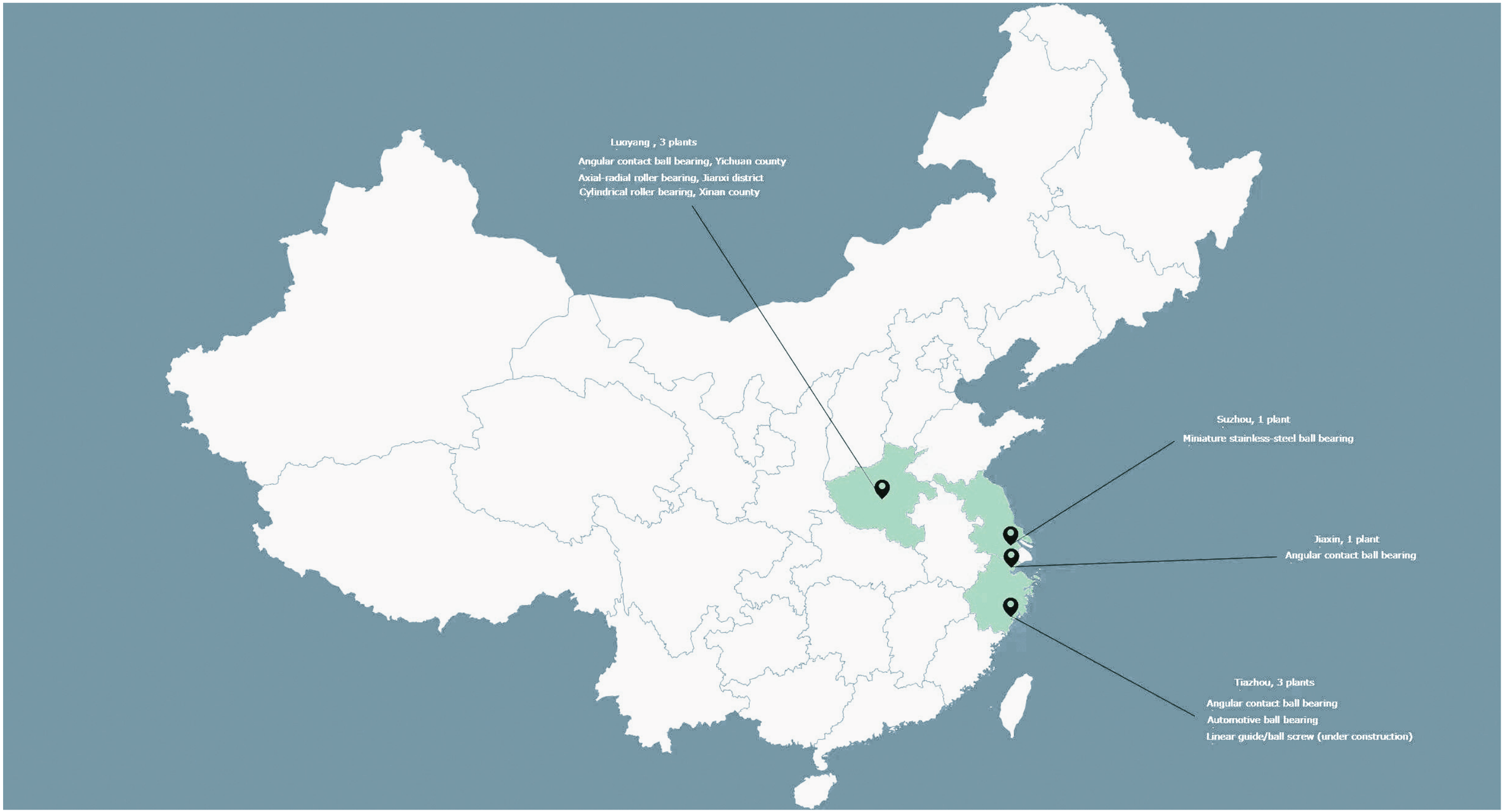
HIGH SPEED SPINDLE BEARINGS

Luoyang Bangrui Machinery Co., Ltd.

CONTENT

Contact our engineering teams for more information:
sales@brzbearing.com



With 27 years involved, BRZB has 7 operating plants for various products.
A newly formed factory is under construction and will be fully functioning in midish of 2024.

Contact our engineering teams for more information:
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30 years of expertise

BRZB, in alliance with XK Precision roller, dominates the super precision ball bearings sector. Renowned for exceptional quality, we guarantee our clients top-tier precision bearings and services. With over 30 years of industry-leading experience in designing and producing super precision ball bearings and roller bearings, our partnership with XK Precision Roller, as Precision Pioneers, involves exchanging best practices and insights. This collaboration enables us to provide custom, high-quality bearings and assemblies, specifically designed to meet our customers' unique needs and specifications.

We manufacture products adhering to the highest quality standards, complemented by a comprehensive suite of engineering support services. Our ethos is characterized by a rapid and adaptable approach, ingrained across all business facets.

Our Spindle Bearings

We specialize in the production of spindle ball bearings which are manufactured to the highest precision standards. Our product range covers bearings from 3mm inner diameter up to 180mm outer diameter. The bearings are specially designed to offer an exceptionally long lifetime, are suitable for the highest operating speeds and, through optional materials, extreme corrosion resistance.

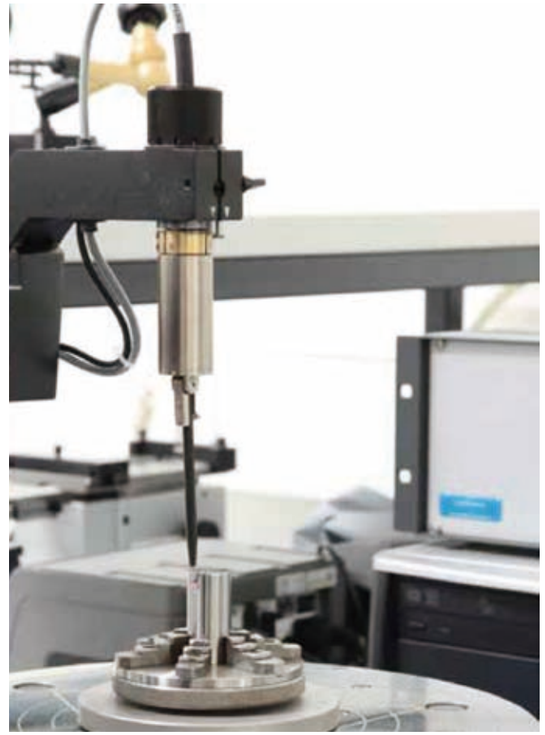
At BRZB, product quality is paramount, incorporating a Class 7 cleanroom in our manufacturing. Our adaptable production methods, along with a vast inventory of diverse products, ensure we consistently meet customer demands and provide swift delivery.

Quality

As a premium manufacturer, BRZB rigorously adheres to international and national standards, including ISO 492, DIN 620, and ABMA Standard 20 ABEC for spindle bearing tolerances. Our bearings, fitted with 'Grade 5' minimum tolerance balls, are manufactured to P4S (P2/P4 precision) as standard, with P2 available on request.

Customers are assured of exceptional quality and precision. Full traceability of our products is available when needed, from initial enquiry, through the complete design and manufacturing process. We have world leading systems and processes in place: our site in Luoyang (China) is fully certified to ISO 9001 for quality and process management.

After assembly in a Class 7 cleanroom our bearings are subjected to 100% noise testing to ensure that our customers always receive bearings which meet the best noise standard for their application. The overall result is a high precision product with a long operating life.



