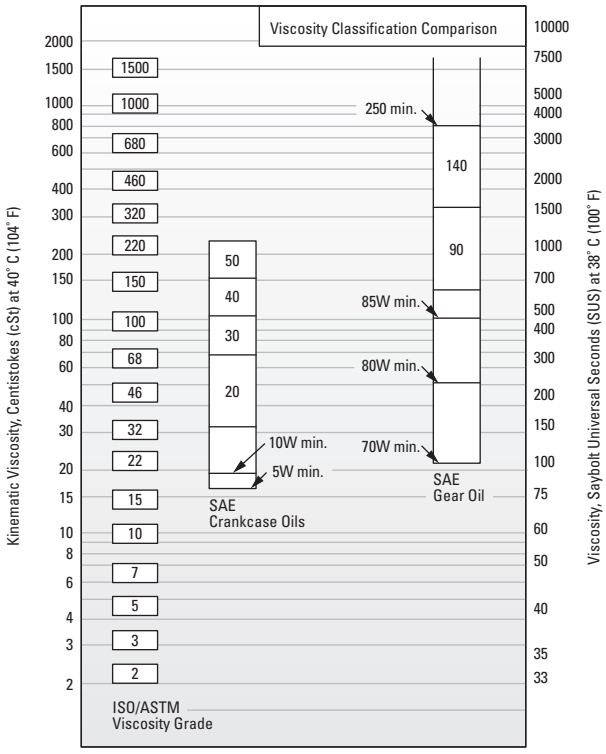


Fig. 13. Comparison between ISO/ASTM grades (ISO 3448/ASTM D2442) and SAE grades (SAE J 300-80 for crankcase oils, SAE J 306-81 for axle and manual transmission oils).

The ASTM/ISO viscosity grade system for industrial oils is depicted below.

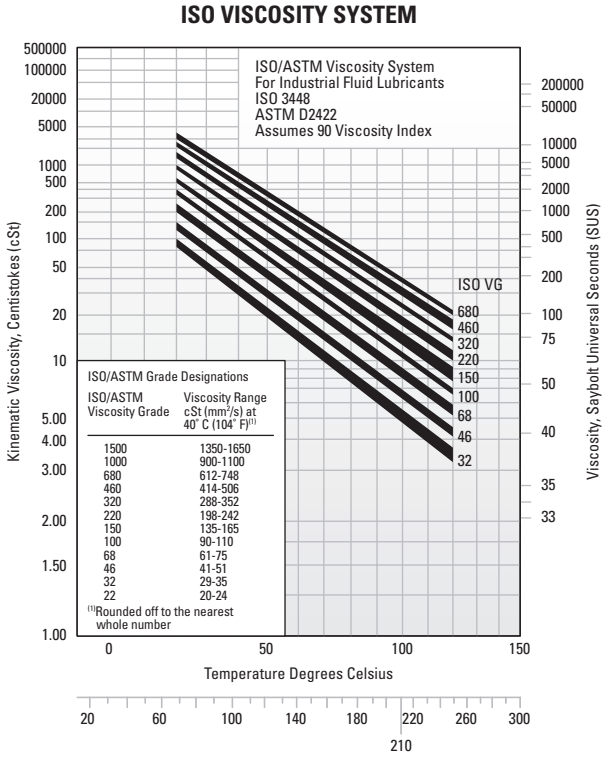


Fig. 14. Viscosity grade system for industrial oils.

TYPICAL BEARING LUBRICATION OILS

In this section, the properties and characteristics of lubricants for typical roller bearing applications are listed. These general characteristics are derived from successful performance in applications across all industries.

General-purpose rust and oxidation lubricating oil

General-purpose rust and oxidation (R&O) inhibited oils are the most common type of industrial lubricant. They are used to lubricate Timken® bearings in all types of industrial applications where conditions requiring special considerations do not exist.

TABLE 24. SUGGESTED GENERAL PURPOSE R&O LUBRICATING OIL PROPERTIES

	Properties
Base stock	Solvent-refined, high-viscosity-index petroleum oil
Additives	Corrosion and oxidation inhibitors
Viscosity index	80 min.
Pour point	-10° C max. (14° F)
Viscosity grades	ISO/ASTM 32 through 220

Some low-speed and/or high-ambient-temperature applications require the higher viscosity grades. High-speed and/or low-temperature applications require the lower viscosity grades.

Industrial extreme-pressure (EP) gear oil

Extreme-pressure gear oils are used to lubricate Timken bearings in most types of heavily loaded industrial equipment. They should be capable of withstanding abnormal shock loads that are common in heavy-duty equipment.

TABLE 25. SUGGESTED INDUSTRIAL EP GEAR OIL PROPERTIES

	Properties
Base stock	Solvent-refined, high-viscosity-index petroleum oil
Additives	Corrosion and oxidation inhibitors Extreme-pressure (EP) additive(1) - 15.8 kg (35 lb.) min.
Viscosity index	80 min.
Pour point	-10° C max. (14° F)
Viscosity grades	ISO/ASTM 100, 150, 220, 320, 460

(1) ASTM D 2782

Industrial EP gear oils should be composed of a highly refined petroleum oil-based stock plus appropriate inhibitors and additives. They should not contain materials that are corrosive or abrasive to bearings. The inhibitors should provide long-term protection from oxidation and protect the bearing from corrosion in the presence of moisture. The oils should resist foaming in service and have good water-separation properties. An EP additive protects against scoring under boundary-lubrication conditions. The viscosity grades suggested represent a wide range. High-temperature and/or slow-speed applications generally require the higher viscosity grades. Low temperatures and/or high speeds require the use of lower viscosity grades.

GREASE LUBRICATION

Grease lubrication is generally applicable to low-to-moderate speed applications that have operating temperatures within the limits of the grease. There is no universal antifriction bearing grease. Each grease has limiting properties and characteristics.

Greases consist of a base oil, a thickening agent and additives. Conventionally, bearing greases have consisted of petroleum base oils thickened to the desired consistency by some form of metallic soap. More recently synthetic base oils have been used with organic and inorganic thickeners. Table 26 summarizes the composition of typical lubricating greases.

TABLE 26. COMPOSITION OF GREASES

Base Oil		Thickening Agents		Additives		Lubricating Grease
Mineral oil	+	Soaps and complex soaps lithium, aluminum, barium, calcium	+	Rust inhibitors	=	
Synthetic hydrocarbon				Dyes		
Esters		Non-Soap (inorganic) microgel (clay), carbon black, silica-gel, PTFE		Tactifiers		
Perfluorinated oil				Metal deactivates		
Silicone				Oxidation inhibitors		
		Non-Soap (organic) Polyurea compounds		Anti-wear EP		

Calcium- and aluminum-based greases have excellent water resistance and are used in industrial applications where water ingress is an issue. Lithium-based greases are multi-purpose and are used in industrial applications and wheel bearings.

Synthetic base oils such as esters, organic esters and silicones used with conventional thickeners and additives typically have higher maximum operating temperatures than petroleum-based greases. Synthetic greases can be designed to operate in temperatures from -73° C (-100° F) to 288° C (550° F).

Below are the general characteristics of common thickeners used with petroleum base oils.

TABLE 27. GENERAL CHARACTERISTICS OF THICKENERS USED WITH PETROLEUM BASE OILS

Thickener	Typical Dropping Point		Maximum Temperature		Typical Water Resistance
	°C	°F	°C	°F	
Lithium soap	**193**	380	**121**	250	Good
Lithium complex	**260+**	500+	**149**	300	Good
Aluminum complex	**249**	480	**149**	300	Excellent
Calcium sulfonate	**299**	570	**177**	350	Excellent
Polyurea	**260**	500	**149**	300	Good

Use of the thickeners in table 27 with synthetic hydrocarbon or ester base oils increases the maximum operating temperature by approximately 10° C (50° F).

Using polyurea as a thickener for lubricating fluids is one of the most significant lubrication developments in more than 30 years. Polyurea grease performance is outstanding in a wide range of bearing applications and, in a relatively short time, it has gained acceptance as a factory-packed lubricant for ball bearings.

LOW TEMPERATURES

Starting torque in a grease-lubricated bearing at low temperatures can be critical. Some greases may function adequately as long as the bearing is operating, but resistance to initial movement may be excessive. In certain smaller machines, starting may be impossible when very cold. Under such operating circumstances, greases containing low-temperature characteristic oils are generally required.

If the operating temperature range is wide, synthetic greases offer advantages. Synthetic greases are available to provide very low starting and running torque at temperatures as low as -73° C (-100° F). In certain instances, these greases perform better in this respect than oil.

An important point concerning lubricating greases is that the starting torque is not necessarily a function of the consistency or the channel properties of the grease. Starting torque is more a function of the individual rheological properties of a particular grease and is best evaluated by application experience.

HIGH TEMPERATURES

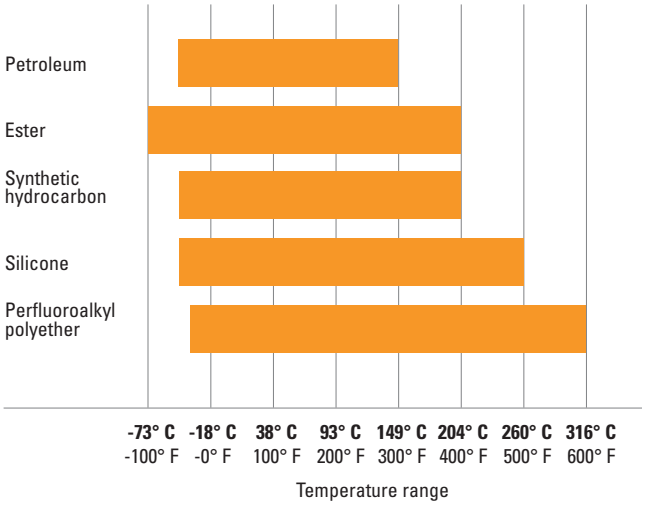
The high temperature limit for lubricating greases is generally a function of the thermal and oxidation stability of the fluid and the effectiveness of the oxidation inhibitors. Grease temperature ranges are defined by both the dropping point of the grease thickener and composition of the base oil. Table 28 shows the temperature ranges of various base oils used in grease formulations.

A rule of thumb, developed from years of testing grease-lubricated bearings, indicates that grease life is halved for every 10° C (50° F) increase in temperature. For example, if a particular grease provides 2000 hours of life at 90° C (194° F), by raising the temperature to 100° C (212° F), reduction in life to approximately 1000 hours would result. On the other hand, 4000 hours could be expected by lowering the temperature to 80° C (176° F).

Thermal stability, oxidation resistance and temperature limitations

must be considered when selecting greases for high-temperature applications. In non-relubricatable applications, highly refined mineral oils or chemically stable synthetic fluids are required as the oil component of greases for operation at temperatures above 121° C (250° F).

TABLE 28. TEMPERATURE RANGES FOR BASE OILS USED IN LUBRICATING GREASES



CONTAMINATION

Abrasive Particles

When roller bearings operate in a clean environment, the primary cause of damage is the eventual fatigue of the surfaces where rolling contact occurs. However, when particle contamination enters the bearing system, it is likely to cause damage such as bruising, which can shorten bearing life.

When dirt from the environment or metallic wear debris from some component in the application are allowed to contaminate the lubricant, wear can become the predominant cause of bearing damage. If bearing wear becomes significant, changes will occur to critical bearing dimensions that could adversely affect machine operation.

Bearings operating in a contaminated lubricant exhibit a higher initial rate of wear than those running in an uncontaminated lubricant. With no further contaminant ingress, this wear rate quickly diminishes. The contamination particles are reduced in size as they pass through the bearing contact area during normal operation.

Water

Water and moisture can be particularly conducive to bearing damage. Lubricating greases may provide a measure of protection from this contamination. Certain greases, such as calcium and aluminum-complex, are highly water-resistant.

Sodium-soap greases are water-soluble and should not be used in applications involving water.

Either dissolved or suspended water in lubricating oils can exert a detrimental influence on bearing fatigue life. Water can cause bearing etching that also can reduce bearing fatigue life. The exact mechanism by which water lowers fatigue life is not fully understood. It has been suggested that water enters micro-cracks in the bearing rings that are caused by repeated stress cycles. This leads to corrosion and hydrogen embrittlement in the micro-cracks, reducing the time required for these cracks to propagate to an unacceptable-sized spall.

Water-based fluids, such as water glycol and invert emulsions, also have shown a reduction in bearing fatigue life. Although water from these sources is not the same as contamination, the results support the previous discussion concerning water-contaminated lubricants.

GREASE SELECTION

The successful use of bearing grease depends on the physical and chemical properties of the lubricant as well as application and environmental conditions. Because the choice of grease for a particular bearing under certain service conditions is often difficult to make, you should consult with your lubricant supplier or equipment maker for specific questions about lubrication requirements for your application. You also can contact your Timken engineer for general lubrication guidelines for any application.

Grease must be carefully selected with regard to its consistency at operating temperature. It should not exhibit thickening, separation of oil, acid formation or hardening to any marked degree. It should be smooth, non-fibrous and entirely free from chemically active ingredients. Its dropping point should be considerably higher than the operating temperature.

Timken® application-specific lubricants were developed by leveraging our knowledge of tribology and antifriction bearings, and how these two elements affect overall system performance. Timken lubricants help bearings and related components operate effectively in demanding industrial operations. High-temperature, anti-wear and water-resistant additives offer superior protection in challenging environments. Table 29 provides an overview of the Timken greases available for general applications. Contact your Timken engineer for a more detailed publication on Timken lubrication solutions.

TABLE 29. GREASE LUBRICATION SELECTION GUIDE

ENVIRONMENT		APPLICATION
High Wear • Moderate Loads Moderate Speeds Moderate Temperatures	Timken Premium All-Purpose Industrial Grease	Agriculture • Bushings/Ball Joints Truck and Auto Wheel Bearings Heavy-Duty Industrial
Extreme Heat • Heavy Loads High Sliding Wear Dirty Environments Slow Speeds • Shock Loading	Timken Construction and Off-Highway Grease	Agriculture/Mining • Cement Plants Construction/Off Road • Rock Quarry Earth-Moving Equipment Fleet Equipment • Heavy Industry Pivot Pins/Splined Shafts
Wet and Corrosive Conditions Quiet Environments • Light Loads Moderate to High Speeds Moderate Temperatures Light Load Moderate Water	Timken Ball Bearing Pillow Block Grease	Lightly Loaded Pillow Blocks Idler Pulleys • Oven Conveyors Electric Motors • Fans • Pumps Alternators • Generators
Corrosive Media • Extreme Heat Heavy Loads • Wet Conditions Slow to Moderate Speeds	Timken Mill Grease	Aluminum Mills • Paper Mills Steel Mills • Offshore Rigs Power Generation
Incidental Food Contact Hot and Cold Temperatures Moderate to High Speeds Medium Loads	Timken Food Safe Grease	Food and Beverage Industries Pharmaceuticals
Extreme Low and High Temperatures Severe Loads Corrosive Media Slow to Moderate Speeds	Timken Synthetic Industrial Grease	Wind Energy Main Bearing Pulp and Paper Machines General Heavy Industry Marine Applications Centralized Grease Systems
Moderate Speeds Light to Moderate Loads Moderate Temperatures Moderate Water	Timken Multi-Use Lithium Grease	General Industrial Applications Pins and Bushings • Track Rollers Water Pumps Plain and Antifriction Bearings
Extreme Load, High Wear, Moderate Speed, High Temperatures, Shock Loading	Timken High-Performance Roller Housed Unit Grease	Metals, Mining, Aggregate, Power Generation, Material Handling, and Heavy Industries

This selection guide is not intended to replace the specifications by the equipment builder, who is responsible for its performance.

Many bearing applications require lubricants with special properties or lubricants formulated specifically for certain environments, such as:

- Friction oxidation (fretting corrosion).
- Chemical and solvent resistance.
- Food handling.
- Quiet running.
- Space and/or vacuum.
- Electrical conductivity.

For assistance with these or other areas requiring special lubricants, consult your Timken engineer.

GREASE USE GUIDELINES

It is important to use the proper amount of grease in the application. In typical industrial applications, the bearing cavity should be kept approximately one-third to one-half full. Less grease may result in the bearing being starved for lubrication. More grease may result in churning. Both conditions may result in excessive heat generation. As the grease temperature rises, viscosity decreases and the grease becomes thinner. This can reduce the lubricating effect and increase leakage of the grease from the bearing. It also may cause the grease components to separate, leading to a general breakdown of the lubricant properties. As the grease breaks down, bearing torque increases. In the case of excess grease resulting in churning, torque may also increase due to the resistance caused by the grease.

For best results, there should be ample space in the housing to allow room for excess grease to be thrown from the bearing. However, it is equally important that the grease be retained all around the bearing. If a large void exists between the bearings, grease closures should be used to prevent the grease from leaving the bearing area.

Only in low-speed applications may the housing be entirely filled with grease. This method of lubrication is a safeguard against the entry of foreign matter, where sealing provisions are inadequate for exclusion of contaminants or moisture.

During periods of non-operation, it is often wise to completely fill the housings with grease to protect the bearing surfaces. Prior to restarting operation, remove the excess grease and restore the proper level.

Applications utilizing grease lubrication should have a grease fitting and a vent at opposite ends of the housing near the top. A drain plug should be located near the bottom of the housing to allow the old grease to purge from the bearing.

Bearings should be relubricated at regular intervals to help prevent damage. Relubrication intervals are difficult to determine. If plant practice or experience with other applications is not available, consult your lubricant supplier.

Timken offers a range of lubricants to help bearings and related components operate effectively in demanding industrial operations. High-temperature, anti-wear and water-resistant additives offer greater protection in challenging environments. Timken also offers a line of single- and multi-point lubricators to simplify grease delivery.



Fig. 15. Grease can easily be packed by hand.



Fig. 16. Mechanical grease packer.

Grease application methods

Grease, in general, is easier to use than oil in industrial bearing lubrication applications. Most bearings that are initially packed with grease require periodic relubrication to operate efficiently.

Grease should be packed into the bearing so that it gets between the rolling elements – the rollers or balls. For tapered roller bearings, forcing grease through the bearing from the large end to the small end will ensure proper distribution.

Grease can be easily packed into small- and medium-size bearings by hand (fig.15). In shops where bearings are frequently regreased, a mechanical grease packer that forces grease through the bearing under pressure may be appropriate (fig.16). Regardless of the method, after packing the internal areas of the bearing, a small amount of grease also should be smeared on the outside of the rollers or balls.

The two primary considerations that determine the relubrication cycle are operating temperature and sealing efficiency. High-operating-temperature applications generally require more frequent regreasing. The less efficient the seals, the greater the grease loss and the more frequently grease must be added.

Grease should be added any time the amount in the bearing falls below the desired amount. The grease should be replaced when its lubrication properties have been reduced through contamination, high temperature, water, oxidation or any other factors. For additional information on appropriate regreasing cycles, consult with the equipment manufacturer or your Timken engineer.

CONSISTENCY

Greases may vary in consistency from semi-fluids that are hardly thicker than a viscous oil to solid grades almost as hard as a soft wood.

Consistency is measured by a penetrometer in which a standard weighted cone is dropped into the grease. The distance the cone penetrates (measured in tenths of a millimeter in a specific time) is the penetration number.

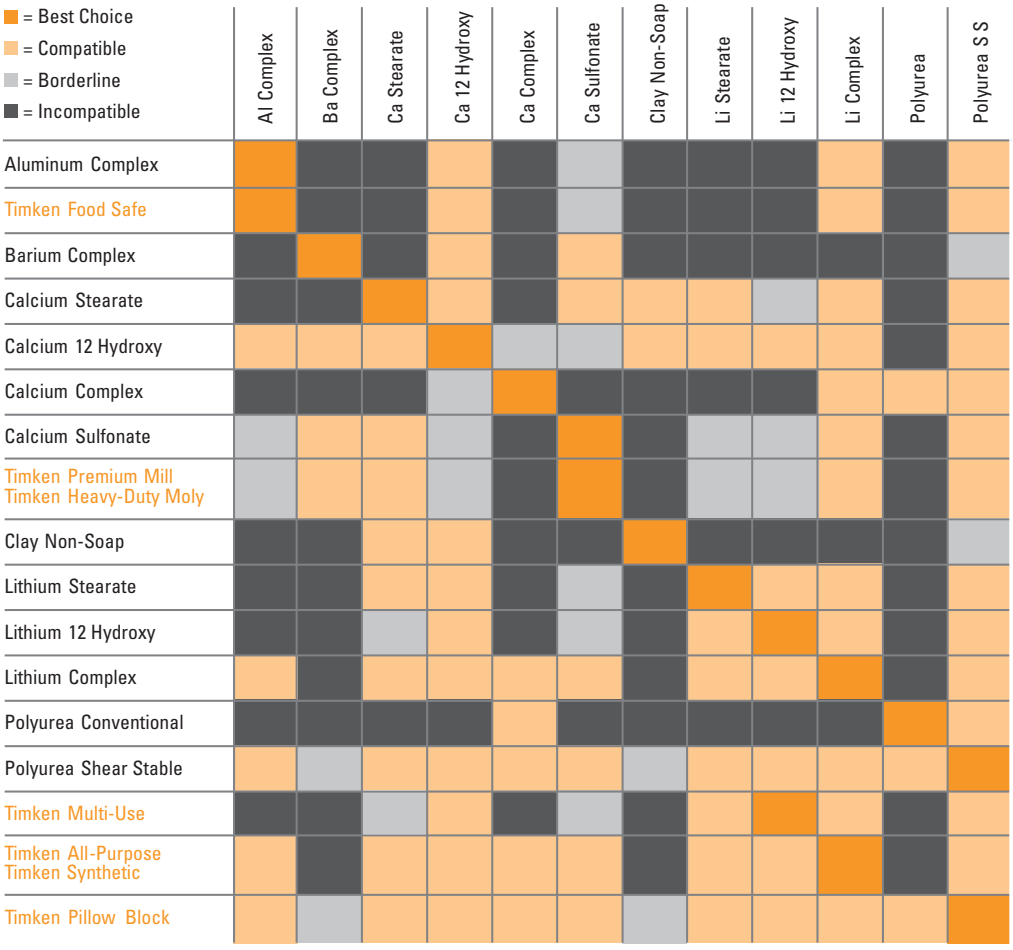
The National Lubricating Grease Institute (NLGI) classification of grease consistency is shown below:

TABLE 30. NLGI CLASSIFICATIONS

NLGI Grease Grades	Penetration Number
0	355-385
1	310-340
2	265-295
3	220-250
4	175-205
5	130-160
6	85-115

Grease consistency is not fixed; it normally becomes softer when sheared or “worked.” In the laboratory, this “working” is accomplished by forcing a perforated plate up and down through a closed container of grease. This “working” does not compare with the violent shearing action that takes place in a bearing and does not necessarily correlate with actual performance.

TABLE 31. GREASE COMPATIBILITY CHART

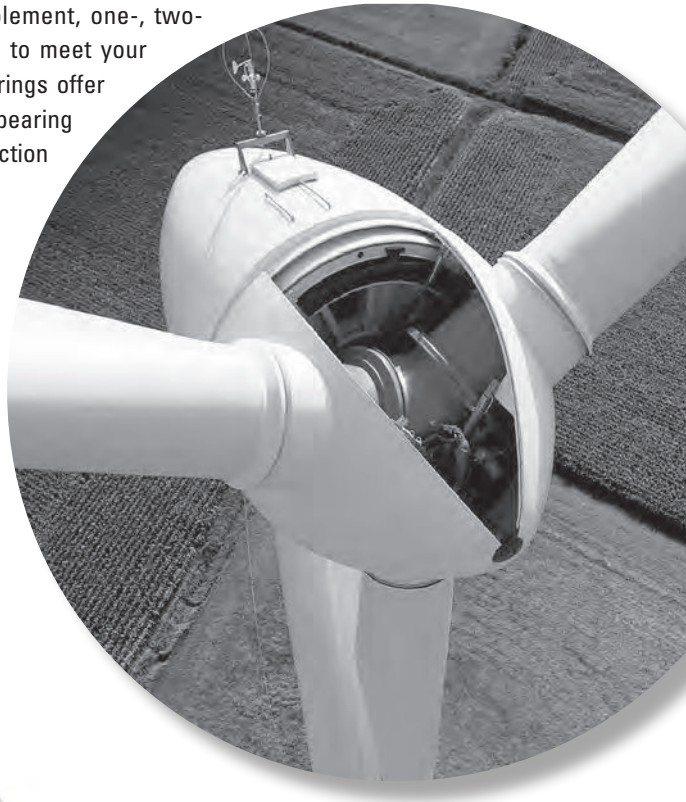


NOTE

Mixing greases can result in improper bearing lubrication.
Always follow the specific lubrication instructions of your equipment supplier.

CYLINDRICAL ROLLER BEARINGS

Our product line includes full-complement, one-, two- and four-row designs, all developed to meet your application requirements. These bearings offer higher radial load capacity than other bearing types, and they effectively reduce friction and help transmit power.



Nomenclature 52
Single-Row Metric Series 54
Single-Row Standard Series ...74
Full-Complement (NCF) 76
Two-Row 80
Four-Row 88
HJ Series.....108
Inner Rings (IR).....112
5200, A5200 Metric Series ...114



NOMENCLATURE

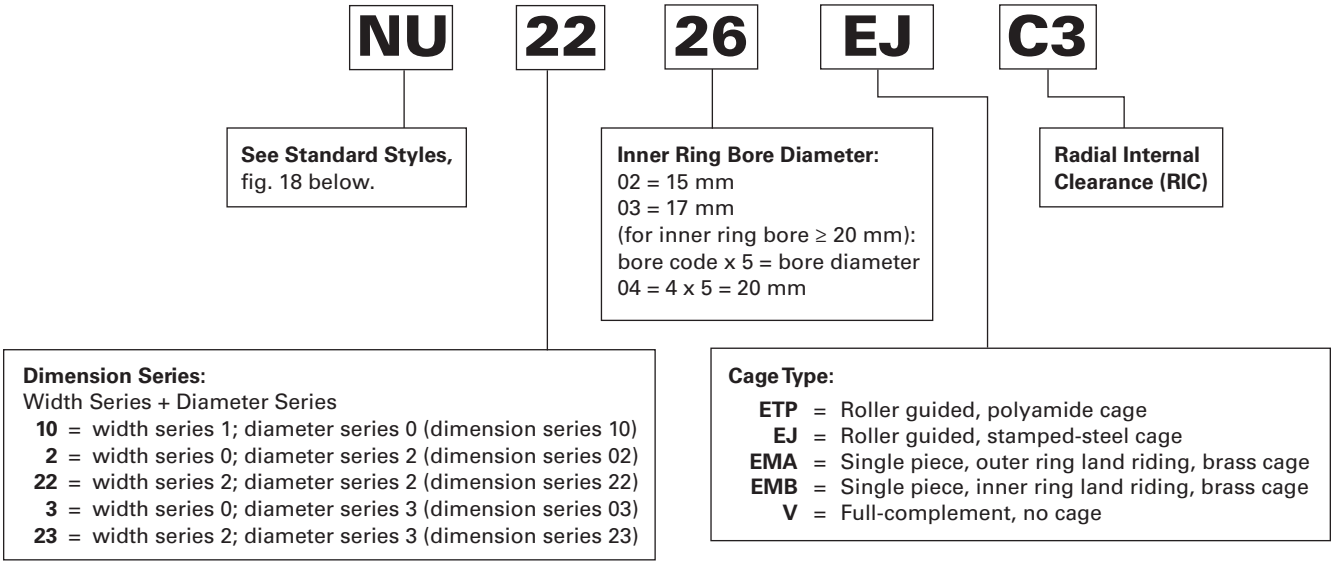


Fig. 17. Metric ISO radial cylindrical roller bearings nomenclature.

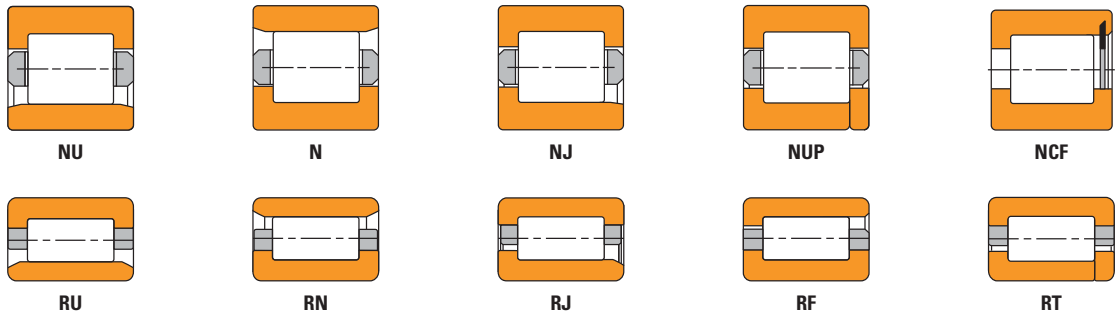


Fig. 18. Standard cylindrical roller bearing styles metric/inch.

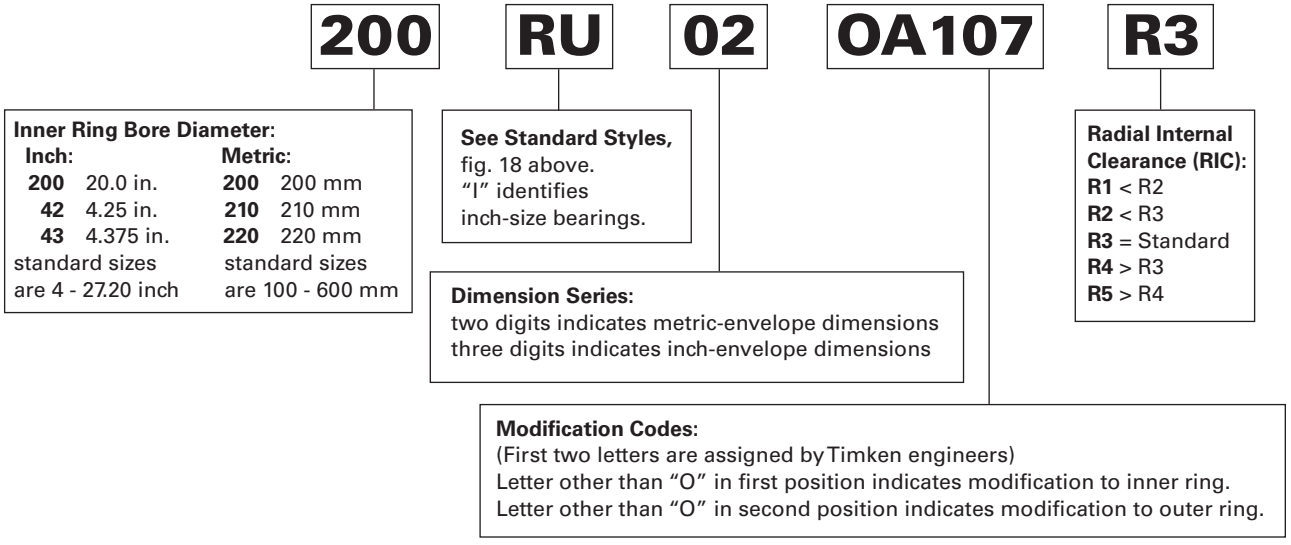


Fig. 19. ABMA radial cylindrical roller bearings nomenclature.

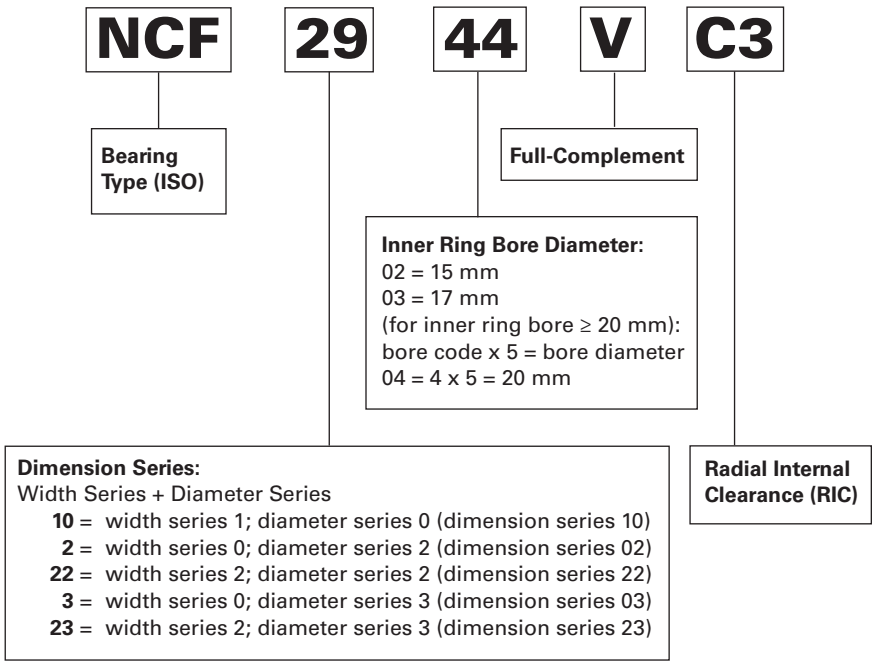


Fig. 20. Full-complement (NCF) cylindrical roller bearing nomenclature.

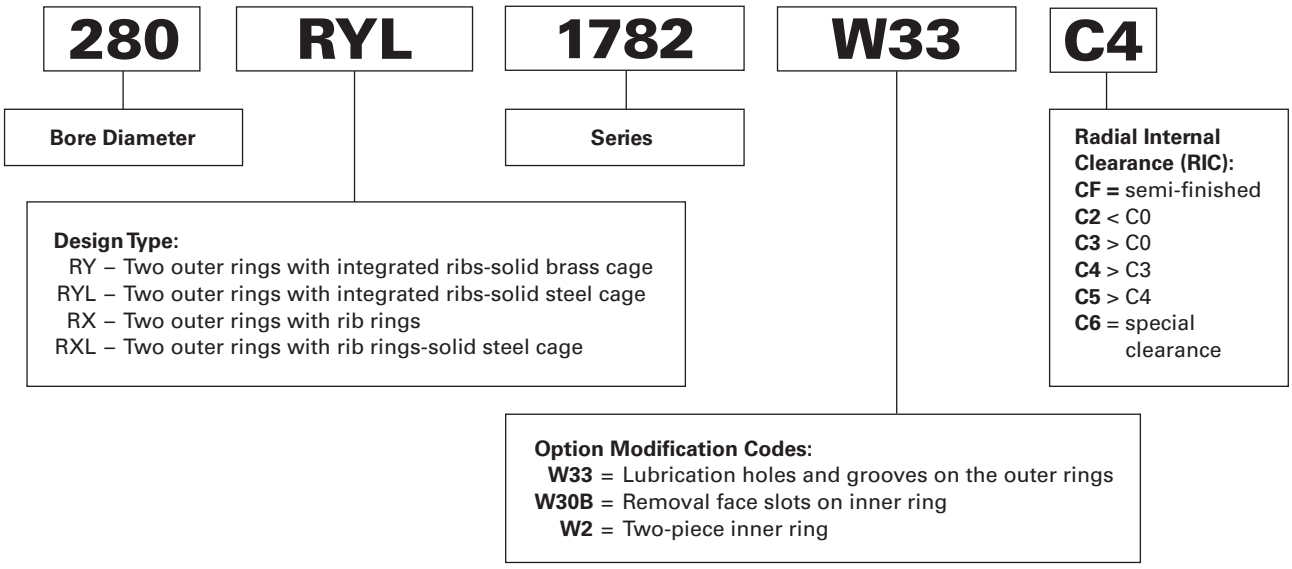
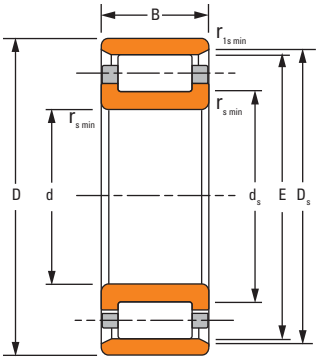
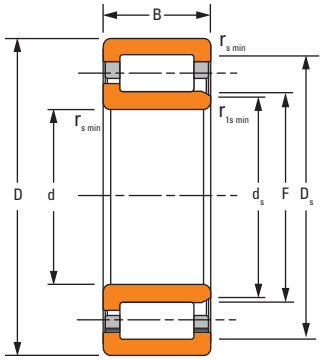


Fig. 21. Four-row cylindrical roller bearing nomenclature.

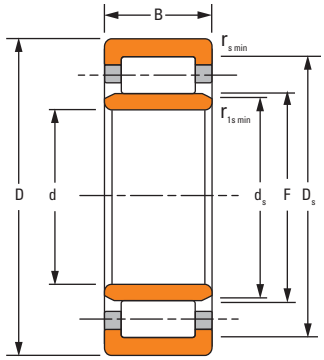
SINGLE-ROW METRIC SERIES



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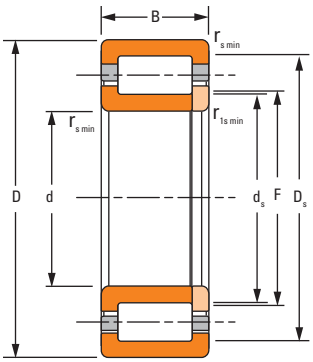


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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
15.000 0.5906	**35.000** 1.3780	**11.000** 0.4331	**30.300** 1.1929	**11** 2518	**14** 3057	N202ETP	**0.6** 0.02	**0.3** 0.01	**18.2** 0.72	**32.3** 1.27	**1.0** 0.04	0.036	17400	14200	**0.05** 0.10
15.000 0.5906	**35.000** 1.3780	**11.000** 0.4331	**19.300** 0.7598	**11** 2518	**14** 3057	NJ202ETP	**0.6** 0.02	**0.3** 0.01	**18.2** 0.72	**31.3** 1.23	**1.0** 0.04	0.036	17400	14200	**0.05** 0.11
15.000 0.5906	**35.000** 1.3780	**11.000** 0.4331	**19.300** 0.7598	**11** 2518	**14** 3057	NU202ETP	**0.6** 0.02	**0.3** 0.01	**17.4** 0.69	**31.3** 1.23	**1.0** 0.04	0.036	17400	14200	**0.05** 0.10
15.000 0.5906	**35.000** 1.3780	**11.000** 0.4331	**19.300** 0.7598	**11** 2518	**14** 3057	NUP202ETP	**0.6** 0.02	**0.3** 0.01	**18.2** 0.72	**31.3** 1.23	- -	0.036	17400	14200	**0.05** 0.11
17.000 0.6693	**40.000** 1.5748	**12.000** 0.4724	**35.100** 1.3819	**16** 3507	**19** 4159	N203ETP	**0.6** 0.02	**0.3** 0.01	**20.7** 0.81	**37.1** 1.46	**1.0** 0.04	0.041	15200	12500	**0.07** 0.15
17.000 0.6693	**40.000** 1.5748	**12.000** 0.4724	**22.100** 0.8701	**16** 3507	**19** 4159	NJ203ETP	**0.6** 0.02	**0.3** 0.01	**20.7** 0.81	**36.0** 1.42	**1.0** 0.04	0.041	15200	12500	**0.07** 0.15
17.000 0.6693	**40.000** 1.5748	**12.000** 0.4724	**22.100** 0.8701	**16** 3507	**19** 4159	NU203ETP	**0.6** 0.02	**0.3** 0.01	**19.9** 0.78	**36.0** 1.42	**1.0** 0.04	0.041	15200	12500	**0.07** 0.15
17.000 0.6693	**40.000** 1.5748	**12.000** 0.4724	**22.100** 0.8701	**16** 3507	**19** 4159	NUP203ETP	**0.6** 0.02	**0.3** 0.01	**20.7** 0.81	**36.0** 1.42	- -	0.041	15200	12500	**0.07** 0.16
17.000 0.6693	**40.000** 1.5748	**16.000** 0.6299	**22.100** 0.8701	**23** 5148	**25** 5598	NU2203ETP	**0.6** 0.02	**0.3** 0.01	**19.9** 0.78	**36.0** 1.42	**1.0** 0.04	0.045	13100	11000	**0.09** 0.19
17.000 0.6693	**40.000** 1.5748	**16.000** 0.6299	**22.100** 0.8701	**23** 5148	**25** 5598	NUP2203ETP	**0.6** 0.02	**0.3** 0.01	**20.7** 0.81	**36.0** 1.42	- -	0.045	13100	11000	**0.10** 0.21
17.000 0.6693	**47.000** 1.8504	**14.000** 0.5512	**40.200** 1.5827	**22** 4878	**26** 5800	N303ETP	**1.0** 0.04	**0.6** 0.02	**22.1** 0.87	**42.7** 1.68	**1.1** 0.04	0.045	13600	11300	**0.12** 0.26
17.000 0.6693	**47.000** 1.8504	**14.000** 0.5512	**24.200** 0.9528	**22** 4878	**26** 5800	NJ303ETP	**1.0** 0.04	**0.6** 0.02	**22.1** 0.87	**41.7** 1.64	**1.1** 0.04	0.045	13600	11300	**0.12** 0.26
17.000 0.6693	**47.000** 1.8504	**14.000** 0.5512	**24.200** 0.9528	**22** 4878	**26** 5800	NU303ETP	**1.0** 0.04	**0.6** 0.02	**21.1** 0.83	**41.7** 1.64	**1.1** 0.04	0.045	13600	11300	**0.12** 0.26
17.000 0.6693	**47.000** 1.8504	**14.000** 0.5512	**24.200** 0.9528	**22** 4878	**26** 5800	NUP303ETP	**1.0** 0.04	**0.6** 0.02	**22.1** 0.87	**41.7** 1.64	- -	0.045	13600	11300	**0.13** 0.28
17.000 0.6693	**47.000** 1.8504	**19.000** 0.7480	**24.200** 0.9528	**30** 6677	**33** 7374	NU2303ETP	**1.0** 0.04	**0.6** 0.02	**22.1** 0.87	**41.7** 1.64	**1.1** 0.04	0.049	11000	9100	**0.14** 0.30