Engineering Support

As a global development and service partner, providing expert technical advice and utilizing advanced laboratory equipment and test rigs for bearing analysis and testing. Our bearing specialists offer:

- **Bearing lifetime calculations and evaluation of kinematics**
- **Rigidity and preload design**
- **Thermal inspection**
- **Shaft calculation**
- **Lubricant recommendation**

Services offered by our laboratory:

- **Bearing damage analysis**
- **Grease/oil analysis**
- **Dimensional check**
- **Friction measurement**

Contact our engineering teams for more information:
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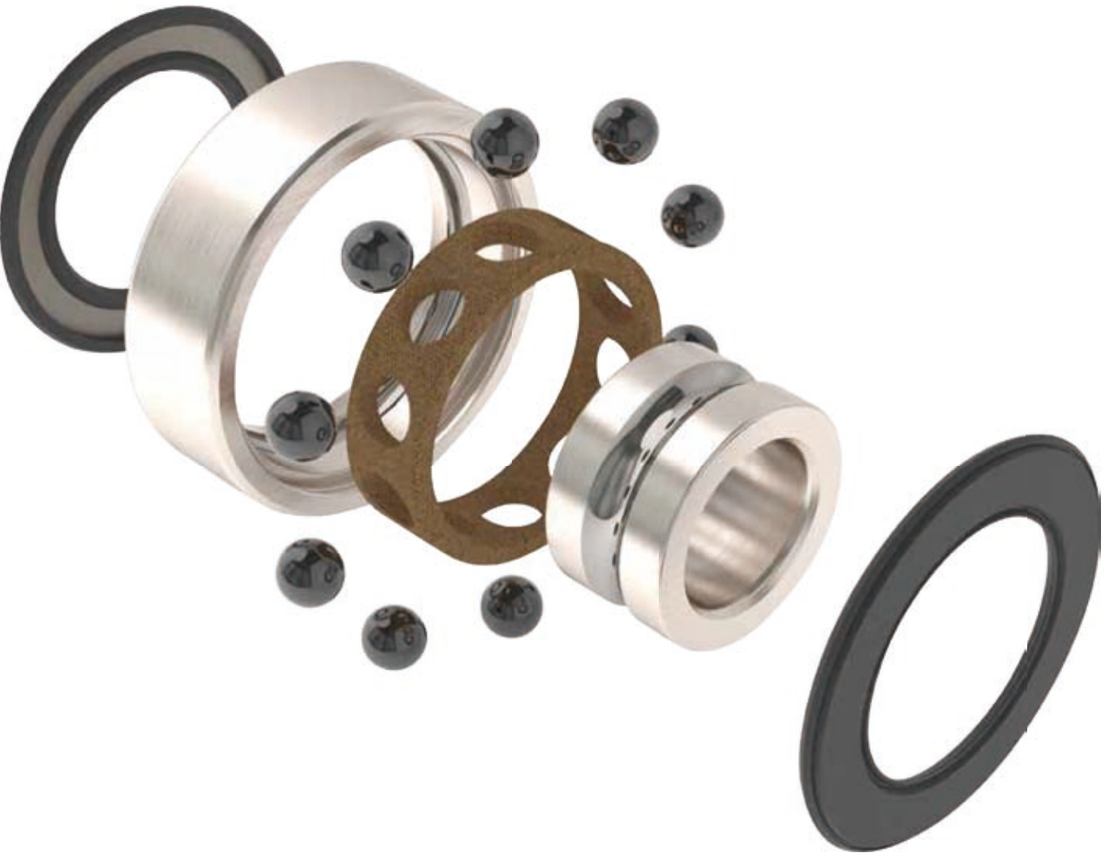
Spindle Bearings

Spindle bearings, as single row angular contact ball bearings, are engineered for maximum speeds and load ratings. They handle one-directional thrust loads and, at high velocities, can concurrently withstand significant radial forces and single-direction axial forces.

These bearings usually feature an open shoulder on the outer ring, a standard design that accommodates more balls than similar deep groove bearings, enhancing load capacity.

They incorporate a halo cage to optimize speed and are known for their exceptionally high running accuracy.

Our spindle bearings are designed with a nominal contact angle of 15° or 25°. They can be arranged in pre-loaded duplex sets, either back-to-back (DB) or face to face (DF), to support thrust loads in both directions, or in tandem (DT) to enhance capacity.



Applications

Spindle bearings are primarily utilized in machine tool spindles, tailored to withstand the challenging operating conditions of these applications. They must accommodate diverse machine speeds and handle varying sizes and types of materials being machined, all while providing maintenance-free and reliable performance.

Modern grinding motor spindles achieve speeds up to 180,000 rpm. Essential requirements for this application include high running accuracy and low noise. These are achieved by finely balancing all rotating components and ensuring the bearings conform to the highest quality standards. Our bearings meet these stringent requirements with precision down to the last micron.

Our spindle bearings are versatile, fitting for motorized spindles, belt-driven mechanical spindles, and specialized applications like rotary unions for machine tool spindles. In such scenarios, where cooling liquids are supplied through rotating spindle shafts at pressures up to 150 bar and high operating speeds, bearings face extreme demands in terms of speed and axial loads. Our bearings excel under these challenging conditions.

Operating Temperature

Standard spindle bearings are suitable for temperatures up to 120°C, limited by the phenolic resin cages and high-speed grease. For higher temperature environments, alternative materials are available. Please contact our Engineering Department for further details.

➤ Materials and Components

The components of the bearing design will vary according to the application and choices should be based on anticipated operating conditions.

Design choices include:

- **Materials (rings and balls)**
- **Cages**
- **Lubrication**
- **Internal design parameters**
- **Preloading (Abutment)**
- **Tolerances & geometric accuracy**
- **Closures**

Please consult our bearing specialists for special requirements.

➤ Rings

Carbon chrome bearing steels such as 100Cr6, GCr15 and SAE52100 are used as standard in this application.
They have good load carrying capacity, fatigue resistance and stability.

The high-performance stainless-steel material AMS5898 can also be specified. This highly refined material has a very fine grain structure which enhances its mechanical properties. It also provides excellent corrosion resistance, fatigue resistance and stability.

The composition of these materials is shown in the table below.

Material Composition									
Designation	Chemical Reference	Cr	C	Si	Mn	P	S	Mo	N
Carbon Chrome	100Cr6/SAE52100	1.35-1.60	0.93 -1.05	0.15 - 0.35	0.25 - 0.45	<0.025	<0.015	<0.1	-
Stainless Steel	X65Cr13 AISI440C	12.50-14.50 16.00-18.00	0.43 - 0.50 0.95-1.20	<1.00	<1.00	<0.040	<0.030	0.40 - 0.65	-
AMS5898	X30CrMoN15-1	14.50-16.00	0.28 - 0.34	0.30 - 0.80	0.30 - 0.60	<0.02	<0.01	0.95 -1.10	0.35 - 0.44

➤ Hybrid Bearings

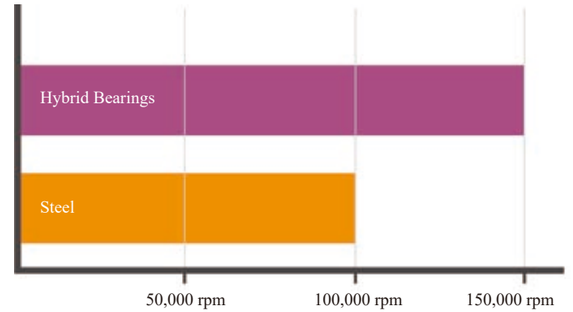
For carbon chrome bearings, the standard ball material matches the raceways. In AMS5898 bearings, stainless steel is the default for balls. For demanding applications, many bearings use silicon nitride (Si_3N_4) ceramic balls. We use only grade 3 and 5 balls, adhering to the strictest tolerances for size, roundness, and roughness in our spindle bearing.

Hybrid Bearings

Hybrid spindle bearings cater to demanding applications, featuring inner and outer rings made from either carbon chrome or highly fatigue resistant AMS5898 steel. The balls in these bearings are made of ceramic (Si_3N_4), combining materials for enhanced performance.

Ceramic balls used in place of steel balls can radically improve bearing performance in several ways:

- **Low vibration and noise. Vibration levels can be up to seven times lower than conventional steel ball bearings due to the almost perfectly smooth finish and exceptional geometry of ceramic balls.**
- **High running speeds. Ceramic hybrid bearings run at significantly lower operating temperatures with reduced internal loading due to a 60% lower ball mass than steel, allowing running speeds to increase by up to 50% (as shown opposite).**
- **Low wear and long operating life. Bearings with ceramic balls have been proven to last up to five times longer than conventional steel ball bearings. The inherent properties of silicon nitride mean the balls drastically reduce the predominant cause of surface wear in conventional bearings. Lower operating temperatures also help extend lubricant life and they provide excellent performance where there is insufficient lubrication.**
- **Systems equipped with ceramic hybrids show higher rigidity and a higher natural frequency making them less sensitive to vibration.**
- **Please consult our bearing specialists for more information on how hybrid bearings can improve application performance.**



Limiting speed for hybrid spindle bearings (illustrative)

Contact our engineering teams for more information:
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V Series Spindle Bearings

V angular contact series bearings can provide increased speed capability due to lower torque and temperature characteristics while offering improved stiffness and extended grease life.

As operating speeds increase, existing standard bearing designs are pushed to their limits and beyond. To address these challenges V bearings, use a smaller ball, in comparison to the bearing cross section, than their standard counterparts. This smaller ball, coupled with optimized internal geometry, reduces the influence of centrifugal effects, and allows the V range bearings to operate at speeds up to 40% higher than large ball variants with no loss of accuracy.

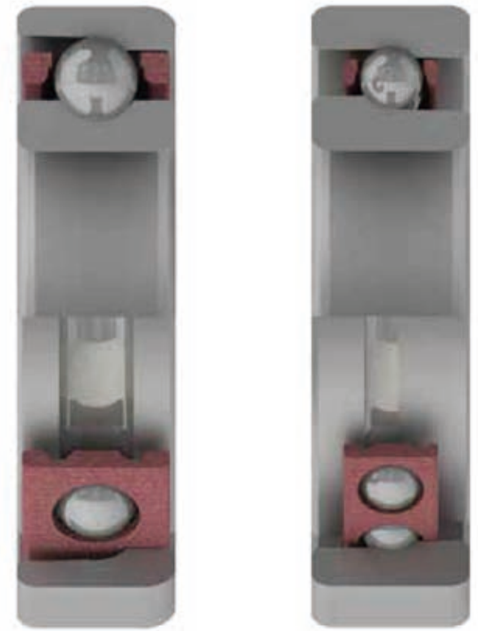
With a reduction in ball diameter comes an increase in ball complement. The increased ball complement means greater bearing stiffness, translating into greater machining accuracy and enhanced workpiece finish characteristics.

Operating speeds can be enhanced further when the V design bearings are supplied with the optional ceramic (Si_3N_4) balls are used in place of steel balls. The ceramic material used to produce these balls has a density 60% lower than steel further reducing the effects of ball loading at high speeds, improving dynamic operating conditions.

V series bearings are available either in open configuration for oil lubrication or fitted with closures and grease lubricated. Closures act to keep contaminants out and prolong lubricant life, thus reducing the risk of bearing failure.

Design Features

- **Small ball design allows a greater number of balls for increased bearing stiffness.**
- **The land diameters of the inner and outer rings are relived to provide:**
  - Optimum exposure, and flow through, characteristics for air/oil lube systems.
  - Increased internal volume for lubricant in shielded/sealed bearings.
- **Ceramic (Silicon Nitride Si3N4) balls available as an option.**
- **Closures-available as an option.**
  - Interchangeable with standard series bearings.
  - Factory controlled and filtered grease ensures clean, proper amount of lubrication.
- **Available with 15° or 25° contact angles.**



Comparison of ball diameter as proportion of cross section for H and V style bearings

Benefits of Using V Small Ball Bearings

- Increased bearing stiffness allows enhanced workpiece finish and greater machining accuracy.
- Up to 40% or more increase in operating speeds possible. Lower bearing friction means cooler running temperatures.
- Grease life increased due to lower temperatures.
- Closures keep contaminants out, lubricants in, reducing risk of bearing failure.
- Bearing grease life prolonged, which increases production capacity, reduces downtime.
- The ceramic ball option offers further reductions in torque and increased stiffness as well as increased speed ability.
- Direct dimensional interchangeability of H and B Series with other standard angular contact bearings.

Contact our engineering teams for more information:
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Cages

Proper selection of cage design and materials is essential to the successful performance of a precision ball bearing. The basic purpose of a cage is to maintain uniform ball spacing, to prevent the balls contacting, thus ensuring an even load distribution within the bearing. They can also be designed to reduce torque and minimize heat build-up.

Our spindle bearings have a halo cage made of fabric reinforced phenolic as standard. If required, cages can also be produced from high-performance plastics such as PEEK or Polyamide-imide (such as Torelon®). These materials are used on account of their low weight, their corrosion resistance and low friction, which results in reduced wear and less heat generation. This enables the bearings to operate at higher speeds while prolonging grease service life.

Cage Types	Short Designation	Cage Type	Features
	/	Machined one-piece, outer ring guided, halo cage produced from fabric reinforced phenolic resin.	Standard cage type Oil impregnation possible Suitable for spindle ball bearings with high accuracy Very high speeds High strength Good low lubricant running characteristics
	TN1	Machined one-piece, outer ring guided, halo cage produced from fabric reinforced phenolic resin.	As standard cage, plus: Bore grooves to reduce friction and improve lubricant circulation Typical cage design for bearings of bore size 05 (25mm) and above

Lubrication

Good lubrication is critical to the performance of anti¬friction bearings. Increased speeds, higher temperatures, improved accuracy, and reliability requirements result in the need for closer attention to lubricant selection. Lubricant type and quantity have a marked effect on functional properties and service life of each application.

The main task of a lubricant is to form an electrohydrodynamic lubricating film between the rolling element and the raceway, thereby preventing direct contact between the friction surfaces of the individual components.

A good lubricating film:

- **Reduces friction.**
- **Minimizes wear.**
- **Protects against corrosion.**
- **Dissipates heat from the bearing.**
- **Acts as barrier to contaminant**

Lubrication Selection

The lubricant type is typically selected according to the operating conditions and limitations of the application while considering specific customer requirements. The most significant factors in selecting a lubricant are:

- **Viscosity of the lubricant at operating temperature**
- **Maximum and minimum allowable operating temperatures**
- **Operating speed**
- **Required friction values.**

Lubricants are available in two basic forms:

- **Oils (fluid lubricants)**
- **Greases - solid to semi-solid products consisting of an oil and a thickening agent.**

We have over 300 different oils and greases available, please consult us for any specific requirements.

Grease Lubrication

Grease lubrication is characterized as oil, bound by a thickener, which is continuously dispensed to the contact point during the lifetime. The primary advantage of grease over oil is that bearings can be pre-lubricated with grease, eliminating the need for an external lubrication system.
Our sealed spindle bearings are lubricated with a high-performance grease for the entire lifetime, and attainable running speeds are generally lower compared with oil lubrication.
The standard grease used in our spindle bearings is based on synthetic oil and polyurea thickener as standard. The grease exhibits optimal performance during tests at speed factors of two million n·dm (speed x PCD of balls). Bearing run-in occurs much faster and the starting torque is greatly reduced.
Grease lubrication also requires less maintenance and has less stringent sealing requirements than oil systems. Grease tends to remain in proximity to bearing components, metering its oil content to operating surfaces as needed.
Other considerations to grease selection include:

- **Speed ability**
- **Temperature**
- **Consistency (stiffness)**
- **Bleeding**

Factory pre-lubrication of bearings is highly recommended since the correct quantity of applied lubricant can be as important as the correct type of lubricant. This is especially true of greases, where an excess can cause high torque, overheating and — if the speed is high enough — rapid bearing failure. Based on our vast experience in this field, we have established standard quantities of lubricants that are suitable for most applications.

In grease lubricated bearings life is often not determined by the internal design, fitting and specification of the bearing but by the grease itself. It is important for this reason to ensure appropriate running conditions to optimize useful grease life.

In addition, we can offer special finishing of the spindle bearing itself or its individual components. This could include, for example, vacuum impregnation of the cage, special coating of the rings and film greasing.

Advantages of Sealed Spindle Bearings with Grease Lubrication

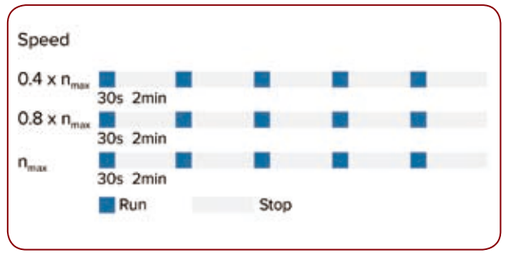
- **Lifetime lubrication**
- **Maintenance-free**
- **No external lubrication system required.**
- **Optimal grease quantity**
- **Use of a high-performance lubricant (speed factor n·dm = 2,200,000)**
- **Greasing, sealing and packaging in a clean room Class 7**

Grease Distribution

Before operating under load, spindle bearings with lifetime lubrication first need to be run in to distribute the grease evenly. This distribution process should be carried out at intervals with pauses at rest, allowing the bearing temperature to stabilize and prevent overheating and degradation of the grease.