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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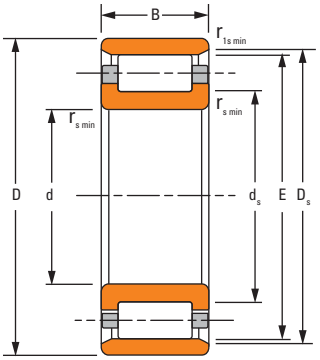
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
17.000 0.6693	**47.000** 1.8504	**19.000** 0.7480	**24.200** 0.9528	**30** 6677	**33** 7374	NUP2303ETP	**1.0** 0.04	**0.6** 0.02	**22.1** 0.87	**41.7** 1.64	- -	0.049	11000	9100	**0.15** 0.32
20.000 0.7874	**47.000** 1.8504	**14.000** 0.5512	**41.500** 1.6339	**25** 5688	**28** 6288	N204ETP	**1.0** 0.04	**0.6** 0.02	**25.0** 0.98	**43.5** 1.71	**1.0** 0.04	0.049	13000	10800	**0.11** 0.24
20.000 0.7874	**47.000** 1.8504	**14.000** 0.5512	**26.500** 1.0433	**25** 5688	**28** 6288	NJ204ETP	**1.0** 0.04	**0.6** 0.02	**25.0** 0.98	**41.7** 1.64	**1.0** 0.04	0.049	13000	10800	**0.12** 0.26
20.000 0.7874	**47.000** 1.8504	**14.000** 0.5512	**26.500** 1.0433	**25** 5688	**28** 6288	NU204ETP	**1.0** 0.04	**0.6** 0.02	**24.0** 0.94	**41.7** 1.64	**1.0** 0.04	0.049	13000	10800	**0.11** 0.25
20.000 0.7874	**47.000** 1.8504	**14.000** 0.5512	**26.500** 1.0433	**25** 5688	**28** 6288	NUP204ETP	**1.0** 0.04	**0.6** 0.02	**25.0** 0.98	**41.7** 1.64	- -	0.049	13000	10800	**0.12** 0.26
20.000 0.7874	**47.000** 1.8504	**18.000** 0.7087	**26.500** 1.0433	**32** 7081	**33** 7464	NJ2204ETP	**1.0** 0.04	**0.6** 0.02	**25.0** 0.98	**41.7** 1.64	**1.0** 0.04	0.051	11400	9500	**0.15** 0.33
20.000 0.7874	**47.000** 1.8504	**18.000** 0.7087	**26.500** 1.0433	**32** 7081	**33** 7464	NU2204ETP	**1.0** 0.04	**0.6** 0.02	**24.0** 0.94	**41.7** 1.64	1.0 0.04	0.051	11400	9500	**0.15** 0.32
20.000 0.7874	**47.000** 1.8504	**18.000** 0.7087	**26.500** 1.0433	**32** 7081	**33** 7464	NUP2204ETP	**1.0** 0.04	**0.6** 0.02	**25.0** 0.98	**41.7** 1.64	- -	0.051	11400	9500	**0.15** 0.34
20.000 0.7874	**52.000** 2.0472	**15.000** 0.5906	**45.500** 1.7913	**27** 6047	**32** 7081	N304ETP	**1.1** 0.04	**0.6** 0.02	**26.1** 1.03	**48.0** 1.89	**1.2** 0.05	0.049	12100	10100	**0.15** 0.33
20.000 0.7874	**52.000** 2.0472	**15.000** 0.5906	**27.500** 1.0827	**27** 6047	**32** 7081	NJ304ETP	**1.1** 0.04	**0.6** 0.02	**26.1** 1.03	**45.4** 1.79	**1.2** 0.05	0.049	12100	10100	**0.16** 0.34
20.000 0.7874	**52.000** 2.0472	**15.000** 0.5906	**27.500** 1.0827	**27** 6047	**32** 7081	NU304ETP	**1.1** 0.04	**0.6** 0.02	**24.1** 0.95	**45.4** 1.79	**1.2** 0.05	0.049	12100	10100	**0.15** 0.34
20.000 0.7874	**52.000** 2.0472	**15.000** 0.5906	**27.500** 1.0827	**27** 6047	**32** 7081	NUP304ETP	**1.1** 0.04	**0.6** 0.02	**26.1** 1.03	**45.4** 1.79	- -	0.049	12100	10100	**0.16** 0.35
20.000 0.7874	**52.000** 2.0472	**21.000** 0.8268	**27.500** 1.0827	**39** 8723	**42** 9442	NJ2304ETP	**1.1** 0.04	**0.6** 0.02	**26.1** 1.03	**45.4** 1.79	**1.2** 0.05	0.054	9900	8300	**0.22** 0.48
20.000 0.7874	**52.000** 2.0472	**21.000** 0.8268	**27.500** 1.0827	**39** 8723	**42** 9442	NU2304ETP	**1.1** 0.04	**0.6** 0.02	**24.1** 0.95	**45.4** 1.79	**1.2** 0.05	0.054	9900	8300	**0.21** 0.47
20.000 0.7874	**52.000** 2.0472	**21.000** 0.8268	**27.500** 1.0827	**39** 8723	**42** 9442	NUP2304ETP	**1.1** 0.04	**0.6** 0.02	**26.1** 1.03	**45.4** 1.79	- -	0.054	9900	8300	**0.22** 0.49

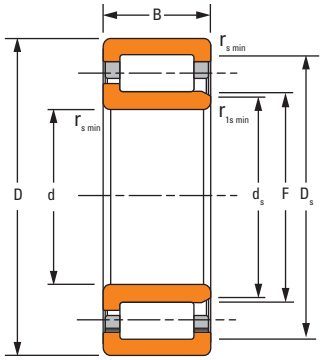
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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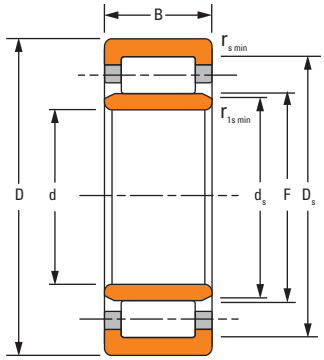
SINGLE-ROW METRIC SERIES – *continued*



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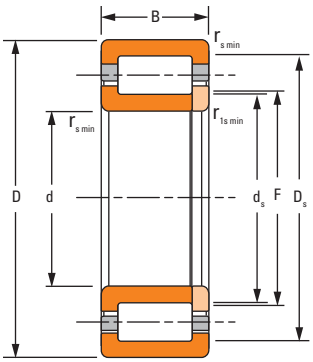


NU

Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
25.000 0.9843	**52.000** 2.0472	**15.000** 0.5906	**46.500** 1.8307	**28** 6385	**30** 6722	N205ETP	**1.0** 0.04	**0.6** 0.02	**29.9** 1.18	**48.5** 1.91	**1.0** 0.04	0.053	11700	9700	**0.14** 0.30
25.000 0.9843	**52.000** 2.0472	**15.000** 0.5906	**31.500** 1.2402	**28** 6385	**30** 6722	NJ205ETP	**1.0** 0.04	**0.6** 0.02	**29.9** 1.18	**46.4** 1.83	**1.0** 0.04	0.053	11700	9700	**0.14** 0.31
25.000 0.9843	**52.000** 2.0472	**15.000** 0.5906	**31.500** 1.2402	**28** 6385	**30** 6722	NU205ETP	**1.0** 0.04	**0.6** 0.02	**28.9** 1.14	**46.4** 1.83	**1.0** 0.04	0.053	11700	9700	**0.14** 0.30
25.000 0.9843	**52.000** 2.0472	**15.000** 0.5906	**31.500** 1.2402	**28** 6385	**30** 6722	NUP205ETP	**1.0** 0.04	**0.6** 0.02	**29.9** 1.18	**46.4** 1.83	- -	0.053	11700	9700	**0.14** 0.32
25.000 0.9843	**52.000** 2.0472	**18.000** 0.7087	**31.500** 1.2402	**35** 7936	**35** 7958	NJ2205ETP	**1.0** 0.04	**0.6** 0.02	**29.9** 1.18	**46.4** 1.83	**1.0** 0.04	0.056	9800	8200	**0.17** 0.37
25.000 0.9843	**52.000** 2.0472	**18.000** 0.7087	**31.500** 1.2402	**35** 7936	**35** 7958	NU2205ETP	**1.0** 0.04	**0.6** 0.02	**28.9** 1.14	**46.4** 1.83	**1.0** 0.04	0.056	9800	8200	**0.16** 0.36
25.000 0.9843	**52.000** 2.0472	**18.000** 0.7087	**31.500** 1.2402	**35** 7936	**35** 7958	NUP2205ETP	**1.0** 0.04	**0.6** 0.02	**29.9** 1.18	**46.4** 1.83	- -	0.056	9800	8200	**0.17** 0.38
25.000 0.9843	**62.000** 2.4409	**17.000** 0.6693	**54.000** 2.1260	**37** 8408	**41** 9307	N305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**56.4** 2.22	1.2 0.05	0.058	10300	8600	**0.23** 0.51
25.000 0.9843	**62.000** 2.4409	**17.000** 0.6693	**34.000** 1.3386	**37** 8408	**41** 9307	NJ305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**54.9** 2.16	**1.2** 0.05	0.058	10300	8600	**0.25** 0.55
25.000 0.9843	**62.000** 2.4409	**17.000** 0.6693	**34.000** 1.3386	**37** 8408	**41** 9307	NU305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**54.9** 2.16	**1.2** 0.05	0.058	10300	8600	**0.25** 0.54
25.000 0.9843	**62.000** 2.4409	**17.000** 0.6693	**34.000** 1.3386	**37** 8408	**41** 9307	NUP305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**54.9** 2.16	- -	0.058	10300	8600	**0.26** 0.57
25.000 0.9843	**62.000** 2.4409	**24.000** 0.9449	**34.000** 1.3386	**56** 12612	**57** 12769	NJ2305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**54.9** 2.16	**1.2** 0.05	0.064	8400	7000	**0.36** 0.78
25.000 0.9843	**62.000** 2.4409	**24.000** 0.9449	**34.000** 1.3386	**56** 12612	**57** 12769	NU2305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**54.9** 2.16	**1.2** 0.05	0.064	8400	7000	**0.35** 0.77
25.000 0.9843	**62.000** 2.4409	**24.000** 0.9449	**34.000** 1.3386	**56** 12612	**57** 12769	NUP2305ETP	**1.1** 0.04	**1.1** 0.04	**31.0** 1.22	**54.9** 2.16	- -	0.064	8400	7000	**0.36** 0.80
30.000 1.1811	**62.000** 2.4409	**16.000** 0.6299	**55.500** 2.1850	**37** 8408	**39** 8790	N206ETP	**1.0** 0.04	**0.6** 0.02	**35.3** 1.39	**58.1** 2.29	**1.2** 0.05	0.060	9800	8100	**0.20** 0.44

(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

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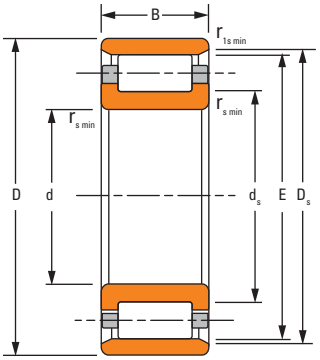
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
30.000 1.1811	**62.000** 2.4409	**16.000** 0.6299	**37.500** 1.4764	**37** 8408	**39** 8790	NJ206ETP	**1.0** 0.04	**0.6** 0.02	**35.3** 1.39	**55.9** 2.20	**1.2** 0.05	0.060	9800	8100	**0.21** 0.47
30.000 1.1811	**62.000** 2.4409	**16.000** 0.6299	**37.500** 1.4764	**37** 8408	**39** 8790	NU206ETP	**1.0** 0.04	**0.6** 0.02	**34.3** 1.35	**55.9** 2.20	**1.2** 0.05	0.060	9800	8100	**0.21** 0.46
30.000 1.1811	**62.000** 2.4409	**16.000** 0.6299	**37.500** 1.4764	**37** 8408	**39** 8790	NUP206ETP	**1.0** 0.04	**0.6** 0.02	**35.3** 1.39	**55.9** 2.20	- -	0.060	9800	8100	**0.22** 0.49
30.000 1.1811	**62.000** 2.4409	**20.000** 0.7874	**37.500** 1.4764	**50** 11195	**49** 10993	NJ2206ETP	**1.0** 0.04	**0.6** 0.02	**35.3** 1.39	**55.9** 2.20	**1.2** 0.05	0.065	8200	6900	**0.27** 0.59
30.000 1.1811	**62.000** 2.4409	**20.000** 0.7874	**37.500** 1.4764	**50** 11195	**49** 10993	NU2206ETP	**1.0** 0.04	**0.6** 0.02	**34.3** 1.35	**55.9** 2.20	**1.2** 0.05	0.065	8200	6900	**0.26** 0.58
30.000 1.1811	**62.000** 2.4409	**20.000** 0.7874	**37.500** 1.4764	**50** 11195	**49** 10993	NUP2206ETP	**1.0** 0.04	**0.6** 0.02	**35.3** 1.39	**55.9** 2.20	- -	0.065	8200	6900	**0.28** 0.61
30.000 1.1811	**72.000** 2.8346	**19.000** 0.7480	**62.500** 2.4606	**50** 11285	**53** 11960	N306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.5** 2.58	1.2 0.05	0.066	8900	7500	**0.36** 0.79
30.000 1.1811	**72.000** 2.8346	**19.000** 0.7480	**40.500** 1.5945	**50** 11285	**53** 11960	NJ306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.1** 2.56	**1.2** 0.05	0.066	8900	7500	**0.38** 0.83
30.000 1.1811	**72.000** 2.8346	**19.000** 0.7480	**40.500** 1.5945	**50** 11285	**53** 11960	NU306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.1** 2.56	**1.2** 0.05	0.066	8900	7500	**0.37** 0.81
30.000 1.1811	**72.000** 2.8346	**19.000** 0.7480	**40.500** 1.5945	**50** 11285	**53** 11960	NUP306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.1** 2.56	- -	0.066	8900	7500	**0.39** 0.85
30.000 1.1811	**72.000** 2.8346	**27.000** 1.0630	**40.500** 1.5945	**78** 17445	**75** 16771	NJ2306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.1** 2.56	**1.2** 0.05	0.073	7200	6100	**0.54** 1.19
30.000 1.1811	**72.000** 2.8346	**27.000** 1.0630	**40.500** 1.5945	**78** 17445	**75** 16771	NU2306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.1** 2.56	**1.2** 0.05	0.073	7200	6100	**0.53** 1.16
30.000 1.1811	**72.000** 2.8346	**27.000** 1.0630	**40.500** 1.5945	**78** 17445	**75** 16771	NUP2306ETP	**1.1** 0.04	**1.1** 0.04	**37.0** 1.46	**65.1** 2.56	- -	0.073	7200	6100	**0.55** 1.21
35.000 1.3780	**72.000** 2.8346	**17.000** 0.6693	**64.000** 2.5197	**50** 11285	**50** 11308	N207ETP	**1.1** 0.04	**0.6** 0.02	**41.8** 1.65	**67.2** 2.65	**1.2** 0.05	0.068	8300	6900	**0.30** 0.66
35.000 1.3780	**72.000** 2.8346	**17.000** 0.6693	**44.000** 1.7323	**50** 11285	**50** 11308	NJ207ETP	**1.1** 0.04	**0.6** 0.02	**41.8** 1.65	**65.1** 2.56	**1.2** 0.05	0.068	8300	6900	**0.31** 0.69

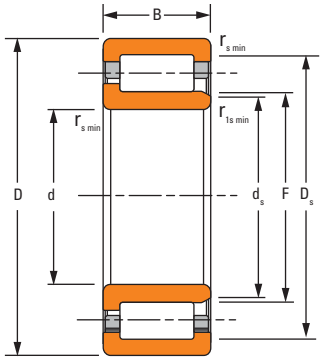
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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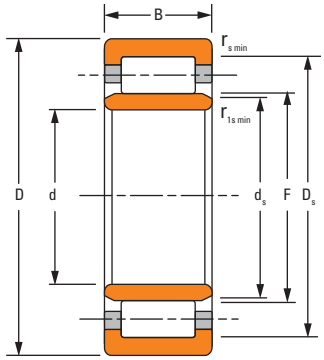
SINGLE-ROW METRIC SERIES – *continued*



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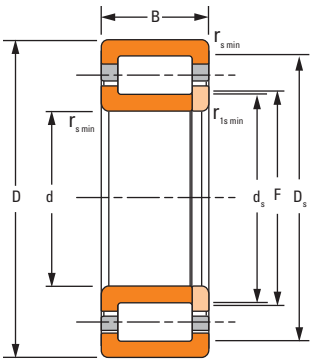


NU

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
35.000 1.3780	**72.000** 2.8346	**17.000** 0.6693	**44.000** 1.7323	**50** 11285	**50** 11308	NU207ETP	**1.1** 0.04	**0.6** 0.02	**39.8** 1.57	**65.1** 2.56	**1.2** 0.05	0.068	8300	6900	**0.31** 0.67
35.000 1.3780	**72.000** 2.8346	**17.000** 0.6693	**44.000** 1.7323	**50** 11285	**50** 11308	NUP207ETP	**1.1** 0.04	**0.6** 0.02	**41.8** 1.65	**65.1** 2.56	- -	0.068	8300	6900	**0.32** 0.71
35.000 1.3780	**72.000** 2.8346	**23.000** 0.9055	**44.000** 1.7323	**65** 14680	**62** 13848	NJ2207ETP	**1.1** 0.04	**0.6** 0.02	**41.8** 1.65	**65.1** 2.56	**1.2** 0.05	0.073	7300	6200	**0.41** 0.91
35.000 1.3780	**72.000** 2.8346	**23.000** 0.9055	**44.000** 1.7323	**65** 14680	**62** 13848	NU2207ETP	**1.1** 0.04	**0.6** 0.02	**39.8** 1.57	**65.1** 2.56	**1.2** 0.05	0.073	7300	6200	**0.40** 0.89
35.000 1.3780	**72.000** 2.8346	**23.000** 0.9055	**44.000** 1.7323	**65** 14680	**62** 13848	NUP2207ETP	**1.1** 0.04	**0.6** 0.02	**41.8** 1.65	**65.1** 2.56	- -	0.073	7300	6200	**0.43** 0.94
35.000 1.3780	**80.000** 3.1496	**21.000** 0.8268	**70.200** 2.7638	**65** 14703	**67** 14995	N307ETP	**1.5** 0.06	**1.1** 0.04	**43.0** 1.69	**73.4** 2.89	1.2 0.05	0.073	8000	6700	**0.48** 1.06
35.000 1.3780	**80.000** 3.1496	**21.000** 0.8268	**46.200** 1.8189	**65** 14703	**67** 14995	NJ307ETP	**1.5** 0.06	**1.1** 0.04	**43.0** 1.69	**72.2** 2.84	**1.2** 0.05	0.073	8000	6700	**0.50** 1.10
35.000 1.3780	**80.000** 3.1496	**21.000** 0.8268	**46.200** 1.8189	**65** 14703	**67** 14995	NU307ETP	**1.5** 0.06	**1.1** 0.04	**42.0** 1.65	**72.2** 2.84	**1.2** 0.05	0.073	8000	6700	**0.49** 1.08
35.000 1.3780	**80.000** 3.1496	**21.000** 0.8268	**46.200** 1.8189	**65** 14703	**67** 14995	NUP307ETP	**1.5** 0.06	**1.1** 0.04	**43.0** 1.69	**72.2** 2.84	- -	0.073	8000	6700	**0.51** 1.13
35.000 1.3780	**80.000** 3.1496	**31.000** 1.2205	**46.200** 1.8189	**101** 22616	**93** 20952	NJ2307ETP	**1.5** 0.06	**1.1** 0.04	**43.0** 1.69	**72.2** 2.84	**1.2** 0.05	0.081	6700	5600	**0.74** 1.63
35.000 1.3780	**80.000** 3.1496	**31.000** 1.2205	**46.200** 1.8189	**101** 22616	**93** 20952	NU2307ETP	**1.5** 0.06	**1.1** 0.04	**42.0** 1.65	**72.2** 2.84	**1.2** 0.05	0.081	6700	5600	**0.72** 1.59
35.000 1.3780	**80.000** 3.1496	**31.000** 1.2205	**46.200** 1.8189	**101** 22616	**93** 20952	NUP2307ETP	**1.5** 0.06	**1.1** 0.04	**43.0** 1.69	**72.2** 2.84	- -	0.081	6700	5600	**0.76** 1.66
40.000 1.5748	**80.000** 3.1496	**18.000** 0.7087	**71.500** 2.8150	**55** 12454	**56** 12522	N208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**74.1** 2.92	**1.2** 0.05	0.073	7600	6300	**0.38** 0.83
40.000 1.5748	**80.000** 3.1496	**18.000** 0.7087	**49.500** 1.9488	**55** 12454	**56** 12522	NJ208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**72.8** 2.87	**1.2** 0.05	0.073	7600	6300	**0.39** 0.87
40.000 1.5748	**80.000** 3.1496	**18.000** 0.7087	**49.500** 1.9488	**55** 12454	**56** 12522	NU208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**72.8** 2.87	**1.2** 0.05	0.073	7600	6300	**0.38** 0.84

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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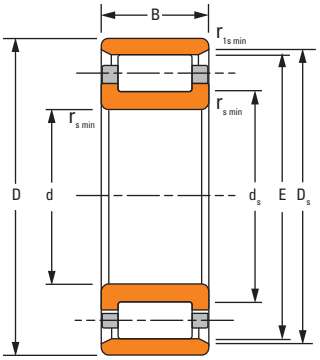
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
40.000 1.5748	**80.000** 3.1496	**18.000** 0.7087	**49.500** 1.9488	**55** 12454	**56** 12522	NUP208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**72.8** 2.87	- -	0.073	7600	6300	**0.41** 0.90
40.000 1.5748	**80.000** 3.1496	**23.000** 0.9055	**49.500** 1.9488	**78** 17445	**72** 16254	NJ2208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**72.8** 2.87	**1.2** 0.05	0.079	6300	5300	**0.51** 1.12
40.000 1.5748	**80.000** 3.1496	**23.000** 0.9055	**49.500** 1.9488	**78** 17445	**72** 16254	NU2208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**72.8** 2.87	**1.2** 0.05	0.079	6300	5300	**0.49** 1.09
40.000 1.5748	**80.000** 3.1496	**23.000** 0.9055	**49.500** 1.9488	**78** 17445	**72** 16254	NUP2208ETP	**1.1** 0.04	**1.1** 0.04	**47.0** 1.85	**72.8** 2.87	- -	0.079	6300	5300	**0.52** 1.15
40.000 1.5748	**90.000** 3.5433	**23.000** 0.9055	**80.000** 3.1496	**80** 18075	**82** 18479	N308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**83.2** 3.28	1.3 0.05	0.079	7200	6100	**0.65** 1.43
40.000 1.5748	**90.000** 3.5433	**23.000** 0.9055	**52.000** 2.0472	**80** 18075	**82** 18479	NJ308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**81.8** 3.22	**1.3** 0.05	0.079	7200	6100	**0.68** 1.50
40.000 1.5748	**90.000** 3.5433	**23.000** 0.9055	**52.000** 2.0472	**80** 18075	**82** 18479	NU308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**81.8** 3.22	**1.3** 0.05	0.079	7200	6100	**0.66** 1.46
40.000 1.5748	**90.000** 3.5433	**23.000** 0.9055	**52.000** 2.0472	**80** 18075	**82** 18479	NUP308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**81.8** 3.22	- -	0.079	7200	6100	**0.70** 1.53
40.000 1.5748	**90.000** 3.5433	**33.000** 1.2992	**52.000** 2.0472	**121** 27224	**113** 25426	NJ2308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**81.8** 3.22	**1.3** 0.05	0.088	5900	5000	**0.97** 2.15
40.000 1.5748	**90.000** 3.5433	**33.000** 1.2992	**52.000** 2.0472	**121** 27224	**113** 25426	NU2308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**81.8** 3.22	**1.3** 0.05	0.088	5900	5000	**0.95** 2.10
40.000 1.5748	**90.000** 3.5433	**33.000** 1.2992	**52.000** 2.0472	**121** 27224	**113** 25426	NUP2308ETP	**1.5** 0.06	**1.5** 0.06	**48.0** 1.89	**81.8** 3.22	- -	0.088	5900	5000	**1.00** 2.20
45.000 1.7717	**85.000** 3.3465	**19.000** 0.7480	**76.500** 3.0118	**66** 14927	**63** 14174	N209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**79.1** 3.11	**1.2** 0.05	0.079	7000	5800	**0.43** 0.95
45.000 1.7717	**85.000** 3.3465	**19.000** 0.7480	**54.500** 2.1457	**66** 14927	**63** 14174	NJ209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**77.6** 3.06	**1.2** 0.05	0.079	7000	5800	**0.45** 1.00
45.000 1.7717	**85.000** 3.3465	**19.000** 0.7480	**54.500** 2.1457	**66** 14927	**63** 14174	NU209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**77.6** 3.06	**1.2** 0.05	0.079	7000	5800	**0.44** 0.97
45.000 1.7717	**85.000** 3.3465	**19.000** 0.7480	**54.500** 2.1457	**66** 14927	**63** 14174	NUP209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**77.6** 3.06	- -	0.079	7000	5800	**0.46** 1.02

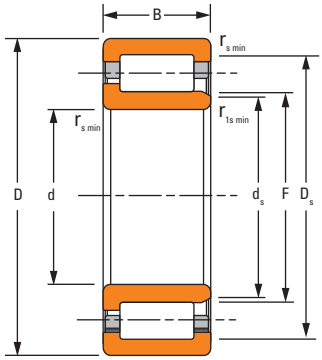
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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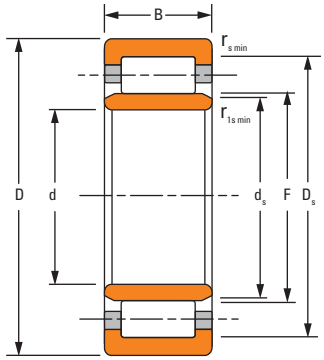
SINGLE-ROW METRIC SERIES – *continued*



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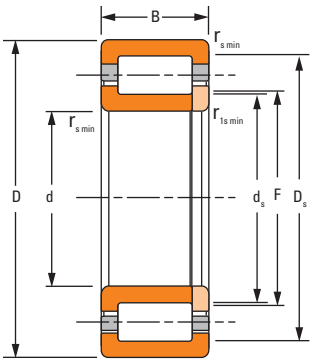


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Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
45.000 1.7717	**85.000** 3.3465	**23.000** 0.9055	**54.500** 2.1457	**85** 19019	**76** 17108	NJ2209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**77.6** 3.06	**1.2** 0.05	0.084	5800	4900	**0.55** 1.21
45.000 1.7717	**85.000** 3.3465	**23.000** 0.9055	**54.500** 2.1457	**85** 19019	**76** 17108	NU2209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**77.6** 3.06	**1.2** 0.05	0.084	5800	4900	**0.53** 1.18
45.000 1.7717	**85.000** 3.3465	**23.000** 0.9055	**54.500** 2.1457	**85** 19019	**76** 17108	NUP2209ETP	**1.1** 0.04	**1.1** 0.04	**52.0** 2.05	**77.6** 3.06	- -	0.084	5800	4900	**0.56** 1.24
45.000 1.7717	**100.000** 3.9370	**25.000** 0.9843	**88.500** 3.4843	**101** 22728	**100** 22368	N309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**92.3** 3.63	1.8 0.07	0.087	6500	5500	**0.88** 1.94
45.000 1.7717	**100.000** 3.9370	**25.000** 0.9843	**58.500** 2.3031	**101** 22728	**100** 22368	NJ309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**91.4** 3.60	**1.8** 0.07	0.087	6500	5500	**0.93** 2.05
45.000 1.7717	**100.000** 3.9370	**25.000** 0.9843	**58.500** 2.3031	**101** 22728	**100** 22368	NU309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**91.4** 3.60	**1.8** 0.07	0.087	6500	5500	**0.91** 2.00
45.000 1.7717	**100.000** 3.9370	**25.000** 0.9843	**58.500** 2.3031	**101** 22728	**100** 22368	NUP309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**91.4** 3.60	- -	0.087	6500	5500	**0.95** 2.10
45.000 1.7717	**100.000** 3.9370	**36.000** 1.4173	**58.500** 2.3031	**156** 35003	**139** 31293	NJ2309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**91.4** 3.60	**1.8** 0.07	0.097	5300	4500	**1.34** 2.96
45.000 1.7717	**100.000** 3.9370	**36.000** 1.4173	**58.500** 2.3031	**156** 35003	**139** 31293	NU2309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**91.4** 3.60	**1.8** 0.07	0.097	5300	4500	**1.31** 2.89
45.000 1.7717	**100.000** 3.9370	**36.000** 1.4173	**58.500** 2.3031	**156** 35003	**139** 31293	NUP2309ETP	**1.5** 0.06	**1.5** 0.06	**54.0** 2.13	**91.4** 3.60	- -	0.097	5300	4500	**1.37** 3.02
50.000 1.9685	**90.000** 3.5433	**20.000** 0.7874	**81.500** 3.2087	**72** 16162	**66** 14830	N210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**84.0** 3.31	**1.2** 0.05	0.083	6600	5500	**0.48** 1.06
50.000 1.9685	**90.000** 3.5433	**20.000** 0.7874	**59.500** 2.3425	**72** 16162	**66** 14830	NJ210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**82.4** 3.24	**1.2** 0.05	0.083	6600	5500	**0.51** 1.11
50.000 1.9685	**90.000** 3.5433	**20.000** 0.7874	**59.500** 2.3425	**72** 16162	**66** 14830	NU210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**82.4** 3.24	**1.2** 0.05	0.083	6600	5500	**0.49** 1.08
50.000 1.9685	**90.000** 3.5433	**20.000** 0.7874	**59.500** 2.3425	**72** 16162	**66** 14830	NUP210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**82.4** 3.24	- -	0.083	6600	5500	**0.52** 1.15
50.000 1.9685	**90.000** 3.5433	**23.000** 0.9055	**59.500** 2.3425	**92** 20570	**80** 17895	NJ2210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**82.4** 3.24	**1.2** 0.05	0.088	5300	4500	**0.59** 1.30

(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

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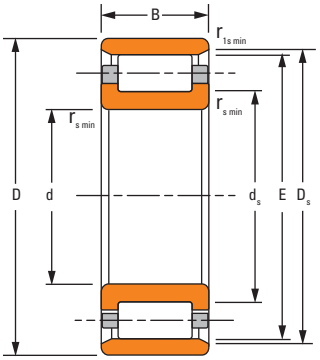
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
50.000 1.9685	**90.000** 3.5433	**23.000** 0.9055	**59.500** 2.3425	**92** 20570	**80** 17895	NU2210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**82.4** 3.24	**1.2** 0.05	0.088	5300	4500	**0.57** 1.26
50.000 1.9685	**90.000** 3.5433	**23.000** 0.9055	**59.500** 2.3425	**92** 20570	**80** 17895	NUP2210ETP	**1.1** 0.04	**1.1** 0.04	**57.0** 2.24	**82.4** 3.24	- -	0.088	5300	4500	**0.60** 1.33
50.000 1.9685	**110.000** 4.3307	**27.000** 1.0630	**97.000** 3.8189	**116** 26078	**112** 25269	N310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**101.0** 3.98	1.8 0.07	0.064	6100	5200	**1.10** 2.43
50.000 1.9685	**110.000** 4.3307	**27.000** 1.0630	**65.000** 2.5591	**116** 26078	**112** 25269	NJ310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**99.6** 3.92	**1.8** 0.07	0.064	6100	5200	**1.20** 2.64
50.000 1.9685	**110.000** 4.3307	**27.000** 1.0630	**65.000** 2.5591	**116** 26078	**112** 25269	NU310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**99.6** 3.92	**1.8** 0.07	0.064	6100	5200	**1.17** 2.58
50.000 1.9685	**110.000** 4.3307	**27.000** 1.0630	**65.000** 2.5591	**116** 26078	**112** 25269	NUP310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**99.6** 3.92	- -	0.064	6100	5200	**1.22** 2.70
50.000 1.9685	**110.000** 4.3307	**40.000** 1.5748	**65.000** 2.5591	**190** 42601	**165** 37004	NJ2310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**99.6** 3.92	**1.8** 0.07	0.073	5000	4200	**1.79** 3.94
50.000 1.9685	**110.000** 4.3307	**40.000** 1.5748	**65.000** 2.5591	**190** 42601	**165** 37004	NU2310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**99.6** 3.92	**1.8** 0.07	0.073	5000	4200	**1.75** 3.85
50.000 1.9685	**110.000** 4.3307	**40.000** 1.5748	**65.000** 2.5591	**190** 42601	**165** 37004	NUP2310ETP	**2.0** 0.08	**2.0** 0.08	**60.0** 2.36	**99.6** 3.92	- -	0.073	5000	4200	**1.82** 4.02
55.000 2.1654	**100.000** 3.9370	**21.000** 0.8268	**90.000** 3.5433	**99** 22189	**86** 19401	N211ETP	**1.5** 0.06	**1.1** 0.04	**63.0** 2.48	**93.0** 3.66	**1.2** 0.05	0.093	5800	4800	**0.65** 1.43
55.000 2.1654	**100.000** 3.9370	**21.000** 0.8268	**66.000** 2.5984	**99** 22189	**86** 19401	NJ211ETP	**1.5** 0.06	**1.1** 0.04	**63.0** 2.48	**91.4** 3.60	**1.2** 0.05	0.093	5800	4800	**0.68** 1.50
55.000 2.1654	**100.000** 3.9370	**21.000** 0.8268	**66.000** 2.5984	**99** 22189	**86** 19401	NU211ETP	**1.5** 0.06	**1.1** 0.04	**62.0** 2.44	**91.4** 3.60	**1.2** 0.05	0.093	5800	4800	**0.67** 1.47
55.000 2.1654	**100.000** 3.9370	**21.000** 0.8268	**66.000** 2.5984	**99** 22189	**86** 19401	NUP211ETP	**1.5** 0.06	**1.1** 0.04	**63.0** 2.48	**91.4** 3.60	- -	0.093	5800	4800	**0.70** 1.54
55.000 2.1654	**100.000** 3.9370	**25.000** 0.9843	**66.000** 2.5984	**122** 27314	**101** 22796	NJ2211ETP	**1.5** 0.06	**1.1** 0.04	**63.0** 2.48	**91.4** 3.60	**1.2** 0.05	0.098	4700	4000	**0.81** 1.79
55.000 2.1654	**100.000** 3.9370	**25.000** 0.9843	**66.000** 2.5984	**122** 27314	**101** 22796	NU2211ETP	**1.5** 0.06	**1.1** 0.04	**62.0** 2.44	**91.4** 3.60	**1.2** 0.05	0.098	4700	4000	**0.80** 1.76

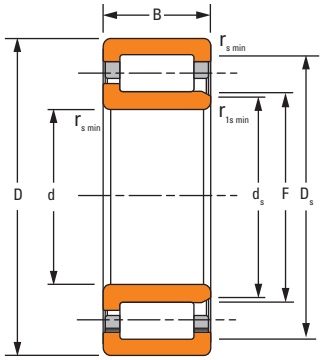
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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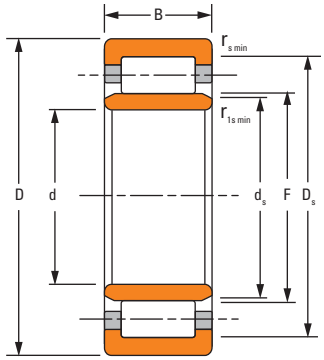
SINGLE-ROW METRIC SERIES – *continued*



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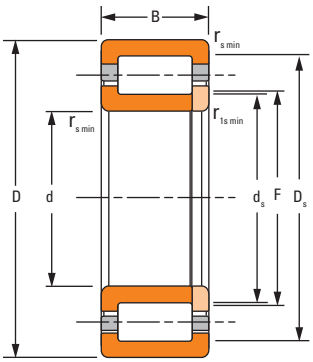


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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
55.000 2.1654	**100.000** 3.9370	**25.000** 0.9843	**66.000** 2.5984	**122** 27314	**101** 22796	NUP2211ETP	**1.5** 0.06	**1.1** 0.04	**63.0** 2.48	**91.4** 3.60	- -	0.098	4700	4000	**0.83** 1.84
55.000 2.1654	**120.000** 4.7244	**29.000** 1.1417	**106.500** 4.1929	**144** 32462	**139** 31136	N311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**111.0** 4.37	1.8 0.07	0.069	5500	4700	**1.45** 3.20
55.000 2.1654	**120.000** 4.7244	**29.000** 1.1417	**70.500** 2.7756	**144** 32462	**139** 31136	NJ311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**109.0** 4.29	**1.8** 0.07	0.069	5500	4700	**1.53** 3.37
55.000 2.1654	**120.000** 4.7244	**29.000** 1.1417	**70.500** 2.7756	**144** 32462	**139** 31136	NU311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**109.0** 4.29	**1.8** 0.07	0.069	5500	4700	**1.50** 3.30
55.000 2.1654	**120.000** 4.7244	**29.000** 1.1417	**70.500** 2.7756	**144** 32462	**139** 31136	NUP311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**109.0** 4.29	- -	0.069	5500	4700	**1.56** 3.44
55.000 2.1654	**120.000** 4.7244	**43.000** 1.6929	**70.500** 2.7756	**235** 52740	**202** 45411	NJ2311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**109.0** 4.29	**1.8** 0.07	0.078	4500	3900	**2.28** 5.02
55.000 2.1654	**120.000** 4.7244	**43.000** 1.6929	**70.500** 2.7756	**235** 52740	**202** 45411	NU2311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**109.0** 4.29	**1.8** 0.07	0.078	4500	3900	**2.24** 4.93
55.000 2.1654	**120.000** 4.7244	**43.000** 1.6929	**70.500** 2.7756	**235** 52740	**202** 45411	NUP2311ETP	**2.0** 0.08	**2.0** 0.08	**65.0** 2.56	**109.0** 4.29	- -	0.078	4500	3900	**2.32** 5.12
60.000 2.3622	**110.000** 4.3307	**22.000** 0.8661	**100.000** 3.9370	**106** 23740	**96** 21672	N212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**103.0** 4.06	**1.3** 0.05	0.096	5400	4500	**0.82** 1.81
60.000 2.3622	**110.000** 4.3307	**22.000** 0.8661	**72.000** 2.8346	**106** 23740	**96** 21672	NJ212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**101.0** 3.98	**1.3** 0.05	0.096	5400	4500	**0.86** 1.89
60.000 2.3622	**110.000** 4.3307	**22.000** 0.8661	**72.000** 2.8346	**106** 23740	**96** 21672	NU212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**101.0** 3.98	**1.3** 0.05	0.096	5400	4500	**0.84** 1.84
60.000 2.3622	**110.000** 4.3307	**22.000** 0.8661	**72.000** 2.8346	**106** 23740	**96** 21672	NUP212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**101.0** 3.98	- -	0.096	5400	4500	**0.88** 1.94
60.000 2.3622	**110.000** 4.3307	**28.000** 1.1024	**72.000** 2.8346	**155** 34868	**130** 29225	NJ2212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**101.0** 3.98	**1.3** 0.05	0.106	4400	3700	**1.12** 2.46
60.000 2.3622	**110.000** 4.3307	**28.000** 1.1024	**72.000** 2.8346	**155** 34868	**130** 29225	NU2212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**101.0** 3.98	**1.3** 0.05	0.106	4400	3700	**1.09** 2.41
60.000 2.3622	**110.000** 4.3307	**28.000** 1.1024	**72.000** 2.8346	**155** 34868	**130** 29225	NUP2212ETP	**1.5** 0.06	**1.5** 0.06	**68.0** 2.68	**101.0** 3.98	- -	0.106	4400	3700	**1.14** 2.51

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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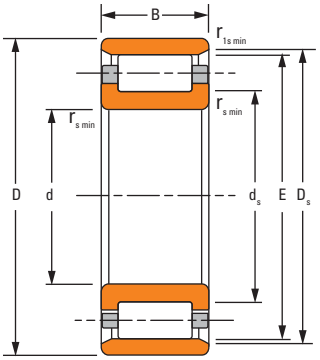
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
60.000 2.3622	**130.000** 5.1181	**31.000** 1.2205	**115.000** 4.5276	**162** 36442	**153** 34486	N312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**119.0** 4.69	2.0 0.08	0.073	5200	4500	**1.78** 3.92
60.000 2.3622	**130.000** 5.1181	**31.000** 1.2205	**77.000** 3.0315	**162** 36442	**153** 34486	NJ312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**118.0** 4.65	**2.0** 0.08	0.073	5200	4500	**1.87** 4.12
60.000 2.3622	**130.000** 5.1181	**31.000** 1.2205	**77.000** 3.0315	**162** 36442	**153** 34486	NU312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**118.0** 4.65	**2.0** 0.08	0.073	5200	4500	**1.83** 4.03
60.000 2.3622	**130.000** 5.1181	**31.000** 1.2205	**77.000** 3.0315	**162** 36442	**153** 34486	NUP312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**118.0** 4.65	- -	0.073	5200	4500	**1.91** 4.21
60.000 2.3622	**130.000** 5.1181	**46.000** 1.8110	**77.000** 3.0315	**267** 59957	**226** 50784	NJ2312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**118.0** 4.65	**2.0** 0.08	0.083	4300	3700	**2.81** 6.19
60.000 2.3622	**130.000** 5.1181	**46.000** 1.8110	**77.000** 3.0315	**267** 59957	**226** 50784	NU2312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**118.0** 4.65	**2.0** 0.08	0.083	4300	3700	**2.75** 6.06
60.000 2.3622	**130.000** 5.1181	**46.000** 1.8110	**77.000** 3.0315	**267** 59957	**226** 50784	NUP2312ETP	**2.1** 0.08	**2.1** 0.08	**72.0** 2.83	**118.0** 4.65	- -	0.083	4300	3700	**2.86** 6.31
65.000 2.5591	**120.000** 4.7244	**23.000** 0.9055	**108.500** 4.2717	**122** 27494	**110** 24729	N213ETP	**1.5** 0.06	**1.5** 0.06	**74.0** 2.91	**112.0** 4.41	**1.8** 0.07	0.071	5000	4200	**1.05** 2.31
65.000 2.5591	**120.000** 4.7244	**23.000** 0.9055	**78.500** 3.0906	**122** 27494	**110** 24729	NJ213ETP	**1.5** 0.06	**1.5** 0.06	**74.0** 2.91	**110.0** 4.33	**1.8** 0.07	0.071	5000	4200	**1.08** 2.39
65.000 2.5591	**120.000** 4.7244	**23.000** 0.9055	**78.500** 3.0906	**122** 27494	**110** 24729	NU213ETP	**1.5** 0.06	**1.5** 0.06	**74.0** 2.91	**110.0** 4.33	**1.8** 0.07	0.071	5000	4200	**1.06** 2.33
65.000 2.5591	**120.000** 4.7244	**23.000** 0.9055	**78.500** 3.0906	**122** 27494	**110** 24729	NUP213ETP	**1.5** 0.06	**1.5** 0.06	**76.0** 2.99	**110.0** 4.33	- -	0.071	5000	4200	**1.11** 2.45
65.000 2.5591	**120.000** 4.7244	**31.000** 1.2205	**78.500** 3.0906	**184** 41455	**151** 34014	NJ2213ETP	**1.5** 0.06	**1.5** 0.06	**74.0** 2.91	**110.0** 4.33	**1.8** 0.07	0.078	4200	3600	**1.48** 3.26
65.000 2.5591	**120.000** 4.7244	**31.000** 1.2205	**78.500** 3.0906	**184** 41455	**151** 34014	NU2213ETP	**1.5** 0.06	**1.5** 0.06	**74.0** 2.91	**110.0** 4.33	**1.8** 0.07	0.078	4200	3600	**1.45** 3.19
65.000 2.5591	**120.000** 4.7244	**31.000** 1.2205	**78.500** 3.0906	**184** 41455	**151** 34014	NUP2213ETP	**1.5** 0.06	**1.5** 0.06	**74.0** 2.91	**110.0** 4.33	- -	0.078	4200	3600	**1.51** 3.32
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**124.500** 4.9016	**195** 43905	**183** 41207	N313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**129.0** 5.08	2.0 0.08	0.074	4800	4100	**2.20** 4.85

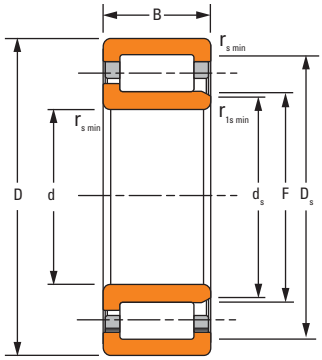
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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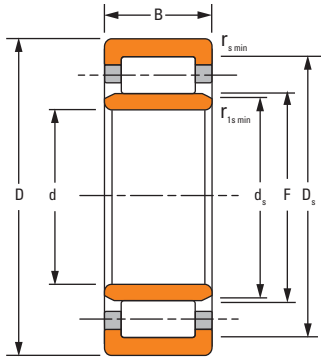
SINGLE-ROW METRIC SERIES – *continued*



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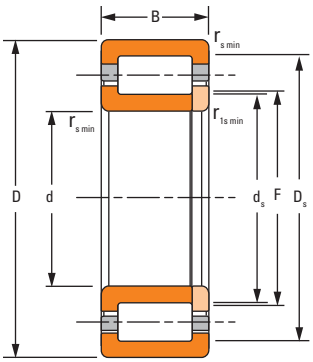