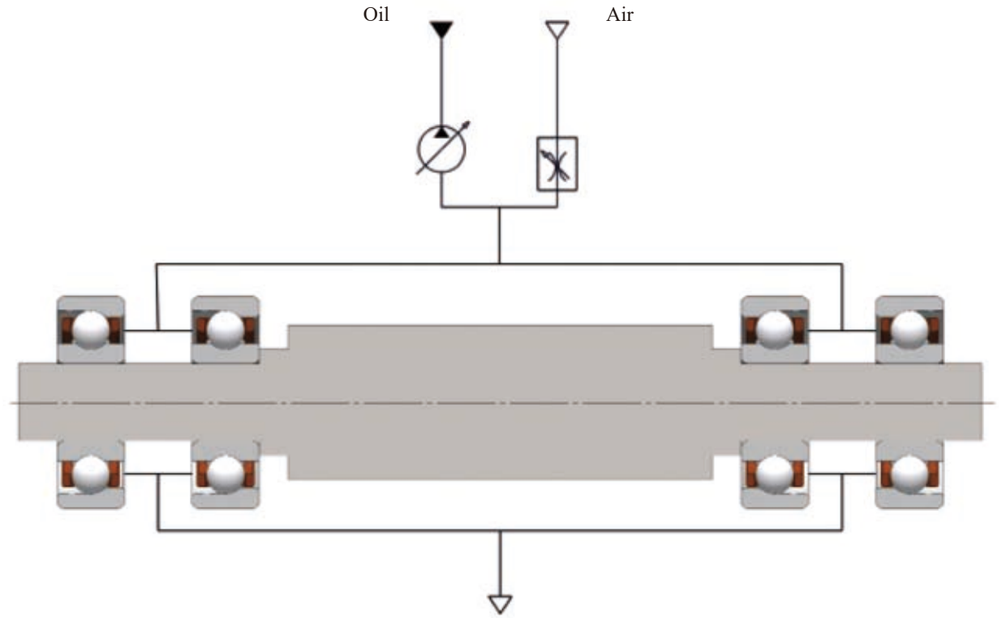
The procedure for grease distribution is as follows: Three process steps with increasing speeds (0.4 x nmax; 0.8 x nmax; nmax) in relation to the maximum speed of the application, and five intervals composed of one 30-second run and a two-minute stop. It is recommended to monitor the temperature and continue the last iteration with max. speed, longer run procedures and shorter stops until a steady temperature is reached.

Run In Intervals



Oil Lubrication

Oil lubrication can offer advantages when compared with grease lubrication, particularly in the case of spindle bearings rotating at high speed.
Our open spindle bearings are supplied oil lubricated as standard. In contrast to grease lubricated bearings, oil lubricated bearings must be lubricated regularly with exactly the right amount of lubricant to achieve the expected bearing life. The optimization of relubrication intervals and lubricant quantity can have a significant cost saving effect for the end user. If regular relubrication of the bearings is necessary, an external oil-air lubrication system can be integrated into the system.
Oil-Air lubrication or oil minimum quantity lubrication (MQL) is often used in modern machine tool spindles.
and is shown in the diagram below. In this process, an oil film is formed in front of the spindle and conveyed to the bearing. It enables exceptionally high speeds to be achieved and dissipates heat from the bearing. Ideally each bearing has its own oil-air supply.



Oil-Air Lubrication

Design of Spindle Bearings

Open Design

Open spindle bearings make optimum use of the internal space by allowing large balls and a halo cage. This results in maximum load carrying capacities and therefore maximum bearing life. This open design is recommended for oil lubrication. Contamination should be prevented from entering the bearing and continuous relubrication should be used.

Sealed Design

Seals exclude contamination, contain lubricants, and protect the bearing from internal damage during handling.

Our sealed spindle bearings typically have non-contact seals on both sides, which ensure good protection against contaminants, such as dust, which could damage the internal workings of the bearing. This design also limits lubricant leakage from the bearing. They are recommended for applications where lifetime grease lubrication is required or where air flow through the bearing is present.

Since the seals are non-contact there is no negative effect on friction or speed ratings. Our standard seals are made from NBR with steel reinforcement. For extreme environments the flour elastomer FKM is available, offering high chemical resistance and operating temperatures up to 230°C.

In some instances, it is necessary to reduce the ball diameter to provide space for the seals, an outcome of which can be a moderate increase in speed. Further advantages of the sealed design include ease of handling and trouble-free installation, making it particularly suitable where bearings are being replaced.

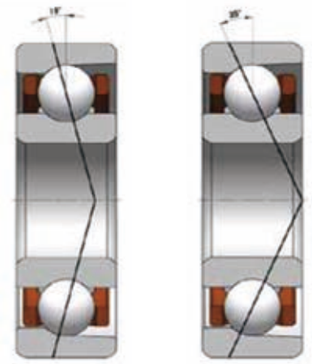
Open design

Sealed design

Contact Angle

Contact angle is the nominal angle between ball-to-race contact line and a plane through the ball centers, perpendicular to the bearing axis. Load is transmitted from the shaft to the inner ring and then via the contact angle through the balls to the outer ring and subsequently the housing. To ensure an even load on all bearings within a set, they should all have the same contact angle.

Angular contact bearings are assembled to a constant contact angle by varying the radial clearance. Our spindle bearings are available with a contact angle of 15° or 25°. The larger the angle, the higher the axial capacity and rigidity as axial forces can be absorbed. Conversely, bearings with a smaller contact angle have better radial capacity and rigidity and can operate at higher speed. Non-standard contact angles are available on request.

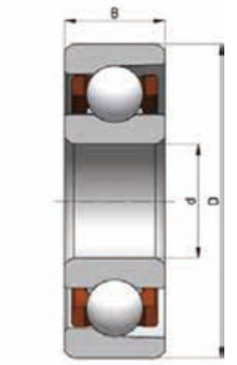


α=15° α=25°

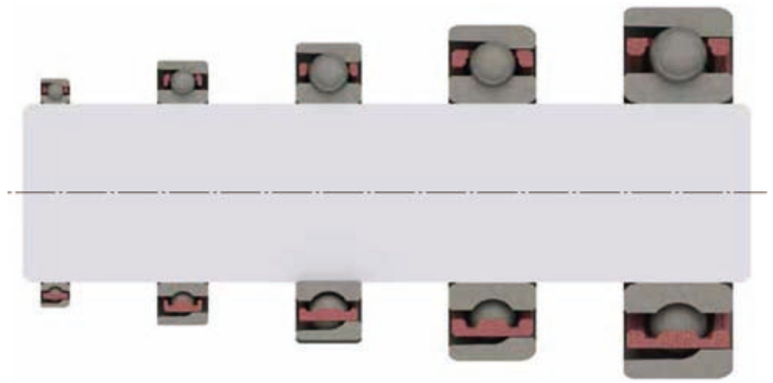
Dimension Series

Our spindle bearings range from 3mm inner diameter to 180mm outer diameter, and the following tables indicate the dimensions, the dynamic and static load rating, and the limiting speed for the various designs of bearing. The diagram opposite shows the envelope dimensions which are referred to by the abbreviations d, D and B.

The envelope dimensions of our bearings are in line with ISO standards. These fall into different series where for the same given bore diameter and range of cross sections are available, in general smaller cross section offer higher speeds but lower load carrying capacity and vice-versa.



Dimension abbreviations



Comparison shown for 25mm bore diameter bearings

➤ Nomenclature

Material	Design	Series & Size	Contact Angel	Sealing	Cage	Abutment	Preload	Calibration	Lubrication
S30X		70		RS		DG	A		
C	H	72	AC	RZ	TN1	DB/DF	B		L252
	B	718	C	2RS	PEEK	DT	C		NBU15
		719	A	2RZ		Other	S		

No symbol indicates carbon chrome steel		No symbol indicates standard design		**70**	Available in metric, either 15°, 18° or 25°	**AC**	25°	**RS**	Single shield	**(/)**	Reinforced phenolic, one-piece halo design	**DG**	Duplex pair universal mounting	Other set configurations are available on request		Spindle bearings are supplied with the deviation to nominal bore, OD and width identified to the nearest μm as standard		Request oil/grease will be added in the very back of suffix	
S	Stainless Steel	**H**	Small ball high speed	**72**		**C**	15°	**RZ**		**TN1**	Reinforced phenolic,one-piece ball retaining design	**DB**	Back to back mounting	**A**	Light preload			**L252**	Lubcon Turmogrease
30X	AMS5898 (Nitrogen Alloyed Martensitic Stainless Steel)	**B**	Optimaized internal design	**718**		**SD**	18°	**2RS**	Double shield	() indicates that the letter is already included in the nomenclature from bearing type column		**DF**	Face to face mounting	**B**	Medium preload			**NBU15**	Kluber ISOFLEX
C	Ceramic Si3N4 (balls)			**719**				**2RZ**				**DT**	Tandem mounting	**C**	Heavy preload			Other lubricants are available on request	
												QFT	Face to face quad mounting	**Sxx**	xx is the mean preload specified in kN				
												QBT	Back to back quad mounting						