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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**195** 43905	**183** 41207	NJ313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**127.0** 5.00	**2.0** 0.08	0.074	4800	4100	**2.31** 5.08
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**195** 43905	**183** 41207	NU313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**127.0** 5.00	**2.0** 0.08	0.074	4800	4100	**2.26** 4.97
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**195** 43905	**183** 41207	NUP313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**127.0** 5.00	- -	0.074	4800	4100	**2.36** 5.19
65.000 2.5591	**140.000** 5.5118	**48.000** 1.8898	**82.500** 3.2480	**291** 65442	**250** 56202	NJ2313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**127.0** 5.00	**2.0** 0.08	0.081	4000	3500	**3.34** 7.36
65.000 2.5591	**140.000** 5.5118	**48.000** 1.8898	**82.500** 3.2480	**291** 65442	**250** 56202	NU2313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**127.0** 5.00	**2.0** 0.08	0.081	4000	3500	**3.26** 7.19
65.000 2.5591	**140.000** 5.5118	**48.000** 1.8898	**82.500** 3.2480	**291** 65442	**250** 56202	NUP2313ETP	**2.1** 0.08	**2.1** 0.08	**77.0** 3.03	**127.0** 5.00	- -	0.081	4000	3500	**3.42** 7.53
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**196** 44100	**204** 45900	NU313EMA	**2.1** 0.08	**2.1** 0.08	**78.2** 3.08	**124.5** 4.90	**2.5** 0.10	0.075	4800	4100	**2.50** 5.40
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**196** 44100	**204** 45900	NU313EJ	**2.1** 0.08	**2.1** 0.08	**78.2** 3.08	**124.5** 4.90	**2.5** 0.10	0.075	4800	4100	**2.20** 4.90
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**196** 44100	**204** 45900	NJ313EMA	**2.1** 0.08	**2.1** 0.08	**78.2** 3.08	**124.5** 4.90	**2.5** 0.10	0.075	4800	4100	**2.50** 5.40
65.000 2.5591	**140.000** 5.5118	**33.000** 1.2992	**82.500** 3.2480	**196** 44100	**204** 45900	NJ313EJ	**2.1** 0.08	**2.1** 0.08	**78.2** 3.08	**124.5** 4.90	**2.5** 0.10	0.075	4800	4100	**2.30** 5.00
65.000 2.5591	**140.000** 5.5118	**48.000** 1.8898	**82.500** 3.2480	**293** 65900	**282** 63300	NU2313EMA	**2.1** 0.08	**2.1** 0.08	**77.1** 3.04	**124.5** 4.90	**4.0** 0.16	0.082	4500	3900	**3.60** 8.00
65.000 2.5591	**140.000** 5.5118	**48.000** 1.8898	**82.500** 3.2480	**293** 65900	**282** 63300	NU2313EJ	**2.1** 0.08	**2.1** 0.08	**77.1** 3.04	**124.5** 4.90	**4.0** 0.16	0.082	4500	3900	**3.30** 7.30
65.000 2.5591	**140.000** 5.5118	**48.000** 1.8898	**82.500** 3.2480	**293** 65900	**282** 63300	NJ2313EJ	**2.1** 0.08	**2.1** 0.08	**77.1** 3.04	**124.5** 4.90	**4.0** 0.16	0.082	4500	3900	**3.40** 7.40
70.000 2.7559	**125.000** 4.9213	**24.000** 0.9449	**113.500** 4.4685	**141** 31653	**121** 27247	N214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**117.0** 4.61	**1.8** 0.07	0.075	4700	3900	**1.14** 2.51
70.000 2.7559	**125.000** 4.9213	**24.000** 0.9449	**83.500** 3.2874	**141** 31653	**121** 27247	NJ214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**115.0** 4.53	**1.8** 0.07	0.075	4700	3900	**1.20** 2.64

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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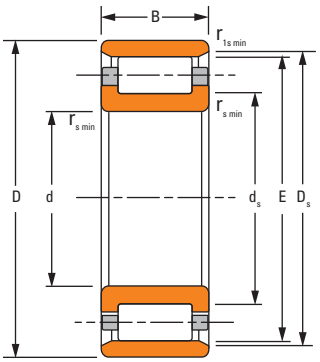
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
70.000 2.7559	**125.000** 4.9213	**24.000** 0.9449	**83.500** 3.2874	**141** 31653	**121** 27247	NU214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**115.0** 4.53	**1.8** 0.07	0.075	4700	3900	**1.17** 2.58
70.000 2.7559	**125.000** 4.9213	**24.000** 0.9449	**83.500** 3.2874	**141** 31653	**121** 27247	NUP214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**115.0** 4.53	- -	0.075	4700	3900	**1.23** 2.70
70.000 2.7559	**125.000** 4.9213	**31.000** 1.2205	**83.500** 3.2874	**198** 44467	**158** 35497	NJ2214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**115.0** 4.53	**1.8** 0.07	0.082	3900	3300	**1.56** 3.44
70.000 2.7559	**125.000** 4.9213	**31.000** 1.2205	**83.500** 3.2874	**198** 44467	**158** 35497	NU2214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**115.0** 4.53	**1.8** 0.07	0.082	3900	3300	**1.53** 3.37
70.000 2.7559	**125.000** 4.9213	**31.000** 1.2205	**83.500** 3.2874	**198** 44467	**158** 35497	NUP2214ETP	**1.5** 0.06	**1.5** 0.06	**79.0** 3.11	**115.0** 4.53	- -	0.082	3900	3300	**1.59** 3.51
70.000 2.7559	**150.000** 5.9055	**35.000** 1.3780	**133.000** 5.2362	**226** 50807	**208** 46648	N314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**138.0** 5.43	2.0 0.08	0.078	4500	3900	**2.67** 5.89
70.000 2.7559	**150.000** 5.9055	**35.000** 1.3780	**89.000** 3.5039	**226** 50807	**208** 46648	NJ314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**137.0** 5.39	**2.0** 0.08	0.078	4500	3900	**2.86** 6.30
70.000 2.7559	**150.000** 5.9055	**35.000** 1.3780	**89.000** 3.5039	**226** 50807	**208** 46648	NU314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**137.0** 5.39	**2.0** 0.08	0.078	4500	3900	**2.80** 6.18
70.000 2.7559	**150.000** 5.9055	**35.000** 1.3780	**89.000** 3.5039	**226** 50807	**208** 46648	NUP314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**137.0** 5.39	- -	0.078	4500	3900	**2.91** 6.42
70.000 2.7559	**150.000** 5.9055	**51.000** 2.0079	**89.000** 3.5039	**327** 73490	**276** 62137	NJ2314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**137.0** 5.39	**2.0** 0.08	0.086	3800	3300	**4.10** 9.05
70.000 2.7559	**150.000** 5.9055	**51.000** 2.0079	**89.000** 3.5039	**327** 73490	**276** 62137	NU2314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**137.0** 5.39	**2.0** 0.08	0.086	3800	3300	**4.01** 8.84
70.000 2.7559	**150.000** 5.9055	**51.000** 2.0079	**89.000** 3.5039	**327** 73490	**276** 62137	NUP2314ETP	**2.1** 0.08	**2.1** 0.08	**82.0** 3.23	**137.0** 5.39	- -	0.086	3800	3300	**4.20** 9.25
70.000 2.7559	**150.000** 5.9055	**51.000** 2.0079	**89.000** 3.5039	**328** 73700	**311** 69800	NU2314EMA	**2.1** 0.08	**2.1** 0.08	**83.3** 3.28	**133.0** 5.24	4.7 0.19	0.087	4300	3700	**4.40** 9.80
70.000 2.7559	**150.000** 5.9055	**51.000** 2.0079	**89.000** 3.5039	**328** 73700	**311** 69800	NU2314EJ	**2.1** 0.08	**2.1** 0.08	**83.3** 3.28	**133.0** 5.24	**4.7** 0.19	0.087	4300	3700	**4.00** 8.80
70.000 2.7559	**150.000** 5.9055	**51.000** 2.0079	**89.000** 3.5039	**328** 73700	**311** 69800	NJ2314EJ	**2.1** 0.08	**2.1** 0.08	**83.3** 3.28	**133.0** 5.24	**4.7** 0.19	0.087	4300	3700	**4.10** 9.00

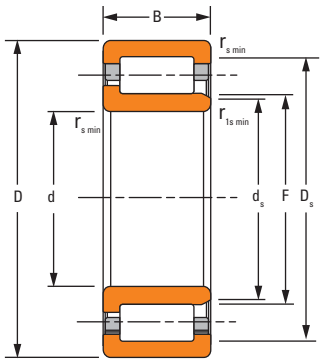
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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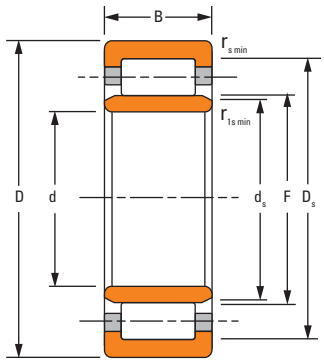
SINGLE-ROW METRIC SERIES – *continued*



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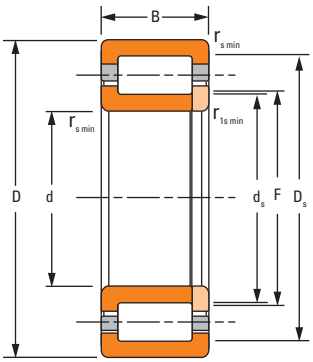


NU

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
75.000 2.9528	**130.000** 5.1181	**25.000** 0.9843	**118.500** 4.6654	**161** 36082	**133** 29810	N215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**122.0** 4.80	**1.8** 0.07	0.075	4500	3800	**1.23** 2.71
75.000 2.9528	**130.000** 5.1181	**25.000** 0.9843	**88.500** 3.4843	**161** 36082	**133** 29810	NJ215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**121.0** 4.76	**1.8** 0.07	0.075	4500	3800	**1.32** 2.91
75.000 2.9528	**130.000** 5.1181	**25.000** 0.9843	**88.500** 3.4843	**161** 36082	**133** 29810	NU215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**121.0** 4.76	**1.8** 0.07	0.075	4500	3800	**1.29** 2.85
75.000 2.9528	**130.000** 5.1181	**25.000** 0.9843	**88.500** 3.4843	**161** 36082	**133** 29810	NUP215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**121.0** 4.76	- -	0.075	4500	3800	**1.35** 2.97
75.000 2.9528	**130.000** 5.1181	**31.000** 1.2205	**88.500** 3.4843	**211** 47502	**164** 36914	NJ2215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**121.0** 4.76	**1.8** 0.07	0.080	3700	3100	**1.64** 3.62
75.000 2.9528	**130.000** 5.1181	**31.000** 1.2205	**88.500** 3.4843	**211** 47502	**164** 36914	NU2215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**121.0** 4.76	**1.8** 0.07	0.080	3700	3100	**1.61** 3.55
75.000 2.9528	**130.000** 5.1181	**31.000** 1.2205	**88.500** 3.4843	**211** 47502	**164** 36914	NUP2215ETP	**1.5** 0.06	**1.5** 0.06	**84.0** 3.31	**121.0** 4.76	- -	0.080	3700	3100	**1.68** 3.70
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**143.000** 5.6299	**267** 60114	**243** 54696	N315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	2.0 0.08	0.083	4200	3600	**3.30** 7.28
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**267** 60114	**243** 54696	NJ315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	**2.0** 0.08	0.083	4200	3600	**3.43** 7.57
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**267** 60114	**243** 54696	NU315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	**2.0** 0.08	0.083	4200	3600	**3.37** 7.43
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**267** 60114	**243** 54696	NUP315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	- -	0.083	4200	3600	**3.50** 7.71
75.000 2.9528	**160.000** 6.2992	**55.000** 2.1654	**95.000** 3.7402	**399** 89676	**332** 74659	NJ2315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	**2.0** 0.08	0.092	3600	3100	**5.00** 11.02
75.000 2.9528	**160.000** 6.2992	**55.000** 2.1654	**95.000** 3.7402	**399** 89676	**332** 74659	NU2315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	**2.0** 0.08	0.092	3600	3100	**4.80** 10.58
75.000 2.9528	**160.000** 6.2992	**55.000** 2.1654	**95.000** 3.7402	**399** 89676	**332** 74659	NUP2315ETP	**2.1** 0.08	**2.1** 0.08	**87.0** 3.43	**148.0** 5.83	- -	0.092	3600	3100	**5.00** 11.02
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**269** 60600	**272** 61200	NU315EMA	**2.0** 0.08	**2.0** 0.08	**91.0** 3.58	**143.0** 5.63	**2.7** 0.11	0.083	4600	4000	**3.60** 8.00

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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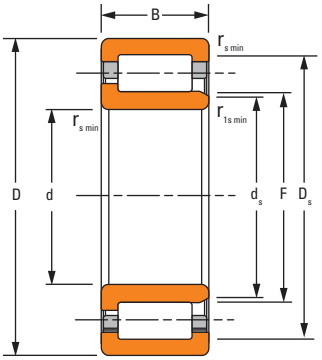
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**269** 60600	**272** 61200	NU315EJ	**2.0** 0.08	**2.0** 0.08	**91.0** 3.58	**143.0** 5.63	**2.7** 0.11	0.083	4600	4000	**3.30** 7.20
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**269** 60600	**272** 61200	NJ315EMA	**2.0** 0.08	**2.0** 0.08	**91.0** 3.58	**143.0** 5.63	**2.7** 0.11	0.083	4600	4000	**3.70** 8.10
75.000 2.9528	**160.000** 6.2992	**37.000** 1.4567	**95.000** 3.7402	**269** 60600	**272** 61200	NJ315EJ	**2.0** 0.08	**2.0** 0.08	**91.0** 3.58	**143.0** 5.63	**2.7** 0.11	0.083	4600	4000	**3.40** 7.40
75.000 2.9528	**190.000** 7.4803	**45.000** 1.7717	**104.500** 4.1142	**305** 68700	**318** 71500	NU415EMA	**3.0** 0.12	**3.0** 0.12	**98.8** 3.89	**160.5** 6.32	**4.0** 0.16	0.089	4400	3800	**7.00** 15.40
80.000 3.1496	**140.000** 5.5118	**26.000** 1.0236	**127.300** 5.0118	**171** 38532	**142** 31923	N216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**131.0** 5.16	**1.8** 0.07	0.078	4200	3600	**1.47** 3.24
80.000 3.1496	**140.000** 5.5118	**26.000** 1.0236	**95.300** 3.7520	**171** 38532	**142** 31923	NJ216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**129.0** 5.08	**1.8** 0.07	0.078	4200	3600	**1.58** 3.48
80.000 3.1496	**140.000** 5.5118	**26.000** 1.0236	**95.300** 3.7520	**171** 38532	**142** 31923	NU216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**129.0** 5.08	**1.8** 0.07	0.078	4200	3600	**1.55** 3.41
80.000 3.1496	**140.000** 5.5118	**26.000** 1.0236	**95.300** 3.7520	**171** 38532	**142** 31923	NUP216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**129.0** 5.08	- -	0.078	4200	3600	**1.61** 3.56
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**247** 55618	**189** 42466	NJ2216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**129.0** 5.08	**1.8** 0.07	0.085	3400	2900	**2.05** 4.51
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**247** 55618	**189** 42466	NU2216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**129.0** 5.08	**1.8** 0.07	0.085	3400	2900	**2.01** 4.44
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**247** 55618	**189** 42466	NUP2216ETP	**2.0** 0.08	**2.0** 0.08	**90.0** 3.54	**129.0** 5.08	- -	0.085	3400	2900	**2.08** 4.58
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**151.000** 5.9449	**291** 65464	**262** 58990	N316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	2.6 0.10	0.087	4000	3500	**3.85** 8.49
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**291** 65464	**262** 58990	NJ316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	**2.6** 0.10	0.087	4000	3500	**4.05** 8.94
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**291** 65464	**262** 58990	NU316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	**2.6** 0.10	0.087	4000	3500	**3.98** 8.78
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**291** 65464	**262** 58990	NUP316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	- -	0.087	4000	3500	**4.13** 9.10

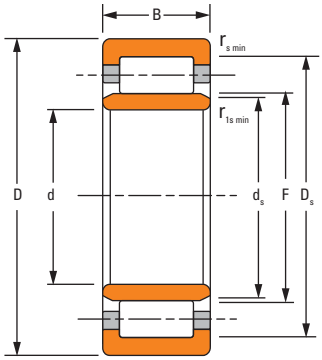
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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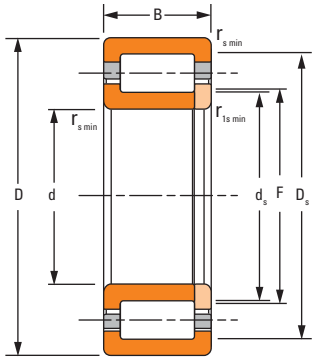
SINGLE-ROW METRIC SERIES – *continued*



NJ



NU



NUP

Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**440** 98961	**362** 81358	NJ2316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	**2.6** 0.10	0.096	3400	2900	**5.95** 13.12
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**440** 98961	**362** 81358	NU2316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	**2.6** 0.10	0.096	3400	2900	**5.85** 12.90
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**440** 98961	**362** 81358	NUP2316ETP	**2.1** 0.08	**2.1** 0.08	**92.0** 3.62	**157.0** 6.18	- -	0.096	3400	2900	**6.00** 13.23
80.000 3.1496	**140.000** 5.5118	**26.000** 1.0236	**95.300** 3.7520	**169** 38000	**155** 34900	NU216EMA	**2.0** 0.08	**2.0** 0.08	**92.4** 3.64	**127.3** 5.01	**1.7** 0.07	0.079	4900	4100	**1.80** 3.63
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**245** 55100	**208** 46800	NU2216EMA	**2.0** 0.08	**2.0** 0.08	**91.3** 3.59	**127.3** 5.01	**1.7** 0.07	0.086	3800	3300	**2.20** 4.80
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**245** 55100	**208** 46800	NU2216EJ	**2.0** 0.08	**2.0** 0.08	**91.3** 3.59	**127.3** 5.01	**1.7** 0.07	0.086	3800	3300	**2.00** 4.30
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**245** 55100	**208** 46800	NJ2216EMA	**2.0** 0.08	**2.0** 0.08	**91.3** 3.59	**127.3** 5.01	**1.7** 0.07	0.086	3800	3300	**2.20** 4.90
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**245** 55100	**208** 46800	NJ2216EJ	**2.0** 0.08	**2.0** 0.08	**91.3** 3.59	**127.3** 5.01	**1.7** 0.07	0.086	3800	3300	**2.00** 4.40
80.000 3.1496	**140.000** 5.5118	**33.000** 1.2992	**95.300** 3.7520	**245** 55100	**208** 46800	NUP2216EMA	**2.0** 0.08	**2.0** 0.08	**95.3** 3.75	**127.3** 5.01	–	0.086	3800	3300	**2.30** 5.10
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**289** 64900	**291** 65300	NU316EMA	**2.1** 0.08	**2.1** 0.08	**96.5** 3.80	**151.0** 5.94	**2.4** 0.09	0.088	4500	3900	**4.60** 10.12
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**289** 64900	**291** 65300	NU316EJ	**2.1** 0.08	**2.1** 0.08	**96.5** 3.80	**151.0** 5.94	**2.4** 0.09	0.088	4500	3900	**3.90** 8.50
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**289** 64900	**291** 65300	NJ316EMA	**2.1** 0.08	**2.1** 0.08	**96.5** 3.80	**151.0** 5.94	**2.4** 0.09	0.088	4500	3900	**4.40** 9.70
80.000 3.1496	**170.000** 6.6929	**39.000** 1.5354	**101.000** 3.9764	**289** 64900	**291** 65300	NJ316EJ	**2.1** 0.08	**2.1** 0.08	**96.5** 3.80	**151.0** 5.94	**2.4** 0.09	0.088	4500	3900	**3.90** 8.70
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**439** 98700	**406** 91300	NU2316EMA	**2.1** 0.08	**2.1** 0.08	**95.4** 3.76	**151.0** 5.94	**5.0** 0.20	0.097	3800	3300	**6.50** 14.30
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**439** 98700	**406** 91300	NU2316EJ	**2.1** 0.08	**2.1** 0.08	**95.4** 3.76	**151.0** 5.94	**5.0** 0.20	0.097	3800	3300	**5.90** 12.90

(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

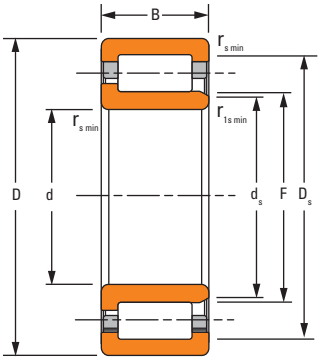
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**439** 98700	**406** 91300	NJ2316EMA	**2.1** 0.08	**2.1** 0.08	**95.4** 3.76	**151.0** 5.94	**5.0** 0.20	0.097	3800	3300	**6.60** 14.60
80.000 3.1496	**170.000** 6.6929	**58.000** 2.2835	**101.000** 3.9764	**439** 98700	**406** 91300	NJ2316EJ	**2.1** 0.08	**2.1** 0.08	**95.4** 3.76	**151.0** 5.94	**5.0** 0.20	0.097	3800	3300	**6.00** 13.20
85.000 3.3465	**150.000** 5.9055	**28.000** 1.1024	**100.500** 3.9567	**201** 45200	**186** 41900	NU217EMA	**2.0** 0.08	**2.0** 0.08	**97.4** 3.83	**136.5** 5.37	**1.7** 0.07	0.083	4600	3900	**2.10** 4.70
85.000 3.3465	**150.000** 5.9055	**28.000** 1.1024	**100.500** 3.9567	**201** 45200	**186** 41900	NU217EJ	**2.0** 0.08	**2.0** 0.08	**97.4** 3.83	**136.5** 5.37	**1.7** 0.07	0.083	4600	3900	**1.90** 4.20
85.000 3.3465	**150.000** 5.9055	**28.000** 1.1024	**100.500** 3.9567	**201** 45200	**186** 41900	NJ217EMA	**2.0** 0.08	**2.0** 0.08	**97.4** 3.83	**136.5** 5.37	**1.7** 0.07	0.083	4600	3900	**2.10** 4.70
85.000 3.3465	**150.000** 5.9055	**28.000** 1.1024	**100.500** 3.9567	**201** 45200	**186** 41900	NJ217EJ	**2.0** 0.08	**2.0** 0.08	**97.4** 3.83	**136.5** 5.37	**1.7** 0.07	0.083	4600	3900	**1.90** 4.23
85.000 3.3465	**150.000** 5.9055	**36.000** 1.4173	**100.500** 3.9567	**282** 63300	**244** 54900	NU2217EMA	**2.0** 0.08	**2.0** 0.08	**97.1** 3.82	**136.5** 5.37	**2.2** 0.09	0.090	3600	3200	**2.70** 6.00
85.000 3.3465	**150.000** 5.9055	**36.000** 1.4173	**100.500** 3.9567	**282** 63300	**244** 54900	NU2217EJ	**2.0** 0.08	**2.0** 0.08	**97.1** 3.82	**136.5** 5.37	**2.2** 0.09	0.090	3600	3200	**2.40** 5.40
85.000 3.3465	**150.000** 5.9055	**36.000** 1.4173	**100.500** 3.9567	**282** 63300	**244** 54900	NJ2217EMA	**2.0** 0.08	**2.0** 0.08	**97.1** 3.82	**136.5** 5.37	**2.2** 0.09	0.090	3600	3200	**2.80** 6.10
85.000 3.3465	**150.000** 5.9055	**36.000** 1.4173	**100.500** 3.9567	**282** 63300	**244** 54900	NJ2217EJ	**2.0** 0.08	**2.0** 0.08	**97.1** 3.82	**136.5** 5.37	**2.2** 0.09	0.090	3600	3200	**2.50** 5.50
85.000 3.3465	**180.000** 7.0866	**41.000** 1.6142	**108.000** 4.2520	**314** 70600	**313** 70400	NU317EMA	**2.5** 0.10	**2.5** 0.10	**103.6** 4.08	**160.0** 6.30	**3.5** 0.14	0.092	4300	3700	**5.00** 11.11
85.000 3.3465	**180.000** 7.0866	**41.000** 1.6142	**108.000** 4.2520	**314** 70600	**313** 70400	NU317EJ	**2.5** 0.10	**2.5** 0.10	**103.6** 4.08	**160.0** 6.30	**3.5** 0.14	0.092	4300	3700	**4.50** 10.10
85.000 3.3465	**180.000** 7.0866	**41.000** 1.6142	**108.000** 4.2520	**314** 70600	**313** 70400	NJ317EMA	**2.5** 0.10	**2.5** 0.10	**103.6** 4.08	**160.0** 6.30	**3.5** 0.14	0.092	4300	3700	**5.10** 11.22
85.000 3.3465	**180.000** 7.0866	**41.000** 1.6142	**108.000** 4.2520	**314** 70600	**313** 70400	NJ317EJ	**2.5** 0.10	**2.5** 0.10	**103.6** 4.08	**160.0** 6.30	**3.5** 0.14	0.092	4300	3700	**4.60** 10.20
85.000 3.3465	**180.000** 7.0866	**60.000** 2.3622	**108.000** 4.2520	**458** 103000	**423** 95200	NU2317EMA	**3.0** 0.12	**3.0** 0.12	**101.8** 4.01	**160.0** 6.30	**5.5** 0.22	0.100	3700	3200	**7.40** 16.40

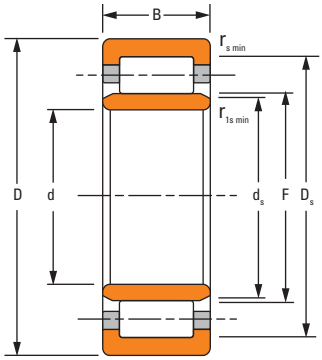
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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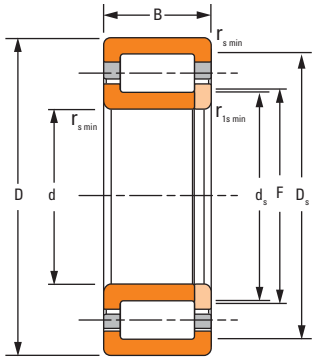
SINGLE-ROW METRIC SERIES – *continued*



NJ



NU



NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
85.000 3.3465	**180.000** 7.0866	**60.000** 2.3622	**108.000** 4.2520	**458** 103000	**423** 95200	NU2317EJ	**3.0** 0.12	**3.0** 0.12	**101.8** 4.01	**160.0** 6.30	**5.5** 0.22	0.100	3700	3200	**6.60** 14.60
85.000 3.3465	**180.000** 7.0866	**60.000** 2.3622	**108.000** 4.2520	**458** 103000	**423** 95200	NJ2317EMA	**3.0** 0.12	**3.0** 0.12	**101.8** 4.01	**160.0** 6.30	**5.5** 0.22	0.100	3700	3200	**7.60** 16.70
85.000 3.3465	**180.000** 7.0866	**60.000** 2.3622	**108.000** 4.2520	**458** 103000	**423** 95200	NJ2317EJ	**3.0** 0.12	**3.0** 0.12	**101.8** 4.01	**160.0** 6.30	**5.5** 0.22	0.100	3700	3200	**6.80** 15.00
90.000 3.5433	**160.000** 6.2992	**30.000** 1.1811	**107.000** 4.2126	**225** 50500	**206** 46400	NU218EMA	**2.0** 0.08	**2.0** 0.08	**103.6** 4.08	**145.0** 5.71	**2.7** 0.11	0.087	4400	3700	**2.60** 5.80
90.000 3.5433	**160.000** 6.2992	**30.000** 1.1811	**107.000** 4.2126	**225** 50500	**206** 46400	NU218EJ	**2.0** 0.08	**2.0** 0.08	**103.6** 4.08	**145.0** 5.71	**2.7** 0.11	0.087	4400	3700	**2.30** 5.10
90.000 3.5433	**160.000** 6.2992	**30.000** 1.1811	**107.000** 4.2126	**225** 50500	**206** 46400	NJ218EMA	**2.0** 0.08	**2.0** 0.08	**103.6** 4.08	**145.0** 5.71	**2.7** 0.11	0.087	4400	3700	**2.70** 5.90
90.000 3.5433	**160.000** 6.2992	**30.000** 1.1811	**107.000** 4.2126	**225** 50500	**206** 46400	NJ218EJ	**2.0** 0.08	**2.0** 0.08	**103.6** 4.08	**145.0** 5.71	**2.7** 0.11	0.087	4400	3700	**2.40** 5.20
90.000 3.5433	**160.000** 6.2992	**40.000** 1.5748	**107.000** 4.2126	**322** 72400	**275** 61900	NU2218EMA	**2.0** 0.08	**2.0** 0.08	**103.0** 4.06	**145.0** 5.71	**3.2** 0.12	0.094	3600	3100	**3.50** 7.70
90.000 3.5433	**160.000** 6.2992	**40.000** 1.5748	**107.000** 4.2126	**322** 72400	**275** 61900	NU2218EJ	**2.0** 0.08	**2.0** 0.08	**103.0** 4.06	**145.0** 5.71	**3.2** 0.12	0.094	3600	3100	**3.20** 6.90
90.000 3.5433	**160.000** 6.2992	**40.000** 1.5748	**107.000** 4.2126	**322** 72400	**275** 61900	NJ2218EMA	**2.0** 0.08	**2.0** 0.08	**102.9** 4.05	**145.0** 5.71	**3.2** 0.12	0.094	3600	3100	**3.60** 7.90
90.000 3.5433	**160.000** 6.2992	**40.000** 1.5748	**107.000** 4.2126	**322** 72400	**275** 61900	NJ2218EJ	**2.0** 0.08	**2.0** 0.08	**102.9** 4.05	**145.0** 5.71	**3.2** 0.12	0.094	3600	3100	**3.20** 7.10
90.000 3.5433	**160.000** 6.2992	**40.000** 1.5748	**107.000** 4.2126	**322** 72400	**275** 61900	NUP2218EMA	**2.0** 0.08	**2.0** 0.08	**102.9** 4.05	**145.0** 5.71	–	0.094	3600	3100	**3.60** 8.00
90.000 3.5433	**190.000** 7.4803	**43.000** 1.6929	**113.500** 4.4685	**362** 81500	**359** 80700	NU318EMA	**3.0** 0.12	**3.0** 0.12	**107.9** 4.25	**169.5** 6.67	**2.5** 0.10	0.096	4000	3500	**6.10** 13.40
90.000 3.5433	**190.000** 7.4803	**43.000** 1.6929	**113.500** 4.4685	**362** 81500	**359** 80700	NU318EJ	**3.0** 0.12	**3.0** 0.12	**107.9** 4.25	**169.5** 6.67	**2.5** 0.10	0.096	4000	3500	**5.30** 11.60
90.000 3.5433	**190.000** 7.4803	**43.000** 1.6929	**113.500** 4.4685	**362** 81500	**359** 80700	NJ318EMA	**3.0** 0.12	**3.0** 0.12	**107.9** 4.25	**169.5** 6.67	**2.5** 0.10	0.096	4000	3500	**6.20** 13.60

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

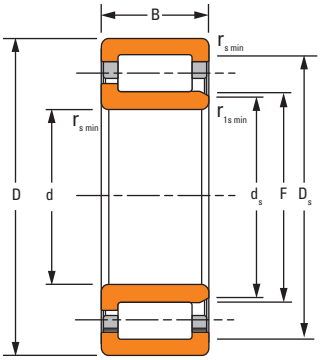
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
90.000 3.5433	**190.000** 7.4803	**43.000** 1.6929	**113.500** 4.4685	**362** 81500	**359** 80700	NJ318EJ	**3.0** 0.12	**3.0** 0.12	**107.9** 4.25	**169.5** 6.67	**2.5** 0.10	0.096	4000	3500	**5.40** 11.80
90.000 3.5433	**190.000** 7.4803	**64.000** 2.5197	**113.500** 4.4685	**544** 122000	**497** 112000	NU2318EMA	**3.0** 0.12	**3.0** 0.12	**106.8** 4.20	**169.5** 6.67	**5.0** 0.20	0.106	3300	2900	**9.10** 20.00
90.000 3.5433	**190.000** 7.4803	**64.000** 2.5197	**113.500** 4.4685	**544** 122000	**497** 112000	NU2318EJ	**3.0** 0.12	**3.0** 0.12	**106.8** 4.20	**169.5** 6.67	**5.0** 0.20	0.106	3300	2900	**8.00** 17.50
90.000 3.5433	**190.000** 7.4803	**64.000** 2.5197	**113.500** 4.4685	**544** 122000	**497** 112000	NJ2318EMA	**3.0** 0.12	**3.0** 0.12	**106.8** 4.20	**169.5** 6.67	**5.0** 0.20	0.106	3300	2900	**9.30** 20.40
90.000 3.5433	**190.000** 7.4803	**64.000** 2.5197	**113.500** 4.4685	**544** 122000	**497** 112000	NJ2318EJ	**3.0** 0.12	**3.0** 0.12	**106.8** 4.20	**169.5** 6.67	**5.0** 0.20	0.106	3300	2900	**8.10** 17.90
95.000 3.7402	**170.000** 6.6929	**32.000** 1.2598	**112.500** 4.4291	**271** 60900	**248** 55800	NU219EMA	**2.1** 0.08	**2.1** 0.08	**109.1** 4.30	**154.5** 6.08	**1.8** 0.07	0.092	4100	3500	**3.10** 6.90
95.000 3.7402	**170.000** 6.6929	**32.000** 1.2598	**112.500** 4.4291	**271** 60900	**248** 55800	NU219EJ	**2.1** 0.08	**2.1** 0.08	**109.1** 4.30	**154.5** 6.08	**1.8** 0.07	0.092	4100	3500	**2.80** 6.20
95.000 3.7402	**170.000** 6.6929	**32.000** 1.2598	**112.500** 4.4291	**271** 60900	**248** 55800	NJ219EMA	**2.1** 0.08	**2.1** 0.08	**109.1** 4.30	**154.5** 6.08	**1.8** 0.07	0.092	4100	3500	**3.20** 7.00
95.000 3.7402	**170.000** 6.6929	**32.000** 1.2598	**112.500** 4.4291	**271** 60900	**248** 55800	NJ219EJ	**2.1** 0.08	**2.1** 0.08	**109.1** 4.30	**154.5** 6.08	**1.8** 0.07	0.092	4100	3500	**2.90** 6.30
95.000 3.7402	**170.000** 6.6929	**43.000** 1.6929	**112.500** 4.4291	**378** 84900	**324** 72800	NU2219EMA	**2.1** 0.08	**2.1** 0.08	**108.1** 4.26	**154.5** 6.08	**3.5** 0.14	0.099	3400	2900	**4.20** 9.30
95.000 3.7402	**170.000** 6.6929	**43.000** 1.6929	**112.500** 4.4291	**378** 84900	**324** 72800	NU2219EJ	**2.1** 0.08	**2.1** 0.08	**108.1** 4.26	**154.5** 6.08	**3.5** 0.14	0.099	3400	2900	**3.80** 8.40
95.000 3.7402	**170.000** 6.6929	**43.000** 1.6929	**112.500** 4.4291	**378** 84900	**324** 72800	NJ2219EMA	**2.1** 0.08	**2.1** 0.08	**108.1** 4.26	**154.5** 6.08	**3.5** 0.14	0.099	3400	2900	**4.30** 9.50
95.000 3.7402	**170.000** 6.6929	**43.000** 1.6929	**112.500** 4.4291	**378** 84900	**324** 72800	NJ2219EJ	**2.1** 0.08	**2.1** 0.08	**108.1** 4.26	**154.5** 6.08	**3.5** 0.14	0.099	3400	2900	**3.90** 8.60
95.000 3.7402	**200.000** 7.8740	**45.000** 1.7717	**121.500** 4.7835	**395** 88900	**379** 85300	NU319EMA	**3.0** 0.12	**3.0** 0.12	**115.3** 4.54	**177.5** 6.99	**3.0** 0.12	0.101	3900	3400	**7.10** 15.70
95.000 3.7402	**200.000** 7.8740	**45.000** 1.7717	**121.500** 4.7835	**395** 88900	**379** 85300	NU319EJ	**3.0** 0.12	**3.0** 0.12	**115.3** 4.54	**177.5** 6.99	**3.0** 0.12	0.101	3900	3400	**6.20** 13.60

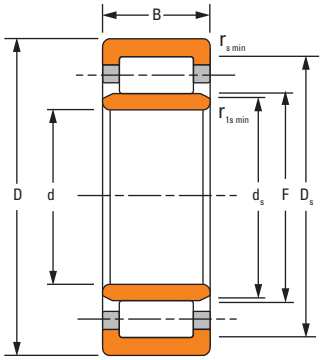
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

Continued on next page.

SINGLE-ROW METRIC SERIES – *continued*



NJ



NU

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
95.000 3.7402	**200.000** 7.8740	**45.000** 1.7717	**121.500** 4.7835	**395** 88900	**379** 85300	NJ319EMA	**3.0** 0.12	**3.0** 0.12	**115.3** 4.54	**177.5** 6.99	**3.0** 0.12	0.101	3900	3400	**7.30** 16.00
95.000 3.7402	**200.000** 7.8740	**45.000** 1.7717	**121.500** 4.7835	**395** 88900	**379** 85300	NJ319EJ	**3.0** 0.12	**3.0** 0.12	**115.3** 4.54	**177.5** 6.99	**3.0** 0.12	0.101	3900	3400	**6.30** 13.90
95.000 3.7402	**200.000** 7.8740	**67.000** 2.6378	**121.500** 4.7835	**593** 133000	**525** 118000	NU2319EMA	**3.0** 0.12	**3.0** 0.12	**115.5** 4.55	**177.5** 6.99	**7.1** 0.28	0.111	3100	2700	**10.40** 22.80
95.000 3.7402	**200.000** 7.8740	**67.000** 2.6378	**121.500** 4.7835	**593** 133000	**525** 118000	NU2319EJ	**3.0** 0.12	**3.0** 0.12	**115.5** 4.55	**177.5** 6.99	**7.1** 0.28	0.111	3100	2700	**9.30** 20.50
95.000 3.7402	**200.000** 7.8740	**67.000** 2.6378	**121.500** 4.7835	**593** 133000	**525** 118000	NJ2319EMA	**3.0** 0.12	**3.0** 0.12	**115.5** 4.55	**177.5** 6.99	**7.1** 0.28	0.111	3100	2700	**10.60** 23.30
95.000 3.7402	**200.000** 7.8740	**67.000** 2.6378	**121.500** 4.7835	**593** 133000	**525** 118000	NJ2319EJ	**3.0** 0.12	**3.0** 0.12	**115.5** 4.55	**177.5** 6.99	**7.1** 0.28	0.111	3100	2700	**9.50** 21.00
100.000 3.9370	**180.000** 7.0866	**34.000** 1.3386	**119.000** 4.6850	**311** 70000	**280** 63000	NU220EMA	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**2.3** 0.09	0.097	3900	3300	**3.80** 8.40
100.000 3.9370	**180.000** 7.0866	**34.000** 1.3386	**119.000** 4.6850	**311** 70000	**280** 63000	NU220EJ	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**2.3** 0.09	0.097	3900	3300	**3.40** 7.50
100.000 3.9370	**180.000** 7.0866	**34.000** 1.3386	**119.000** 4.6850	**311** 70000	**280** 63000	NJ220EMA	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**2.3** 0.09	0.097	3900	3300	**3.90** 8.60
100.000 3.9370	**180.000** 7.0866	**34.000** 1.3386	**119.000** 4.6850	**311** 70000	**280** 63000	NJ220EJ	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**2.3** 0.09	0.097	3900	3300	**3.50** 7.60
100.000 3.9370	**180.000** 7.0866	**46.000** 1.8110	**119.000** 4.6850	**451** 101000	**377** 84800	NU2220EMA	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**3.3** 0.13	0.105	3100	2800	**5.20** 11.40
100.000 3.9370	**180.000** 7.0866	**46.000** 1.8110	**119.000** 4.6850	**451** 101000	**377** 84800	NU2220EJ	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**3.3** 0.13	0.105	3100	2800	**4.70** 10.40
100.000 3.9370	**180.000** 7.0866	**46.000** 1.8110	**119.000** 4.6850	**451** 101000	**377** 84800	NJ2220EMA	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**3.3** 0.13	0.105	3100	2800	**5.30** 11.60
100.000 3.9370	**180.000** 7.0866	**46.000** 1.8110	**119.000** 4.6850	**451** 101000	**377** 84800	NJ2220EJ	**2.1** 0.08	**2.1** 0.08	**115.0** 4.53	**163.0** 6.42	**3.3** 0.13	0.105	3100	2800	**4.80** 10.60
100.000 3.9370	**215.000** 8.4646	**47.000** 1.8504	**127.500** 5.0197	**442** 99400	**437** 98200	NU320EMA	**3.0** 0.12	**3.0** 0.12	**120.7** 4.75	**191.5** 7.54	**3.0** 0.12	0.104	3600	3200	**8.40** 18.50

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

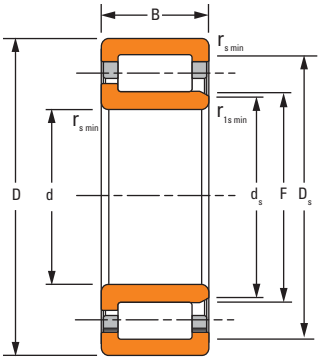
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
100.000 3.9370	**215.000** 8.4646	**47.000** 1.8504	**127.500** 5.0197	**442** 99400	**437** 98200	NU320EJ	**3.0** 0.12	**3.0** 0.12	**120.7** 4.75	**191.5** 7.54	**3.0** 0.12	0.104	3600	3200	**7.00** 16.00
100.000 3.9370	**215.000** 8.4646	**47.000** 1.8504	**127.500** 5.0197	**442** 99400	**437** 98200	NJ320EMA	**3.0** 0.12	**3.0** 0.12	**120.7** 4.75	**191.5** 7.54	**3.0** 0.12	0.104	3600	3200	**8.80** 19.40
100.000 3.9370	**215.000** 8.4646	**47.000** 1.8504	**127.500** 5.0197	**442** 99400	**437** 98200	NJ320EJ	**3.0** 0.12	**3.0** 0.12	**120.7** 4.75	**191.5** 7.54	**3.0** 0.12	0.104	3600	3200	**8.00** 17.00
100.000 3.9370	**215.000** 8.4646	**73.000** 2.8740	**127.500** 5.0197	**737** 166000	**658** 148000	NU2320EMA	**3.0** 0.12	**3.0** 0.12	**120.4** 4.74	**191.5** 7.54	**5.2** 0.20	0.117	2700	2400	**13.40** 29.50
100.000 3.9370	**215.000** 8.4646	**73.000** 2.8740	**127.500** 5.0197	**737** 166000	**658** 148000	NU2320EJ	**3.0** 0.12	**3.0** 0.12	**120.4** 4.74	**191.5** 7.54	**5.2** 0.20	0.117	2700	2400	**12.00** 26.30
100.000 3.9370	**215.000** 8.4646	**73.000** 2.8740	**127.500** 5.0197	**737** 166000	**658** 148000	NJ2320EMA	**3.0** 0.12	**3.0** 0.12	**120.4** 4.74	**191.5** 7.54	**5.2** 0.20	0.117	2700	2400	**13.70** 30.10
100.000 3.9370	**215.000** 8.4646	**73.000** 2.8740	**127.500** 5.0197	**737** 166000	**658** 148000	NJ2320EJ	**3.0** 0.12	**3.0** 0.12	**120.4** 4.74	**191.5** 7.54	**5.2** 0.20	0.117	2700	2400	**12.20** 26.80
110.000 4.3307	**200.000** 7.8740	**38.000** 1.4961	**132.500** 5.2165	**374** 84000	**331** 74400	NU222EMA	**2.1** 0.08	**2.1** 0.08	**128.5** 5.06	**180.5** 7.11	**2.5** 0.10	0.104	3600	3100	**5.40** 11.90
110.000 4.3307	**200.000** 7.8740	**38.000** 1.4961	**132.500** 5.2165	**374** 84000	**331** 74400	NU222EJ	**2.1** 0.08	**2.1** 0.08	**128.5** 5.06	**180.5** 7.11	**2.5** 0.10	0.104	3600	3100	**4.70** 10.40
110.000 4.3307	**200.000** 7.8740	**38.000** 1.4961	**132.500** 5.2165	**374** 84000	**331** 74400	NJ222EMA	**2.1** 0.08	**2.1** 0.08	**128.5** 5.06	**180.5** 7.11	**2.5** 0.10	0.104	3600	3100	**5.50** 12.10
110.000 4.3307	**200.000** 7.8740	**38.000** 1.4961	**132.500** 5.2165	**374** 84000	**331** 74400	NJ222EJ	**2.1** 0.08	**2.1** 0.08	**128.5** 5.06	**180.5** 7.11	**2.5** 0.10	0.104	3600	3100	**4.80** 10.70
110.000 4.3307	**200.000** 7.8740	**53.000** 2.0866	**132.500** 5.2165	**527** 118000	**436** 98000	NU2222EMA	**2.1** 0.08	**2.1** 0.08	**126.8** 4.99	**180.5** 7.11	**4.1** 0.16	0.113	3000	2700	**7.50** 16.50
110.000 4.3307	**200.000** 7.8740	**53.000** 2.0866	**132.500** 5.2165	**527** 118000	**436** 98000	NU2222EJ	**2.1** 0.08	**2.1** 0.08	**126.8** 4.99	**180.5** 7.11	**4.1** 0.16	0.113	3000	2700	**6.70** 14.80
110.000 4.3307	**200.000** 7.8740	**53.000** 2.0866	**132.500** 5.2165	**527** 118000	**436** 98000	NJ2222EMA	**2.1** 0.08	**2.1** 0.08	**126.8** 4.99	**180.5** 7.11	**4.1** 0.16	0.113	3000	2700	**7.60** 16.80
110.000 4.3307	**200.000** 7.8740	**53.000** 2.0866	**132.500** 5.2165	**527** 118000	**436** 98000	NJ2222EJ	**2.1** 0.08	**2.1** 0.08	**126.8** 4.99	**180.5** 7.11	**4.1** 0.16	0.113	3000	2700	**6.90** 15.10

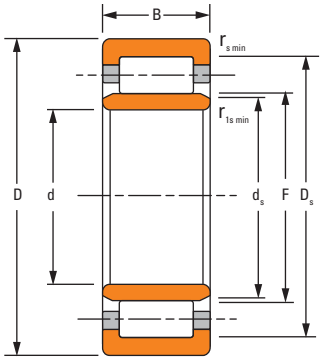
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

Continued on next page.

SINGLE-ROW METRIC SERIES – *continued*



NJ



NU

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
110.000 4.3307	**240.000** 9.4488	**50.000** 1.9685	**143.000** 5.6299	**546** 123000	**519** 11700	NU322EMA	**3.0** 0.12	**3.0** 0.12	**136.2** 5.36	**211.0** 8.31	**3.0** 0.12	0.114	3100	2800	**11.60** 25.40
110.000 4.3307	**240.000** 9.4488	**50.000** 1.9685	**143.000** 5.6299	**546** 123000	**519** 11700	NU322EJ	**3.0** 0.12	**3.0** 0.12	**136.2** 5.36	**211.0** 8.31	**3.0** 0.12	0.114	3100	2800	**10.30** 22.70
110.000 4.3307	**240.000** 9.4488	**50.000** 1.9685	**143.000** 5.6299	**546** 123000	**519** 11700	NJ322EMA	**3.0** 0.12	**3.0** 0.12	**136.2** 5.36	**211.0** 8.31	**3.0** 0.12	0.114	3100	2800	**11.80** 25.90
110.000 4.3307	**240.000** 9.4488	**50.000** 1.9685	**143.000** 5.6299	**546** 123000	**519** 11700	NJ322EJ	**3.0** 0.12	**3.0** 0.12	**136.2** 5.36	**211.0** 8.31	**3.0** 0.12	0.114	3100	2800	**10.50** 23.20
110.000 4.3307	**240.000** 9.4488	**80.000** 3.1496	**143.000** 5.6299	**891** 200000	**768** 173000	NU2322EMA	**3.0** 0.12	**3.0** 0.12	**134.6** 5.30	**211.0** 8.31	**6.4** 0.25	0.128	2400	2100	**18.60** 40.90
110.000 4.3307	**240.000** 9.4488	**80.000** 3.1496	**143.000** 5.6299	**891** 200000	**768** 173000	NU2322EJ	**3.0** 0.12	**3.0** 0.12	**134.6** 5.30	**211.0** 8.31	**6.4** 0.25	0.128	2400	2100	**16.90** 37.20
110.000 4.3307	**240.000** 9.4488	**80.000** 3.1496	**143.000** 5.6299	**891** 200000	**768** 173000	NJ2322EMA	**3.0** 0.12	**3.0** 0.12	**134.6** 5.30	**211.0** 8.31	**6.4** 0.25	0.128	2400	2100	**19.20** 42.10
110.000 4.3307	**240.000** 9.4488	**80.000** 3.1496	**143.000** 5.6299	**891** 200000	**768** 173000	NJ2322EJ	**3.0** 0.12	**3.0** 0.12	**134.6** 5.30	**211.0** 8.31	**6.4** 0.25	0.128	2400	2100	**17.20** 37.90
120.000 4.7244	**180.000** 7.0866	**28.000** 1.1024	**135.000** 5.3150	**202** 45300	**158** 35600	NU1024MA	**2.0** 0.08	**1.1** 0.04	**131.2** 5.17	**165.0** 6.50	**3.8** 0.15	0.096	3600	2900	**2.60** 5.60
120.000 4.7244	**215.000** 8.4646	**40.000** 1.5748	**143.500** 5.6496	**431** 97000	**379** 85300	NU224EMA	**2.1** 0.08	**2.1** 0.08	**138.0** 5.43	**195.5** 7.70	**2.1** 0.08	0.111	3400	2900	**6.50** 14.30
120.000 4.7244	**215.000** 8.4646	**40.000** 1.5748	**143.500** 5.6496	**431** 97000	**379** 85300	NU224EJ	**2.1** 0.08	**2.1** 0.08	**138.0** 5.43	**195.5** 7.70	**2.1** 0.08	0.111	3400	2900	**5.60** 12.40
120.000 4.7244	**215.000** 8.4646	**40.000** 1.5748	**143.500** 5.6496	**431** 97000	**379** 85300	NJ224EMA	**2.1** 0.08	**2.1** 0.08	**138.0** 5.43	**195.5** 7.70	**2.1** 0.08	0.111	3400	2900	**6.60** 14.50
120.000 4.7244	**215.000** 8.4646	**40.000** 1.5748	**143.500** 5.6496	**431** 97000	**379** 85300	NJ224EJ	**2.1** 0.08	**2.1** 0.08	**138.0** 5.43	**195.5** 7.70	**2.1** 0.08	0.111	3400	2900	**5.80** 12.70
120.000 4.7244	**215.000** 8.4646	**58.000** 2.2835	**143.500** 5.6496	**630** 142000	**514** 116000	NU2224EMA	**2.1** 0.08	**2.1** 0.08	**137.4** 5.41	**195.5** 7.70	**4.6** 0.18	0.121	2700	2400	**9.40** 20.80
120.000 4.7244	**215.000** 8.4646	**58.000** 2.2835	**143.500** 5.6496	**630** 142000	**514** 116000	NU2224EJ	**2.1** 0.08	**2.1** 0.08	**137.4** 5.41	**195.5** 7.70	**4.6** 0.18	0.121	2700	2400	**8.30** 18.30

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

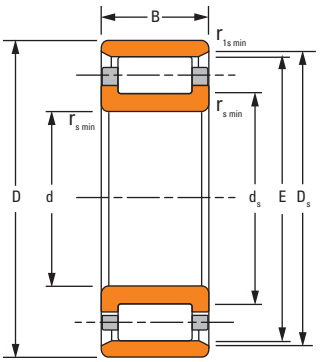
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
120.000 4.7244	**215.000** 8.4646	**58.000** 2.2835	**143.500** 5.6496	**630** 142000	**514** 116000	NJ2224EMA	**2.1** 0.08	**2.1** 0.08	**137.4** 5.41	**195.5** 7.70	**4.6** 0.18	0.121	2700	2400	**9.60** 21.20
120.000 4.7244	**215.000** 8.4646	**58.000** 2.2835	**143.500** 5.6496	**630** 142000	**514** 116000	NJ2224EJ	**2.1** 0.08	**2.1** 0.08	**137.4** 5.41	**195.5** 7.70	**4.6** 0.18	0.121	2700	2400	**8.50** 18.70
120.000 4.7244	**260.000** 10.2362	**55.000** 2.1654	**154.000** 6.0630	**614** 138000	**594** 134000	NU324EMA	**3.0** 0.12	**3.0** 0.12	**147.0** 5.79	**230.0** 9.06	**3.8** 0.15	0.120	2900	2500	**14.70** 32.30
120.000 4.7244	**260.000** 10.2362	**55.000** 2.1654	**154.000** 6.0630	**614** 138000	**594** 134000	NU324EJ	**3.0** 0.12	**3.0** 0.12	**147.0** 5.79	**230.0** 9.06	**3.8** 0.15	0.120	2900	2500	**13.00** 28.60
120.000 4.7244	**260.000** 10.2362	**55.000** 2.1654	**154.000** 6.0630	**614** 138000	**594** 134000	NJ324EMA	**3.0** 0.12	**3.0** 0.12	**147.0** 5.79	**230.0** 9.06	**3.8** 0.15	0.120	2900	2500	**15.00** 32.90
120.000 4.7244	**260.000** 10.2362	**55.000** 2.1654	**154.000** 6.0630	**614** 138000	**594** 134000	NJ324EJ	**3.0** 0.12	**3.0** 0.12	**147.0** 5.79	**230.0** 9.06	**3.8** 0.15	0.120	2900	2500	**13.30** 29.20
120.000 4.7244	**260.000** 10.2362	**86.000** 3.3858	**154.000** 6.0630	**1040** 233000	**902** 203000	NU2324EMA	**3.0** 0.12	**3.0** 0.12	**145.9** 5.74	**230.0** 9.06	**6.3** 0.25	0.136	2100	1900	**23.10** 50.90
120.000 4.7244	**260.000** 10.2362	**86.000** 3.3858	**154.000** 6.0630	**1040** 233000	**902** 203000	NJ2324EMA	**3.0** 0.12	**3.0** 0.12	**145.9** 5.74	**230.0** 9.06	**6.3** 0.25	0.136	2100	1900	**23.60** 52.00
130.000 5.1181	**200.000** 7.8740	**33.000** 1.2992	**148.000** 5.8268	**251** 56500	**197** 44300	NU1026MA	**2.0** 0.08	**1.1** 0.04	**142.6** 5.61	**182.0** 7.17	**2.2** 0.09	0.104	3500	2900	**7.20** 15.80
130.000 5.1181	**230.000** 9.0551	**40.000** 1.5748	**153.500** 6.0433	**464** 104000	**411** 92300	NU226EMA	**3.0** 0.12	**3.0** 0.12	**148.0** 5.83	**209.5** 8.25	**2.2** 0.09	0.115	3100	2700	**7.20** 15.80
130.000 5.1181	**230.000** 9.0551	**40.000** 1.5748	**153.500** 6.0433	**464** 104000	**411** 92300	NU226EJ	**3.0** 0.12	**3.0** 0.12	**148.0** 5.83	**209.5** 8.25	**2.2** 0.09	0.115	3100	2700	**6.30** 13.90
130.000 5.1181	**230.000** 9.0551	**40.000** 1.5748	**153.500** 6.0433	**464** 104000	**411** 92300	NJ226EMA	**3.0** 0.12	**3.0** 0.12	**148.0** 5.83	**209.5** 8.25	**2.2** 0.09	0.115	3100	2700	**7.30** 16.10
130.000 5.1181	**230.000** 9.0551	**40.000** 1.5748	**153.500** 6.0433	**464** 104000	**411** 92300	NJ226EJ	**3.0** 0.12	**3.0** 0.12	**148.0** 5.83	**209.5** 8.25	**2.2** 0.09	0.115	3100	2700	**6.50** 14.20
130.000 5.1181	**230.000** 9.0551	**64.000** 2.5197	**153.500** 6.0433	**750** 169000	**603** 135000	NU2226EMA	**3.0** 0.12	**3.0** 0.12	**146.8** 5.78	**209.5** 8.25	**5.0** 0.20	0.129	2400	2200	**11.50** 25.40
130.000 5.1181	**230.000** 9.0551	**64.000** 2.5197	**153.500** 6.0433	**750** 169000	**603** 135000	NU2226EJ	**3.0** 0.12	**3.0** 0.12	**146.8** 5.78	**209.5** 8.25	**5.0** 0.20	0.129	2400	2200	**10.00** 23.00

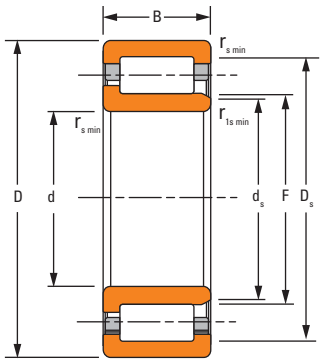
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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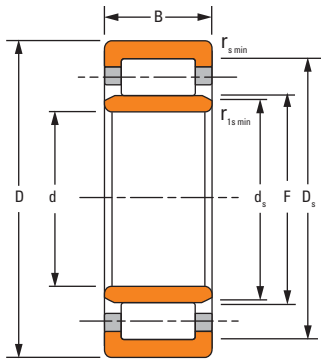
SINGLE-ROW METRIC SERIES – *continued*



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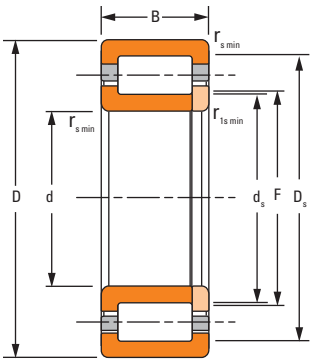


NU

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
130.000 5.1181	**230.000** 9.0551	**64.000** 2.5197	**153.500** 6.0433	**750** 169000	**603** 135000	NJ2226EMA	**3.0** 0.12	**3.0** 0.12	**146.8** 5.78	**209.5** 8.25	**5.0** 0.20	0.129	2400	2200	**11.80** 25.90
130.000 5.1181	**230.000** 9.0551	**64.000** 2.5197	**153.500** 6.0433	**750** 169000	**603** 135000	NJ2226EJ	**3.0** 0.12	**3.0** 0.12	**146.8** 5.78	**209.5** 8.25	**5.0** 0.20	0.129	2400	2200	**11.00** 23.00
130.000 5.1181	**280.000** 11.0236	**58.000** 2.2835	**167.000** 6.5748	**753** 169000	**701** 158000	NU326EMA	**4.0** 0.16	**4.0** 0.16	**159.7** 6.29	**247.0** 9.72	**3.7** 0.14	0.108	2500	2200	**18.10** 39.70
130.000 5.1181	**280.000** 11.0236	**58.000** 2.2835	**167.000** 6.5748	**753** 169000	**701** 158000	NU326EJ	**4.0** 0.16	**4.0** 0.16	**159.7** 6.29	**247.0** 9.72	**3.7** 0.14	0.108	2500	2200	**16.10** 35.40
130.000 5.1181	**280.000** 11.0236	**58.000** 2.2835	**167.000** 6.5748	**753** 169000	**701** 158000	NJ326EMA	**4.0** 0.16	**4.0** 0.16	**159.7** 6.29	**247.0** 9.72	**3.7** 0.14	0.108	2500	2200	**18.50** 40.70
130.000 5.1181	**280.000** 11.0236	**58.000** 2.2835	**167.000** 6.5748	**753** 169000	**701** 158000	NJ326EJ	**4.0** 0.16	**4.0** 0.16	**159.7** 6.29	**247.0** 9.72	**3.7** 0.14	0.108	2500	2200	**16.40** 36.10
130.000 5.1181	**280.000** 11.0236	**93.000** 3.6614	**167.000** 6.5748	**1240** 278000	**1040** 235000	NU2326EMA	**4.0** 0.16	**4.0** 0.16	**158.1** 6.22	**247.0** 9.72	**7.6** 0.30	0.122	1900	1700	**29.30** 64.40
130.000 5.1181	**280.000** 11.0236	**93.000** 3.6614	**167.000** 6.5748	**1240** 278000	**1040** 235000	NJ2326EMA	**4.0** 0.16	**4.0** 0.16	**158.1** 6.22	**247.0** 9.72	**7.6** 0.30	0.122	1900	1700	**29.80** 65.50
140.000 5.5118	**210.000** 8.2677	**33.000** 1.2992	**158.000** 6.2205	**263** 59200	**201** 45200	NU1028MA	**2.0** 0.08	**1.1** 0.04	**152.9** 6.02	**192.0** 7.56	**3.8** 0.15	0.108	3300	2700	**4.00** 8.90
140.000 5.5118	**250.000** 9.8425	**42.000** 1.6535	**169.000** 6.6535	**526** 118000	**443** 99500	NU228EMA	**3.0** 0.12	**3.0** 0.12	**162.4** 6.39	**225.0** 8.86	**2.1** 0.08	0.124	2900	2500	**9.20** 20.30
140.000 5.5118	**250.000** 9.8425	**42.000** 1.6535	**169.000** 6.6535	**526** 118000	**443** 99500	NU228EJ	**3.0** 0.12	**3.0** 0.12	**162.4** 6.39	**225.0** 8.86	**2.1** 0.08	0.124	2900	2500	**8.20** 17.90
140.000 5.5118	**250.000** 9.8425	**42.000** 1.6535	**169.000** 6.6535	**526** 118000	**443** 99500	NJ228EMA	**3.0** 0.12	**3.0** 0.12	**162.4** 6.39	**225.0** 8.86	**2.1** 0.08	0.124	2900	2500	**9.40** 20.70
140.000 5.5118	**250.000** 9.8425	**42.000** 1.6535	**169.000** 6.6535	**526** 118000	**443** 99500	NJ228EJ	**3.0** 0.12	**3.0** 0.12	**162.4** 6.39	**225.0** 8.86	**2.1** 0.08	0.124	2900	2500	**8.30** 18.30
140.000 5.5118	**250.000** 9.8425	**68.000** 2.6772	**169.000** 6.6535	**850** 191000	**650** 146000	NU2228EMA	**3.0** 0.12	**3.0** 0.12	**160.1** 6.30	**225.0** 8.86	**5.0** 0.20	0.138	2200	2000	**14.80** 32.50
140.000 5.5118	**250.000** 9.8425	**68.000** 2.6772	**169.000** 6.6535	**850** 191000	**650** 146000	NJ2228EMA	**3.0** 0.12	**3.0** 0.12	**160.1** 6.30	**225.0** 8.86	**5.0** 0.20	0.138	2200	2000	**15.10** 33.20

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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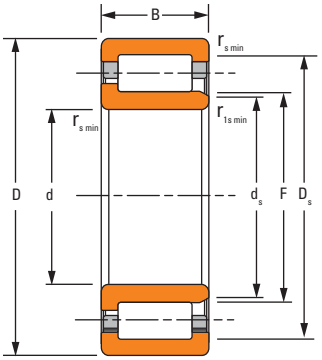
NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
140.000 5.5118	**300.000** 11.8110	**62.000** 2.4409	**180.000** 7.0866	**837** 188000	**771** 173000	NU328EMA	**4.0** 0.16	**4.0** 0.16	**174.2** 6.86	**264.0** 10.39	**5.2** 0.20	0.114	2300	2000	**22.10** 48.50
140.000 5.5118	**300.000** 11.8110	**62.000** 2.4409	**180.000** 7.0866	**837** 188000	**771** 173000	NU328EJ	**4.0** 0.16	**4.0** 0.16	**174.2** 6.86	**264.0** 10.39	**5.2** 0.20	0.114	2300	2000	**19.70** 43.20
140.000 5.5118	**300.000** 11.8110	**62.000** 2.4409	**180.000** 7.0866	**837** 188000	**771** 173000	NJ328EMA	**4.0** 0.16	**4.0** 0.16	**174.2** 6.86	**264.0** 10.39	**5.2** 0.20	0.114	2300	2000	**22.50** 49.50
140.000 5.5118	**300.000** 11.8110	**62.000** 2.4409	**180.000** 7.0866	**837** 188000	**771** 173000	NJ328EJ	**4.0** 0.16	**4.0** 0.16	**174.2** 6.86	**264.0** 10.39	**5.2** 0.20	0.114	2300	2000	**20.00** 44.10
140.000 5.5118	**300.000** 11.8110	**102.000** 4.0157	**180.000** 7.0866	**1420** 319000	**1180** 265000	NU2328EMA	**4.0** 0.16	**4.0** 0.16	**171.3** 6.74	**264.0** 10.39	**9.7** 0.38	0.129	1700	1500	**36.10** 79.40
140.000 5.5118	**300.000** 11.8110	**102.000** 4.0157	**180.000** 7.0866	**1420** 319000	**1180** 265000	NJ2328EMA	**4.0** 0.16	**4.0** 0.16	**171.3** 6.74	**264.0** 10.39	**9.7** 0.38	0.129	1700	1500	**36.80** 81.00
150.000 5.9055	**225.000** 8.8583	**35.000** 1.3780	**169.500** 6.6732	**309** 69500	**231** 51900	NU1030MA	**2.1** 0.08	**1.5** 0.06	**164.6** 6.48	**205.5** 8.09	**4.9** 0.19	0.115	3100	2500	**4.90** 10.80
150.000 5.9055	**270.000** 10.6299	**45.000** 1.7717	**182.000** 7.1654	**607** 137000	**506** 114000	NU230EMA	**3.0** 0.12	**3.0** 0.12	**176.9** 6.96	**242.0** 9.53	**4.0** 0.16	0.109	2600	2300	**11.60** 25.60
150.000 5.9055	**270.000** 10.6299	**45.000** 1.7717	**182.000** 7.1654	**607** 137000	**506** 114000	NU230EJ	**3.0** 0.12	**3.0** 0.12	**176.9** 6.96	**242.0** 9.53	**4.0** 0.16	0.109	2600	2300	**10.40** 22.80
150.000 5.9055	**270.000** 10.6299	**45.000** 1.7717	**182.000** 7.1654	**607** 137000	**506** 114000	NJ230EMA	**3.0** 0.12	**3.0** 0.12	**176.9** 6.96	**242.0** 9.53	**4.0** 0.16	0.109	2600	2300	**12.00** 26.30
150.000 5.9055	**270.000** 10.6299	**45.000** 1.7717	**182.000** 7.1654	**607** 137000	**506** 114000	NJ230EJ	**3.0** 0.12	**3.0** 0.12	**176.9** 6.96	**242.0** 9.53	**4.0** 0.16	0.109	2600	2300	**10.60** 23.30
150.000 5.9055	**270.000** 10.6299	**45.000** 1.7717	**182.000** 7.1654	**607** 137000	**506** 114000	NUP230EMA	**3.0** 0.12	**3.0** 0.12	**176.9** 6.96	**242.0** 9.53	–	0.109	2600	2300	**12.10** 26.60
150.000 5.9055	**270.000** 10.6299	**73.000** 2.8740	**182.000** 7.1654	**998** 224000	**752** 169000	NU2230EMA	**3.0** 0.12	**3.0** 0.12	**173.5** 6.83	**242.0** 9.53	**6.0** 0.24	0.123	2000	1800	**18.60** 40.90
150.000 5.9055	**270.000** 10.6299	**73.000** 2.8740	**182.000** 7.1654	**998** 224000	**752** 169000	NJ2230EMA	**3.0** 0.12	**3.0** 0.12	**173.5** 6.83	**242.0** 9.53	**6.0** 0.24	0.123	2000	1800	**18.90** 41.36
150.000 5.9055	**270.000** 10.6299	**73.000** 2.8740	**242.000** 9.5276	**998** 224000	**752** 169000	N2230EMB	**3.0** 0.12	**3.0** 0.12	**182.0** 7.17	**250.5** 9.86	**6.0** 0.24	0.123	2000	1800	**18.40** 40.40

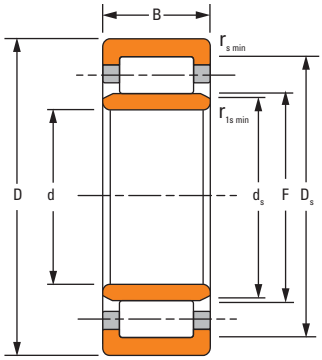
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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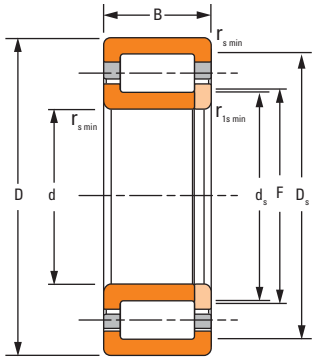
SINGLE-ROW METRIC SERIES – *continued*



NJ



NU



NUP

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
150.000 5.9055	**320.000** 12.5984	**65.000** 2.5591	**193.000** 7.5984	**951** 214000	**870** 196000	NU330EMA	**4.0** 0.16	**4.0** 0.16	**185.7** 7.31	**283.0** 11.14	**4.0** 0.16	0.120	2100	1900	**26.20** 57.70
150.000 5.9055	**320.000** 12.5984	**65.000** 2.5591	**193.000** 7.5984	**951** 214000	**870** 196000	NJ330EMA	**4.0** 0.16	**4.0** 0.16	**185.7** 7.31	**283.0** 11.14	**4.0** 0.16	0.120	2100	1900	**26.70** 58.80
150.000 5.9055	**320.000** 12.5984	**108.000** 4.2520	**193.000** 7.5984	**1620** 364000	**1330** 299000	NU2330EMA	**4.0** 0.16	**4.0** 0.16	**182.7** 7.19	**283.0** 11.14	**9.0** 0.35	0.136	1600	1400	**43.60** 95.80
150.000 5.9055	**320.000** 12.5984	**108.000** 4.2520	**193.000** 7.5984	**1620** 364000	**1330** 299000	NJ2330EMA	**4.0** 0.16	**4.0** 0.16	**182.7** 7.19	**283.0** 11.14	**9.0** 0.35	0.136	1600	1400	**44.40** 97.70
160.000 6.2992	**240.000** 9.4488	**38.000** 1.4961	**180.000** 7.0866	**367** 82500	**276** 62000	NU1032MA	**2.1** 0.08	**1.5** 0.06	**173.9** 6.85	**220.0** 8.66	**4.4** 0.17	0.121	3000	2400	**5.90** 13.00
160.000 6.2992	**290.000** 11.4173	**48.000** 1.8898	**195.000** 7.6772	**695** 156000	**572** 129000	NU232EMA	**3.0** 0.12	**3.0** 0.12	**189.6** 7.46	**259.0** 10.20	**4.2** 0.17	0.115	2400	2100	**14.50** 31.80
160.000 6.2992	**290.000** 11.4173	**48.000** 1.8898	**195.000** 7.6772	**695** 156000	**572** 129000	NJ232EMA	**3.0** 0.12	**3.0** 0.12	**189.6** 7.46	**259.0** 10.20	**4.2** 0.17	0.115	2400	2100	**14.70** 32.40
160.000 6.2992	**290.000** 11.4173	**48.000** 1.8898	**195.000** 7.6772	**695** 156000	**572** 129000	NUP232EMA	**3.0** 0.12	**3.0** 0.12	**189.6** 7.46	**259.0** 10.20	–	0.115	2400	2100	**15.00** 33.00
160.000 6.2992	**290.000** 11.4173	**80.000** 3.1496	**193.000** 7.5984	**1210** 271000	**919** 207000	NU2232EMA	**3.0** 0.12	**3.0** 0.12	**183.6** 7.23	**261.0** 10.28	**4.5** 0.18	0.130	1700	1600	**23.80** 52.40
160.000 6.2992	**290.000** 11.4173	**80.000** 3.1496	**193.000** 7.5984	**1210** 271000	**919** 207000	NJ2232EMA	**3.0** 0.12	**3.0** 0.12	**183.6** 7.23	**261.0** 10.28	**4.5** 0.18	0.130	1700	1600	**24.30** 53.50
160.000 6.2992	**340.000** 13.3858	**68.000** 2.6772	**204.000** 8.0315	**1090** 244000	**985** 221000	NU332EMA	**4.0** 0.16	**4.0** 0.16	**197.3** 7.77	**300.0** 11.81	**5.5** 0.22	0.126	1900	1700	**31.10** 68.40
160.000 6.2992	**340.000** 13.3858	**68.000** 2.6772	**204.000** 8.0315	**1090** 244000	**985** 221000	NJ332EMA	**4.0** 0.16	**4.0** 0.16	**197.3** 7.77	**300.0** 11.81	**5.5** 0.22	0.126	1900	1700	**31.60** 69.50
160.000 6.2992	**340.000** 13.3858	**114.000** 4.4882	**204.000** 8.0315	**1840** 413000	**1500** 337000	NU2332EMA	**4.0** 0.16	**4.0** 0.16	**194.0** 7.64	**300.0** 11.81	**10.0** 0.39	0.143	1400	1300	**52.20** 114.80
160.000 6.2992	**340.000** 13.3858	**114.000** 4.4882	**204.000** 8.0315	**1840** 413000	**1500** 337000	NJ2332EMA	**4.0** 0.16	**4.0** 0.16	**194.0** 7.64	**300.0** 11.81	**10.0** 0.39	0.143	1400	1300	**53.10** 116.80
170.000 6.6929	**260.000** 10.2362	**42.000** 1.6535	**193.000** 7.5984	**425** 95600	**321** 72200	NU1034MA	**2.1** 0.08	**2.1** 0.08	**186.3** 7.33	**237.0** 9.33	**4.9** 0.19	0.107	2800	2300	**8.00** 17.70

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

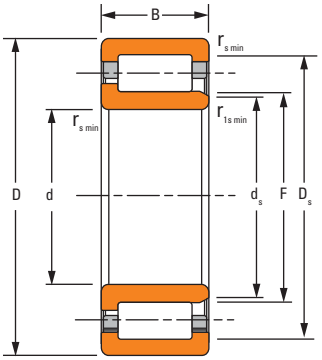
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
170.000 6.6929	**260.000** 10.2362	**67.000** 2.6378	**191.000** 7.5197	**1080** 243000	**722** 162000	NU3034EMA	**2.1** 0.08	**2.1** 0.08	**185.2** 7.29	**241.0** 9.49	**4.4** 0.17	0.131	1500	1300	**8.00** 17.70
170.000 6.6929	**310.000** 12.2047	**52.000** 2.0472	**207.000** 8.1496	**822** 185000	**685** 154000	NU234EMA	**4.0** 0.16	**4.0** 0.16	**201.6** 7.94	**279.0** 10.98	**4.4** 0.17	0.122	2200	1900	**17.60** 38.70
170.000 6.6929	**310.000** 12.2047	**52.000** 2.0472	**207.000** 8.1496	**822** 185000	**685** 154000	NJ234EMA	**4.0** 0.16	**4.0** 0.16	**201.6** 7.94	**279.0** 10.98	**4.4** 0.17	0.122	2200	1900	**17.90** 39.40
170.000 6.6929	**310.000** 12.2047	**86.000** 3.3858	**205.000** 8.0709	**1420** 320000	**1100** 246000	NU2234EMA	**4.0** 0.16	**4.0** 0.16	**196.9** 7.75	**281.0** 11.06	**4.5** 0.18	0.138	1600	1400	**28.70** 63.20
170.000 6.6929	**310.000** 12.2047	**86.000** 3.3858	**205.000** 8.0709	**1420** 320000	**1100** 246000	NJ2234EMA	**4.0** 0.16	**4.0** 0.16	**196.9** 7.75	**281.0** 11.06	**4.5** 0.18	0.138	1600	1400	**29.30** 64.50
170.000 6.6929	**360.000** 14.1732	**72.000** 2.8346	**218.000** 8.5827	**1160** 261000	**1050** 236000	NU334EMA	**4.0** 0.16	**4.0** 0.16	**210.5** 8.29	**318.0** 12.52	**6.4** 0.25	0.131	1800	1600	**36.90** 81.18
170.000 6.6929	**360.000** 14.1732	**72.000** 2.8346	**218.000** 8.5827	**1160** 261000	**1050** 236000	NJ334EMA	**4.0** 0.16	**4.0** 0.16	**210.5** 8.29	**318.0** 12.52	**6.4** 0.25	0.131	1800	1600	**37.50** 82.50
170.000 6.6929	**360.000** 14.1732	**120.000** 4.7244	**216.000** 8.5039	**2110** 474000	**1710** 385000	NU2334EMA	**4.0** 0.16	**4.0** 0.16	**205.7** 8.10	**320.0** 12.60	**10.3** 0.41	0.150	1300	1200	**61.90** 136.20
170.000 6.6929	**360.000** 14.1732	**120.000** 4.7244	**216.000** 8.5039	**2110** 474000	**1710** 385000	NJ2334EMA	**4.0** 0.16	**4.0** 0.16	**205.7** 8.10	**320.0** 12.60	**10.3** 0.41	0.150	1300	1200	**63.00** 138.50
180.000 7.0866	**280.000** 11.0236	**46.000** 1.8110	**205.000** 8.0709	**500** 112000	**386** 86800	NU1036MA	**2.1** 0.08	**2.1** 0.08	**198.9** 7.83	**255.0** 10.04	**6.1** 0.24	0.112	2600	2100	**10.30** 22.80
180.000 7.0866	**320.000** 12.5984	**52.000** 2.0472	**217.000** 8.5433	**874** 196000	**711** 160000	NU236EMA	**4.0** 0.16	**4.0** 0.16	**211.6** 8.33	**289.0** 11.38	**4.4** 0.17	0.126	2000	1800	**18.30** 40.40
180.000 7.0866	**320.000** 12.5984	**52.000** 2.0472	**217.000** 8.5433	**874** 196000	**711** 160000	NJ236EMA	**4.0** 0.16	**4.0** 0.16	**211.6** 8.33	**289.0** 11.38	**4.4** 0.17	0.126	2000	1800	**18.70** 41.10
180.000 7.0866	**320.000** 12.5984	**86.000** 3.3858	**215.000** 8.4646	**1520** 342000	**1140** 256000	NU2236EMA	**4.0** 0.16	**4.0** 0.16	**206.0** 8.11	**291.0** 11.46	**5.5** 0.22	0.143	1400	1300	**30.60** 67.32
180.000 7.0866	**320.000** 12.5984	**86.000** 3.3858	**215.000** 8.4646	**1520** 342000	**1140** 256000	NJ2236EMA	**4.0** 0.16	**4.0** 0.16	**206.0** 8.11	**291.0** 11.46	**5.5** 0.22	0.143	1400	1300	**31.20** 68.60
180.000 7.0866	**380.000** 14.9606	**75.000** 2.9528	**231.000** 9.0945	**1290** 290000	**1150** 258000	NU336EMA	**4.0** 0.16	**4.0** 0.16	**223.2** 8.79	**335.0** 13.19	**6.5** 0.26	0.137	1600	1500	**42.60** 93.60

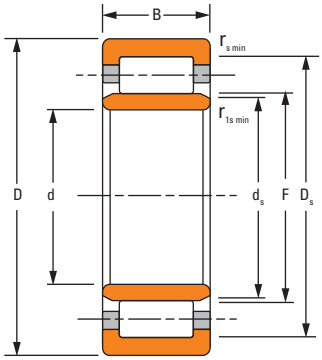
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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SINGLE-ROW METRIC SERIES – *continued*



NJ



NU

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
180.000 7.0866	**380.000** 14.9606	**75.000** 2.9528	**231.000** 9.0945	**1290** 290000	**1150** 258000	NJ336EMA	**4.0** 0.16	**4.0** 0.16	**223.2** 8.79	**335.0** 13.19	**6.5** 0.26	0.137	1600	1500	**43.40** 95.50
180.000 7.0866	**380.000** 14.9606	**126.000** 4.9606	**227.000** 8.9370	**2250** 506000	**1860** 419000	NU2336EMA	**4.0** 0.16	**4.0** 0.16	**215.7** 8.49	**339.0** 13.35	**8.7** 0.34	0.154	1200	1100	**70.90** 155.90
180.000 7.0866	**380.000** 14.9606	**126.000** 4.9606	**227.000** 8.9370	**2250** 506000	**1860** 419000	NJ2336EMA	**4.0** 0.16	**4.0** 0.16	**215.7** 8.49	**339.0** 13.35	**8.7** 0.34	0.154	1200	1100	**72.10** 158.70
190.000 7.4803	**290.000** 11.4173	**46.000** 1.8110	**215.000** 8.4646	**525** 118000	**396** 89100	NU1038MA	**2.1** 0.08	**2.1** 0.08	**207.9** 8.19	**265.0** 10.43	**6.1** 0.24	0.116	2400	2000	**10.70** 23.50
190.000 7.4803	**340.000** 13.3858	**55.000** 2.1654	**230.000** 9.0551	**960** 216000	**777** 175000	NU238EMA	**4.0** 0.16	**4.0** 0.16	**224.2** 8.83	**306.0** 12.05	**4.5** 0.18	0.132	1900	1600	**22.20** 48.80
190.000 7.4803	**340.000** 13.3858	**55.000** 2.1654	**230.000** 9.0551	**960** 216000	**777** 175000	NJ238EMA	**4.0** 0.16	**4.0** 0.16	**224.2** 8.83	**306.0** 12.05	**4.5** 0.18	0.132	1900	1600	**22.60** 49.60
190.000 7.4803	**340.000** 13.3858	**92.000** 3.6220	**228.000** 8.9764	**1680** 377000	**1250** 281000	NU2238EMA	**4.0** 0.16	**4.0** 0.16	**219.0** 8.62	**308.0** 12.13	**7.0** 0.28	0.149	1300	1200	**39.00** 85.80
190.000 7.4803	**340.000** 13.3858	**92.000** 3.6220	**228.000** 8.9764	**1680** 377000	**1250** 281000	NJ2238EMA	**4.0** 0.16	**4.0** 0.16	**219.0** 8.62	**308.0** 12.13	**7.0** 0.28	0.149	1300	1200	**37.80** 83.20
190.000 7.4803	**400.000** 15.7480	**78.000** 3.0709	**245.000** 9.6457	**1500** 337000	**1300** 292000	NU338EMA	**5.0** 0.20	**5.0** 0.20	**236.5** 9.31	**353.0** 13.90	**6.0** 0.24	0.145	1500	1300	**49.40** 108.70
190.000 7.4803	**400.000** 15.7480	**78.000** 3.0709	**245.000** 9.6457	**1500** 337000	**1300** 292000	NJ338EMA	**5.0** 0.20	**5.0** 0.20	**236.5** 9.31	**353.0** 13.90	**6.0** 0.24	0.145	1500	1300	**50.20** 110.50
190.000 7.4803	**400.000** 15.7480	**132.000** 5.1969	**240.000** 9.4488	**2500** 561000	**2060** 464000	NU2338EMA	**5.0** 0.20	**5.0** 0.20	**227.6** 8.96	**360.0** 14.17	**9.8** 0.39	0.161	1100	1000	**80.30** 176.60
190.000 7.4803	**400.000** 15.7480	**132.000** 5.1969	**240.000** 9.4488	**2500** 561000	**2060** 464000	NJ2338EMA	**5.0** 0.20	**5.0** 0.20	**227.6** 8.96	**360.0** 14.17	**9.8** 0.39	0.161	1100	1000	**81.80** 179.90
200.000 7.8740	**310.000** 12.2047	**51.000** 2.0079	**229.000** 9.0157	**596** 134000	**440** 98800	NU1040MA	**2.1** 0.08	**2.1** 0.08	**221.1** 8.70	**281.0** 11.06	**6.5** 0.26	0.122	2300	1900	**14.00** 30.70
200.000 7.8740	**360.000** 14.1732	**58.000** 2.2835	**243.000** 9.5669	**1090** 245000	**870** 196000	NU240EMA	**4.0** 0.16	**4.0** 0.16	**236.9** 9.33	**323.0** 12.72	**4.7** 0.19	0.137	1700	1500	**26.50** 58.30
200.000 7.8740	**360.000** 14.1732	**58.000** 2.2835	**243.000** 9.5669	**1090** 245000	**870** 196000	NJ240EMA	**4.0** 0.16	**4.0** 0.16	**236.9** 9.33	**323.0** 12.72	**4.7** 0.19	0.137	1700	1500	**27.00** 59.40

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

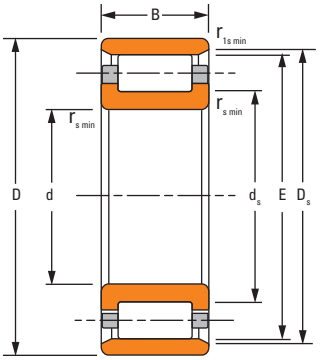
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
200.000 7.8740	**360.000** 14.1732	**98.000** 3.8583	**241.000** 9.4882	**1920** 431000	**1410** 316000	NU2240EMA	**4.0** 0.16	**4.0** 0.16	**231.5** 9.11	**325.0** 12.80	**7.0** 0.28	0.156	1200	1100	**44.40** 97.70
200.000 7.8740	**360.000** 14.1732	**98.000** 3.8583	**241.000** 9.4882	**1920** 431000	**1410** 316000	NJ2240EMA	**4.0** 0.16	**4.0** 0.16	**231.5** 9.11	**325.0** 12.80	**7.0** 0.28	0.156	1200	1100	**45.20** 99.50
200.000 7.8740	**420.000** 16.5354	**80.000** 3.1496	**258.000** 10.1575	**1580** 354000	**1360** 306000	NU340EMA	**5.0** 0.20	**5.0** 0.20	**249.9** 9.84	**370.0** 14.57	**7.0** 0.28	0.150	1300	1200	**55.80** 122.70
200.000 7.8740	**420.000** 16.5354	**80.000** 3.1496	**258.000** 10.1575	**1580** 354000	**1360** 306000	NJ340EMA	**5.0** 0.20	**5.0** 0.20	**249.9** 9.84	**370.0** 14.57	**7.0** 0.28	0.150	1300	1200	**56.70** 124.70
200.000 7.8740	**420.000** 16.5354	**138.000** 5.4331	**253.000** 9.9606	**2760** 619000	**2250** 505000	NU2340EMA	**5.0** 0.20	**5.0** 0.20	**240.7** 9.48	**377.0** 14.84	**9.2** 0.36	0.167	1000	940	**93.20** 205.00
200.000 7.8740	**420.000** 16.5354	**138.000** 5.4331	**253.000** 9.9606	**2760** 619000	**2250** 505000	NJ2340EMA	**5.0** 0.20	**5.0** 0.20	**240.7** 9.48	**377.0** 14.84	**9.2** 0.36	0.167	1000	940	**94.80** 208.70
220.000 8.6614	**340.000** 13.3858	**56.000** 2.2047	**250.000** 9.8425	**765** 172000	**565** 127000	NU1044MA	**3.0** 0.12	**3.0** 0.12	**242.6** 9.55	**310.0** 12.20	**8.4** 0.33	0.132	2000	1700	**18.40** 40.40
220.000 8.6614	**340.000** 13.3858	**56.000** 2.2047	**250.000** 9.8425	**765** 172000	**565** 127000	NJ1044MA	**3.0** 0.12	**3.0** 0.12	**242.6** 9.55	**310.0** 12.20	**8.4** 0.33	0.132	2000	1700	**18.90** 41.60
220.000 8.6614	**340.000** 13.3858	**90.000** 3.5433	**250.000** 9.8425	**1910** 429000	**1210** 272000	NU3044EMA	**3.0** 0.12	**3.0** 0.12	**242.5** 9.55	**314.0** 12.36	**8.4** 0.33	0.163	1100	940	**30.70** 67.60
220.000 8.6614	**400.000** 15.7480	**65.000** 2.5591	**268.000** 10.5512	**1290** 290000	**1040** 233000	NU244EMA	**4.0** 0.16	**4.0** 0.16	**261.2** 10.28	**358.0** 14.09	**4.0** 0.16	0.148	1500	1400	**36.90** 81.20
220.000 8.6614	**400.000** 15.7480	**65.000** 2.5591	**268.000** 10.5512	**1290** 290000	**1040** 233000	NJ244EMA	**4.0** 0.16	**4.0** 0.16	**261.2** 10.28	**358.0** 14.09	**4.0** 0.16	0.148	1500	1400	**37.60** 82.70
220.000 8.6614	**400.000** 15.7480	**108.000** 4.2520	**259.000** 10.1969	**2370** 533000	**1820** 409000	NU2244EMA	**4.0** 0.16	**4.0** 0.16	**250.7** 9.87	**363.0** 14.29	**7.3** 0.29	0.165	1000	970	**60.80** 133.80
220.000 8.6614	**400.000** 15.7480	**108.000** 4.2520	**259.000** 10.1969	**2370** 533000	**1820** 409000	NJ2244EMA	**4.0** 0.16	**4.0** 0.16	**250.7** 9.87	**363.0** 14.29	**7.3** 0.29	0.165	1000	970	**61.80** 136.00
220.000 8.6614	**460.000** 18.1102	**88.000** 3.4646	**282.000** 11.1024	**1930** 433000	**1650** 370000	NU344EMA	**5.0** 0.20	**5.0** 0.20	**272.9** 10.74	**406.0** 15.98	**7.5** 0.30	0.162	1100	1000	**73.70** 162.10
220.000 8.6614	**460.000** 18.1102	**88.000** 3.4646	**282.000** 11.1024	**1930** 433000	**1650** 370000	NJ344EMA	**5.0** 0.20	**5.0** 0.20	**272.9** 10.74	**406.0** 15.98	**7.5** 0.30	0.162	1100	1000	**74.90** 164.70