➤ 70

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
706C	15	6.00	17.00	6.00	2.15	0.85	66,000	87,000	13	10	20	13	50	18	0.006
706A	30	6.00	17.00	6.00	2.03	0.80	92,000	140,000							0.006
707C	15	7.00	19.00	6.00	2.39	1.00	89,000	135,000	10	8	30	13	60	18	0.007
707AC	25	7.00	19.00	6.00	2.24	0.94	100,000	150,000	30	31	60	41	120	54	0.007
708C	15	8.00	22.00	7.00	3.55	1.54	77,000	117,000	20	27	40	35	80	45	0.012
708AC	25	8.00	22.00	7.00	2.80	1.50	63,000	95,000	25	28	80	42	160	54	0.012
708A	30	8.00	22.00	7.00	3.35	1.45	50,000	67,000							0.012
7000C	15	10.00	26.00	8.00	5.30	2.49	63,900	97,300	23	14	70	20	140	25	0.019
7000AC	25	10.00	26.00	8.00	5.15	2.41	55,600	83,400	35	37	100	51	200	64	0.019
7000A	30	10.00	26.00	8.00	5.00	2.34	41,700	55,600							0.019
7001C	15	12.00	28.00	8.00	5.80	2.90	57,500	87,500	27	16	80	22	160	28	0.021
7001AC	25	12.00	28.00	8.00	5.60	2.79	50,000	75,000	45	41	130	57	260	72	0.021
7001A	30	12.00	28.00	8.00	5.40	2.71	37,500	50,000							0.021
7002C	15	15.00	32.00	9.00	6.25	3.40	49,000	74,500	30	19	90	26	180	33	0.030
7002AC	25	15.00	32.00	9.00	5.95	3.25	42,600	63,900	50	49	150	69	300	86	0.030
7002A	30	15.00	32.00	9.00	5.80	3.15	32,000	42,600							0.030
7003C	15	17.00	35.00	10.00	6.60	3.80	44,300	67,400	40	20	120	29	240	36	0.039
7003AC	25	17.00	35.00	10.00	6.30	3.65	38,500	57,700	65	53	190	74	380	94	0.040
7003A	30	17.00	35.00	10.00	6.10	3.50	28,900	38,500							0.040
7004C	15	20.00	42.00	12.00	11.10	6.55	37,100	56,500	50	24	150	35	300	44	0.067
7004AC	25	20.00	42.00	12.00	10.60	6.25	32,300	48,400	80	64	240	90	480	113	0.067
7004A	30	20.00	42.00	12.00	10.30	6.10	24,200	32,300							0.068
7005C	15	25.00	47.00	12.00	11.70	7.40	32,000	48,700	65	29	190	42	380	53	0.078
7005AC	25	25.00	47.00	12.00	11.10	7.10	27,800	41,700	105	77	310	108	620	136	0.077
7005A	30	25.00	47.00	12.00	10.70	6.85	20,900	27,800							0.079
7006C	15	30.00	55.00	13.00	15.10	10.30	27,100	41,200	80	35	240	50	480	63	0.114
7006AC	25	30.00	55.00	13.00	14.40	9.80	23,600	35,300	130	92	390	128	780	161	0.114
7006A	30	30.00	55.00	13.00	13.90	9.45	17,700	23,600							0.116

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
7007C	15	35.00	62.00	14.00	19.10	13.70	23,800	36,100	100	39	300	56	600	71	0.151
7007AC	25	35.00	62.00	14.00	18.20	13.00	20,700	31,000	165	104	490	146	980	183	0.151
7007A	30	35.00	62.00	14.00	17.50	12.60	15,500	20,700							0.153
7008C	15	40.00	68.00	15.00	20.60	15.90	21,300	32,500	105	41	310	59	620	75	0.189
7008AC	25	40.00	68.00	15.00	19.50	15.10	18,600	27,800	170	109	510	153	1,020	193	0.188
7008A	30	40.00	68.00	15.00	18.80	14.60	13,900	18,600							0.191
7009C	15	45.00	75.00	16.00	24.40	19.30	19,200	29,200	140	46	420	67	840	85	0.238
7009AC	25	45.00	75.00	16.00	23.10	18.30	16,700	25,000	230	123	690	172	1,380	216	0.250
7009A	30	45.00	75.00	16.00	22.30	17.70	12,500	16,700							0.241
7010C	15	50.00	80.00	16.00	26.00	21.90	17,700	27,000	145	49	430	71	860	89	0.259
7010AC	25	50.00	80.00	16.00	24.60	20.80	15,400	23,100	235	130	700	182	1,400	229	0.270
7010A	30	50.00	80.00	16.00	23.70	20.10	11,600	15,400							0.262
7011C	15	55.00	90.00	18.00	34.00	28.60	15,900	24,200	195	56	580	81	1,160	103	0.380
7011AC	25	55.00	90.00	18.00	32.50	27.20	13,800	20,700	315	150	940	210	1,880	264	0.383
7011A	30	55.00	90.00	18.00	31.00	26.30	10,400	13,800							0.385
7012C	15	60.00	95.00	18.00	35.00	30.50	14,900	22,600	200	59	600	85	1,200	108	0.405
7012AC	25	60.00	95.00	18.00	33.00	29.10	13,000	19,400	325	158	970	221	1,940	278	0.408
7012A	30	60.00	95.00	18.00	32.00	28.10	9,700	13,000							0.410
7013C	15	65.00	100.00	18.00	37.00	34.50	14,000	21,300	210	62	630	90	1,260	114	0.435
7013AC	25	65.00	100.00	18.00	35.00	32.50	12,200	18,200	330	165	990	232	1,990	292	0.455
7013A	30	65.00	100.00	18.00	33.50	31.50	9,100	12,200							0.441
7014C	15	70.00	110.00	20.00	47.00	43.00	12,800	19,500	270	70	810	102	1,620	129	0.606
7014AC	25	70.00	110.00	20.00	44.50	41.00	11,200	16,700	425	188	1,270	263	2,540	331	0.625
7014A	30	70.00	110.00	20.00	42.50	39.50	8,400	11,200							0.613
7015C	15	75.00	115.00	20.00	48.00	45.50	12,200	18,500	275	74	820	106	1,640	135	0.643
7015AC	25	75.00	115.00	20.00	45.50	43.50	10,600	15,800	435	197	1,300	276	2,600	346	0.652
7015A	30	75.00	115.00	20.00	43.50	41.50	7,900	10,600							0.650
7016C	15	80.00	125.00	22.00	58.50	55.50	11,300	17,100	330	78	990	113	1,980	144	0.855

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
7016AC	25	80.00	125.00	22.00	55.50	52.50	9,800	14,700	525	209	1,570	294	3,140	369	0.880
7016A	30	80.00	125.00	22.00	53.50	50.50	7,400	9,800							0.864
7017C	15	85.00	130.00	22.00	60.00	58.50	10,700	16,300	340	82	1,000	119	2,000	150	0.898
7017AC	25	85.00	130.00	22.00	57.00	55.50	9,400	14,000	540	219	1,620	307	3,240	386	0.904
7017A	30	85.00	130.00	22.00	54.50	53.50	7,000	9,400							0.907
7018C	15	90.00	140.00	24.00	71.50	69.00	10,000	15,300	360	89	1,050	129	2,100	163	1.160
7018AC	25	90.00	140.00	24.00	68.00	65.50	8,700	13,100	570	239	1,710	335	3,420	421	1.170
7018A	30	90.00	140.00	24.00	65.00	63.50	6,600	8,700							1.180
7019C	15	95.00	145.00	24.00	73.50	73.00	9,600	14,600	420	94	1,250	137	2,500	173	1.210
7019AC	25	95.00	145.00	24.00	69.50	69.50	8,400	12,500	670	253	2,010	354	4,020	446	1.410
7019A	30	95.00	145.00	24.00	67.00	67.00	6,300	8,400							1.230
7020C	15	100.00	150.00	24.00	75.50	77.00	9,200	14,000	430	98	1,290	142	2,580	180	1.270
7020AC	25	100.00	150.00	24.00	71.00	73.50	8,000	12,000	690	263	2,070	370	4,140	464	1.450
7020A	30	100.00	150.00	24.00	68.50	70.50	6,000	8,000							1.280
7021C	15	105.00	160.00	26.00	88.00	89.50	8,700	13,300	500	103	1,500	149	3,000	189	1.580
7021AC	25	105.00	160.00	26.00	83.50	85.00	7,600	11,400	800	276	2,400	387	4,800	487	1.820
7021A	30	105.00	160.00	26.00	80.00	81.50	5,700	7,600							1.600
7022C	15	110.00	170.00	28.00	106.00	104.00	8,300	12,500	590	112	1,750	162	3,500	205	1.940
7022AC	25	110.00	170.00	28.00	100.00	99.00	7,200	10,800	950	299	2,850	421	5,700	529	2.260
7022A	30	110.00	170.00	28.00	96.50	95.50	5,400	7,200							1.960
7024C	15	120.00	180.00	28.00	112.00	117.00	7,700	11,700	600	116	1,800	169	3,600	213	2.090
7024AC	25	120.00	180.00	28.00	106.00	111.00	6,700	10,000	970	312	2,910	438	5,820	550	2.430
7024A	30	120.00	180.00	28.00	102.00	107.00	5,000	6,700							2.120
7026C	15	130.00	200.00	33.00	129.00	137.00	7,000	10,700	750	129	2,200	187	4,400	236	3.220
7026AC	25	130.00	200.00	33.00	122.00	130.00	6,100	9,100	1,200	346	3,600	485	7,200	610	3.660
7026A	30	130.00	200.00	33.00	117.00	125.00	4,600	6,100							3.260
7028C	15	140.00	210.00	33.00	132.00	145.00	6,600	10,000	800	134	2,400	194	4,800	246	3.410
7028AC	25	140.00	210.00	33.00	125.00	138.00	5,800	8,600	1,300	350	3,900	505	7,800	635	3.870