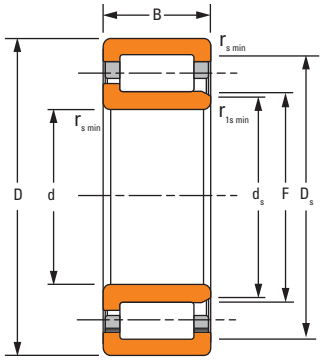
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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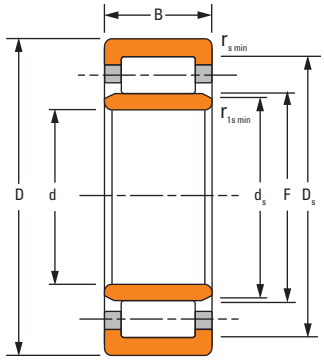
SINGLE-ROW METRIC SERIES – *continued*



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NJ

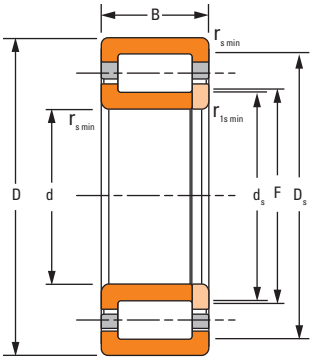


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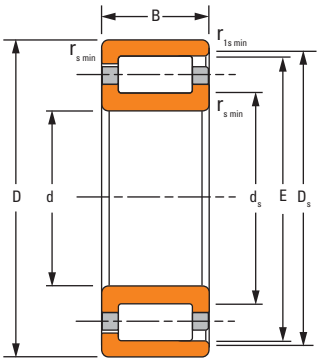
Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
220.000 8.6614	**460.000** 18.1102	**145.000** 5.7087	**277.000** 10.9055	**3130** 704000	**2550** 574000	NU2344EMA	**5.0** 0.20	**5.0** 0.20	**264.1** 10.40	**413.0** 16.26	**11.2** 0.44	0.178	910	840	**118.50** 260.70
220.000 8.6614	**460.000** 18.1102	**145.000** 5.7087	**277.000** 10.9055	**3130** 704000	**2550** 574000	NJ2344EMA	**5.0** 0.20	**5.0** 0.20	**264.1** 10.40	**413.0** 16.26	**11.2** 0.44	0.178	910	840	**120.60** 265.20
220.000 8.6614	**460.000** 18.1102	**145.000** 5.7087	**413.000** 16.2598	**3130** 704000	**2550** 574000	N2344EMB	**5.0** 0.20	**5.0** 0.20	**277.0** 10.91	**425.9** 16.77	**10.2** 0.40	0.178	910	840	**117.50** 258.60
240.000 9.4488	**360.000** 14.1732	**56.000** 2.2047	**270.000** 10.6299	**838** 188000	**595** 134000	NU1048MA	**3.0** 0.12	**3.0** 0.12	**262.6** 10.34	**330.0** 12.99	**7.0** 0.28	0.140	1900	1500	**19.70** 43.40
240.000 9.4488	**440.000** 17.3228	**72.000** 2.8346	**293.000** 11.5354	**1570** 352000	**1250** 281000	NU248EMA	**4.0** 0.16	**4.0** 0.16	**285.5** 11.24	**393.0** 15.47	**6.0** 0.24	0.159	1300	1100	**50.30** 110.60
240.000 9.4488	**440.000** 17.3228	**72.000** 2.8346	**293.000** 11.5354	**1570** 352000	**1250** 281000	NJ248EMA	**4.0** 0.16	**4.0** 0.16	**285.5** 11.24	**393.0** 15.47	**6.0** 0.24	0.159	1300	1100	**51.10** 112.50
240.000 9.4488	**500.000** 19.6850	**95.000** 3.7402	**306.000** 12.0472	**2530** 568000	**2080** 468000	NU348EMA	**5.0** 0.20	**5.0** 0.20	**295.0** 11.61	**442.0** 17.40	**7.5** 0.30	0.170	1100	990	**96.10** 211.40
240.000 9.4488	**500.000** 19.6850	**95.000** 3.7402	**306.000** 12.0472	**2530** 568000	**2080** 468000	NJ348EMA	**5.0** 0.20	**5.0** 0.20	**295.0** 11.61	**442.0** 17.40	**7.5** 0.30	0.170	1100	990	**97.50** 214.50
240.000 9.4488	**500.000** 19.6850	**155.000** 6.1024	**303.000** 11.9291	**3760** 846000	**2970** 668000	NU2348EMA	**5.0** 0.20	**5.0** 0.20	**287.8** 11.33	**447.0** 17.60	**11.9** 0.47	0.192	770	700	**153.00** 336.60
240.000 9.4488	**500.000** 19.6850	**155.000** 6.1024	**303.000** 11.9291	**3760** 846000	**2970** 668000	NJ2348EMA	**5.0** 0.20	**5.0** 0.20	**287.8** 11.33	**447.0** 17.60	**11.9** 0.47	0.192	770	700	**155.70** 342.50
260.000 10.2362	**400.000** 15.7480	**65.000** 2.5591	**296.000** 11.6535	**1040** 233000	**737** 166000	NU1052MA	**4.0** 0.16	**4.0** 0.16	**287.2** 11.31	**364.0** 14.33	**8.8** 0.35	0.151	1700	1400	**29.20** 64.10
260.000 10.2362	**400.000** 15.7480	**104.000** 4.0945	**294.000** 11.5748	**2500** 563000	**1580** 354000	NU3052MA	**4.0** 0.16	**4.0** 0.16	**284.9** 11.22	**370.0** 14.57	**7.5** 0.30	0.170	860	770	**29.20** 64.10
260.000 10.2362	**480.000** 18.8976	**80.000** 3.1496	**320.000** 12.5984	**1720** 387000	**1320** 297000	NU252MA	**5.0** 0.20	**5.0** 0.20	**308.8** 12.16	**420.0** 16.54	**7.0** 0.28	0.168	1200	1000	**69.70** 153.30
260.000 10.2362	**480.000** 18.8976	**80.000** 3.1496	**320.000** 12.5984	**1720** 387000	**1320** 297000	NUP252MA	**5.0** 0.20	**5.0** 0.20	**307.0** 12.09	**420.0** 16.54	–	0.168	1200	1000	**72.30** 159.06
260.000 10.2362	**480.000** 18.8976	**130.000** 5.1181	**320.000** 12.5984	**2950** 663000	**2030** 457000	NU2252MA	**5.0** 0.20	**5.0** 0.20	**305.6** 12.03	**420.0** 16.54	**11.6** 0.46	0.192	850	780	**113.00** 248.60

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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NUP



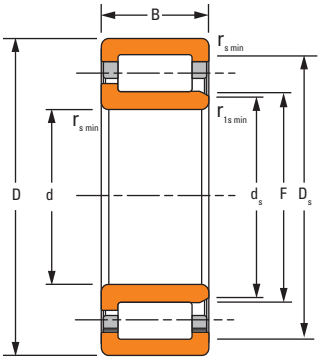
NF

Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
260.000 10.2362	**540.000** 21.2598	**165.000** 6.4961	**324.000** 12.7559	**4200** 945000	**3370** 758000	NU2352EMA	**6.0** 0.24	**6.0** 0.24	**308.8** 12.16	**484.0** 19.06	**12.2** 0.48	0.201	700	640	**186.10** 409.30
280.000 11.0236	**420.000** 16.5354	**65.000** 2.5591	**316.000** 12.4409	**1090** 245000	**754** 169000	NU1056MA	**4.0** 0.16	**4.0** 0.16	**306.4** 12.06	**384.0** 15.12	**8.0** 0.31	0.157	1600	1300	**31.00** 68.20
300.000 11.8110	**460.000** 18.1102	**74.000** 2.9134	**340.000** 13.3858	**1430** 322000	**1000** 225000	NU1060MA	**4.0** 0.16	**4.0** 0.16	**329.8** 12.98	**420.0** 16.54	**10.7** 0.42	0.169	1400	1200	**43.70** 96.10
320.000 12.5984	**440.000** 17.3228	**56.000** 2.2047	**350.000** 13.7795	**1210** 272000	**767** 172000	NU1964MA	**3.0** 0.12	**3.0** 0.12	**342.0** 13.46	**414.0** 16.30	**5.6** 0.22	0.170	770	660	**26.90** 59.18
320.000 12.5984	**440.000** 17.3228	**72.000** 2.8346	**413.000** 16.2598	**2010** 453000	**1150** 259000	NF2964EMB	**3.0** 0.12	**3.0** 0.12	**349.0** 13.74	**419.7** 16.52	**4.0** 0.16	0.191	710	620	**33.70** 74.20
320.000 12.5984	**480.000** 18.8976	**74.000** 2.9134	**360.000** 14.1732	**1500** 337000	**1020** 230000	NU1064MA	**4.0** 0.16	**4.0** 0.16	**349.8** 13.77	**440.0** 17.32	**9.2** 0.36	0.176	1300	1100	**45.90** 101.00
320.000 12.5984	**580.000** 22.8346	**150.000** 5.9055	**390.000** 15.3543	**3920** 882000	**2690** 605000	NU2264MA	**5.0** 0.20	**5.0** 0.20	**374.2** 14.73	**510.0** 20.08	**15.9** 0.63	0.199	680	620	**178.50** 392.70
340.000 13.3858	**460.000** 18.1102	**72.000** 2.8346	**431.000** 16.9685	**2090** 469000	**1170** 263000	NF2968EMB	**3.0** 0.12	**3.0** 0.12	**367.0** 14.45	**437.8** 17.24	**4.0** 0.16	0.197	660	580	**35.50** 78.00
340.000 13.3858	**520.000** 20.4724	**82.000** 3.2283	**385.000** 15.1575	**1800** 405000	**1240** 278000	NU1068MA	**5.0** 0.20	**5.0** 0.20	**371.5** 14.63	**475.0** 18.70	**7.9** 0.31	0.186	1200	1000	**61.30** 134.90
340.000 13.3858	**520.000** 20.4724	**133.000** 5.2362	**385.000** 15.1575	**4280** 961000	**2550** 572000	NU3068EMA	**5.0** 0.20	**5.0** 0.20	**374.3** 14.74	**481.0** 18.94	**10.0** 0.39	0.228	580	530	**105.50** 232.00
340.000 13.3858	**580.000** 22.8346	**190.000** 7.4803	**399.000** 15.7087	**7010** 158000	**4300** 967000	NU3168EMA	**5.0** 0.20	**5.0** 0.20	**388.8** 15.31	**523.0** 20.59	**8.5** 0.34	0.253	480	450	**224.70** 494.40
360.000 14.1732	**750.000** 29.5276	**224.000** 8.8189	**465.000** 18.3071	**8060** 1810000	**5740** 1290000	NU2372EMA	**7.5** 0.30	**7.5** 0.30	**443.3** 17.45	**655.0** 25.79	**12.7** 0.50	0.266	430	400	**498.10** 1095.90
360.000 14.1732	**540.000** 21.2598	**82.000** 3.2283	**405.000** 15.9449	**1890** 424000	**1270** 285000	NU1072MA	**5.0** 0.20	**5.0** 0.20	**390.3** 15.37	**495.0** 19.49	**6.9** 0.27	0.193	1100	940	**64.20** 141.20
380.000 14.9606	**560.000** 22.0472	**82.000** 3.2283	**425.000** 16.7323	**1970** 443000	**1300** 291000	NU1076MA	**5.0** 0.20	**5.0** 0.20	**412.4** 16.24	**515.0** 20.28	**9.0** 0.35	0.199	1100	890	**67.20** 147.90
400.000 15.7480	**540.000** 21.2598	**82.000** 3.2283	**435.000** 17.1260	**2920** 657000	**1600** 360000	NJ2980EMA	**4.0** 0.16	**4.0** 0.16	**426.6** 16.80	**511.0** 20.12	**4.0** 0.16	0.226	520	460	**54.80** 120.50

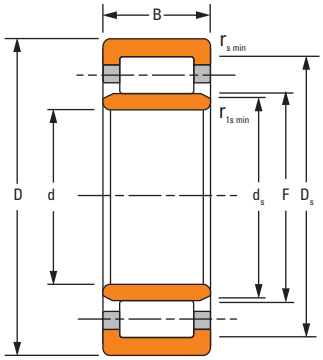
(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

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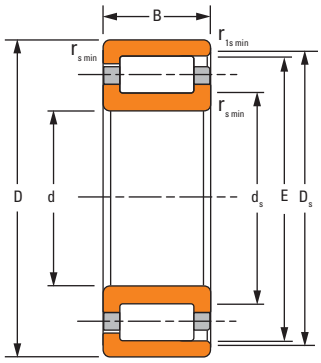
SINGLE-ROW METRIC SERIES – *continued*



NJ



NU



NF

Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geo-metry Factor	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s		C_g	Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
400.000 15.7480	**600.000** 23.6220	**90.000** 3.5433	**450.000** 17.7165	**2290** 516000	**1530** 343000	NU1080MA	**5.0** 0.20	**5.0** 0.20	**436.4** 17.18	**550.0** 21.65	**10.0** 0.39	0.209	980	830	**87.50** 192.60
400.000 15.7480	**600.000** 23.6220	**118.000** 4.6457	**449.000** 17.6772	**4290** 965000	**2620** 589000	NU2080EMA	**5.0** 0.20	**5.0** 0.20	**440.4** 17.34	**557.0** 21.93	**9.6** 0.38	0.240	490	440	**119.30** 262.40
420.000 16.5354	**560.000** 22.0472	**82.000** 3.2283	**531.000** 20.9055	**3020** 680000	**1630** 366000	NF2984EMB	**4.0** 0.16	**4.0** 0.16	**455.0** 17.91	**537.9** 21.18	**5.0** 0.20	0.232	490	440	**57.20** 125.80
440.000 17.3228	**650.000** 25.5906	**94.000** 3.7008	**493.000** 19.4094	**2760** 620000	**1760** 395000	NU1088MA	**6.0** 0.24	**6.0** 0.24	**480.0** 18.90	**597.0** 23.50	**11.0** 0.43	0.226	860	730	**106.60** 234.60
440.000 17.3228	**650.000** 25.5906	**122.000** 4.8031	**487.000** 19.1732	**4900** 1100000	**2950** 663000	NU2088EMA	**6.0** 0.24	**6.0** 0.24	**476.1** 18.74	**603.0** 23.74	**8.5** 0.33	0.255	430	390	**141.00** 310.10
440.000 17.3228	**720.000** 28.3465	**226.000** 8.8976	**509.000** 20.0394	**9330** 2100000	**5740** 1290000	NU3188EMA	**6.0** 0.24	**6.0** 0.24	**490.0** 19.29	**665.0** 26.18	**13.6** 0.54	0.292	370	350	**371.20** 816.50
460.000 18.1102	**580.000** 22.8346	**72.000** 2.8346	**489.000** 19.2520	**2660** 599000	**1310** 294000	NJ2892EMA	**3.0** 0.12	**3.0** 0.12	**482.0** 18.98	**553.0** 21.77	**4.0** 0.16	0.238	470	410	**45.70** 100.50
460.000 18.1102	**620.000** 24.4094	**95.000** 3.7402	**579.000** 22.7953	**3690** 830000	**1970** 443000	NF2992EMB	**4.0** 0.16	**4.0** 0.16	**495.0** 19.49	**586.6** 23.09	**6.5** 0.26	0.249	440	390	**84.50** 185.90
460.000 18.1102	**760.000** 29.9213	**240.000** 9.4488	**529.300** 20.8386	**10100** 2270000	**6100** 1370000	NU3192EMA	**7.5** 0.30	**7.5** 0.30	**505.6** 19.91	**689.3** 27.14	**17.2** 0.68	0.302	360	330	**448.80** 987.30
480.000 18.8976	**700.000** 27.5591	**100.000** 3.9370	**536.000** 21.1024	**3950** 887000	**2360** 531000	NU1096EMA	**6.0** 0.24	**6.0** 0.24	**527.7** 20.78	**646.0** 25.43	**10.4** 0.41	0.253	710	620	**131.80** 290.00
480.000 18.8976	**700.000** 27.5591	**100.000** 3.9370	**536.000** 21.1024	**3920** 881000	**2360** 531000	NJ1096EMA	**6.0** 0.24	**6.0** 0.24	**528.5** 20.81	**646.0** 25.43	**10.4** 0.41	0.253	710	620	**138.00** 304.20
500.000 19.6850	**830.000** 32.6772	**264.000** 10.3937	**576.000** 22.6772	**12000** 2690000	**7490** 1680000	NU31/500EMA	**7.5** 0.30	**7.5** 0.30	**555.7** 21.88	**764.0** 30.08	**18.0** 0.71	0.319	310	290	**585.00** 1287.10
560.000 22.0472	**680.000** 26.7717	**56.000** 2.2047	**594.000** 23.3858	**1730** 388000	**806** 181000	NU18/560MA	**3.0** 0.12	**3.0** 0.12	**584.3** 23.00	**650.0** 25.59	**6.6** 0.26	0.240	410	350	**40.90** 90.00
600.000 23.6220	**870.000** 34.2520	**200.000** 7.8740	**661.000** 26.0236	**11000** 2480000	**6180** 1390000	NU30/600EMA	**6.0** 0.24	**6.0** 0.24	**646.5** 25.45	**821.0** 32.32	**14.8** 0.58	0.338	270	250	**396.80** 872.90
630.000 24.8031	**920.000** 36.2205	**170.000** 6.6929	**699.000** 27.5197	**9570** 2150000	**5390** 1210000	NU20/630EMA	**7.5** 0.30	**7.5** 0.30	**684.6** 26.95	**855.0** 33.66	**10.9** 0.43	0.336	260	240	**386.10** 849.40

(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

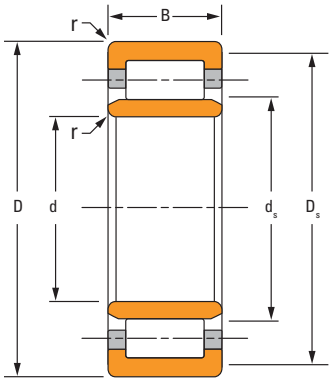
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Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
670.000 26.3780	**980.000** 38.5827	**180.000** 7.0866	**746.000** 29.3701	**11100** 2490000	**6170** 1390000	NU20/670EMA	**7.5** 0.30	**7.5** 0.30	**730.0** 28.74	**912.0** 35.91	**11.7** 0.46	0.356	230	210	**468.80** 1031.30
670.000 26.3780	**980.000** 38.5827	**230.000** 9.0551	**744.000** 29.2913	**14000** 3140000	**7510** 1690000	NU30/670EMA	**7.5** 0.30	**7.5** 0.30	**725.1** 28.55	**914.0** 35.98	**17.6** 0.69	0.375	230	210	**608.10** 1337.80
710.000 27.9528	**870.000** 34.2520	**95.000** 3.7402	**751.000** 29.5669	**5110** 1150000	**2200** 494000	NJ28/710EMA	**4.0** 0.16	**4.0** 0.16	**740.9** 29.17	**831.0** 32.72	**7.8** 0.31	0.328	270	240	**125.40** 275.80
710.000 27.9528	**950.000** 37.4016	**140.000** 5.5118	**770.000** 30.3150	**8190** 1840000	**4020** 903000	NJ29/710MA	**6.0** 0.24	**6.0** 0.24	**756.6** 29.79	**890.0** 35.04	**10.5** 0.41	0.351	250	220	**307.00** 676.80
750.000 29.5276	**1090.000** 42.9134	**195.000** 7.6772	**832.000** 32.7559	**13800** 3110000	**7550** 1700000	NU20/750EMA	**7.5** 0.30	**7.5** 0.30	**817.6** 32.19	**1018.0** 40.08	**13.2** 0.52	0.388	190	180	**621.20** 1366.50
800.000 31.4961	**1150.000** 45.2756	**200.000** 7.8740	**882.000** 34.7244	**14600** 3290000	**8040** 1810000	NU20/800EMA	**7.5** 0.30	**7.5** 0.30	**864.6** 34.04	**1080.0** 42.52	**13.4** 0.53	0.400	180	170	**690.30** 1518.60
850.000 33.4646	**1220.000** 48.0315	**212.000** 8.3465	**937.000** 36.8898	**16200** 3640000	**8850** 1990000	NU20/850EMA	**7.5** 0.30	**7.5** 0.30	**917.5** 36.12	**1147.0** 45.16	**14.6** 0.57	0.418	170	160	**820.30** 1804.60
900.000 35.4331	**1180.000** 46.4567	**206.000** 8.1102	**969.000** 38.1496	**16800** 3770000	**7500** 1690000	NU39/900EMA	**6.0** 0.24	**6.0** 0.24	**949.9** 37.40	**1119.0** 44.06	**10.0** 0.39	0.447	160	150	**609.30** 1340.40
900.000 35.4331	**1280.000** 50.3937	**218.000** 8.5827	**990.000** 38.9764	**16900** 3800000	**9030** 2030000	NU20/900EMA	**7.5** 0.30	**7.5** 0.30	**968.5** 38.13	**1200.0** 47.24	**15.5** 0.61	0.432	160	150	**915.80** 2014.80
1120.000 44.0945	**1360.000** 53.5433	**106.000** 4.1732	**1162.000** 45.7480	**8370** 1880000	**3680** 828000	NJ18/1120EMA	**6.0** 0.24	**6.0** 0.24	**1167.5** 45.96	**1310.0** 51.57	**10.0** 0.39	0.422	150	130	**323.80** 712.40

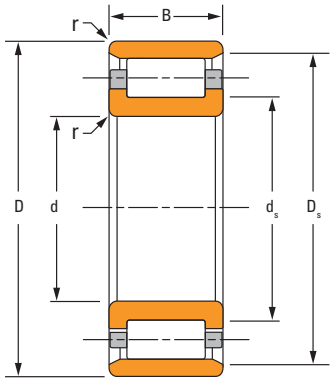
[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

SINGLE-ROW STANDARD SERIES

- Similar in construction to ISO counterparts.
- Designed to ABMA standards.
- Inch bearing sizes identified by "I" in the part number.



RU

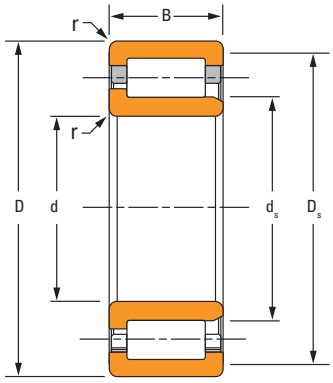


RN

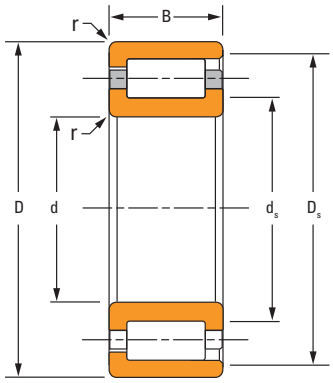
Bearing Number and Style[1]					Bearing Dimensions			Fillet Radius (Max.)	Backing Diameter		Load Rating		Geometry Factor	Thermal Speed Ratings		Weight
RU RIU	RN RIN	RJ RIJ	RF RIF	RT RIT	Bore d	O.D. D	Width B	r[2]	Shaft d_s	Housing D_s	Static C_o	Dynamic C_1[3]	C_g	Oil	Grease	
					mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	kN lbf.	kN lbf.		RPM	RPM	kg lbs.
105RU32	105RN32	105RJ32	105RF32	105RT32	**105.000** 4.1339	**190.000** 7.4803	**65.100** 2.5625	**2.0** 0.08	**120.7** 4.75	**174.6** 6.88	**640** 144000	**471** 106000	0.115	2800	2500	**8.3** 18.3
170RU51	170RN51	170RJ51	170RF51	170RT51	**170.000** 6.6929	**265.000** 10.4331	**42.000** 1.6535	**2.50** 0.10	**184.3** 7.26	**246.1** 9.69	**521** 117000	**391** 87800	0.108	1600	1300	**8.6** 18.8
170RU91	170RN91	170RJ91	170RF91	170RT91	**170.000** 6.6929	**265.000** 10.4331	**76.200** 3.0000	**2.5** 0.10	**187.3** 7.38	**247.7** 9.75	**1170** 264000	**735** 165000	0.131	1500	1400	**16.1** 35.5
170RU93	170RN93	170RJ93	170RF93	170RT93	**170.000** 6.6929	**360.000** 14.1732	**139.700** 5.5000	**3.0** 0.12	**204.7** 8.06	**325.4** 12.81	**2580** 580000	**1820** 410000	0.156	1200	1100	**73.6** 162.4
180RU51	180RN51	180RJ51	180RF51	180RT51	**180.000** 7.0866	**280.000** 11.0236	**44.000** 1.7323	**2.5** 0.10	**196.1** 7.72	**262.7** 10.34	**560** 126000	**419** 94200	0.114	1500	1300	**10.3** 22.7
180RU91	180RN91	180RJ91	180RF91	180RT91	**180.000** 7.0866	**280.000** 11.0236	**82.550** 3.2500	**2.5** 0.10	**196.9** 7.75	**261.9** 10.31	**1440** 323000	**833** 187000	0.142	1400	1200	**19.4** 42.9
190RU91	190RN91	190RJ91	190RF91	190RT91	**190.000** 7.4803	**300.000** 11.8110	**85.725** 3.3750	**2.5** 0.10	**209.6** 8.25	**281.0** 11.06	**1600** 360000	**973** 219000	0.147	1300	1100	**23.8** 52.5
190RU92	190RN92	190RJ92	190RF92	190RT92	**190.000** 7.4803	**340.000** 13.3858	**114.300** 4.5000	**3.0** 0.12	**217.5** 8.56	**311.9** 12.28	**2210** 497000	**1450** 326000	0.156	1200	1000	**47.3** 104.2

[1]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[2]Maximum shaft or housing fillet radius that bearing corners will clear.
[3]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.

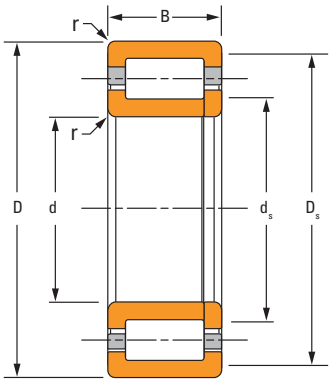
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RJ



RF



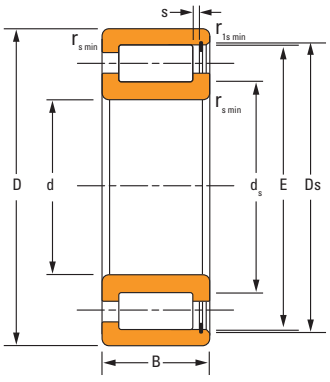
RT

Bearing Number and Style[1]					Bearing Dimensions			Fillet Radius (Max.)	Backing Diameter		Load Rating		Geometry Factor	Thermal Speed Ratings		Weight
RU RIU	RN RIN	RJ RIJ	RF RIF	RT RIT	Bore d	O.D. D	Width B	r[2]	Shaft d_s	Housing D_s	Static C_o	Dynamic C_1[3]	C_g	Oil	Grease	
					mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		RPM	RPM	**kg** lbs.
200RU91	200RN91	200RJ91	200RF91	200RT91	**200.000** 7.8740	**320.000** 12.5984	**88.900** 3.5000	**3.0** 0.12	**218.9** 8.62	**294.9** 11.61	**1740** 391000	**1060** 239000	0.151	1200	1000	**27.7** 60.9
200RU92	200RN92	200RJ92	200RF92	200RT92	**200.000** 7.8740	**360.000** 14.1732	**120.650** 4.7500	**3.0** 0.12	**230.1** 9.06	**330.2** 13.00	**2590** 581000	**1630** 366000	0.166	1000	940	**56.8** 125.2
210RU92	210RN92	210RJ92	210RF92	210RT92	**210.000** 8.2677	**380.000** 14.9606	**127.000** 5.0000	**3.0** 0.12	**239.8** 9.44	**350.0** 13.78	**2640** 593000	**1740** 391000	0.167	1000	920	**66.1** 145.8
220RU51	220RN51	220RJ51	220RF51	220RT51	**220.000** 8.6614	**350.000** 13.7796	**51.000** 2.0079	**2.5** 0.10	**243.7** 9.59	**326.2** 12.84	**830** 187000	**612** 138000	0.133	1100	960	**19.6** 43.2
220RU91	220RN91	220RJ91	220RF91	220RT91	**220.000** 8.6614	**350.000** 13.7795	**98.425** 3.8750	**2.5** 0.10	**239.3** 9.42	**324.6** 12.78	**2090** 470000	**1290** 289000	0.162	1000	930	**37.6** 82.9
220RU92	220RN92	220RJ92	220RF92	220RT92	**220.000** 8.6614	**400.000** 15.7480	**133.350** 5.2500	**3.0** 0.12	**252.4** 9.94	**368.3** 14.50	**3230** 727000	**2010** 452000	0.180	880	810	**78.4** 172.9
240RU91	240RN91	240RJ91	240RF91	240RT91	**240.000** 9.4488	**390.000** 15.3543	**107.950** 4.2500	**3.0** 0.12	**265.2** 10.44	**365.3** 14.38	**2670** 600000	**1580** 355000	0.178	880	790	**53.4** 117.7
250RU91	250RN91	250RJ91	250RF91	250RT91	**250.000** 9.8425	**410.000** 16.1417	**111.125** 4.3750	**3.0** 0.12	**277.8** 10.94	**382.6** 15.06	**2720** 611000	**1680** 377000	0.180	850	770	**60.9** 134.3

[1]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[2]Maximum shaft or housing fillet radius that bearing corners will clear.
[3]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.

FULL-COMPLEMENT (NCF)

- Single-row, full-complement cylindrical roller bearings.
- Features include integral flanges on the inner and outer rings.
- Can manage axial loads in one direction and small axial displacement.

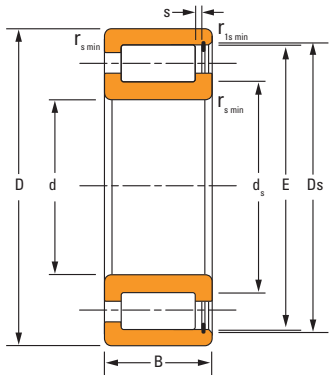


NCF

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
110.000 4.3307	**150.000** 5.9055	**24.000** 0.9449	**141.100** 5.5551	**223** 50100	**146** 32900	NCF2922V	**1.1** 0.04	**1.0** 0.04	**119.1** 4.69	**142.1** 5.59	**1.5** 0.06	0.136	1200	1000	**1.20** 2.65
120.000 4.7244	**165.000** 6.4961	**27.000** 1.0630	**154.000** 6.0630	**297** 66800	**188** 42400	NCF2924V	**1.1** 0.04	**1.0** 0.04	**130.0** 5.12	**155.0** 6.10	**1.55** 0.061	0.150	1200	970	**1.70** 3.80
130.000 5.1181	**180.000** 7.0866	**30.000** 1.1811	**166.800** 6.5669	**361** 81100	**225** 50600	NCF2926V	**1.5** 0.06	**1.1** 0.04	**140.8** 5.54	**167.5** 6.59	**2.00** 0.079	0.160	1100	920	**2.30** 5.00
140.000 5.5118	**190.000** 7.4803	**30.000** 1.1811	**179.600** 7.0709	**389** 87300	**243** 54700	NCF2928V	**1.5** 0.06	**1.1** 0.04	**151.6** 5.97	**180.2** 7.10	**1.9** 0.075	0.167	1000	850	**2.40** 5.30
150.000 5.9055	**210.000** 8.2677	**36.000** 1.4173	**196.400** 7.7323	**506** 114000	**328** 73800	NCF2930V	**2.0** 0.08	**1.1** 0.04	**162.4** 6.39	**200.5** 7.89	**2.20** 0.087	0.128	1010	840	**3.80** 8.30
160.000 6.2992	**220.000** 8.6614	**36.000** 1.4173	**207.200** 8.1575	**540** 121000	**340** 76300	NCF2932V	**2.0** 0.08	**1.1** 0.04	**173.2** 6.82	**208.5** 8.21	**2.20** 0.087	0.133	940	790	**4.00** 8.70
170.000 6.6929	**230.000** 9.0551	**36.000** 1.4173	**218.000** 8.5827	**574** 129000	**350** 78700	NCF2934V	**2.0** 0.08	**1.1** 0.04	**184.0** 7.24	**219.5** 8.64	**2.20** 0.087	0.116	890	740	**4.20** 9.30
180.000 7.0866	**250.000** 9.8425	**42.000** 1.6535	**231.500** 9.1142	**711** 160000	**436** 98000	NCF2936V	**2.0** 0.08	**1.1** 0.04	**193.5** 7.62	**232.5** 9.15	**2.50** 0.098	0.123	850	710	**6.30** 13.80
190.000 7.4803	**260.000** 10.2362	**42.000** 1.6535	**244.000** 9.6063	**803** 180000	**487** 109000	NCF2938V	**2.0** 0.08	**1.1** 0.04	**204.0** 8.03	**248.2** 9.77	**1.50** 0.059	0.129	780	660	**6.50** 14.30

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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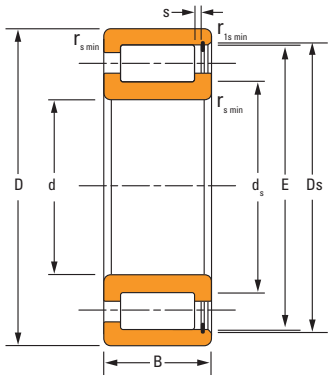
NCF

Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
200.000 7.8740	**250.000** 9.8425	**24.000** 0.9449	**237.500** 9.3504	**337** 75700	**188** 42400	NCF1840V	**1.5** 0.06	**1.1** 0.04	**211.5** 8.33	**238.5** 9.39	**1.80** 0.071	0.146	740	610	**2.52** 5.60
200.000 7.8740	**280.000** 11.0236	**48.000** 1.8898	**261.100** 10.2795	**971** 218000	**587** 132000	NCF2940V	**2.1** 0.08	**1.5** 0.06	**217.1** 8.55	**262.0** 10.32	**1.95** 0.077	0.137	730	620	**9.20** 20.10
220.000 8.6614	**270.000** 10.6299	**24.000** 0.9449	**257.700** 10.1457	**370** 83100	**198** 44400	NCF1844V	**1.5** 0.06	**1.1** 0.04	**231.7** 9.12	**258.7** 10.19	**1.80** 0.071	0.155	670	550	**2.92** 6.44
220.000 8.6614	**300.000** 11.8110	**48.000** 1.8898	**282.100** 11.1063	**1070** 239000	**615** 138000	NCF2944V	**2.1** 0.08	**1.5** 0.06	**238.1** 9.37	**284.0** 11.18	**1.95** 0.077	0.146	650	550	**9.90** 21.70
260.000 10.2362	**320.000** 12.5984	**28.000** 1.1024	**307.000** 12.0866	**553** 124000	**292** 65500	NCF1852V	**2.0** 0.08	**1.1** 0.04	**275** 10.83	**308.0** 12.13	**1.80** 0.071	0.140	580	480	**4.80** 10.60
260.000 10.2362	**360.000** 14.1732	**60.000** 2.3622	**333.400** 13.1260	**1480** 333000	**837** 188000	NCF2952V	**2.1** 0.08	**2.1** 0.08	**281.3** 11.07	**334.6** 13.17	**4.00** 0.157	0.167	540	460	**18.50** 40.80
300.000 11.8110	**420.000** 16.5354	**72.000** 2.8346	**390.000** 15.3543	**2260** 508000	**1260** 284000	NCF2960V	**3.0** 0.12	**3.0** 0.12	**326.0** 12.83	**390.5** 15.37	**4.00** 0.157	0.191	430	370	**31.30** 68.80
320.000 12.5984	**400.000** 15.7480	**38.000** 1.4961	**382.800** 15.0709	**900** 202000	**471** 106000	NCF1864V	**2.1** 0.08	**1.5** 0.06	**340.8** 13.42	**383.8** 15.11	**3.00** 0.118	0.167	460	380	**10.60** 23.40
320.000 12.5984	**440.000** 17.3228	**72.000** 2.8346	**410.500** 16.1614	**2400** 540000	**1300** 293000	NCF2964V	**3.0** 0.12	**3.0** 0.12	**346.5** 13.64	**412.0** 16.22	**4.00** 0.157	0.199	400	340	**32.90** 72.53

(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

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FULL-COMPLEMENT (NCF) – *continued*

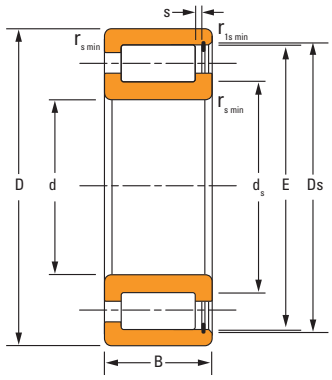


NCF

Bearing Dimensions				Load Rating		Bearing Part Number[2]	Mounting Data				s[3]	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1[1]		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
340.000 13.3858	**420.000** 16.5354	**38.000** 1.4961	**402.800** 15.8583	**953** 214000	**484** 109000	NCF1868V	**2.1** 0.08	**1.5** 0.06	**360.8** 14.20	**403.8** 15.90	**3.00** 0.118	0.174	430	360	**11.00** 24.20
380.000 14.9606	**480.000** 18.8976	**46.000** 1.8110	**457.300** 18.0039	**1350** 304000	**698** 157000	NCF1876V	**2.1** 0.08	**1.5** 0.06	**405.3** 15.96	**458.3** 18.04	**3.50** 0.138	0.193	370	310	**18.90** 41.60
380.000 14.9606	**520.000** 20.4724	**82.000** 3.2283	**487.300** 19.1850	**3360** 756000	**1790** 402000	NCF2976V	**4.0** 0.16	**4.0** 0.16	**411.3** 16.19	**488.8** 19.24	**4.00** 0.157	0.228	310	270	**52.90** 116.62
400.000 15.7480	**500.000** 19.6850	**46.000** 1.8110	**474.000** 18.6614	**1410** 316000	**713** 160000	NCF1880V	**2.1** 0.08	**1.5** 0.06	**422.0** 16.61	**475.0** 18.70	**3.50** 0.138	0.198	350	290	**20.60** 45.41
420.000 16.5354	**520.000** 20.4724	**46.000** 1.8110	**498.800** 19.6378	**1490** 335000	**733** 165000	NCF1884V	**2.1** 0.08	**1.5** 0.06	**446.8** 17.59	**499.8** 19.68	**3.50** 0.138	0.206	330	280	**21.14** 46.50
440.000 17.3228	**540.000** 21.2598	**46.000** 1.8110	**515.500** 20.2953	**1550** 347000	**746** 168000	NCF1888V	**2.1** 0.08	**1.5** 0.06	**463.5** 18.25	**516.5** 20.33	**3.50** 0.138	0.212	310	260	**22.30** 49.16
460.000 18.1102	**580.000** 22.8346	**56.000** 2.2047	**552.600** 21.7559	**2040** 458000	**1030** 232000	NCF1892V	**3.0** 0.12	**3.0** 0.12	**488.6** 19.24	**553.6** 21.80	**4.50** 0.177	0.224	290	250	**33.20** 73.00
460.000 18.1102	**620.000** 24.4094	**95.000** 3.7402	**578.500** 22.7756	**4610** 1040000	**2310** 518000	NCF2992V	**4.0** 0.16	**4.0** 0.16	**494.5** 19.47	**580.0** 22.84	**5.00** 0.197	0.263	240	220	**84.00** 185.19
480.000 18.8976	**650.000** 25.5906	**100.000** 3.9370	**615.200** 24.2205	**4910** 110000	**2570** 579000	NCF2996V	**5.0** 0.20	**5.0** 0.20	**519.2** 20.44	**616.8** 24.28	**6.00** 0.236	0.269	230	210	**94.30** 207.50
500.000 19.6850	**620.000** 24.4094	**56.000** 2.2047	**593.300** 23.3583	**2210** 496000	**1070** 241000	NCF18/500V	**3.0** 0.12	**3.0** 0.12	**529.3** 20.84	**594.3** 23.40	**5.0** 0.197	0.237	260	220	**35.90** 79.00

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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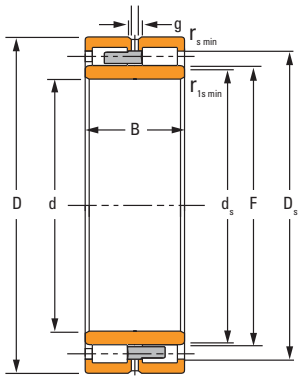


NCF

Bearing Dimensions				Load Rating		Bearing Part Number(2)	Mounting Data				s(3)	Geometry Factor C_g	Thermal Speed Ratings		Weight
							Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1(1)		r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
500.000 19.6850	**670.000** 26.3780	**100.000** 3.9370	**630.900** 24.8386	**5060** 1140000	**2610** 587000	NCF29/500V	**5.0** 0.20	**5.0** 0.20	**534.9** 21.06	**632.5** 24.90	**6.0** 0.236	0.274	220	200	**97.30** 214.10
530.000 20.8661	**650.000** 25.5906	**56.000** 2.2047	**624.000** 24.5669	**2340** 525000	**1100** 248000	NCF18/530V	**3.0** 0.12	**3.0** 0.12	**560.0** 22.05	**625.5** 24.63	**4.1** 0.161	0.246	240	210	**37.80** 83.20
560.000 22.0472	**680.000** 26.7717	**56.000** 2.2047	**654.700** 25.7756	**2460** 554000	**1130** 255000	NCF18/560V	**3.0** 0.12	**3.0** 0.12	**590.7** 23.26	**656.2** 25.84	**4.1** 0.161	0.256	230	190	**39.20** 86.30
600.000 23.6220	**730.000** 28.7402	**60.000** 2.3622	**695.200** 27.3701	**2630** 592000	**1170** 263000	NCF18/600V	**3.0** 0.12	**3.0** 0.12	**631.2** 24.85	**696.7** 27.43	**6.1** 0.240	0.268	210	180	**50.20** 110.40
630.000 24.8031	**780.000** 30.7087	**69.000** 2.7165	**737.500** 29.0354	**3100** 698000	**1410** 316000	NCF18/630V	**4.0** 0.16	**4.0** 0.16	**665.5** 26.20	**739.0** 29.10	**7.5** 0.295	0.281	200	170	**72.20** 159.17
670.000 26.3780	**820.000** 32.2835	**69.000** 2.7165	**782.300** 30.7992	**3320** 746000	**1450** 327000	NCF18/670V	**4.0** 0.16	**4.0** 0.16	**710.3** 27.96	**783.8** 30.86	**7.5** 0.295	0.294	190	160	**74.60** 164.10
710.000 27.9528	**870.000** 34.2520	**74.000** 2.9134	**830.700** 32.7047	**3920** 882000	**1740** 390000	NCF18/710V	**4.0** 0.16	**4.0** 0.16	**750.7** 29.56	**832.7** 32.78	**8.0** 0.315	0.309	170	150	**91.60** 201.94
750.000 29.5276	**920.000** 36.2205	**78.000** 3.0709	**878.000** 34.5669	**4600** 1030000	**2080** 467000	NCF18/750V	**5.0** 0.20	**5.0** 0.20	**788.0** 31.02	**880.0** 34.65	**8.0** 0.315	0.323	160	140	**105.10** 231.20
800.000 31.4961	**980.000** 38.5827	**82.000** 3.2283	**935.000** 36.8110	**4930** 1110000	**2150** 484000	NCF18/800V	**5.0** 0.20	**5.0** 0.20	**845.0** 33.27	**937.0** 36.89	**9.0** 0.354	0.339	150	130	**105.10** 231.20

TWO-ROW

- Additional radial load-carrying capability compared to single-row product.
- Designed to ISO/DIN specified interchangeable dimensions.
- Sold as complete assembly.



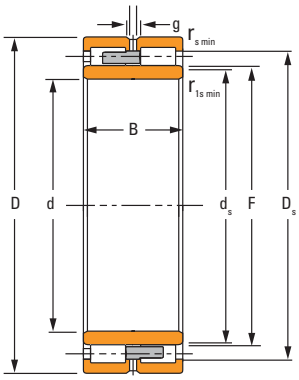
NNU-1

Bearing Dimensions				Load Rating		Bearing Part Number [2]
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1 [1]	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.	
150.000 5.9055	**210.000** 8.2677	**60.000** 2.3622	**168.500** 6.6339	**668** 150200	**374** 84100	NNU4930MAW33
160.000 6.2992	**220.000** 8.6614	**60.000** 2.3622	**178.500** 7.0276	**692** 155600	**380** 85300	NNU4932MAW33
170.000 6.6929	**230.000** 9.0551	**60.000** 2.3622	**188.500** 7.4213	**696** 156200	**376** 84600	NNU4934MAW33
180.000 7.0866	**250.000** 9.8425	**69.000** 2.7165	**202.000** 7.9528	**850** 191000	**449** 101000	NNU4936MAW33
190.000 7.4803	**260.000** 10.2362	**69.000** 2.7165	**212.000** 8.3465	**890** 200000	**459** 103000	NNU4938MAW33
200.000 7.8740	**280.000** 11.0236	**80.000** 3.1496	**225.000** 8.8583	**1046** 234000	**550** 124000	NNU4940MAW33
200.000 7.8740	**340.000** 13.3858	**140.000** 5.5118	**235.000** 9.2520	**2460** 552000	**1690** 381000	NNU4140MAW33
220.000 8.6614	**300.000** 11.8110	**80.000** 3.1496	**245.000** 9.6457	**1150** 258000	**577** 130000	NNU4944MAW33
220.000 8.6614	**370.000** 14.5669	**150.000** 5.9055	**258.000** 10.1575	**2960** 666000	**1930** 434000	NNU4144MAW33
240.000 9.4488	**320.000** 12.5984	**80.000** 3.1496	**265.000** 10.4331	**1220** 274000	**591** 133000	NNU4948MAW33
240.000 9.4488	**400.000** 15.7480	**160.000** 6.2992	**282.000** 11.1024	**3680** 828000	**2290** 515000	NNU4148MAW33
260.000 10.2362	**360.000** 14.1732	**100.000** 3.9370	**292.000** 11.4961	**1710** 385000	**856** 192000	NNU4952MAW33
260.000 10.2362	**440.000** 17.3228	**180.000** 7.0866	**306.000** 12.0472	**4540** 1022000	**2840** 639000	NNU4152MAW33
280.000 11.0236	**380.000** 14.9606	**100.000** 3.9370	**312.000** 12.2835	**1834** 412000	**880** 1980	NNU4956MAW33
280.000 11.0236	**460.000** 18.1102	**180.000** 7.0866	**326.000** 12.8346	**4820** 1084000	**2940** 660000	NNU4156MAW33
300.000 11.8110	**420.000** 16.5354	**118.000** 4.6457	**339.000** 13.3465	**2380** 536000	**1170** 263000	NNU4960MAW33

[1] Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2] The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3] Permissible axial displacement from normal position of one bearing ring in relation to the other.

NNU-1

- Outer rings with solid ribs.
- Lubrication grooves and holes on outer rings.
- One solid brass cage.

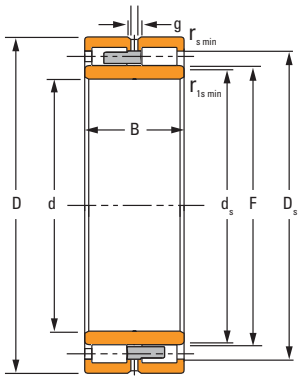


NNU-1

Mounting Data				Lubrication Data				Geometry Factor	Thermal Speed Ratings		Weight
Chamfer		Backing Diameter									
r_{smin}	r_{1smin}	Shaft d_s	Housing D_s	Groove g	Hole Dia. h	Number of Holes z	s[3]	C_g	Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**mm** in.		RPM	RPM	**kg** lbs.
2.0 0.08	**2.0** 0.08	**165.0** 6.50	**197.0** 7.76	**6.8** 0.27	**3** 0.12	6	**2.6** 0.10	0.199	2100	1800	**6.30** 13.90
2.0 0.08	**2.0** 0.08	**175.0** 6.89	**207.0** 8.15	**6.8** 0.27	**3** 0.12	6	**2.8** 0.11	0.206	2000	1700	**6.60** 14.60
2.0 0.08	**2.0** 0.08	**185.0** 7.28	**217.0** 8.54	**6.8** 0.27	**3** 0.12	6	**2.8** 0.11	0.161	1900	1600	**7.00** 15.40
2.0 0.08	**2.0** 0.08	**198.0** 7.80	**232.0** 9.13	**9.6** 0.38	**4.5** 0.18	6	**3.4** 0.13	0.136	1700	1500	**10.50** 23.10
2.0 0.08	**2.0** 0.08	**207.0** 8.15	**242.0** 9.53	**9.6** 0.38	**4.5** 0.18	6	**2.0** 0.08	0.141	1600	1400	**10.80** 23.80
2.1 0.08	**2.1** 0.08	**220.0** 8.66	**259.0** 10.20	**12.3** 0.48	**6** 0.24	6	**3.9** 0.15	0.147	1500	1300	**15.00** 33.10
3.0 0.12	**3.0** 0.12	**229.0** 9.02	**315.0** 12.40	**12.3** 0.48	**6** 0.24	6	**5.40** 0.21	0.165	1200	1100	**51.00** 112.00
2.1 0.08	**2.1** 0.08	**240.0** 9.45	**279.0** 10.98	**12.3** 0.48	**6** 0.24	6	**3.9** 0.15	0.157	1400	1200	**16.50** 36.40
4.0 0.16	**4.0** 0.16	**251.0** 9.88	**342.0** 13.46	**12.3** 0.48	**6** 0.24	6	**5.6** 0.22	0.180	1000	940	**65.00** 143.00
2.1 0.08	**2.1** 0.08	**260.0** 10.24	**299.0** 11.77	**12.3** 0.48	**6** 0.24	6	**3.9** 0.15	0.165	1200	1100	**17.50** 38.60
4.0 0.16	**4.0** 0.16	**275.0** 10.83	**368.0** 14.49	**12.3** 0.48	**6** 0.24	6	**7.2** 0.28	0.196	870	800	**85.00** 187.40
2.1 0.08	**2.1** 0.08	**287.8** 11.33	**334.0** 13.15	**16.0** 0.63	**7.5** 0.30	6	**4.4** 0.17	0.181	1100	950	**30.30** 66.80
4.0 0.16	**4.0** 0.16	**298.9** 11.77	**402.0** 15.83	**16.0** 0.63	**7.5** 0.30	6	**6.3** 0.41	0.210	760	710	**112.00** 247.00
2.1 0.08	**2.1** 0.08	**304.5** 11.99	**354.0** 13.94	**16.0** 0.63	**7.5** 0.30	6	**4.8** 0.19	0.190	1000	880	**32.50** 71.60
5.0 0.20	**5.0** 0.20	**318.9** 12.56	**422.0** 16.61	**16.0** 0.63	**7.5** 0.29	8	**6.3** 0.28	0.219	990	910	**119.00** 262.00
3.0 0.12	**3.0** 0.12	**330.4** 13.01	**389.0** 15.31	**19.3** 0.76	**9.5** 0.37	8	**5.3** 0.21	0.205	880	780	**50.00** 110.00

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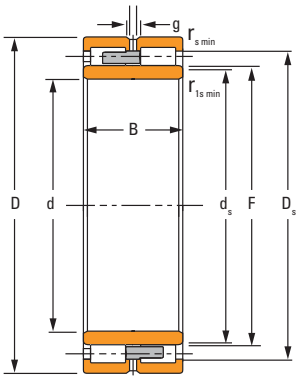
TWO-ROW – continued



NNU-1

Bearing Dimensions				Load Rating		Bearing Part Number [2]
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1 [1]	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.	
300.000 11.8110	**500.000** 19.6850	**200.000** 7.8740	**351.000** 13.8189	**6140** 1382000	**3780** 850000	NNU4160MAW33
320.000 12.5984	**440.000** 17.3228	**118.000** 4.6457	**359.000** 14.1339	**2660** 598000	**1270** 285000	NNU4964MAW33
320.000 12.5984	**540.000** 21.2598	**218.000** 8.5827	**375.000** 14.7638	**6280** 1410000	**3940** 886000	NNU4164MAW33
340.0000 13.3858	**460.0000** 18.1102	**118.0000** 4.6457	**379.0000** 14.9213	**2660** 598000	**1250** 282000	NNU4968MAW33
340.0000 13.3858	**520.0000** 20.4724	**180.0000** 7.0866	**385.0000** 15.1575	**5130** 1153000	**2980** 669000	NNU4068MAW33
340.000 13.3858	**580.000** 22.8346	**243.000** 9.5669	**402.000** 15.8268	**7580** 1704000	**4660** 1050000	NNU4168MAW33
360.0000 14.1732	**480.0000** 18.8976	**118.0000** 4.6457	**399.0000** 15.7087	**2800** 630000	**1270** 285000	NNU4972MAW33
360.0000 14.1732	**540.0000** 21.2598	**180.0000** 7.0866	**405.0000** 15.9449	**5580** 1256000	**3180** 716000	NNU4072MAW33
360.000 14.1732	**600.000** 23.6220	**243.000** 9.5669	**422.000** 16.6142	**8480** 1906000	**5000** 1120000	NNU4172MAW33
380.000 14.9606	**520.000** 20.4724	**140.000** 5.5118	**426.000** 16.7717	**3720** 836000	**1660** 373000	NNU4976MAW33
380.000 14.9606	**560.0000** 22.0472	**180.0000** 7.0866	**425.0000** 16.7323	**5860** 1316000	**3260** 733000	NNU4076MAW33
380.000 14.9606	**620.000** 24.4094	**243.000** 9.5669	**442.000** 17.4016	**8520** 1916000	**4990** 1120000	NNU4176MAW33
400.000 15.7480	**540.000** 21.2598	**140.000** 5.5118	**446.000** 17.5591	**3920** 882000	**1710** 384000	NNU4980MAW33
400.0000 15.7480	**600.0000** 23.6220	**200.0000** 7.8740	**449.0000** 17.6772	**7210** 1621000	**3970** 893000	NNU4080MAW33
400.000 15.7480	**650.000** 25.5906	**250.000** 9.8425	**463.000** 18.2283	**9460** 2120000	**5530** 1240000	NNU4180MAW33
420.0000 16.5354	**560.0000** 22.0472	**140.0000** 5.5118	**466.0000** 18.3465	**4140** 928000	**1750** 394000	NNU4984MAW33

[1] Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2] The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3] Permissible axial displacement from normal position of one bearing ring in relation to the other.

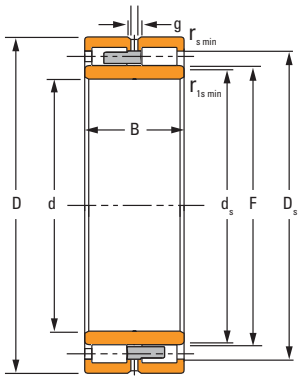


NNU-1

Mounting Data				Lubrication Data				Geometry Factor	Thermal Speed Ratings		Weight
Chamfer		Backing Diameter									
r_{smin}	r_{1smin}	Shaft d_s	Housing D_s	Groove g	Hole Dia. h	Number of Holes z	s[3]	C_g	Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**mm** in.		RPM	RPM	**kg** lbs.
5.0 0.20	**5.0** 0.20	**343.0** 13.50	**463.0** 18.23	**12.0** 0.47	**6** 0.24	8	**6.5** 0.26	0.236	600	560	**158.00** 348.00
3.0 0.12	**3.0** 0.12	**351.0** 13.82	**409.0** 16.10	**10.0** 0.39	**5.0** 0.20	8	**5.2** 0.20	0.216	790	710	**54.00** 119.00
5.0 0.20	**5.0** 0.20	**365.0** 14.37	**495.0** 19.49	**19.3** 0.76	**9.5** 0.37	10	**8.8** 0.35	0.242	590	550	**200.00** 441.00
3.0 0.12	**3.0** 0.12	**380.0** 14.96	**487.0** 19.17	**19.3** 0.76	**9.5** 0.37	8	**6.3** 0.25	0.222	760	670	**56.00** 123.00
5.0 0.20	**5.0** 0.20	**380.0** 14.96	**487.0** 19.17	**19.3** 0.76	**9.5** 0.37	10	**8.9** 0.35	0.238	610	560	**140.00** 309.00
5.0 0.20	**5.0** 0.20	**391.0** 15.39	**530.0** 20.87	**19.3** 0.76	**9.5** 0.37	10	**9.6** 0.38	0.258	530	490	**260.00** 573.00
3.0 0.12	**3.0** 0.12	**392.0** 15.43	**449.0** 17.68	**19.3** 0.76	**9.5** 0.37	8	**5.6** 0.33	0.229	710	630	**58.50** 129.00
5.0 0.20	**5.0** 0.20	**400.0** 15.75	**507.0** 19.96	**19.3** 0.76	**9.5** 0.37	10	**7.9** 0.33	0.248	560	510	**140.00** 309.00
5.0 0.20	**5.0** 0.20	**408.0** 16.06	**550.0** 21.65	**19.3** 0.76	**9.5** 0.37	10	**9.2** 0.36	0.271	470	440	**275.00** 606.00
4.0 0.16	**4.0** 0.16	**418.0** 16.46	**482.0** 18.98	**19.30** 0.76	**9.50** 0.37	10	**6.6** 0.26	0.248	630	560	**87.50** 193.00
5.0 0.20	**5.0** 0.20	**415.00** 16.34	**525.00** 20.67	**19.30** 0.76	**9.50** 0.37	10	**7.90** 0.31	0.256	530	480	**150.00** 331.00
5.0 0.20	**5.0** 0.20	**429.0** 16.89	**570.0** 22.44	**19.30** 0.76	**9.50** 0.37	10	**9.2** 0.36	0.277	460	430	**285.00** 628.00
4.0 0.16	**4.0** 0.16	**437.0** 17.20	**504.0** 19.84	**19.30** 0.76	**9.50** 0.37	10	**7.1** 0.28	0.257	600	530	**91.70** 202.00
5.0 0.20	**5.0** 0.20	**440.0** 17.32	**560.0** 22.05	**19.30** 0.76	**9.50** 0.37	10	**8.2** 0.32	0.274	460	430	**205.00** 452.00
6.0 0.24	**6.0** 0.24	**451.4** 17.77	**599.0** 23.58	**19.30** 0.76	**9.50** 0.37	12	**9.3** 0.37	0.288	410	390	**325.00** 716.00
4.0 0.16	**4.0** 0.16	**456.4** 17.97	**522.0** 20.55	**19.30** 0.76	**9.50** 0.37	10	**5.9** 0.23	0.265	560	500	**98.00** 216.00

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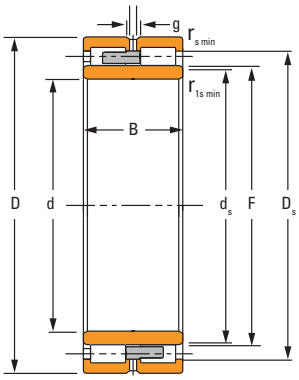
TWO-ROW – continued



NNU-1

Bearing Dimensions				Load Rating		Bearing Part Number [2]
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1 [1]	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.	
420.0000 16.5354	**620.0000** 24.4094	**200.0000** 7.8740	**469.0000** 18.4646	**7600** 1706000	**4070** 914000	NNU4084MAW33
420.000 16.5354	**700.000** 27.5591	**280.000** 11.0236	**497.000** 19.5669	**11420** 2560000	**6430** 1450000	NNU4184MAW33
440.0000 17.3228	**600.0000** 23.6220	**160.0000** 6.2992	**490.0000** 19.2913	**5740** 1292000	**2500** 562000	NNU4988MAW33
440.0000 17.3228	**650.0000** 25.5906	**212.0000** 8.3465	**487.0000** 19.1732	**8180** 1840000	**4530** 1020000	NNU4088MAW33
440.0000 17.3228	**720.0000** 28.3465	**280.0000** 11.0236	**511.0000** 20.1181	**11400** 2560000	**6620** 1490000	NNU4188MAW33
460.000 18.1102	**620.000** 24.4094	**160.000** 6.2992	**510.000** 20.0787	**5540** 1246000	**2420** 544000	NNU4992MAW33
460.000 18.1102	**680.0000** 26.7717	**218.0000** 8.5827	**513.0000** 20.1969	**9420** 2120000	**4980** 1120000	NNU4092MAW33
460.000 18.1102	**760.000** 29.9213	**300.000** 11.8110	**537.000** 21.1417	**12960** 2920000	**7440** 1670000	NNU4192MAW33
480.000 18.8976	**650.000** 25.5906	**170.000** 6.6929	**534.000** 21.0236	**6160** 1382000	**2680** 602000	NNU4996MAW33
480.0000 18.8976	**700.0000** 27.5591	**218.0000** 8.5827	**533.0000** 20.9843	**9730** 2189000	**5090** 1150000	NNU4096MAW33
480.000 18.8976	**790.000** 31.1024	**308.000** 12.1260	**557.000** 21.9291	**14260** 3200000	**8190** 1840000	NNU4196MAW33
500.0000 19.6850	**670.0000** 26.3780	**170.0000** 6.6929	**554.0000** 21.8110	**6280** 1410000	**2690** 605000	NNU49/500MAW33
500.0000 19.6850	**720.0000** 28.3465	**218.0000** 8.5827	**553.0000** 21.7717	**10560** 2380000	**5550** 1250000	NNU40/500MAW33
530.0000 20.8661	**710.0000** 27.9528	**180.0000** 7.0866	**588.0000** 23.1496	**8180** 1839000	**3360** 755000	NNU49/530MAW33
530.0000 20.8661	**780.0000** 30.7087	**250.0000** 9.8425	**591.0000** 23.2677	**12160** 2740000	**6330** 1420000	NNU40/530MAW33
560.0000 22.0472	**750.0000** 29.5276	**190.0000** 7.4803	**623.0000** 24.5276	**8780** 1976000	**3590** 808000	NNU49/560MAW33

[1] Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2] The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3] Permissible axial displacement from normal position of one bearing ring in relation to the other.

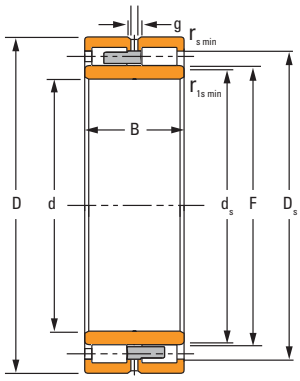


NNU-1

Mounting Data				Lubrication Data				Geometry Factor C_g	Thermal Speed Ratings		Weight
Chamfer		Backing Diameter		Groove g	Hole Dia. h	Number of Holes z	s[3]		Oil	Grease	
r_{smin}	r_{1smin}	Shaft d_s	Housing D_s								
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**mm** in.		RPM	RPM	**kg** lbs.
5.0 0.20	**5.0** 0.20	**459.0** 18.07	**577.0** 22.72	**19.30** 0.76	**9.50** 0.37	10	**8.40** 0.33	0.282	430	400	**183.00** 403.00
6.0 0.24	**6.0** 0.24	**490.0** 19.29	**647.0** 25.47	**19.30** 0.76	**9.50** 0.37	12	**9.3** 0.37	0.309	370	350	**440.00** 970.00
4.0 0.16	**4.0** 0.16	**480.4** 18.91	**558.0** 21.97	**16.00** 0.63	**8.00** 0.31	10	**6.8** 0.27	0.286	460	420	**136.00** 300.00
6.0 0.24	**6.0** 0.24	**478.0** 18.82	**607.0** 23.90	**19.30** 0.76	**9.50** 0.37	12	**8.80** 0.35	0.290	410	380	**215.00** 474.00
6.0 0.24	**6.0** 0.24	**497.4** 19.58	**661.0** 26.02	**25.3** 1.00	**13.0** 0.51	12	**11.0** 0.43	0.311	370	340	**119.00** 262.00
4.0 0.16	**4.0** 0.16	**500.0** 19.69	**578.0** 22.76	**19.3** 0.76	**9.5** 0.37	10	**6.2** 0.24	0.288	460	420	**135.00** 298.00
6.0 0.24	**6.0** 0.24	**502.0** 19.76	**633.0** 24.92	**19.30** 0.76	**9.50** 0.37	12	**8.40** 0.33	0.305	370	340	**240.00** 529.00
7.5 0.30	**7.5** 0.30	**525.0** 20.67	**697.0** 27.44	**19.30** 0.76	**9.50** 0.37	12	**11.3** 0.44	0.324	330	320	**535.00** 1179.00
5.0 0.20	**5.0** 0.20	**526.0** 20.71	**606.0** 23.86	**19.30** 0.76	**9.50** 0.37	12	**6.8** 0.27	0.299	430	390	**160.00** 353.00
6.0 0.24	**6.0** 0.24	**527.0** 20.75	**653.0** 25.71	**19.3** 0.76	**9.5** 0.37	12	**8.7** 0.34	0.313	350	330	**275.00** 606.00
7.5 0.30	**7.5** 0.30	**543.0** 21.38	**727.0** 28.62	**25.3** 1.00	**13.0** 0.51	12	**12.0** 0.47	0.335	310	290	**590.00** 1301.00
5.0 0.20	**5.0** 0.20	**543.0** 21.38	**626.0** 24.65	**19.3** 0.76	**9.5** 0.37	12	**6.4** 0.25	0.306	420	380	**170.00** 375.00
6.0 0.24	**6.0** 0.24	**544.0** 21.42	**681.0** 26.81	**16.0** 0.63	**7.5** 0.30	12	**7.7** 0.30	0.322	330	310	**288.00** 635.00
5.0 0.20	**5.0** 0.20	**577.7** 22.74	**664.0** 26.14	**19.3** 0.76	**9.5** 0.37	12	**6.3** 0.25	0.334	350	320	**207.00** 456.00
6.0 0.24	**6.0** 0.24	**579.3** 22.81	**727.0** 28.62	**19.30** 0.76	**9.50** 0.37	12	**11.00** 0.43	0.341	300	280	**420.00** 925.93
5.0 0.20	**5.0** 0.20	**612.0** 24.09	**703.0** 27.68	**22.0** 0.87	**12.0** 0.47	12	**6.6** 0.26	0.346	330	300	**245.00** 540.00

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TWO-ROW – continued

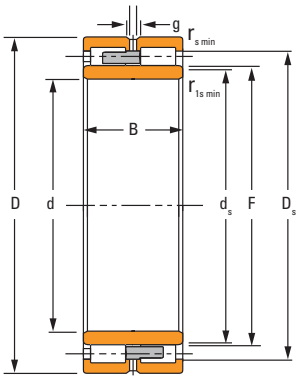


NNU-1

Bearing Dimensions				Load Rating		Bearing Part Number [2]
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_o	Dynamic C_1 [1]	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.	
600.0000 23.6220	**800.0000** 31.4961	**200.0000** 7.8740	**666.0000** 26.2205	**10120** 2280000	**4040** 907000	NNU49/600MAW33
630.0000 24.8031	**850.0000** 33.4646	**218.0000** 8.5827	**704.0000** 27.7165	**11520** 2580000	**4570** 1030000	NNU49/630MAW33
670.0000 26.3780	**900.0000** 35.4331	**230.0000** 9.0551	**738.0000** 29.0551	**13460** 3020000	**5430** 1220000	NNU49/670MAW33
670.0000 26.3780	**980.0000** 38.5827	**308.0000** 12.1260	**744.0000** 29.2913	**18840** 4236000	**9740** 2190000	NNU40/670MAW33
710.0000 27.9528	**950.0000** 37.4016	**243.0000** 9.5669	**782.0000** 30.7874	**14660** 3300000	**6310** 1420000	NNU49/710MAW33
750.0000 29.5276	**1000.0000** 39.3701	**250.0000** 9.8425	**831.0000** 32.7165	**16480** 3700000	**6230** 1400000	NNU49/750MAW33
800.0000 31.4961	**1060.0000** 41.7323	**258.0000** 10.1575	**880.0000** 34.6457	**17390** 3909000	**7070** 1590000	NNU49/800MAW33
850.000 33.4646	**1120.000** 44.0945	**272.000** 10.7087	**939.000** 36.9685	**17900** 4020000	**6810** 1530000	NNU49/850MAW33
900.0000 35.4331	**1180.0000** 46.4567	**280.0000** 11.0236	**986.0000** 38.8189	**20650** 4643000	**7790** 1750000	NNU49/900MAW33

[1]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[2]The radial internal clearance (RIC) for the bearing assembly must be included when ordering the complete assembly.
[3]Permissible axial displacement from normal position of one bearing ring in relation to the other.

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NNU-1

Mounting Data				Lubrication Data				Geometry Factor C_g	Thermal Speed Ratings		Weight
Chamfer		Backing Diameter		Groove g	Hole Dia. h	Number of Holes z	s[3]		Oil	Grease	
r_{smin}	r_{1smin}	Shaft d_s	Housing D_s								
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**mm** in.		RPM	RPM	**kg** lbs.
5.0 0.20	**5.0** 0.20	**655.0** 25.79	**750.0** 29.53	**25.3** 1.00	**13.0** 0.51	12	**6.9** 0.27	0.365	290	270	**294.00** 648.00
6.0 0.24	**6.0** 0.24	**691.0** 27.20	**794.0** 31.26	**25.3** 1.00	**13.0** 0.51	16	**9.4** 0.37	0.383	270	250	**365.00** 804.70
6.0 0.24	**6.0** 0.24	**726.9** 28.62	**838.0** 32.99	**19.3** 0.76	**9.5** 0.37	16	**8.4** 0.33	0.400	240	230	**428.00** 944.00
7.5 0.30	**7.5** 0.30	**726.9** 28.62	**922.0** 36.30	**22.0** 0.87	**12.0** 0.47	16	**13.0** 0.51	0.404	210	200	**769.00** 1695.00
6.0 0.24	**6.0** 0.24	**767.3** 30.21	**902.1** 35.52	**19.3** 0.76	**9.5** 0.37	16	**10.7** 0.42	0.409	220	210	**488.00** 1076.00
6.0 0.24	**6.0** 0.24	**817.9** 32.20	**933.0** 36.73	**19.3** 0.76	**9.5** 0.37	16	**7.6** 0.30	0.442	200	190	**568.00** 1252.20
6.0 0.24	**6.0** 0.24	**865.4** 34.07	**1000.0** 39.37	**19.3** 0.76	**9.5** 0.37	16	**10.5** 0.41	0.450	190	180	**598.00** 1318.00
6.0 0.24	**6.0** 0.24	**928.0** 36.54	**1047.0** 41.22	**25.3** 1.00	**13** 0.51	16	**16.0** 0.63	0.470	190	170	**360.00** 794.00
6.0 0.24	**6.0** 0.24	**968.8** 38.14	**1106.0** 43.54	**25.3** 1.00	**13** 0.51	16	**11.9** 0.47	0.494	160	150	**839.00** 1850.00

FOUR-ROW CYLINDRICAL ROLLER BEARINGS

Timken's four-row cylindrical roller bearings are designed for the rigors of daily use in applications where moderate and high speeds, high radial loads, elevated temperatures and debris are constant challenges. Designed with well-balanced cross sections, these bearings provide high-radial-load capacity within the bearing envelope.

APPLICATIONS

Engineered primarily for rolling mill roll-neck applications, Timken's four-row cylindrical bearings are commonly used in work roll or back-up roll positions in flat product, long product and structural mills.

Product Features

- Available in sizes 140 mm I.D. – 2000 mm O.D. (5.512 in. – 78.740 in.).
- Case-hardened rings and rollers enhance durability.
- Inner races are interchangeable with outer assemblies.
- Manufactured to P6 boundary and P5 runout tolerances.
- Roller profiles are custom designed and manufactured for optimum performance.
- Straight and tapered bores are available.



Fig. 22. Four-row cylindrical roller bearing.

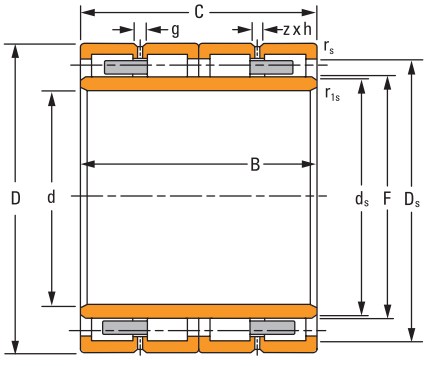


Fig. 23. Cylindrical roller bearing.

DESIGN BENEFITS

Our most common configurations available are types RY, RYL and RX. However, Timken also will custom design and manufacture bearings for your particular size and application requirements. If you have a new mill application, our engineers will work with you in the earliest design stages to help you select the right bearings.

RADIAL INTERNAL CLEARANCE (RIC)

Timken's standard bearings offer different clearances, such as C3 or C4 according to DIN 620-4. If needed for your application, they can be furnished with a tapered bore.

Timken supplies inner rings in two ways: a finished state with no additional grinding required or a semi-finished condition with appropriate grind stock. Semi-finished inner rings allow mill operators to optimize the roll's precision by finish grinding the inner ring after mounting it onto the roll.

The part numbers for these bearings and inner-ring assemblies are identified by a CF suffix.

LUBRICATION

Timken four-row cylindrical roller bearings can be used with grease, oil-air, oil-mist or circulating-oil systems. The bearings must be correctly lubricated for maximum performance through either lubrication grooves, holes in the outer-ring O.D. or through integrated face slots on the outer-ring faces. See detailed design types on pages 92-95 for further information on the standard lubrication configurations by bearing type.

MATERIAL

Our bearings are designed to provide superior size stability, fracture toughness and reliability. By using only high quality, carburized alloy, and applying a special heat-treatment during the manufacturing process, we are able to produce bearings that can withstand the heavy stresses and impact loading often experienced by multi-row cylindrical roller bearings used in rolling mills.

MOUNTING DESIGN AND FITTING PRACTICE

The cylindrical roller bearing is designed to primarily accommodate radial loads, however, it can be used as a locating bearing and take light axial loads with the proper flange configuration.

The housing fitting practice usually results in a loose fit to facilitate easy removal at regular maintenance intervals. The preferred shaft fit is tight. There are occasions where loose shaft fits are tolerated, such as on some roughing-mill equipment. In the cases where a shaft fit is loose, inner-race bore lubrication grooves must be incorporated in the bearing. Check with your Timken engineer for a more details on mounting four-row cylindrical roller bearings. Mounting information also is available in the Timken Engineering Manual (order no. 10424) on timken.com/catalogs.

In order to facilitate the dismounting, face slots can be added on the inner rings (W30B modification code).

Inner rings can be ordered separately from the outer assembly in order to equip additional spare rolls. Inner- and outer- ring assemblies are interchangeable in regard to internal clearance.

MAIN DESIGN TYPES

Optimized rolling elements and race geometry provides high radial-load capacity within the bearing envelope. In addition, multiple cage designs and materials allow for design flexibility and preset radial clearance simplifies the installation process.

TYPE RY

The RY bearing style incorporates two outer races with triple flanges (solid ribs). The inner race is usually single-piece construction. The outer assemblies consist of the outer race, rollers and cages, which create a unitized construction. Handling is made simple by this design. A loading slot is used for roller insertion. Lubrication is generally accomplished via slots in the faces of the outer ring. The cage is single-piece, fully machined-brass or steel material. The roller pockets are staggered between the races.

TYPE RX

The RX bearings are four-row construction, having two single-flanged outer races and rib rings for roller spacing. This allows for complete disassembly for inspection. The RX style is usually preferred in bearings above 400 mm bore.

Both brass and pin-type cages are available in this bearing style. Most inners are two-piece assemblies.

TYPE RYL AND RXL

The most recent RYL and RXL designs are available in sizes up to 340 mm bore and specifically designed for long-product mills. Standard steel cage and enhanced design features are included to maximize bearing life, reduce roller drop and optimize bearing handling.

NOMENCLATURE

BEARING ASSEMBLY

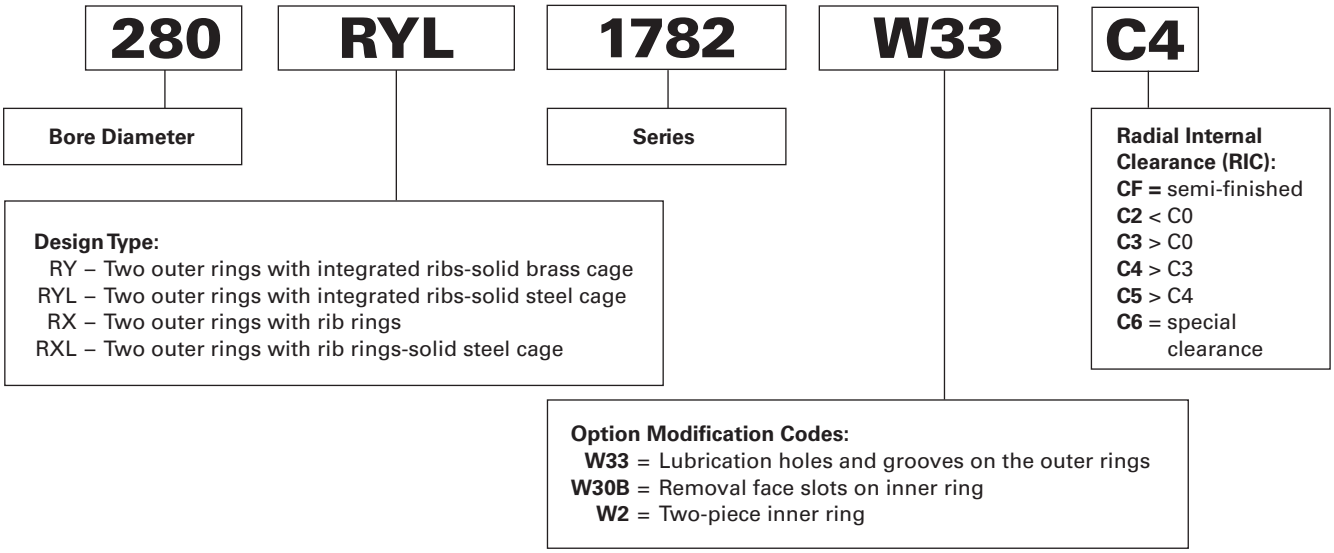


Fig. 38. Four-row cylindrical roller bearing assembly nomenclature.

MODIFICATION CODES

TABLE 47. MODIFICATION CODES

Modification Code	General Definition
W2	Two-piece inner ring
W23	Wide inner ring
W30	Lube slots in face of inner ring
W30A	Removal slots on one face of inner ring
W30B	Removal slots on both faces of inner ring
W30G	Lube slots in one face of inner ring
W33	Outer ring with standard lube holes and machined lube groove in center of O.D.
W50A	Tapped lifting holes in face of inner ring
W69	Inner ring with spiral lube groove
W99	One flange inner ring (for multi-row)
W217	W23-wide inner ring. W30B-removal slots on both faces of inner. W69-inner ring with spiral lube groove.
W224	W23-wide inner ring. W30G-lube slots in one face of inner. W69-inner ring with spiral lube groove. W99-one flange inner ring (for multi-row).

CLEARANCE CODES

TABLE 48. CLEARANCE CODES

Modification Code	General Definition
C2, C0, C3, C4, C5	Radial internal clearance per ISO 5753
C6, C7, C8, C9	Special radial internal clearance
CF1, CF2, …	**Customer Finish:** The inner ring is supplied with added stock (semi-finished) on the outside diameter to account for additional finish grinding required after shrink-fitting the inner ring set onto the neck in order to suite the mounted RIC requirement.

NOTE: Most long-product applications use C4 or sometimes C3 radial internal clearances.
The Radial Internal Clearance (RIC) for the bearing assembly must be included when ordering either the complete assembly or the inner-ring set. It is advisable to order the inner-ring set independent of the outer-ring set when the final grind of the inner-ring O.D. is accomplished after mounting on the roll neck.

INNER-ASSEMBLY NOMENCLATURE

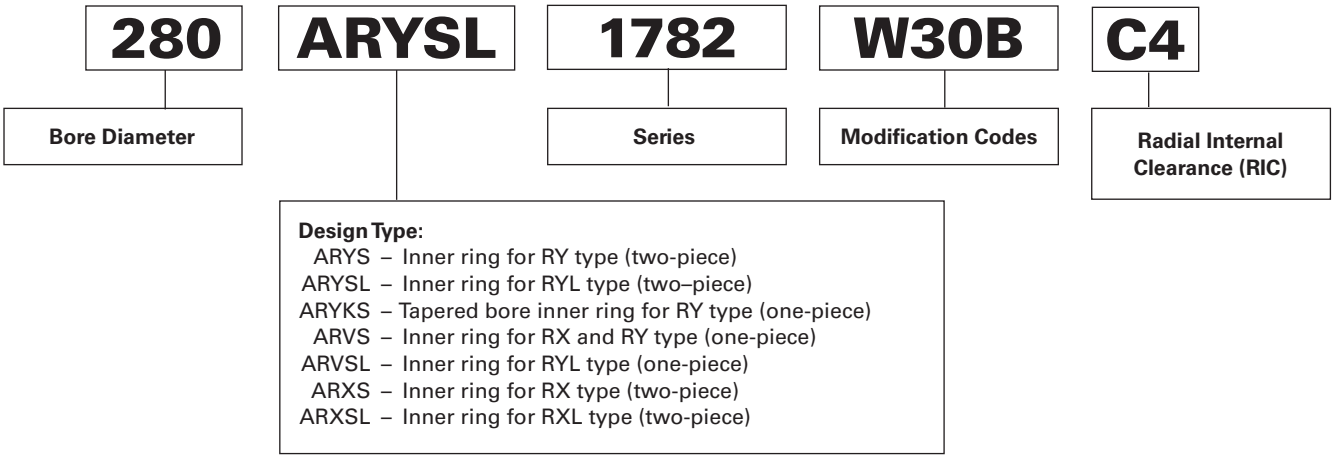


Fig. 39. Four-row cylindrical roller inner-ring nomenclature.

OUTER-ASSEMBLY NOMENCLATURE

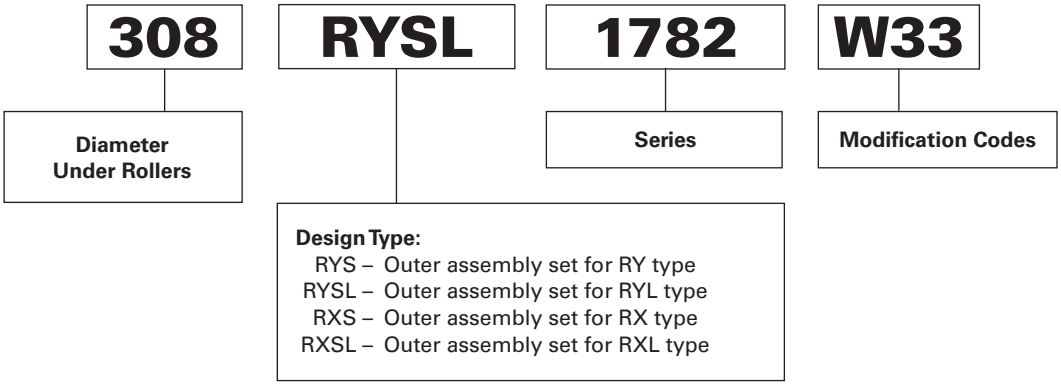
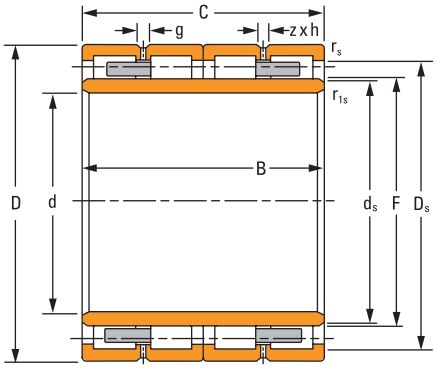


Fig. 40. Four-row cylindrical roller outer-assembly nomenclature.

FOUR-ROW CYLINDRICAL ROLLER BEARING DESIGN TYPES (TIGHT FIT MOUNTING)

RY-1, RYL-1

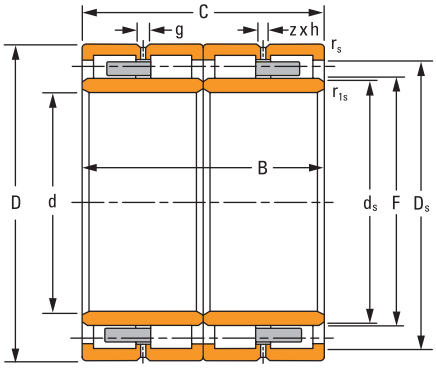
- Two outer rings with integral ribs.
- One-piece inner ring.
- Lubrication grooves and holes on outer rings.
- RY-1 – two solid-brass cages.
- RYL-1 – two solid-steel cages.



RY-1, RYL-1

RY-2, RYL-2

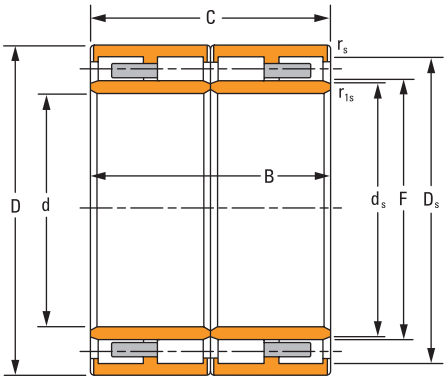
- Two outer rings with integral ribs.
- Two inner rings.
- Lubrication grooves and holes on outer rings
- RY-2 – two solid-brass cages.
- RYL-2 – two solid-steel cages.



RY-2, RYL-2

RY-3, RYL-3

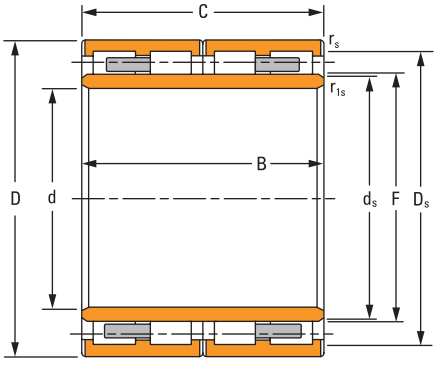
- Two outer rings with integral ribs.
- Two inner rings.
- Lubrication face slots on outer rings.
- RY-3 – two solid-brass cages.
- RYL-3 – two solid-steel cages.