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
7028A	30	140.00	210.00	33.00	120.00	133.00	4,300	5,800							3.440
7030C	15	150.00	225.00	35.00	151.00	168.00	6,200	9,400	900	143	2,700	207	5,400	262	4.150
7030AC	25	150.00	225.00	35.00	143.00	160.00	5,400	8,000	1,400	384	4,200	539	8,400	677	4.190
7030A	30	150.00	225.00	35.00	137.00	154.00	4,000	5,400							4.190
7032C	15	160.00	240.00	38.00	171.00	193.00	5,800	8,800	1,000	151	3,000	220	6,000	278	5.110
7032AC	25	160.00	240.00	38.00	162.00	183.00	5,000	7,500	1,600	407	4,800	572	9,600	719	5.710
7032A	30	160.00	240.00	38.00	155.00	176.00	3,800	5,000							5.160
7034C	15	170.00	260.00	42.00	205.00	234.00	5,400	8,200	1,100	158	3,300	230	6,600	291	6.880
7034AC	25	170.00	260.00	42.00	193.00	223.00	4,700	7,000	1,750	427	5,200	600	10,000	754	7.830
7034A	30	170.00	260.00	42.00	186.00	214.00	3,500	4,700							6.940
7036C	15	180.00	280.00	46.00	228.00	276.00	5,000	7,700	1,200	172	3,600	250	7,200	317	10.400
7036AC	25	180.00	280.00	46.00	216.00	262.00	4,400	6,600	1,950	465	5,800	653	11,500	821	10.400
7036A	30	180.00	280.00	46.00	207.00	252.00	3,300	4,400							9.270
7038C	15	190.00	290.00	46.00	247.00	305.00	4,800	7,300	1,300	179	3,800	260	7,600	328	11.200
7038AC	25	190.00	290.00	46.00	233.00	291.00	4,200	6,300	2,000	483	6,000	678	12,000	852	11.200
7038A	30	190.00	290.00	46.00	224.00	280.00	3,200	4,200							11.300
7040C	15	200.00	310.00	51.00	265.00	340.00	4,600	6,900	1,600	186	4,800	270	9,600	342	13.600
7040AC	25	200.00	310.00	51.00	250.00	325.00	4,000	5,900	2,500	504	7,500	707	15,000	889	13.700
7040A	30	200.00	310.00	51.00	240.00	310.00	3,000	4,000							13.700
7044C	15	220.00	340.00	56.00	325.30	559.40	3,600	5,300	1,800	198	5,400	288	10,800	365	16.100
7044AC	25	220.00	340.00	56.00	307.30	530.80	3,200	4,800	2,800	538	8,400	756	16,800	951	16.100
7048C	15	240.00	360.00	56.00	344.20	623.60	3,200	4,800	1,900	215	5,700	312	11,400	395	17.100
7048AC	25	240.00	360.00	56.00	325.10	591.70	3,000	4,500	3,000	584	9,000	820	18,000	1,031	17.100

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
725C	15	5.00	16.00	5.00	1.70	0.66	110,000	167,000							0.005
725A	30	5.00	16.00	5.00	1.61	0.62	72,000	96,000							0.005
726C	15	6.00	19.00	6.00	1.00	0.84	92,000	140,000							0.008
726A	30	6.00	19.00	6.00	0.94	0.40	60,000	80,000							0.008
728C	15	8.00	24.00	8.00	4.50	2.30	67,000	100,000	23	12	70	18	140	22	0.020
728AC	25	8.00	24.00	8.00	4.40	2.20	60,000	90,000	35	30	105	45	210	56	0.020
728A	30	8.00	24.00	8.00	1.48	0.61	47,000	63,000							0.016
7200C	15	10.00	30.00	9.00	5.40	2.61	57,500	87,500	35	16	100	23	200	29	0.032
7200AC	25	10.00	30.00	9.00	5.20	2.51	50,000	75,000	55	42	160	59	320	74	0.031
7200A	30	10.00	30.00	9.00	5.05	2.44	37,500	50,000							0.032
7201C	15	12.00	32.00	10.00	7.90	3.85	52,300	79,600	35	18	100	25	200	32	0.036
7201AC	25	12.00	32.00	10.00	7.65	3.70	45,500	68,200	60	47	180	66	360	83	0.036
7201A	30	12.00	32.00	10.00	7.45	3.65	34,100	45,500							0.030
7202C	15	15.00	35.00	11.00	8.65	4.55	46,000	70,000	48	20	140	29	280	37	0.045
7202AC	25	15.00	35.00	11.00	8.35	4.35	40,000	60,000	80	53	240	74	480	94	0.044
7202A	30	15.00	35.00	11.00	8.10	4.25	30,000	40,000							0.045
7203C	15	17.00	40.00	12.00	10.90	5.85	40,400	61,500	60	23	180	32	360	41	0.065
7203AC	25	17.00	40.00	12.00	10.40	5.60	35,100	52,700	95	60	280	83	560	105	0.064
7203A	30	17.00	40.00	12.00	10.10	5.45	26,400	35,100							0.065
7204C	15	20.00	47.00	14.00	14.60	8.05	34,400	52,300	70	27	210	39	420	49	0.103
7204AC	25	20.00	47.00	14.00	14.00	7.75	29,900	44,800	115	72	340	100	680	126	0.102
7204A	30	20.00	47.00	14.00	13.60	7.55	22,400	29,900							0.104
7205C	15	25.00	52.00	15.00	16.60	10.20	29,900	45,500	90	32	270	46	540	58	0.127
7205AC	25	25.00	52.00	15.00	15.90	9.80	26,000	39,000	150	85	450	119	900	150	0.130
7205A	30	25.00	52.00	15.00	15.40	9.45	19,500	26,000							0.129