RY-3, RYL-3

RYL-6

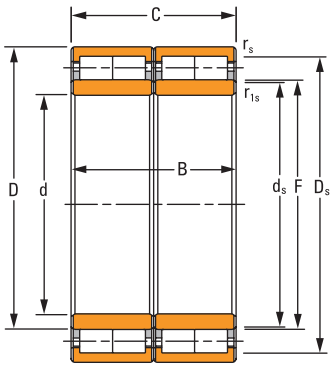
- Two outer rings with integral ribs.
- One-piece inner ring.
- Lubrication face slots on outer rings.
- Two solid-steel cages.



RYL-6

RY-10

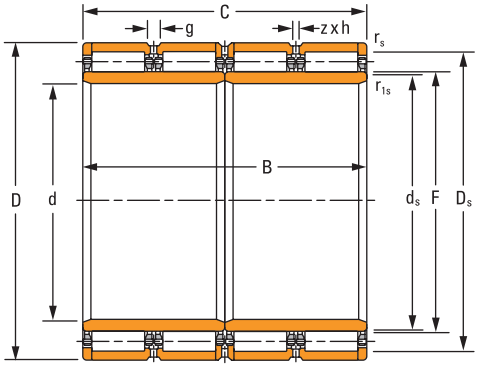
- Two outer rings with integral ribs.
- Two inner rings.
- Lubrication face slots on outer rings.
- Solid-brass cages.



RY-10

RX-1, RX-9, RX-11

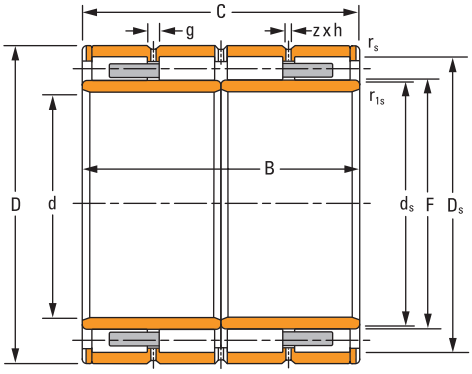
- Two outer rings with three rib rings.
- Two inner rings.
- Four pin-type steel cages.
- RX-1 – with lubrication grooves and holes on outer rings (illustrated).
- RX-9 – with oil-mist nozzles and O-rings in outer rings.
- RX-11 – with lubrication grooves, holes and O-rings on outer rings.



RX-1, RX-9, RX-11

RX-2, RXL-2

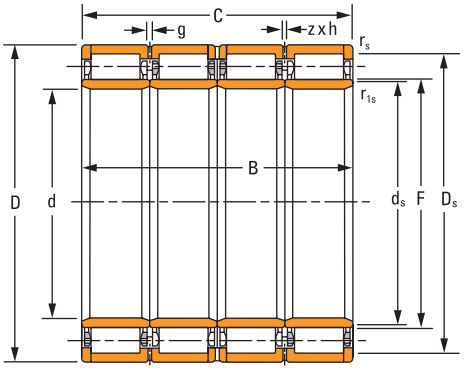
- Two outer rings with three rib rings.
- Two inner rings.
- Lubrication grooves and holes on outer rings.
- Lubrication face slots on outer rib rings.
- RX-2 – two solid-brass cages.
- RXL-2 – two solid-steel cages.



RX-2, RXL-2

RX-7

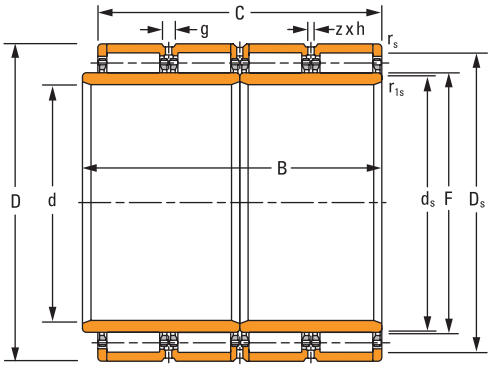
- Two outer rings with three rib rings.
- Four inner rings.
- Four pin-type steel cages.
- Lubrication grooves and holes on outer rings.



RX-7

RX-8

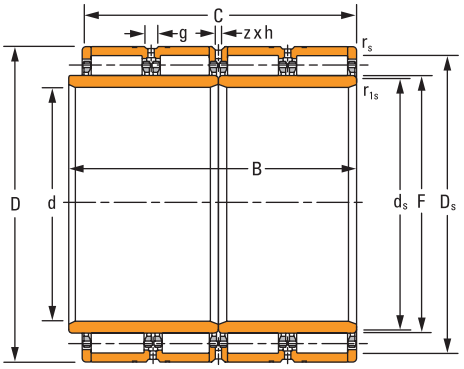
- Two outer rings with three rib rings.
- Two inner rings.
- Extended inner ring on one side.
- Four pin-type steel cages.
- Lubrication grooves and holes on outer rings.



RX-8

RX-10

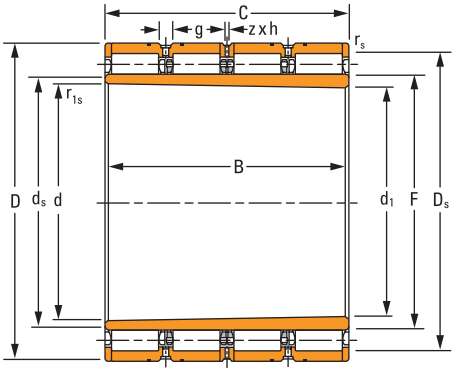
- Two outer rings with three rib rings.
- Two inner rings.
- Extended inner ring on one side.
- Four pin-type steel cages.
- Lubrication grooves and holes on outer rings.
- With oil-mist nozzles and O-rings in outer rings.



RX-10

RXK-1, RXK-2

- Two outer rings with three rib rings.
- One-piece tapered-bore inner ring.
- Four pin-type steel cages.
- Lubrication grooves and holes on outer rings.
- RXK-1 – with oil-mist nozzles and O-rings in outer rings (illustrated).
- RXK-2 – without oil-mist nozzles and O-rings in outer rings.

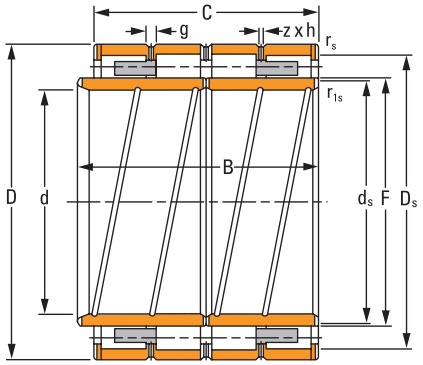


RXK-1, RXK-2

FOUR-ROW CYLINDRICAL ROLLER BEARING DESIGN TYPES (LOOSE FIT MOUNTING)

RX-3, RXL-3

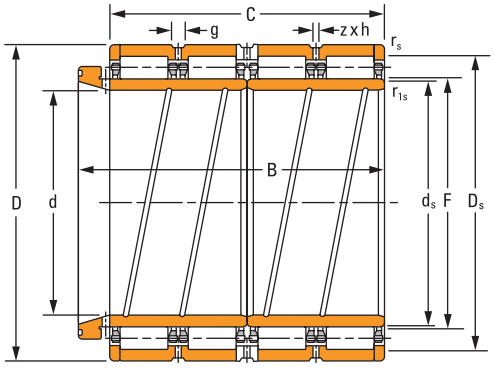
- Two outer rings with three rib rings.
- Two inner rings.
- Extended inner ring on one side.
- Lubrication grooves and face slots on inner rings.
- Lubrication grooves and holes on outer rings.
- Lubrication face slots on outer rib rings.
- RX-3 – two solid-brass cages.
- RXL-3 – two solid-steel cages.



RX-3, RXL-3

RX-4

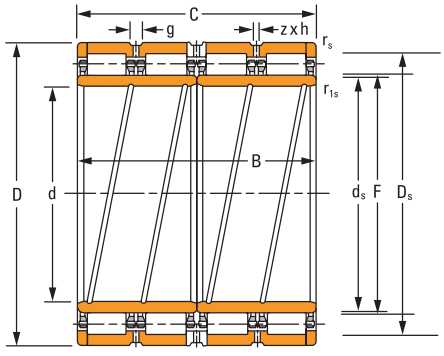
- Two outer rings with three rib rings.
- Two inner rings.
- Extended inner ring on one side.
- Four pin-type steel cages.
- Lubrication grooves and face slots on inner rings.
- Lubrication grooves and holes on outer rings.



RX-4

RX-5

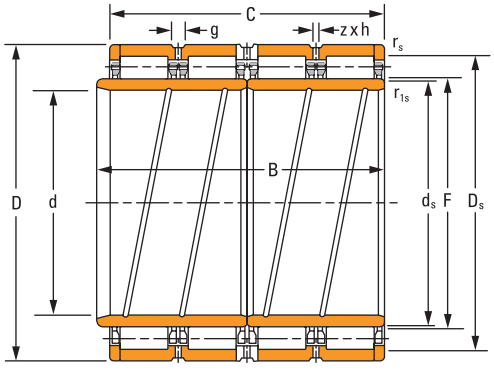
- Two outer rings with three rib rings.
- Two inner rings.
- Four pin-type steel cages.
- Lubrication grooves and face slots on inner rings.
- Lubrication grooves and holes on outer rings.
- Identical width on outer and inner assembly.



RX-5

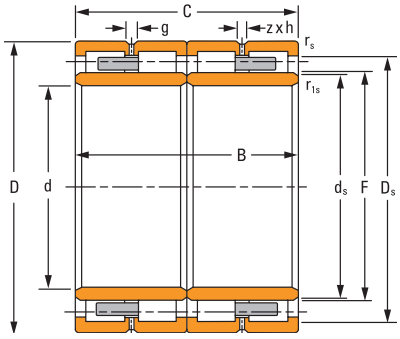
RX-6

- Two outer rings with three rib rings.
- Two inner rings.
- Extended inner ring on one side.
- Four pin-type steel cages.
- Lubrication grooves and face slots on inner rings.
- Lubrication grooves and holes on outer rings.

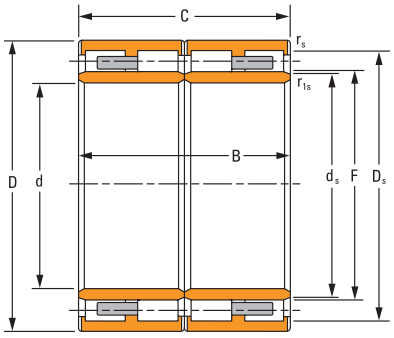


RX-6

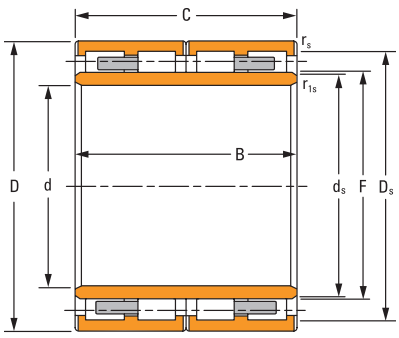
FOUR-ROW CYLINDRICAL ROLLER BEARINGS



RYL-2



RYL-3



RYL-6

Bearing Dimensions					Dynamic Load Rating[2]	Bearing Assembly Part Number	
Bore d	O.D. D	Width B	Width C	DUR[1] F	$C_{1(4)}$	Bearing	Type
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf		
145 5.7087	**225** 8.8583	**156** 6.1417	**156** 6.1417	**169** 6.6535	**1100** 248000	145RYL1452	RYL-6
160 6.2992	**230** 9.0551	**130** 5.1181	**130** 5.1181	**180** 1.0866	**856** 192400	160RYL1468	RYL-6
160 6.2992	**230** 9.0551	**168** 6.6142	**168** 6.6142	**179** 7.0472	**1188** 268000	160RYL1467	RYL-6
165.1 6.5000	**225.425** 8.8750	**168.275** 6.6250	**168.275** 6.6250	**181** 7.1260	**1158** 260000	165RYL1451	RYL-3
170 6.6929	**230** 9.0551	**160** 6.2992	**160** 6.2992	**185.5** 7.3032	**1194** 268000	170RYL6462	RYL-2
180 7.0866	**260** 10.2362	**168** 6.6142	**168** 6.6142	**202** 7.9528	**1452** 326000	180RYL1527	RYL-6
190 7.4803	**260** 10.2362	**168** 6.6142	**168** 6.6142	**212** 8.3465	**1288** 290000	190RYL1528	RYL-6
190 7.4803	**270** 10.6299	**200** 7.8740	**200** 7.8740	**212** 8.3465	**1702** 382000	190RYL1543	RYL-6
200 7.8740	**270** 10.6299	**170** 6.6929	**170** 6.6929	**222** 8.7402	**1334** 300000	200RYL1544	RYL-6
200 7.8740	**270** 10.6299	**200** 7.8740	**200** 7.8740	**222.250** 8.7500	**1554** 350000	200RYL1545	RYL-6
200 7.8740	**280** 11.0236	**170** 6.6929	**170** 6.6929	**222** 8.7402	**1542** 346000	200RYL1566	RYL-6
200 7.8740	**280** 11.0236	**200** 7.8740	**200** 7.8740	**222** 8.7402	**1730** 388000	200RYL1567	RYL-6
200 7.8740	**290** 11.4173	**192** 7.5591	**192** 7.5591	**226** 8.8976	**1774** 398000	200RYL1585	RYL-6
210 8.2677	**290** 11.4173	**192** 7.5591	**192** 7.5591	**236** 9.2913	**1622** 364000	210RYL1584	RYL-6
220 8.6614	**310** 12.2047	**192** 7.5591	**192** 7.5591	**246** 9.6850	**1840** 414000	220RYL1621	RYL-6

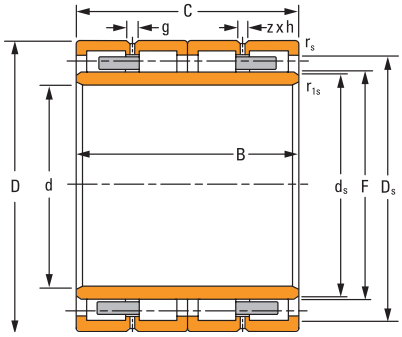
[1]DUR–Diameter Under Rollers.
[2]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.

Sub Assembly Part Number		Mounting Dimensions				Lubrication Data			Weight
		Fillet Radius		Backing Diameter		Groove	Hole Diameter	No. of Holes	
Inner Ring	Outer Assembly	Maximum		Shaft	Housing				
		r_s[3]	r_{1s}[3]	d_s	D_s	g	h	z	
		mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.
145ARVSL1452	169RYSL1452	**2.0** 0.08	**2.0** 0.08	**164.2** 6.46	**205.0** 8.07	–	–	–	**23.0** 50.7
160ARVSL1468	180RYSL1468	**1.5** 0.06	**1.5** 0.06	**174.6** 6.87	**216.0** 8.50	–	–	–	**16.8** 37.0
160ARVSL1467	179RYSL1467	**2.0** 0.08	**2.0** 0.08	**174.5** 6.87	**211.0** 8.31	–	–	–	**23.1** 50.8
165ARVSL1451	181RYSL1451	**1.5** 0.06	**1.5** 0.06	**176.2** 6.94	**211.0** 8.31	–	–	–	**19.6** 43.2
170ARYSL6462	186RYSL6462	**1.5** 0.06	**1.5** 0.06	**180.8** 7.12	**215.5** 8.48	**6.8** 0.27	**3.0** 0.12	6	**19.0** 41.8
180ARVSL1527	202RYSL1527	**2.1** 0.08	**2.1** 0.08	**196.3** 7.73	**242.0** 9.53	–	–	–	**29.7** 65.4
190ARVSL1528	212RYSL1528	**2.0** 0.08	**2.0** 0.08	**207.2** 8.16	**244.0** 9.61	–	–	–	**26.5** 58.2
190ARVSL1543	212RYSL1543	**2.1** 0.08	**2.1** 0.08	**207.0** 8.15	**250.0** 9.84	–	–	–	**36.7** 80.8
200ARVSL1544	222RYSL1544	**2.1** 0.08	**2.1** 0.08	**216.9** 8.54	**254.0** 10.00	–	–	–	**27.9** 61.5
200ARVSL1545	222RYSL1545	**2.1** 0.08	**2.1** 0.08	**216.7** 8.53	**254.3** 10.01	–	–	–	**33.3** 73.2
200ARVSL1566	222RYSL1566	**2.1** 0.08	**2.1** 0.08	**217.5** 8.56	**262.0** 10.31	–	–	–	**32.4** 71.2
200ARVSL1567	222RYSL1567	**2.1** 0.08	**2.1** 0.08	**218.0** 8.58	**260.0** 10.24	–	–	–	**39.0** 86.0
200ARVSL1585	226RYSL1585	**2.1** 0.08	**2.1** 0.08	**220.6** 8.69	**270.0** 10.63	–	–	–	**41.8** 92.1
210ARVSL1584	236RYSL1584	**2.1** 0.08	**2.1** 0.08	**230.0** 9.05	**272.0** 10.71	–	–	–	**38.9** 85.5
220ARVSL1621	246RYSL1621	**3.0** 0.12	**3.0** 0.12	**240.5** 9.47	**290.0** 11.42	–	–	–	**45.1** 99.3

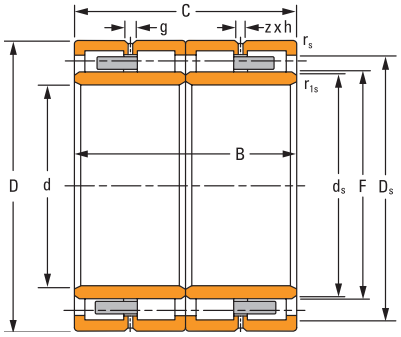
[3]Maximum shaft or housing fillet radius that bearing corner will clear.

Continued on next page.

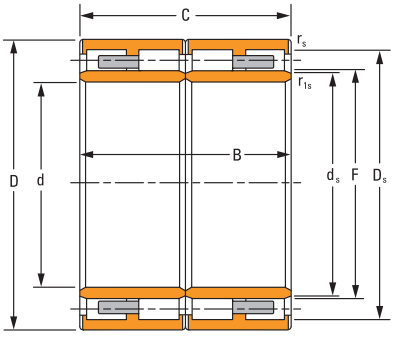
FOUR-ROW CYLINDRICAL ROLLER BEARINGS – *continued*



RY-1



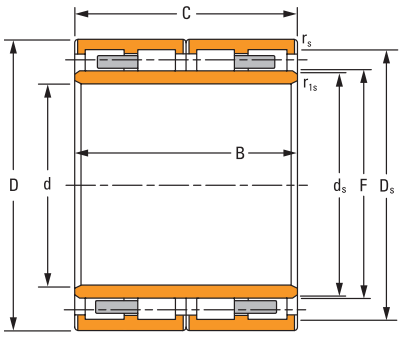
RY-2, RYL-2



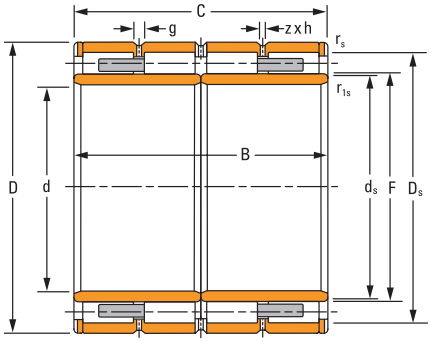
RYL-3

Bearing Dimensions					Dynamic Load Rating[2]	Bearing Assembly Part Number	
Bore d	O.D. D	Width B	Width C	DUR[1] F	$C_{1(4)}$	Bearing	Type
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf		
220 8.6614	**340** 13.3858	**218** 8.5827	**218** 8.5827	**257.18** 10.1252	**2320** 522000	220RY1683	RY-1
230 9.0551	**330** 12.9921	**206** 8.1102	**206** 8.1102	**260** 10.2362	**2120** 478000	230RYL1667	RYL-6
240 9.4488	**320** 12.5984	**200** 7.8740	**200** 7.8740	**260** 10.2362	**1994** 448000	240RY1643	RY-2
240 9.4488	**330** 12.9921	**220** 8.6614	**220** 8.6614	**270** 10.6299	**1924** 432000	240RYL1668	RYL-6
250 9.8425	**340** 13.3858	**230** 9.0551	**230** 9.0551	**276** 10.8661	**1952** 438800	250RY1681	RY-1
260 10.2362	**370** 14.5669	**220** 8.6614	**220** 8.6614	**292** 11.4961	**2580** 582000	260RYL1744	RYL-6
260 10.2362	**380** 14.9606	**280** 11.0236	**280** 11.0236	**294** 11.5748	**3240** 728000	260RY1763	RY-2
280 11.0236	**380** 14.9606	**290** 11.4173	**290** 11.4173	**308** 12.1260	**3180** 714000	280RYL1764	RYL-3
280 11.0236	**390** 15.3543	**220** 8.6614	**220** 8.6614	**312** 12.2835	**2620** 590000	280RYL1783	RYL-6
280 11.0236	**390** 15.3543	**275** 10.8268	**275** 10.8268	**308** 12.1260	**3049** 685500	280RYL1782	RYL-2
290 11.4173	**440** 17.3228	**310** 12.2047	**310** 12.2047	**328** 12.9134	**4460** 1002000	290RYL1881	RYL-3
300 11.8110	**420** 16.5354	**300** 11.8110	**300** 11.8110	**332** 13.0709	**4140** 932000	300RX1846	RX-1
300 11.8110	**420** 16.5354	**300** 11.8110	**300** 11.8110	**332** 13.0709	**4080** 918000	300RXL1845	RXL-2
300 11.8110	**420** 16.5354	**300** 11.8110	**320** 13.1148	**332** 13.0709	**4080** 918000	300RXL1845	RXL-3[4]
300 11.8110	**500** 19.6850	**360** 14.1732	**360** 14.1732	**354.25** 13.9469	**6200** 1392000	300RY2002	RY-2

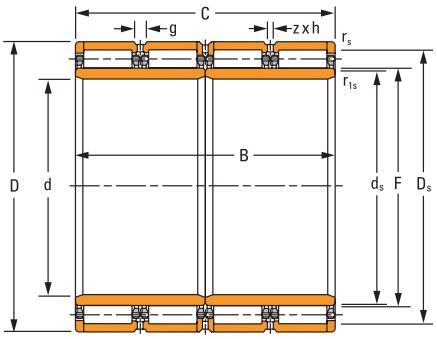
[1]DUR–Diameter Under Rollers.
[2]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
[4]Not illustrated.
[5]RXL-3 configuration requires specifying W217 modification code.



RYL-6



RXL-2



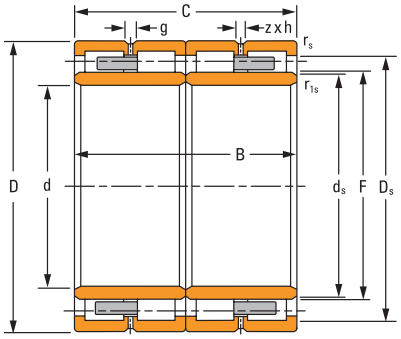
RX-1

Sub Assembly Part Number		Mounting Dimensions				Lubrication Data			Weight
		Fillet Radius		Backing Diameter		Groove	Hole Diameter	No. of Holes	
Inner Ring	Outer Assembly	Maximum		Shaft	Housing				
		r_s[3]	r_{1s}[3]	d_s	D_s	g	h	z	
		mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.
220ARVS1683	257RYS1683	**3.0** 0.12	**3.0** 0.12	**251.0** 9.88	**309.2** 12.17	**10.0** 0.39	**5.0** 0.20	8	**75.6** 166
230ARVSL1667	260RYSL1667	**2.1** 0.08	**2.1** 0.08	**253.5** 9.98	**308.0** 12.13	–	–	–	**58.3** 128
240ARYS1643	260RYS1643	**2.1** 0.08	**2.1** 0.08	**253.4** 9.98	**304.0** 11.97	–	–	–	**43.0** 95
240ARVSL1668	270RYSL1668	**2.1** 0.08	**2.1** 0.08	**264.2** 75.49	**306.0** 12.05	–	–	–	**56.7** 125
250ARVS1681	276RYS1681	**4.0** 0.16	**3.5x45°** 0.14x45°	**269.5** 10.61	**320.0** 12.60	**10.0** 0.39	**5.0** 0.20	6	**60.3** 133
260ARVSL1744	292RYSL1744	**3.0** 0.12	**3.0** 0.12	**285.0** 11.22	**344.0** 13.54	–	–	–	**108** 237
260ARYS1763	294RYS1763	**3.0** 0.12	**3.0** 0.12	**286.5** 11.28	**350.0** 13.78	**10.0** 0.39	**5.0** 0.20	6	**108** 237
280ARVSL1764	308RYSL1764	**2.5** 0.10	**2.5** 0.10	**300.8** 11.84	**356.0** 14.02	–	–	–	**96.4** 212
280ARVSL1783	312RYSL1783	**4.0** 0.16	**4.0** 0.16	**305.2** 12.02	**364.0** 14.33	–	–	–	**81.9** 180
280ARYSL1782	308RYSL1782	**2.5** 0.10	**3.5** 0.14	**301.8** 11.88	**364.0** 14.33	**9.0** 0.35	**4.5** 0.18	6	**101** 222
290ARYSL1881	328RYSL1881	**3.0** 0.12	**3.0** 0.12	**321.3** 12.65	**404.0** 15.91	–	–	–	**170** 373
300ARXS1845B	332RXS1846	**3.5** 0.14	**7.0x20°** 0.28x20°	**325.1** 12.80	**392.0** 15.43	**18.0** 0.71	**9.0** 0.35	8	**131** 287
300ARXSL1845	332RXSL1845	**3.5** 0.14	**7.0x20°** 0.28x20°	**326.1** 12.84	**392.0** 15.43	**12.0** 0.47	**6.0** 0.24	8	**132** 290
300ARXSL1845W217	332RXSL1845	**3.5** 0.14	**7.0x20°** 0.28x20°	**326.1** 12.84	**392.0** 15.43	**12.0** 0.47	**6.0** 0.24	8	**132** 290
300ARYS2002	354RYS2002	**5.0** 0.20	**5.0** 0.20	**347.4** 13.68	**454.3** 17.89	**18.0** 0.71	**10.0** 0.39	8	**289** 635

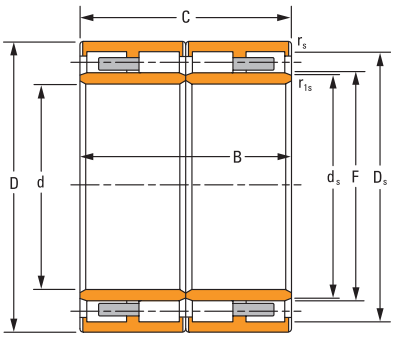
[3]Maximum shaft or housing fillet radius that bearing corner will clear.

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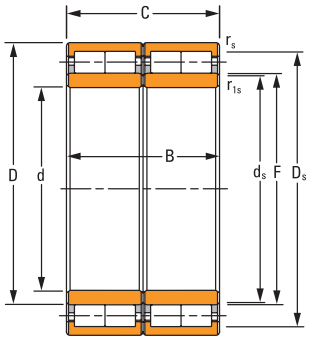
FOUR-ROW CYLINDRICAL ROLLER BEARINGS – continued



RY-2, RYL-2



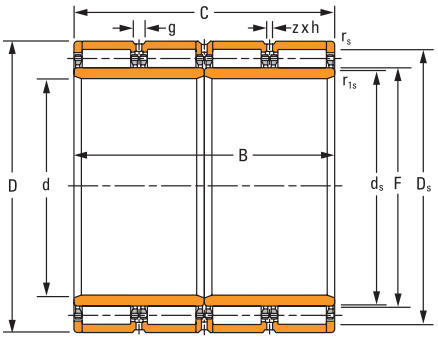
RYL-3



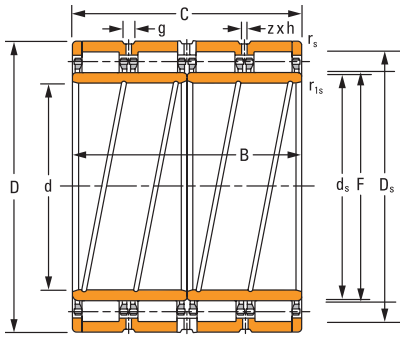
RY-10

Bearing Dimensions					Dynamic Load Rating[2]	Bearing Assembly Part Number	
Bore d	O.D. D	Width B	Width C	DUR[1] F	$C_{1(4)}$	Bearing	Type
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf		
320 12.5984	**460** 18.1102	**240** 9.4488	**240** 9.4488	**364** 14.3307	**3860** 870000	D-3716-A	RY-10
330 12.9921	**460** 18.1102	**340** 13.3858	**340** 13.3858	**365** 14.3701	**4980** 1120000	330RX1922	RX-1
340 13.3858	**480** 18.8976	**310** 12.2047	**310** 12.2047	**378** 14.8819	**4660** 1048000	340RX1965A	RX-5
340 13.3858	**480** 18.8976	**350** 13.7795	**350** 13.7795	**378** 14.8819	**5180** 1162000	340RYL1963	RYL-2
360 14.1732	**500** 19.6850	**250** 9.8425	**250** 9.8425	**394** 15.1518	**3900** 878000	360RYL2004	RYL- 3
370 14.5669	**520** 20.4724	**380** 14.9606	**380** 14.9606	**409** 16.1024	**6500** 1460000	370RX2045	RX-1
380 14.9606	**540** 21.2598	**300** 11.8110	**300** 11.8110	**421** 16.5748	**5420** 1218000	380RX2089	RX-1
380 14.9606	**540** 21.2598	**400** 15.7480	**380** 14.9606	**422** 16.6142	**6840** 1536000	380RX2086A	RX-6
380 14.9606	**540** 21.2598	**400** 15.7480	**400** 15.7480	**422** 16.6142	**6900** 1552000	380RX2087	RX-1
390 15.3543	**540** 21.2598	**320** 12.5984	**320** 12.5984	**431** 16.9685	**5540** 1248000	390RX2088	RX-1
390 15.3543	**550** 21.6535	**400** 15.7480	**400** 15.7480	**432.204** 17.0159	**6680** 1500000	390RY2103	RY-2
400 15.7480	**560** 22.0472	**410** 16.1417	**410** 16.1417	**445** 17.5197	**7460** 1676000	400RX2123	RX-1
431.5 16.9882	**571.5** 22.5000	**300** 11.8110	**300** 11.8110	**465** 18.3071	**5200** 1170000	431RX2141	RX-1
440 17.3228	**620** 24.4094	**450** 17.7165	**450** 17.7165	**487** 19.1732	**9100** 2040000	440RX2245	RX-1
460 18.1102	**620** 24.4094	**425** 16.7323	**400** 15.7480	**504** 19.8425	**7580** 1702000	460RX2247A	RX-6

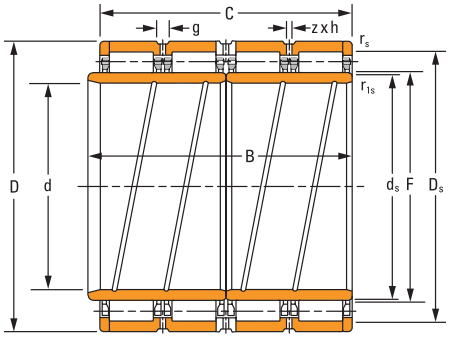
[1]DUR–Diameter Under Rollers.
[2]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.



RX-1, RX-9, RX-11



RX-5



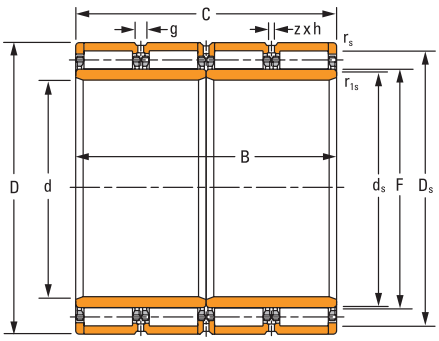
RX-6

Sub Assembly Part Number		Mounting Dimensions				Lubrication Data			Weight
		Fillet Radius		Backing Diameter		Groove	Hole Diameter	No. of Holes	
Inner Ring	Outer Assembly	Maximum		Shaft	Housing				
		r_s[3]	r_{1s}[3]	d_s	D_s	g	h	z	
		mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.
D-3717-A	D-3718-A	**2.5** 0.10	**2.5** 0.10	**358.3** 14.11	**432.0** 17.01	–	–	–	**134** 296
330ARXS1922	365RXS1922	**2.3** 0.09	**10.5x20°** 0.41x20°	**357.1** 14.06	**429.0** 16.89	**12.0** 0.47	**6.0** 0.24	8	**176** 388
340ARXS1965A	378RXS1965A	**3.0** 0.12	**7.0x20°** 0.28x20°	**370.1** 14.57	**446.0** 17.56	**16.0** 0.63	**7.5** 0.30	12	**179** 394
340ARYSL1963	378RYSL1963	**3.0** 0.12	**8.0x20°** 0.32x20°	**370.6** 14.59	**446.0** 17.56	**12.3** 0.48	**6.0** 0.24	8	**201** 443
360ARYSL2004	394RYSL2004	**2.5** 0.10	**2.5** 0.10	**387.3** 15.25	**466.0** 18.35	–	–	–	**148** 326
370ARXS2045	409RXS2045	**1.5** 0.06	**10.0x20°** 0.39x20°	**401.0** 15.79	**485.0** 19.09	**16.0** 0.63	**7.5** 0.30	10	**257** 565
380ARXS2089	421RXS2089	**2.0** 0.08	**10.0x20°** 0.39x20°	**413.0** 16.26	**505.0** 19.88	**12.3** 0.48	**6.0** 0.24	16	**222** 489
380ARXS2086A	422RXS2086	**4.0** 0.16	**7.0x20°** 0.28x20°	**414.0** 16.30	**504.0** 19.84	**16.0** 0.63	**7.5** 0.30	8	**288** 634
380ARXS2087	422RXS2087	**2.0** 0.08	**10.0x20°** 0.39x20°	**412.8** 16.25	**502.0** 19.76	**16.0** 0.63	**8.0** 0.31	8	**298** 655
390ARXS2088	431RXS2088	**2.0** 0.08	**10.0x20°** 0.39x20°	**422.4** 16.63	**509.0** 20.04	**15.0** 0.59	**7.5** 0.30	16	**224** 492
390ARYS2103	432RYS2103	**4.0** 0.16	**11.0x20°** 0.43x20°	**423.1** 16.66	**512.2** 20.17	**16.0** 0.63	**8.0** 0.31	10	**305** 670
400ARXS2123	445RXS2123	**4.0** 0.16	**12.0x20°** 0.47x20°	**436.0** 17.17	**525.0** 20.67	**16.0** 0.63	**7.5** 0.30	10	**320** 704
431ARXS2141	465RXS2141	**4.0** 0.16	**10.5x20°** 0.41x20°	**456.4** 17.97	**545.0** 21.46	**18.0** 0.71	**9.0** 0.35	8	**197** 435
440ARXS2245	487RXS2245	**4.0** 0.16	**12.0x20°** 0.47x20°	**477.4** 18.80	**577.0** 22.72	**16.0** 0.63	**7.5** 0.30	8	**439** 965
460ARXS2247A	504RXS2247	**4.1** 0.16	**12.5x20°** 0.49x20°	**493.3** 19.46	**584.0** 22.99	**19.3** 0.76	**9.5** 0.37	8	**350** 769

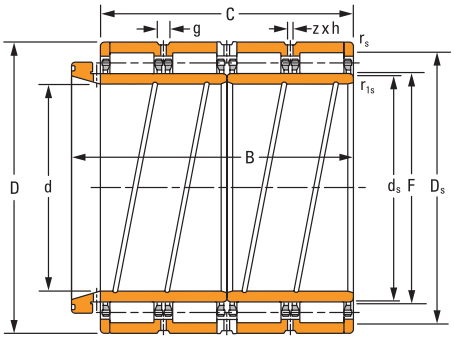
[3]Maximum shaft or housing fillet radius that bearing corner will clear.

Continued on next page.

FOUR-ROW CYLINDRICAL ROLLER BEARINGS – continued



RX-1, RX-9



RX-4

Bearing Dimensions					Dynamic Load Rating[2]	Bearing Assembly Part Number	
Bore d	O.D. D	Width B	Width C	DUR[1] F	$C_{1(4)}$	Bearing	Type
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf		
480 18.8976	**650** 25.5906	**450** 17.7165	**450** 17.7165	**525** 20.6693	**9540** 2140000	480RX2303B	RX-1
500 19.6850	**670** 26.3780	**485** 19.0945	**450** 17.7165	**540** 21.2598	**9520** 2140000	500RX2345A	RX-4
500 19.6850	**710** 27.9528	**480** 18.8976	**480** 18.8976	**558** 21.9685	**10780** 2420000	500RX2422	RX-1
500 19.6850	**720** 28.3465	**530** 20.8661	**530** 20.8661	**568** 22.3622	**12440** 2800000	500RX2443	RX-1
510 20.0787	**680** 26.7717	**500** 19.6850	**500** 19.6850	**560** 22.0472	**10280** 2320000	510RX2364	RX-1
530 20.8661	**760** 29.9213	**520** 20.4724	**520** 20.4724	**587** 23.1102	**13080** 2940000	530RX2522	RX-1
550 21.6535	**740** 29.1339	**510** 20.0787	**510** 20.0787	**600** 23.6220	**11780** 2640000	550RX2484	RX-1
560 22.0472	**820** 32.2835	**600** 23.6220	**600** 23.6220	**625** 24.6063	**16180** 3640000	560RX2644	RX-1
571.1 22.4843	**812.97** 32.0067	**594** 23.3858	**594** 23.3858	**636** 25.0394	**15440** 3480000	571RX2622	RX-1
600 23.6220	**820** 32.2835	**575** 22.6378	**575** 22.6378	**660** 25.9843	**14780** 3320000	600RX2643A	RX-1
600 23.6220	**820** 32.2835	**575** 22.6378	**575** 22.6378	**660** 25.9843	**14780** 3320000	600RX2643B	RX-9
600 23.6220	**870** 34.2520	**640** 25.1969	**640** 25.1969	**672** 26.4567	**18040** 4060000	600RX2744	RX-1
650 25.5906	**900** 35.4331	**650** 25.5906	**650** 25.5906	**704** 27.7165	**18980** 4260000	650RX2803A	RX-1
650 25.5906	**920** 36.2205	**670** 26.3780	**670** 26.3780	**723** 28.4646	**19520** 4380000	650RX2841C	RX-1
690 27.1654	**980** 38.5827	**715** 28.1496	**715** 28.1496	**767.5** 30.2165	**22400** 5040000	690RX2965	RX-1

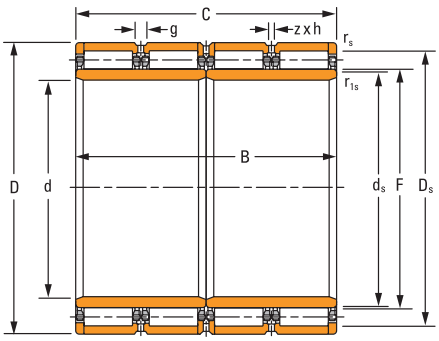
[1]DUR–Diameter Under Rollers.
[2]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.

Sub Assembly Part Number		Mounting Dimensions				Lubrication Data			Weight
		Fillet Radius		Backing Diameter		Groove	Hole Diameter	No. of Holes	
Inner Ring	Outer Assembly	Maximum		Shaft	Housing				
		r_s [3]	r_{1s} [3]	d_s	D_s	g	h	z	
		mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.
480ARXS2303B	525RXS2303	**5.0** 0.20	**12.7x20°** 0.50x20°	**514.5** 20.26	**615.0** 24.21	**18.0** 0.71	**9.0** 0.35	12	**433** 953
500ARXS2345	540RXS2345	**5.0** 0.20	**12.5x20°** 0.49x20°	**531.0** 20.91	**630.0** 24.80	**19.3** 0.76	**9.5** 0.37	12	**458** 1007
500ARXS2422	558RXS2422	**6.0** 0.24	**18.0x20°** 0.71x20°	**545.7** 21.48	**662.0** 26.06	**22.0** 0.87	**12.0** 0.47	12	**617** 1358
500ARXS2443	568RXS2443	**5.0** 0.20	**13.0x20°** 0.51x20°	**556.6** 21.91	**672.0** 26.46	**22.0** 0.87	**12.0** 0.47	16	**737** 1622
510ARXS2364	560RXS2364	**5.0** 0.20	**14.0x20°** 0.551x20°	**549.7** 21.64	**644.0** 25.35	**19.3** 0.76	**9.5** 0.37	12	**515** 1132
530ARXS2522	587RXS2522	**5.0** 0.20	**12.0x20°** 0.47x20°	**576.0** 22.68	**707.0** 27.83	**19.3** 0.76	**9.5** 0.37	12	**787** 1732
550ARXS2484	600RXS2484	**2.0** 0.08	**15.0x20°** 0.59x20°	**588.5** 23.17	**698.0** 27.48	**22.0** 0.87	**12.0** 0.47	16	**632** 1390
560ARXS2644	625RXS2644	**6.0** 0.24	**20.0x20°** 0.79x20°	**611.4** 24.07	**761.0** 29.96	**25.3** 1.00	**13.0** 0.51	16	**1095** 2410
571ARXS2622	636RXS2622	**5.0** 0.20	**14.0x20°** 0.55x20°	**623.3** 24.54	**758.0** 29.84	**25.3** 1.00	**13.0** 0.51	16	**1009** 2220
600ARXS2643	660RXS2643A	**3.0** 0.12	**15.0x20°** 0.59x20°	**648.3** 25.52	**770.0** 30.31	**22.0** 0.87	**12.0** 0.47	16	**925** 2035
600ARXS2643	660RXS2643B	**3.0** 0.12	**15.0x20°** 0.59x20°	**648.3** 25.52	**770.0** 30.31	**32.0** 1.26	**2x1.7** 2x0.07	8	**924** 2032
600ARXS2744	672RXS2744	**7.5** 0.30	**20.0x20°** 0.79x20°	**658.3** 25.92	**808.0** 31.81	**19.3** 0.76	**9.5** 0.37	16	**1312** 2892
650ARXS2803	704RXS2803	**7.5** 0.30	**20.0x20°** 0.79x20°	**686.9** 27.04	**850.0** 33.46	**22.0** 0.87	**12.0** 0.47	16	**1245** 2739
650ARXS2841	723RXS2841	**4.0** 0.16	**18.0x20°** 0.71x20°	**705.9** 27.79	**859.0** 33.82	**25.3** 1.00	**13.0** 0.51	16	**1458** 3208
690ARXS2965	768RXS2965	**4.0** 0.16	**20.0x20°** 0.79x20°	**750.4** 29.54	**911.5** 35.89	**25.3** 1.00	**13.0** 0.51	16	**1781** 3919

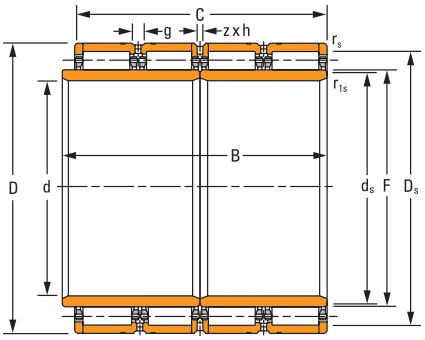
[3]Maximum shaft or housing fillet radius that bearing corner will clear.

Continued on next page.