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
7206C	15	30.00	62.00	16.00	23.00	14.70	25,000	38,100	120	38	360	55	720	69	0.194
7206AC	25	30.00	62.00	16.00	22.10	14.10	21,800	32,700	200	101	600	141	1,200	178	0.194
7206A	30	30.00	62.00	16.00	21.30	13.60	16,400	21,800							0.197
7207C	15	35.00	72.00	17.00	30.50	19.90	21,500	32,800	135	44	400	63	800	79	0.280
7207AC	25	35.00	72.00	17.00	29.10	19.10	18,700	28,100	220	116	660	162	1,320	204	0.277
7207A	30	35.00	72.00	17.00	28.20	18.50	14,100	18,700							0.284
7208C	15	40.00	80.00	18.00	36.50	25.20	19,200	29,200	180	50	540	72	1,080	92	0.366
7208AC	25	40.00	80.00	18.00	34.50	24.10	16,700	25,000	295	134	880	187	1,760	235	0.362
7208A	30	40.00	80.00	18.00	33.50	23.30	12,500	16,700							0.370
7209C	15	45.00	85.00	19.00	41.00	28.80	17,700	27,000	187	53	560	77	1,120	97	0.406
7209AC	25	45.00	85.00	19.00	39.00	27.60	15,400	23,100	300	142	900	199	1,800	250	0.402
7209A	30	45.00	85.00	19.00	37.50	26.70	11,600	15,400							0.410
7210C	15	50.00	90.00	20.00	43.00	31.50	16,500	25,000	225	57	670	82	1,340	104	0.457
7210AC	25	50.00	90.00	20.00	41.00	30.50	14,300	21,500	365	151	1,090	212	2,180	267	0.453
7210A	30	50.00	90.00	20.00	39.50	29.30	10,800	14,300							0.462
7211C	15	55.00	100.00	21.00	53.00	40.00	14,900	22,600	290	63	870	91	1,740	116	0.601
7211AC	25	55.00	100.00	21.00	50.50	38.00	13,000	19,400	460	169	1,380	236	2,760	297	0.596
7211A	30	55.00	100.00	21.00	49.00	37.00	9,700	13,000							0.609
7212C	15	60.00	110.00	22.00	64.00	49.00	13,600	20,600	305	67	910	97	1,820	123	0.780
7212AC	25	60.00	110.00	22.00	61.00	47.00	11,800	17,700	480	179	1,440	251	2,880	316	0.773
7212A	30	60.00	110.00	22.00	59.00	45.50	8,900	11,800							0.789
7213C	15	65.00	120.00	23.00	73.00	58.50	12,500	19,000	355	74	1,060	107	2,120	136	1.010
7213AC	25	65.00	120.00	23.00	69.50	56.00	10,900	16,300	570	198	1,710	277	3,420	348	1.000
7213A	30	65.00	120.00	23.00	67.50	54.00	8,200	10,900							1.020
7214C	15	70.00	125.00	24.00	79.50	64.50	11,800	18,000	370	78	1,110	113	2,220	143	1.090

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
7214AC	25	70.00	125.00	24.00	76.00	61.50	10,300	15,400	590	209	1,770	293	3,540	368	1.080
7214A	30	70.00	125.00	24.00	73.00	59.50	7,700	10,300							1.100
7215C	15	75.00	130.00	25.00	83.00	70.00	11,300	17,100	385	82	1,150	119	2,300	151	1.190
7215AC	25	75.00	130.00	25.00	79.00	66.50	9,800	14,700	615	220	1,840	309	3,680	388	1.180
7215A	30	75.00	130.00	25.00	76.00	64.50	7,400	9,800							1.200
7216C	15	80.00	140.00	26.00	93.00	77.50	10,500	16,000	460	90	1,380	130	2,760	165	1.430
7216AC	25	80.00	140.00	26.00	88.50	74.00	9,100	13,700	750	240	2,250	338	4,500	424	1.420
7216A	30	80.00	140.00	26.00	85.50	71.50	6,900	9,100							1.450
7217C	15	85.00	150.00	28.00	107.00	90.50	9,800	14,900	515	93	1,540	134	3,080	169	1.790
7217AC	25	85.00	150.00	28.00	102.00	86.50	8,600	12,800	825	247	2,470	347	4,940	436	1.790
7217A	30	85.00	150.00	30.00	98.50	83.50	6,400	8,600							1.800
7218C	15	90.00	160.00	30.00	123.00	105.00	9,200	14,000	655	110	1,960	160	3,920	202	2.200
7218AC	25	90.00	160.00	30.00	117.00	100.00	8,000	12,000	1,050	276	3,150	394	6,300	496	2.310
7218A	30	90.00	160.00	30.00	113.00	96.50	6,000	8,000							2.230
7219C	15	95.00	170.00	32.00	133.00	112.00	8,700	13,300	655	107	1,960	154	3,920	195	2.640
7219AC	25	95.00	170.00	32.00	127.00	107.00	7,600	11,400	1,050	286	3,150	410	6,300	517	2.630
7219A	30	95.00	170.00	32.00	122.00	103.00	5,700	7,600							2.670
7220C	15	100.00	180.00	34.00	149.00	127.00	8,300	12,500	770	114	2,310	165	4,620	208	3.180
7220AC	25	100.00	180.00	34.00	142.00	121.00	7,200	10,800	1,240	305	3,720	427	7,440	537	3.160
7220A	30	100.00	180.00	34.00	137.00	117.00	5,400	7,200							3.210
7221C	15	105.00	190.00	36.00	162.00	143.00	7,800	11,900	890	121	2,670	175	5,340	221	3.780
7221AC	25	105.00	190.00	36.00	155.00	137.00	6,800	10,200	1,430	323	4,290	454	8,580	570	3.770
7221A	30	105.00	190.00	36.00	150.00	132.00	5,100	6,800							3.820
7222C	15	110.00	200.00	38.00	176.00	160.00	7,500	11,300	920	127	2,760	184	5,340	233	4.450
7222AC	25	110.00	200.00	38.00	168.00	153.00	6,500	9,700	1,480	341	4,440	478	8,880	601	4.450

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
7222A	30	110.00	200.00	38.00	162.00	148.00	4,900	6,500							4.490
7224C	15	120.00	215.00	40.00	199.00	192.00	6,900	10,500	950	133	2,850	193	5,700	245	5.420
7224AC	25	120.00	215.00	40.00	189.00	184.00	6,000	9,000	1,500	358	4,500	502	9,000	631	5.420
7224A	30	120.00	215.00	40.00	183.00	177.00	4,500	6,000							5.450
7226C	15	130.00	230.00	40.00	206.00	209.00	6,400	9,800	1,050	139	3,100	202	6,200	255	6.230
7226AC	25	130.00	230.00	40.00	196.00	199.00	5,600	8,400	1,600	373	4,800	525	9,600	659	6.220
7226A	30	130.00	230.00	40.00	189.00	193.00	4,200	5,600							6.280
7228C	15	140.00	250.00	42.00	238.00	254.00	5,900	9,000	1,200	152	3,600	221	7,200	279	7.910
7228AC	25	140.00	250.00	42.00	226.00	242.00	5,200	7,700	1,900	410	5,700	575	11,400	723	7.910
7228A	30	140.00	250.00	42.00	218.00	234.00	3,900	5,200							7.970
7230C	15	150.00	270.00	45.00	270.00	305.00	5,500	8,400	1,280	158	3,800	229	7,600	290	11.100
7230AC	25	150.00	270.00	45.00	258.00	290.00	4,800	7,200	2,050	426	6,100	599	12,200	753	11.100
7230A	30	150.00	270.00	45.00	248.00	280.00	3,600	4,800							11.200
7232C	15	160.00	290.00	48.00	248.60	365.80	4,300	6,300	1,300	165	4,000	240	8,000	303	13.100
7232AC	25	160.00	290.00	48.00	236.10	348.60	3,800	5,600	2,100	446	6,300	627	12,600	788	13.100
7234C	15	170.00	310.00	52.00	300.20	459.20	3,800	5,600	1,600	173	4,800	251	9,600	318	15.930
7234AC	25	170.00	310.00	52.00	285.00	437.60	3,600	5,300	2,500	468	7,500	658	15,000	827	15.930
7236C	15	180.00	320.00	52.00	311.20	490.80	3,800	5,600	1,660	181	4,900	264	9,800	334	16.610
7236AC	25	180.00	320.00	52.00	295.50	467.70	3,400	5,000	2,650	492	7,900	691	15,800	869	16.610
7238C	15	190.00	340.00	55.00	321.30	524.80	3,400	5,000	1,700	190	5,100	276	10,200	349	20.290
7238AC	25	190.00	340.00	55.00	305.10	500.10	3,200	4,800	2,700	515	8,100	724	16,200	910	20.290
7240C	15	200.00	360.00	58.00	330.90	558.60	3,200	4,800	1,760	198	5,300	288	10,600	365	24.490
7240AC	25	200.00	360.00	58.00	314.20	532.30	3,000	4,500	2,800	538	8,400	756	16,800	951	24.490
7244C	15	220.00	400.00	65.00	405.90	730.50	2,800	4,300	2,170	216	6,500	314	13,000	397	33.930
7244AC	25	220.00	400.00	65.00	385.40	696.20	2,600	4,000	3,400	588	10,000	826	20,000	1,038	33.930