FOUR-ROW CYLINDRICAL ROLLER BEARINGS – continued



RX-1, RX-9, RX-11



RX-10

Bearing Dimensions					Dynamic Load Rating[2]	Bearing Assembly Part Number	
Bore d	O.D. D	Width B	Width C	DUR[1] F	$C_{1(4)}$	Bearing	Type
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf		
690 27.1654	**980** 38.5827	**750** 29.5276	**750** 29.5276	**766** 30.1575	**23000** 5160000	690RX2966	RX-9
700 27.5591	**930** 36.6142	**620** 24.4094	**620** 24.4094	**763** 30.0394	**16920** 380000	700RX2862	RX-1
705 27.7559	**1066.905** 42.0041	**635** 25.0000	**635** 25.0000	**796** 31.3386	**22600** 5100000	705RX3131B	RX-1
710 27.9528	**1000** 39.3701	**715** 28.1496	**715** 28.1496	**787.5** 31.0039	**22800** 5120000	710RX3006	RX-1
730 28.7402	**960** 37.7953	**620** 24.4094	**620** 24.4096	**790** 31.1024	**17500** 3940000	730RX2922	RX-1
730 28.7402	**1030** 40.5512	**750** 29.5276	**750** 29.5276	**809** 31.8504	**24600** 5520000	730RX3064	RX-1
730 28.7402	**1030** 40.5512	**750** 29.5276	**750** 29.5276	**809** 31.8504	**24600** 5520000	730RX3064A	RX-11
750 29.5276	**1000** 39.3701	**670** 26.3780	**670** 26.3780	**813** 32.0079	**20400** 4580000	750RX3005	RX-1
760 29.9213	**1080** 42.5197	**790** 31.1024	**790** 31.1024	**846** 33.3071	**26800** 6040000	760RX3166	RX-1
760.925 29.9577	**1080** 42.5039	**787.4** 31.0000	**787.4** 31.0000	**846** 33.3071	**26800** 6040000	761RX3166B	RX-1
761.425 29.9774	**1079.6** 42.5039	**787.4** 31.0000	**787.4** 31.0000	**846** 33.3071	**26800** 6040000	761RX3166	RX-1
770 30.3150	**1075** 42.3228	**770** 30.3150	**770** 30.3150	**847** 33.3465	**26000** 5860000	770RX3151	RX-1
780 30.7087	**1070** 42.1260	**780** 30.7087	**780** 30.7087	**853** 33.5827	**25400** 5720000	780RX3141	RX-1
800 31.4961	**1080** 42.5197	**700** 27.5591	**700** 27.5591	**878** 34.5669	**22600** 5100000	800RX3165	RX-1
820 32.2835	**1100** 43.3071	**745** 29.3307	**720** 28.3465	**892** 35.1181	**23000** 5180000	820RX3201A	RX-10

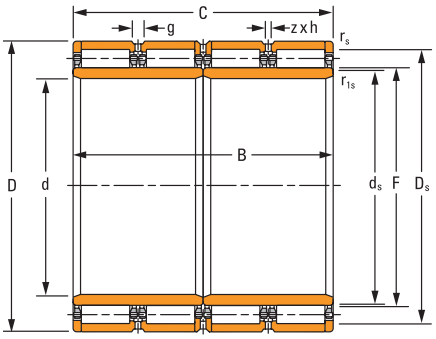
[1]DUR–Diameter Under Rollers.
[2]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.

Sub Assembly Part Number		Mounting Dimensions				Lubrication Data			Weight
		Fillet Radius		Backing Diameter		Groove	Hole Diameter	No. of Holes	
Inner Ring	Outer Assembly	Maximum		Shaft	Housing				
		r_s [3]	r_{1s} [3]	d_s	D_s	g	h	z	
		mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.
690ARXS2966	766RXS2966	**7.5** 0.30	**20.0x20°** 0.79x20°	**749.6** 29.51	**910.0** 35.83	**46.0** 1.81	**2x1.7** 2x0.07	12	**1854** 4079
700ARXS2862	763RXS2862	**3.0** 0.12	**18.0x20°** 0.71x20°	**745.9** 29.37	**875.0** 34.45	**22.0** 0.87	**12.0** 0.47	16	**1189** 2615
705ARXS3131B	796RXS3131	**6.0** 0.24	**6.0** 0.24	**784.5** 30.89	**986.0** 38.82	**34.0** 1.34	**19.0** 0.75	16	**2082** 4580
710ARXS3006	788RXS3006	**4.0** 0.16	**17.0x20°** 0.67x20°	**773.5** 30.45	**931.5** 36.67	**25.3** 1.00	**13.0** 0.51	16	**1841** 4049
730ARXS2922	790RXS2922	**3.0** 0.12	**20.0x20°** 0.79x20°	**776.3** 30.56	**908.0** 35.75	**22.0** 0.87	**12.0** 0.47	16	**1231** 2707
730ARXS3064	809RXS3064	**6.0** 0.24	**21.0x20°** 0.83x20°	**793.9** 31.26	**959.0** 37.76	**25.3** 1.00	**13.0** 0.51	16	**2050** 4510
730ARXS3064	809RXS3064A	**6.0** 0.24	**21.0x20°** 0.83x20°	**793.9** 31.26	**959.0** 37.76	**25.3** 1.00	**13.0** 0.51	16	**2044** 4496
750ARXS3005	813RXS3005	**3.0** 0.12	**20.0x20°** 0.79x20°	**795.9** 31.33	**943.0** 37.13	**22.0** 0.87	**12.0** 0.47	16	**1509** 3319
760ARXS3166	846RXS3166B	**8.0** 0.31	**19.0x20°** 0.75x20°	**830.5** 32.70	**1006.0** 39.61	**22.0** 0.87	**12.0** 0.47	8	**2423** 5331
761ARXS3166B	846RXS3166A	**8.0** 0.31	**19.0x20°** 0.75x20°	**830.5** 32.70	**1006.0** 39.61	**22.0** 0.87	**12.0** 0.47	8	**2406** 5294
761ARXS3166	846RXS3166	**8.0** 0.31	**19.0x20°** 0.75x20°	**830.5** 32.70	**1006.0** 39.61	**22.0** 0.87	**12.0** 0.47	8	**2403** 5286
770ARXS3151	847RXS3151	**7.5** 0.30	**18.0x20°** 0.71x20°	**831.7** 32.74	**1003.0** 39.49	**25.3** 1.00	**13.0** 0.51	16	**1655** 3649
780ARXS3141	853RXS3141	**6.0** 0.24	**25.0x20°** 0.98x20°	**835.9** 32.91	**1005.0** 39.57	**25.3** 1.00	**13.0** 0.51	16	**2142** 4712
800ARXS3165	878RXS3165	**3.0** 0.12	**20.0x20°** 0.79x20°	**864.3** 34.03	**1014.0** 39.92	**26.0** 1.02	**15.0** 0.59	16	**1916** 4214
820ARXS3201A	892RXS3201A	**3.0** 0.12	**22.0x20°** 0.87x20°	**872.2** 34.34	**1036.0** 40.79	**42.0** 1.65	**2x1.7** 2x0.07	12	**1970** 4334

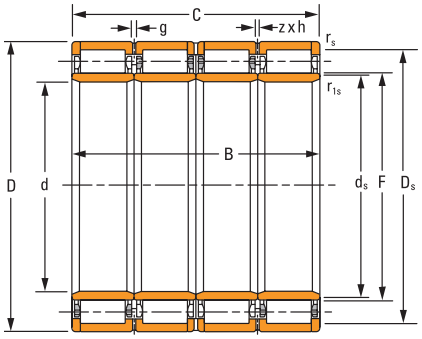
[3]Maximum shaft or housing fillet radius that bearing corner will clear.

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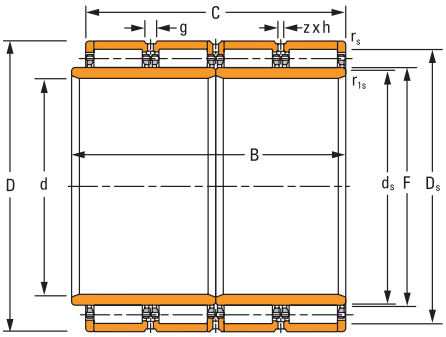
FOUR-ROW CYLINDRICAL ROLLER BEARINGS – *continued*



RX-1, RX-9, RX-11



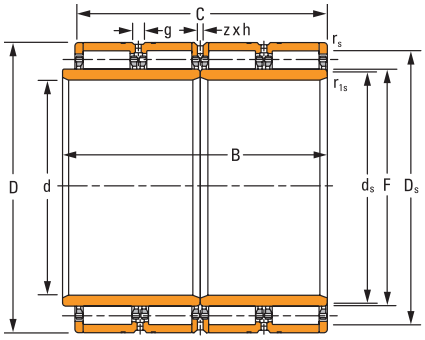
RX-7



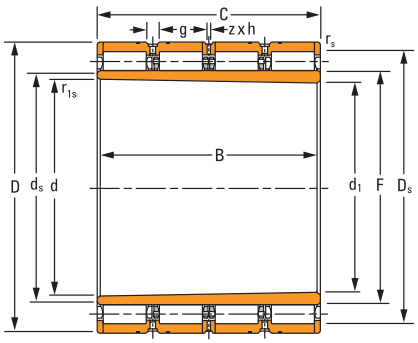
RX-8

Bearing Dimensions					Dynamic Load Rating[2]	Bearing Assembly Part Number	
Bore d	O.D. D	Width B	Width C	DUR[1] F	$C_{1(4)}$	Bearing	Type
mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf		
820 32.2835	**1130** 44.4882	**800** 31.4961	**800** 31.4961	**903** 35.5512	**27400** 6160000	820RX3264	RX-1
820 32.2835	**1130** 44.4882	**800** 31.4961	**800** 31.4961	**903** 35.5512	**27400** 6160000	820RX3264A	RX-9
820 32.2835	**1130** 44.4882	**825** 32.4803	**800** 31.4961	**903** 35.5512	**27400** 6160000	820RX3264C	RX-8
820 32.2835	**1130** 44.4882	**825** 32.4803	**800** 31.4961	**903** 35.5512	**27400** 6160000	820RX3264D	RX-10
850 33.4646	**1150** 45.2756	**840** 33.0709	**840** 33.0709	**928** 36.5354	**28800** 6480000	850RX3304	RX-1
850 33.4646	**1180** 46.4567	**850** 33.4646	**850** 33.4646	**940** 37.0079	**29600** 6660000	850RX3365	RX-1
862.98 33.9756	**1219.302** 48.0040	**876.3** 34.5000	**889** 35.0000	**956** 37.6378	**34600** 7780000	863RX3445A	RX-1
880 34.6457	**1180** 46.4567	**750** 29.5276	**750** 29.5276	**945.300** 37.2165	**26600** 6000000	880RXK3366	RXK-2
900 35.4331	**1220** 48.0315	**840** 33.0709	**840** 33.0709	**989** 38.9370	**30200** 6780000	900RX3444	RX-1
950 37.4016	**1360** 53.5433	**1000** 39.3701	**1000** 39.3701	**1075** 42.3228	**43200** 9700000	950RX3723	RX-1
1040 40.9449	**1439.890** 56.6886	**1000** 39.3701	**1000** 39.3701	**1133** 44.6063	**42600** 9580000	1040RX3882	RX-7

[1]DUR–Diameter Under Rollers.
[2]Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.



RX-10



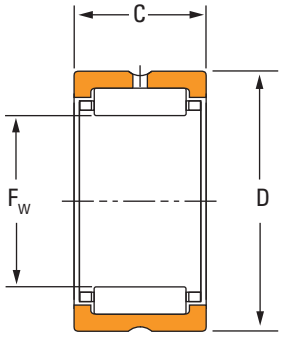
RXK-2

Sub Assembly Part Number		Mounting Dimensions				Lubrication Data			Weight
		Fillet Radius		Backing Diameter		Groove	Hole Diameter	No. of Holes	
Inner Ring	Outer Assembly	Maximum		Shaft	Housing				
		r_s[3]	r_{1s}[3]	d_s	D_s	g	h	z	
		mm in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.
820ARXS3264	903RXS3264	**7.5** 0.30	**23.0x20°** 0.91x20°	**882.5** 34.74	**1059.0** 41.69	**36.0** 1.42	**20.0** 0.79	16	**2491** 5479
820ARXS3264	903RXS3264A	**7.5** 0.30	**23.0x20°** 0.91x20°	**882.5** 34.74	**1059.0** 41.69	**46.0** 1.81	**2x1.7** 2x0.07	12	**2495** 5498
820ARXS3264C	903RXS3264	**7.5** 0.30	**23.0x20°** 0.91x20°	**882.5** 34.74	**1059.0** 41.69	**36.0** 1.42	**20.0** 0.79	16	**2512** 5527
820ARXS3264C	903RXS3264A	**7.5** 0.30	**23.0x20°** 0.91x20°	**882.5** 34.74	**1059.0** 41.69	**46.0** 1.81	**2x1.7** 2x0.07	12	**2495** 5545
850ARXS3304	928RXS3304	**4.0** 0.16	**23.0x20°** 0.91x20°	**910.8** 35.86	**1080.0** 42.52	**22.0** 0.87	**12.0** 0.47	16	**2605** 5732
850ARXS3365	940RXS3365	**7.5** 0.30	**25.0x11°20'** 0.98x11°20'	**911.7** 35.89	**1106.0** 43.54	**36.0** 1.42	**20.0** 0.79	16	**2870** 6408
863ARXS3445A	956RXS3445A	**5.0** 0.20	**12.0x20°** 0.47x20°	**938.2** 36.94	**1140.0** 44.88	**25.3** 1.00	**13.0** 0.51	16	**3431** 7549
880ARVKS3366	945RXS3366	**7.5** 0.30	**8.0** 0.31	**930.0** 36.61	**1105.0** 43.50	**27.0** 1.06	**15.0** 0.59	20	**2497** 5494
900ARXS3444	989RXS3444	**4.0** 0.16	**24.0x24°** 0.95x20°	**971.8** 38.26	**1149.0** 45.24	**22.0** 0.87	**12.0** 0.47	16	**2959** 6510
950ARXS3723	1075RXS3723	**5.0** 0.20	**22.0x24°** 0.87x20°	**1057.1** 41.62	**1275.0** 50.20	**34.0** 1.34	**19.0** 0.75	16	**4987** 10972
1040ARXS3882	1133RXS3882	**7.5** 0.30	**27.0x20°** 1.06x20°	**1110.2** 43.71	**1353.0** 53.27	**22.0** 0.87	**12.0** 0.47	16	**4976** 10970

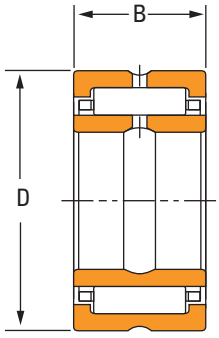
[3]Maximum shaft or housing fillet radius that bearing corner will clear.

HJ SERIES

- Clearance fit suggested for outer ring when housing is stationary relative to load.
- Tight transition fit suggested if housing rotates relative to load.
- Consult your Timken representative for oscillating applications (e.g., low radial-clearance concerns).
- Unmarked end of outer ring should be assembled against housing shoulder to clear maximum allowed housing fillet $r_{a\ max}$ (equal to $r_{s\ min}$).



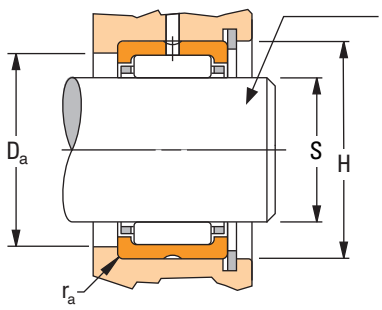
HJ



HJ with IR

Shaft Diameter	Dimensions				Bearing Designation	Used With Inner Ring Designation	Load Rating		Speed Ratings	
	F_w	D	C/B	$r_{s\ min}$			Static C_o	Basic Dynamic $C^{(1)}$	Oil	Grease
in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.			**kN** lbf.	**kN** lbf.	RPM	
3.75	**95.25** 3.75	**120.65** 4.75	**50.8** 2	**2.54** 0.1	HJ-607632	IR-506032 IR-526032	**398** 89400	**193** 43300	3700	3300
4	**101.6** 4	**127** 5	**50.8** 2	**2.54** 0.1	HJ-648032	IR-526432 IR-546432 IR-566432 IR-566432	**428** 96200	**201** 45100	3500	3100
4.25	**107.95** 4.25	**133.35** 5.25	**50.8** 2	**2.54** 0.1	HJ-688432	IR-566832 IR-606832	**444** 99900	**203** 45700	3300	2900
4.5	**114.3** 4.5	**152.4** 6	**57.15** 2.25	**2.54** 0.1	HJ-729636	IR-607236	**517** 116000	**285** 64000	3200	2800
	114.3 4.5	**152.4** 6	**63.5** 2.5	**2.54** 0.1	HJ-729640	IR-607240	**599** 135000	**320** 71900	3200	2800
5	**127** 5	**165.1** 6.5	**50.8** 2	**2.54** 0.1	HJ-8010432	–	**517** 116000	**278** 62400	2800	2400
	127 5	**165.1** 6.5	**57.15** 2.25	**2.54** 0.1	HJ-8010436	IR-648036 IR-688036	**590** 133000	**308** 69200	2800	2500
	127 5	**165.1** 6.5	**63.5** 2.5	**2.54** 0.1	HJ-8010440	IR-648040	**684** 154000	**345** 77600	2800	2500
5.5	**139.7** 5.5	**177.8** 7	**63.5** 2.5	**2.54** 0.1	HJ-8811240	IR-728840	**697** 157000	**342** 76900	2600	2300
	139.7 5.5	**177.8** 7	**76.2** 3	**2.54** 0.1	HJ-8811248	IR-728848	**883** 198000	**411** 92400	2500	2200
5.75	**146.05** 5.75	**184.15** 7.25	**76.2** 3	**3.05** 0.12	HJ-9211648	IR-769248	**918** 206000	**419** 94200	2400	2100
6	**152.4** 6	**190.5** 7.5	**63.5** 2.5	**3.05** 0.12	HJ-9612040	IR-809640	**777** 175000	**364** 81800	2300	2000
	152.4 6	**190.5** 7.5	**76.2** 3	**3.05** 0.12	HJ-9612048	IR-809648	**984** 221000	**438** 98400	2200	2000

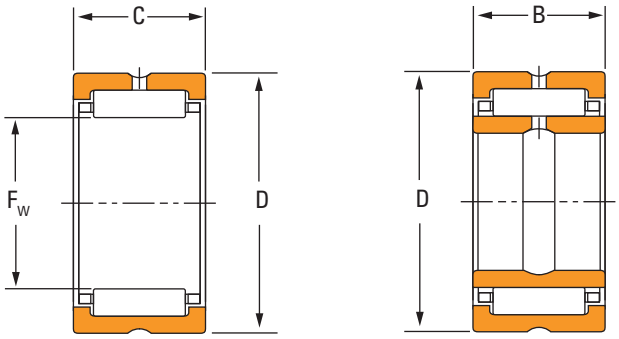
(1) C_g factor for bearing without inner ring.



Weight	Geometry Factor C_g (1)	Mounting Dimensions Clearance Fit				Bearing Designation	Mounting Dimensions Tight Transition Fit				Shoulder Diameter ±0.38 ±0.015 D_a
							S		H		
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	
kg lbs.		**mm** in.	**mm** in.	**mm** in.	**mm** in.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
1.455 3.208	**0.1011**	**95.25** 3.75	**95.227** 3.7491	**120.691** 4.7516	**120.65** 4.75	HJ-607632	**95.217** 3.7487	**95.192** 3.7477	**120.594** 4.7478	**120.635** 4.7494	**111.13** 4.375
1.541 3.397	**0.106**	**101.6** 4	**101.577** 3.9991	**127.041** 5.0016	**127** 5	HJ-648032	**101.564** 3.9986	**101.542** 3.9977	**126.944** 4.9978	**126.985** 4.9994	**117.48** 4.625
1.626 3.586	**0.1099**	**107.95** 4.25	**107.927** 4.2491	**133.391** 5.2516	**133.35** 5.25	HJ-688432	**107.914** 4.2486	**107.892** 4.2477	**133.294** 5.2478	**133.335** 5.2494	**123.83** 4.875
3.035 6.691	**0.1100**	**114.3** 4.5	**114.277** 4.4991	**152.441** 6.0016	**152.4** 6	HJ-729636	**114.264** 4.4986	**114.242** 4.4977	**152.344** 5.9978	**152.385** 5.9994	**138.11** 5.438
3.372 7.434	**0.1137**	**114.3** 4.5	**114.277** 4.4991	**152.441** 6.0016	**152.4** 6	HJ-729640	**114.264** 4.4986	**114.242** 4.4977	**152.344** 5.9978	**152.385** 5.9994	**138.11** 5.438
2.66 5.86	**0.1162**	**127** 5	**126.975** 4.999	**165.141** 6.5016	**165.1** 6.5	HJ-8010432	**126.959** 4.9984	**126.934** 4.9974	**165.044** 6.4978	**165.085** 6.4994	**150.81** 5.938
3.324 7.327	**0.1188**	**127** 5	**126.975** 4.999	**165.141** 6.5016	**165.1** 6.5	HJ-8010436	**126.959** 4.9984	**126.934** 4.9974	**165.044** 6.4978	**165.085** 6.4994	**150.81** 5.938
3.693 8.141	**0.1213**	**127** 5	**126.975** 4.999	**165.141** 6.5016	**165.1** 6.5	HJ-8010440	**126.959** 4.9984	**126.934** 4.9974	**165.044** 6.4978	**165.085** 6.4994	**150.81** 5.938
4.014 8.849	**0.1297**	**139.7** 5.5	**139.675** 5.499	**177.841** 7.0016	**177.8** 7	HJ-8811240	**139.659** 5.4984	**139.634** 5.4974	**177.744** 6.9978	**177.785** 6.9994	**163.51** 6.438
4.817 10.62	**0.1369**	**139.7** 5.5	**139.675** 5.499	**177.841** 7.0016	**177.8** 7	HJ-8811248	**139.659** 5.4984	**139.634** 5.4974	**177.744** 6.9978	**177.785** 6.9994	**163.51** 6.438
5.009 11.04	**0.1409**	**146.05** 5.75	**146.025** 5.749	**184.196** 7.2518	**184.15** 7.25	HJ-9211648	**146.009** 5.7484	**145.984** 5.7474	**184.089** 7.2476	**184.135** 7.2494	**169.86** 6.688
4.335 9.557	**0.1384**	**152.4** 6	**152.375** 5.999	**190.546** 7.5018	**190.5** 7.5	HJ-9612040	**152.359** 5.9984	**152.334** 5.9974	**190.439** 7.4976	**190.485** 7.4994	**176.21** 6.938
5.202 11.47	**0.1461**	**152.4** 6	**152.375** 5.999	**190.546** 7.5018	**190.5** 7.5	HJ-9612048	**152.359** 5.9984	**152.334** 5.9974	**190.439** 7.4976	**190.485** 7.4994	**176.21** 6.938

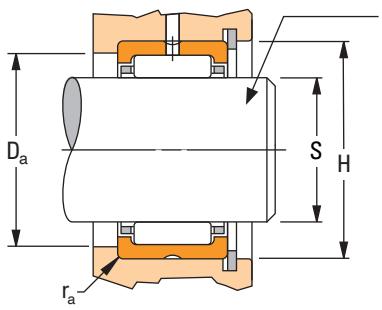
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HJ SERIES – continued



Shaft Diameter	Dimensions				Bearing Designation	Used With Inner Ring Designation	Load Rating		Speed Ratings	
	F_w	D	C/B	$r_{s\,min}$			Static C_o	Basic Dynamic $C^{(1)}$	Oil	Grease
in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.			**kN** lbf.	**kN** lbf.	RPM	
6.5	**165.1** 6.5	**203.2** 8	**63.5** 2.5	**3.05** 0.12	HJ-10412840	IR-8810440	**832** 187000	**376** 84600	2100	1800
	165.1 6.5	**203.2** 8	**76.2** 3	**3.05** 0.12	HJ-10412848	IR-8810448	**1050** 237000	**452** 102000	2000	1800
7.25	**184.15** 7.25	**231.775** 9.125	**76.2** 3	**3.05** 0.12	HJ-11614648	IR-9611648	**1130** 253000	**524** 118000	1800	1600
7.75	**196.85** 7.75	**244.475** 9.625	**76.2** 3	**3.05** 0.12	HJ-12415448	IR-10412448	**1210** 271000	**543** 122000	1600	1400
8.25	**209.55** 8.25	**257.175** 10.125	**76.2** 3	**3.05** 0.12	HJ-13216248	IR-11213248	**1290** 290000	**563** 126000	1500	1300
8.75	**222.25** 8.75	**269.875** 10.625	**76.2** 3	**4.06** 0.16	HJ-14017048	IR-12014048	**1370** 308000	**581** 131000	1400	1200
9.25	**234.95** 9.25	**282.575** 11.125	**76.2** 3	**4.06** 0.16	HJ-14817848	IR-12814848	**1350** 326000	**599** 145000	1300	1200

(1) C_g factor for bearing without inner ring.



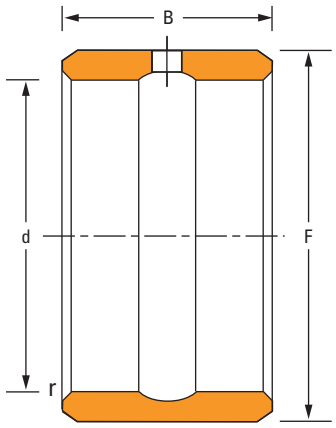
Weight	Geometry Factor C_g (1)	Mounting Dimensions Clearance Fit				Bearing Designation	Mounting Dimensions Tight Transition Fit				Shoulder Diameter ±0.38 ±0.015 D_a
							S		H		
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	
kg lbs.		**mm** in.	**mm** in.	**mm** in.	**mm** in.		**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.
4.656 10.26	**0.1459**	**165.1** 6.5	**165.075** 6.499	**203.246** 8.0018	**203.2** 8	HJ-10412840	**165.059** 6.4984	**165.034** 6.4974	**203.139** 7.9976	**203.185** 7.9994	**188.91** 7.438
5.582 12.31	**0.1539**	**165.1** 6.5	**165.075** 6.499	**203.246** 8.0018	**203.2** 8	HJ-10412848	**165.059** 6.4984	**165.034** 6.4974	**203.139** 7.9976	**203.185** 7.9994	**188.91** 7.438
7.888 17.39	**0.1586**	**184.15** 7.25	**184.12** 7.2488	**231.821** 9.1268	**231.775** 9.125	HJ-11614648	**184.099** 7.248	**184.069** 7.2468	**231.714** 9.1226	**231.76** 9.1244	**216.0** 8.5
8.37 18.45	**0.1662**	**196.85** 7.75	**196.82** 7.7488	**244.521** 9.6268	**244.475** 9.625	HJ-12415448	**196.799** 7.748	**196.769** 7.7468	**244.414** 9.6226	**244.46** 9.6244	**228.6** 9
8.852 19.51	**0.1736**	**209.55** 8.25	**209.52** 8.2488	**257.226** 10.127	**257.175** 10.125	HJ-13216248	**209.499** 8.248	**209.469** 8.2468	**257.109** 10.122	**257.16** 10.124	**241.3** 9.5
9.333 20.58	**0.181**	**222.25** 8.75	**222.22** 8.7488	**269.926** 10.627	**269.875** 10.625	HJ-14017048	**222.199** 8.748	**222.169** 8.7468	**269.809** 10.622	**269.86** 10.624	**254** 10
9.815 21.64	**0.1885**	**234.95** 9.25	**234.92** 9.2488	**282.626** 11.127	**282.575** 11.125	HJ-14817848	**234.899** 9.248	**234.869** 9.2468	**282.509** 11.122	**282.56** 11.124	**266.7** 10.5

INNER RINGS (IR)

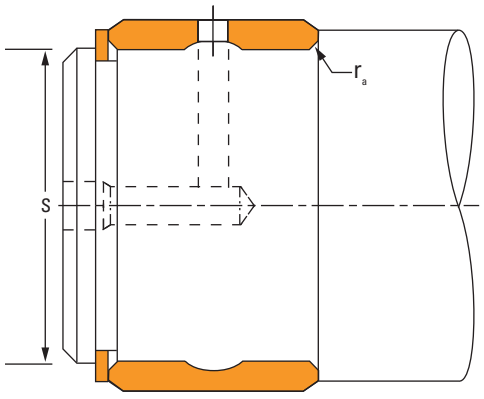
- Ideal choice where the shaft is not practical to use as inner raceway.
- Designed to meet established inch tolerances.
- Maximum shaft fillet radius cannot exceed inner-ring bore chamfer as shown.
- Optional centralized lubrication groove (bore) or through-hole available – specify when ordering.
- Designed to be axially clamped against shoulder for loose transition fit on shaft.
- After mounting, for tight transition fit (keeping inner ring from rotating relative to shaft), inner-ring O.D. must not exceed raceway diameter on matching bearing.
- For custom-finish assemblies, the inner ring requires finish grinding after mounting on the shaft.
- Unmarked end of inner ring to be assembled against the shaft shoulder to ensure clearing the maximum allowable shaft fillet as indicated in tables shown.

Shaft Diameter	Dimensions				Inner-Ring Designation	Weight	Loose Transition Fit S		Interference Fit		Used with Bearing Designation
	d	F	B	$r_{s\,min}$			Max.	Min.	Max.	Min.	
in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	
3.125	**79.375** 3.125	**95.25** 3.75	**50.8** 2	**2.54** 0.1	IR-506032	**0.88** 1.94	**79.365** 3.1246	**79.347** 3.1239	**79.398** 3.1259	**79.385** 3.1254	HJ-607632
3.25	**82.55** 3.25	**95.25** 3.75	**50.8** 2	**2.54** 0.1	IR-526032	**0.708** 1.56	**82.537** 3.2495	**82.517** 3.2487	**82.578** 3.2511	**82.563** 3.2505	HJ-607632
	82.55 3.25	**101.6** 4	**50.8** 2	**2.54** 0.1	IR-526432	**1.089** 2.4	**82.537** 3.2495	**82.517** 3.2487	**82.578** 3.2511	**82.563** 3.2505	HJ-648032
3.375	**85.725** 3.375	**101.6** 4	**50.8** 2	**2.54** 0.1	IR-546432	**0.93** 2.05	**85.712** 3.3745	**85.692** 3.3737	**85.753** 3.3761	**85.738** 3.3755	HJ-648032
3.5	**88.9** 3.5	**101.6** 4	**50.8** 2	**2.54** 0.1	IR-566432	**0.757** 1.67	**88.887** 3.4995	**88.867** 3.4987	**88.928** 3.5011	**88.913** 3.5005	HJ-648032
	88.9 3.5	**107.95** 4.25	**50.8** 2	**2.54** 0.1	IR-566832	**1.179** 2.6	**88.887** 3.4995	**88.867** 3.4987	**88.928** 3.5011	**88.913** 3.5005	HJ-688432
3.75	**95.25** 3.75	**107.95** 4.25	**50.8** 2	**2.54** 0.1	IR-606832	**1.012** 2.23	**95.237** 3.7495	**95.217** 3.7487	**95.278** 3.7511	**95.263** 3.7505	HJ-688432
	95.25 3.75	**114.3** 4.5	**57.15** 2.25	**2.54** 0.1	IR-607236	**1.406** 3.1	**95.237** 3.7495	**95.217** 3.7487	**95.278** 3.7511	**95.263** 3.7505	HJ-729636
	95.25 3.75	**114.3** 4.5	**63.5** 2.5	**2.54** 0.1	IR-607240	**1.565** 3.45	**95.237** 3.7495	**95.217** 3.7487	**95.278** 3.7511	**95.263** 3.7505	HJ-729640
4	**101.6** 4	**127** 5	**57.15** 2.25	**2.54** 0.1	IR-648036	**2.046** 4.51	**101.587** 3.9995	**101.567** 3.9987	**101.628** 4.0011	**101.613** 4.0005	HJ-8010436
	101.6 4	**127** 5	**63.5** 2.5	**2.54** 0.1	IR-648040	**2.272** 5.01	**101.587** 3.9995	**101.567** 3.9987	**101.628** 4.0011	**101.613** 4.0005	HJ-8010440
4.25	**107.95** 4.25	**127** 5	**57.15** 2.25	**2.54** 0.1	IR-688036	**1.565** 3.45	**107.937** 4.2495	**107.917** 4.2487	**107.978** 4.2511	**107.963** 4.2505	HJ-8010436
4.5	**114.3** 4.5	**139.7** 5.5	**63.5** 2.5	**2.54** 0.1	IR-728840	**2.495** 5.5	**114.287** 4.4995	**114.267** 4.4987	**114.328** 4.5011	**114.313** 4.5005	HJ-8811240
	114.3 4.5	**139.7** 5.5	**76.2** 3	**2.54** 0.1	IR-728848	**2.989** 6.59	**114.287** 4.4995	**114.267** 4.4987	**114.328** 4.5011	**114.313** 4.5005	HJ-8811248
4.75	**120.65** 4.75	**146.05** 5.75	**76.2** 3	**3.05** 0.12	IR-769248	**3.18** 7.01	**120.635** 4.7494	**120.612** 4.7485	**120.683** 4.7513	**120.665** 4.7506	HJ-9211648

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Inner Ring

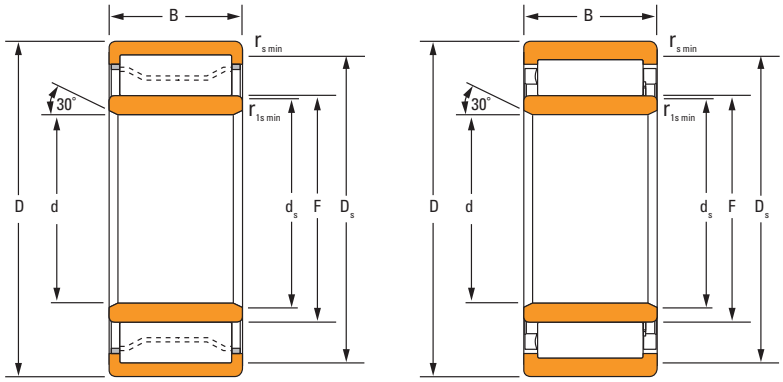


Inner Ring

Shaft Diameter	Dimensions				Inner-Ring Designation	Weight	Loose Transition Fit S		Interference Fit		Used with Bearing Designation
	d	F	B	$r_{s\,min}$			Max.	Min.	Max.	Min.	
in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		**kg** lbs.	**mm** in.	**mm** in.	**mm** in.	**mm** in.	
5	**127** 5	**152.4** 6	**63.5** 2.5	**3.05** 0.12	IR-809640	**2.781** 6.13	**126.985** 4.9994	**126.962** 4.9985	**127.033** 5.0013	**127.015** 5.0006	HJ-9612040
	127 5	**152.4** 6	**76.2** 3	**3.05** 0.12	IR-809648	**3.325** 7.33	**126.985** 4.9994	**126.962** 4.9985	**127.033** 5.0013	**127.015** 5.0006	HJ-9612048
5.5	**139.7** 5.5	**165.1** 6.5	**63.5** 2.5	**3.05** 0.12	IR-8810440	**3.035** 6.69	**139.685** 5.4994	**139.662** 5.4985	**139.733** 5.5013	**139.715** 5.5006	HJ-10412840
	139.7 5.5	**165.1** 6.5	**76.2** 3	**3.05** 0.12	IR-8810448	**3.629** 8	**139.685** 5.4994	**139.662** 5.4985	**139.733** 5.5013	**139.715** 5.5006	HJ-10412848
6	**152.4** 6	**184.15** 7.25	**76.2** 3	**3.05** 0.12	IR-9611648	**4.935** 10.88	**152.385** 5.9994	**152.362** 5.9985	**152.433** 6.0013	**152.415** 6.0006	HJ-11614648
6.5	**165.1** 6.5	**196.85** 7.75	**76.2** 3	**3.05** 0.12	IR-10412448	**5.343** 11.78	**165.085** 6.4994	**165.062** 6.4985	**165.133** 6.5013	**165.115** 6.5006	HJ-12415448
7	**177.8** 7	**209.55** 8.25	**76.2** 3	**3.05** 0.12	IR-11213248	**5.389** 11.88	**177.785** 6.9994	**177.762** 6.9985	**177.833** 7.0013	**177.815** 7.0006	HJ-13216248
7.5	**190.5** 7.5	**222.25** 8.75	**76.2** 3	**4.06** 0.16	IR-12014048	**6.11** 13.47	**190.485** 7.4994	**190.454** 7.4982	**190.536** 7.5014	**190.515** 7.5006	HJ-14017048
8	**203.2** 8	**234.95** 9.25	**76.2** 3	**4.06** 0.16	IR-12814848	**6.518** 14.37	**203.185** 7.9994	**203.154** 7.9982	**203.236** 8.0014	**203.215** 8.0006	HJ-14817848

5200, A5200 METRIC SERIES

- Ring tolerances are found on page 35.
- Life and load calculations are found in the engineering section of this catalog.
- Shaft and housing fits, tolerances and shaft diameters are found on page 34.



Bearing Dimensions				Load Rating		Part Number		Mounting Data				s(3)	Geo-metry Factor C_g	Thermal Speed Ratings		Weight
								Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_0	Dynamic C_1(1)	Bearing(2)	Type	r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.			**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
100.000 3.9370	**180.000** 7.0866	**60.325** 2.3750	**121.133** 4.7690	**594** 134000	**474** 107000	A-5220-WS	WS	**4.4** 0.16	**2.1** 0.08	**117.1** 4.61	**165.6** 6.52	**4.26** 0.168	**0.131**	2800	2500	**6.30** 14.00
110.000 4.3307	**200.000** 7.8740	**69.850** 2.7500	**133.078** 5.2393	**790** 178000	**612** 138000	A-5222-WS	WS	**4.4** 0.16	**2.1** 0.08	**128.8** 5.07	**182.3** 7.18	**4.29** 0.169	**0.144**	2400	2100	**9.20** 20.30
120.000 4.7244	**215.000** 8.4646	**76.200** 3.0000	**145.265** 5.7191	**952** 214000	**707** 159000	A-5224-WS	WS	**5.5** 0.22	**2.1** 0.08	**140.1** 5.52	**196.1** 7.72	**4.29** 0.169	**0.155**	2200	1900	**11.60** 25.60
130.000 5.1181	**230.000** 9.0551	**79.375** 3.1250	**155.115** 6.1069	**1070** 240000	**795** 179000	A-5226-WS	WS	**5.5** 0.22	**3.0** 0.12	**149.7** 5.89	**210.7** 8.30	**4.90** 0.193	**0.162**	2000	1700	**13.50** 29.80
140.000 5.5118	**250.000** 9.8425	**82.550** 3.2500	**168.603** 6.6379	**1210** 272000	**899** 202000	A-5228-WS	WS	**5.5** 0.22	**3.0** 0.12	**163.2** 6.43	**229.1** 9.02	**5.13** 0.202	**0.172**	1700	1600	**16.80** 37.10
150.000 5.9055	**270.000** 10.6299	**88.900** 3.5000	**181.696** 7.1534	**1470** 330000	**1080** 243000	A-5230-WS	WS	**7.5** 0.30	**3.0** 0.12	**176.3** 6.94	**248.4** 9.78	**5.13** 0.202	**0.154**	1500	1400	**21.30** 46.90
160.000 6.2992	**290.000** 11.4173	**98.425** 3.8750	**193.787** 7.6294	**1750** 394000	**1270** 285000	A-5232-WS	WS	**7.5** 0.30	**3.0** 0.12	**187.8** 7.39	**265.3** 10.44	**5.46** 0.215	**0.164**	1400	1200	**27.50** 60.50

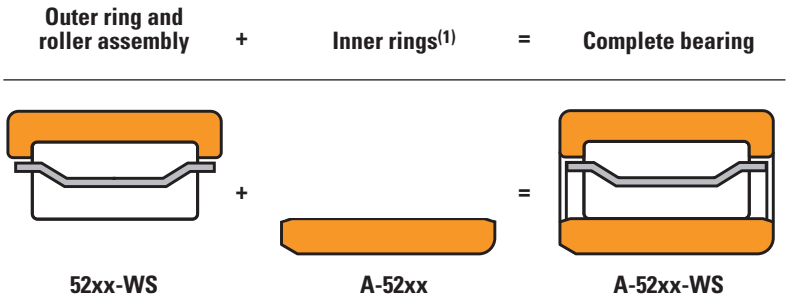
(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.

Continued on next page.

(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering either a) the complete assembly or b) with the inner-ring set.

(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

IN THE BEARING NUMBER
W = double-ribbed outer ring.
S = stamped-steel, land-riding cage.
M = machined-brass, land-riding cage.



(1)Inner ring can be ordered separately.

Bearing Dimensions				Load Rating		Part Number		Mounting Data				s(3)	Geometry Factor C_g	Thermal Speed Ratings		Weight
								Chamfer		Backing Diameter						
Bore d	O.D. D	Width B	DUR/DOR F/E	Static C_0	Dynamic C_1(1)	Bearing(2)	Type	r_{smin}	r_{1smin}	Shaft d_s	Housing D_s			Oil	Grease	
mm in.	**mm** in.	**mm** in.	**mm** in.	**kN** lbf.	**kN** lbf.			**mm** in.	**mm** in.	**mm** in.	**mm** in.	**mm** in.		RPM	RPM	**kg** lbs.
170.000 6.6929	**310.000** 12.2047	**104.775** 4.1250	**205.636** 8.0959	**2040** 459000	**1450** 326000	A-5234-WS	WS	**7.5** 0.30	**4.0** 0.16	**201.6** 7.94	**285.8** 11.25	**3.40** 0.13	**0.172**	1200	1100	**37.60** 82.90
180.000 7.0866	**320.000** 12.5984	**107.950** 4.2500	**216.441** 8.5213	**2130** 479000	**1510** 341000	A-5236-WS	WS	**7.5** 0.30	**4.0** 0.16	**209.0** 8.23	**294.3** 11.59	**4.60** 0.181	**0.178**	1200	1100	**35.70** 78.60
190.000 7.4803	**340.000** 13.3858	**114.300** 4.5000	**229.105** 9.0199	**2340** 526000	**1670** 376000	A-5238-WS	WS	**9.5** 0.37	**4.0** 0.16	**223.8** 8.81	**312.7** 12.31	**5.70** 0.22	**0.186**	1100	1010	**48.50** 107.00
200.000 7.8740	**360.000** 14.1732	**120.650** 4.7500	**242.369** 9.5421	**2370** 534000	**1600** 360000	A-5240-WM	WM	**9.5** 0.37	**4.0** 0.16	**233.0** 9.17	**318.6** 12.54	**6.00** 0.24	**0.189**	1100	990	**57.60** 127.00
220.000 8.6614	**400.000** 15.7480	**133.350** 5.2500	**266.078** 10.4755	**3340** 750000	**2300** 517000	A-5244-WM	WM	**11.0** 0.43	**4.0** 0.16	**260.4** 10.25	**366.7** 14.44	**4.60** 0.18	**0.211**	860	790	**76.40** 175.00
240.000 9.4488	**440.000** 17.3228	**146.050** 5.7500	**291.368** 11.4712	**4010** 902000	**2750** 619000	A-5248-WM	WM	**11.0** 0.43	**4.0** 0.16	**285.0** 11.22	**402.4** 15.84	**4.75** 0.19	**0.228**	750	690	**106.10** 234.00

(1)Based on 1 x 10^6 revolutions L_{10} life, for the ISO life calculation method.
(2)The radial internal clearance (RIC) for the bearing assembly must be included when ordering either a) the complete assembly or b) with the inner-ring set.
(3)Permissible axial displacement from normal position of one bearing ring in relation to the other.

NOTES

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TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related industrial motion rebuild and repair services.

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SCAN TO VISIT

تماس با کارشناس فروش

مشاهده محصولات در سایت

برای استعلام قیمت، اعلام موجودی و ثبت سفارش تکی و عمده بلبرینگ TIMKEN با کارشناسان محرک چرخش تماس بگیرید.

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تمامی حقوق کاتالوگ متعلق به سازنده TIMKEN است