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Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
71800C	15	10.00	19.00	5.00	1.80	1.10	75,000	120,000	10	10	30	14	60	17	0.005
71800AC	25	10.00	19.00	5.00	1.70	1.10	70,000	110,000	16	26	48	35	95	44	0.005
71801C	15	12.00	21.00	5.00	2.00	1.40	70,000	110,000	11	11	33	16	66	20	0.006
71801AC	25	12.00	21.00	5.00	1.90	1.30	63,000	95,000	17	30	50	42	100	52	0.006
71802C	15	15.00	24.00	5.00	2.20	1.80	60,000	90,000	12	13	36	19	72	24	0.007
71802AC	25	15.00	24.00	5.00	2.10	1.70	53,000	80,000	19	35	57	49	115	61	0.007
71803C	15	17.00	26.00	5.00	2.30	1.90	53,000	80,000	12	14	36	20	72	25	0.008
71803AC	25	17.00	26.00	5.00	2.10	1.80	50,000	75,000	20	37	60	52	120	65	0.008
71804C	15	20.00	32.00	7.00	3.90	3.40	45,000	67,000	20	18	60	26	120	34	0.018
71804AC	25	20.00	32.00	7.00	3.70	3.20	40,000	60,000	32	49	95	69	190	86	0.018
71805C	15	25.00	37.00	7.00	4.20	4.10	38,000	56,000	22	21	66	30	130	38	0.022
71805AC	25	25.00	37.00	7.00	3.90	3.90	34,000	50,000	35	56	105	78	210	99	0.022
71806C	15	30.00	42.00	7.00	4.40	4.80	32,000	48,000	22	24	66	34	130	43	0.025
71806AC	25	30.00	42.00	7.00	4.10	4.50	28,000	43,000	37	63	110	88	220	111	0.025
71807C	15	35.00	47.00	7.00	4.60	5.50	26,000	40,000	25	26	75	37	150	47	0.029
71807AC	25	35.00	47.00	7.00	4.30	5.20	24,000	38,000	39	69	115	96	230	121	0.029
71808C	15	40.00	52.00	7.00	4.80	6.20	24,000	38,000	26	28	78	40	155	51	0.032
71808AC	25	40.00	52.00	7.00	4.50	5.80	20,000	34,000	40	75	120	106	240	133	0.032
71809C	15	45.00	58.00	7.00	4.90	6.70	20,000	34,000	27	30	80	43	160	54	0.040
71809AC	25	45.00	58.00	7.00	4.60	6.30	18,000	30,000	40	79	120	110	240	139	0.040
71810C	15	50.00	65.00	7.00	7.40	10.00	18,000	30,000	40	36	120	51	240	65	0.052
71810AC	25	50.00	65.00	7.00	6.90	9.50	16,000	26,000	60	95	180	134	360	168	0.052
71811C	15	55.00	72.00	9.00	10.20	13.80	16,000	26,000	55	41	165	60	330	75	0.081
71811AC	25	55.00	72.00	9.00	9.60	13.10	15,000	24,000	87	111	260	155	520	195	0.081
71812C	15	60.00	78.00	10.00	13.40	18.00	15,000	24,000	70	47	210	67	420	85	0.100
71812AC	25	60.00	78.00	10.00	12.60	17.00	14,000	22,000	114	125	340	175	680	220	0.100
71813C	15	65.00	85.00	10.00	13.40	18.80	14,000	22,000	70	48	210	69	420	87	0.125
71813AC	25	65.00	85.00	10.00	12.60	17.80	13,000	20,000	115	127	345	179	690	225	0.125
71814C	15	70.00	90.00	10.00	13.80	20.30	13,000	20,000	73	50	220	73	44	92	0.133

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Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
71814AC	25	70.00	90.00	10.00	13.00	19.10	12,000	19,000	117	134	350	189	700	237	0.133
71815C	15	75.00	95.00	10.00	14.20	21.70	12,000	19,000	76	53	225	76	450	97	0.142
71815AC	25	75.00	95.00	10.00	13.30	20.50	11,000	18,000	120	141	360	199	720	250	0.142
71816C	15	80.00	100.00	10.00	14.50	23.10	11,000	18,000	78	55	230	80	460	101	0.150
71816AC	25	80.00	100.00	10.00	13.60	21.80	9,500	16,000	123	148	370	208	740	261	0.150
71817C	15	85.00	110.00	13.00	21.50	32.20	10,000	17,000	115	62	345	89	690	113	0.262
71817AC	25	85.00	110.00	13.00	20.20	30.50	9,000	15,000	183	166	550	233	1,100	292	0.262
71818C	15	90.00	115.00	13.00	21.70	33.50	9,500	16,000	116	63	350	92	700	116	0.274
71818AC	25	90.00	115.00	13.00	20.40	31.60	8,500	14,000	184	170	550	239	1,100	300	0.274
71819C	15	95.00	120.00	13.00	21.90	34.70	9,000	15,000	116	65	350	94	700	119	0.287
71819AC	25	95.00	120.00	13.00	20.60	32.80	8,500	14,000	186	174	560	244	1,120	307	0.287
71820C	15	100.00	125.00	13.00	22.50	37.00	8,500	14,000	120	69	360	99	720	125	0.301
71820AC	25	100.00	125.00	13.00	21.20	34.90	8,000	13,000	190	183	570	257	1,140	323	0.301
71821C	15	105.00	130.00	13.00	22.70	38.30	8,500	14,000	130	70	390	101	780	127	0.314
71821AC	25	105.00	130.00	13.00	21.30	36.10	8,000	13,000	200	187	600	263	1,200	330	0.314
71822C	15	110.00	140.00	16.00	31.80	51.60	8,000	13,000	160	78	480	114	960	144	0.496
71822AC	25	110.00	140.00	16.00	29.90	48.70	7,500	12,000	260	211	780	296	1,560	372	0.496
71824C	15	120.00	150.00	16.00	33.10	56.90	7,000	11,000	180	84	540	122	1,080	154	0.537
71824AC	25	120.00	150.00	16.00	31.10	53.70	6,700	10,000	280	227	850	318	1,700	400	0.537
71826C	15	130.00	165.00	18.00	38.70	67.60	6,700	10,000	210	91	620	132	1,240	167	0.782
71826AC	25	130.00	165.00	18.00	36.30	63.80	6,000	9,000	320	246	950	345	1,900	434	0.782
71828C	15	140.00	175.00	18.00	44.80	79.20	6,000	9,000	240	98	720	142	1,440	180	0.813
71828AC	25	140.00	175.00	18.00	42.00	74.70	5,600	8,500	380	265	1,140	372	2,280	467	0.813
71830C	15	150.00	190.00	20.00	51.20	92.00	5,600	8,500	270	105	810	153	1,620	193	1.140
71830AC	25	150.00	190.00	20.00	48.00	86.80	5,000	7,500	430	284	1,260	399	2,500	501	1.140
71832C	15	160.00	200.00	20.00	52.40	97.70	5,000	7,500	280	110	840	159	1,680	202	1.210
71832AC	25	160.00	200.00	20.00	49.20	92.20	4,800	7,000	450	297	1,350	417	2,700	524	1.210
71834C	15	170.00	215.00	22.00	66.50	123.40	4,800	7,000	350	122	1,000	177	2,000	224	1.610
71834AC	25	170.00	215.00	22.00	62.40	116.50	4,300	6,300	550	329	1,650	463	3,300	582	1.610

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Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
719/8C	15	8.00	19.00	6.00	2.50	1.50	75,000	120,000	10	10	30	14	60	17	0.010
719/8AC	25	8.00	19.00	6.00	2.30	1.30	67,000	100,000	16	25	48	35	95	44	0.010
71900C	15	10.00	22.00	6.00	3.00	1.52	71,900	109,400	13	12	40	17	80	21	0.010
71900AC	25	10.00	22.00	6.00	2.88	1.45	62,500	93,800	22	31	65	43	130	54	0.009
71901C	15	12.00	24.00	6.00	3.35	1.86	63,900	97,300	15	14	49	19	60	25	0.011
71901AC	25	12.00	24.00	6.00	3.20	1.77	55,600	83,400	26	37	80	51	160	64	0.011
71902C	15	15.00	28.00	7.00	4.75	2.64	53,500	81,400	24	17	70	24	140	31	0.016
71902AC	25	15.00	28.00	7.00	4.55	2.53	46,600	69,800	41	45	120	62	240	78	0.016
71903C	15	17.00	30.00	7.00	5.00	2.94	49,000	74,500	26	18	80	26	160	33	0.017
71903AC	25	17.00	30.00	7.00	4.75	2.80	42,600	63,900	43	48	130	67	260	84	0.017
71904C	15	20.00	37.00	9.00	6.95	4.25	40,400	61,500	40	23	120	33	240	42	0.036
71904AC	25	20.00	37.00	9.00	6.60	4.05	35,100	52,700	62	61	185	85	370	107	0.037
71905C	15	25.00	42.00	9.00	7.85	5.40	34,400	52,300	40	24	120	35	240	44	0.043
71905AC	25	25.00	42.00	9.00	7.45	5.15	29,900	44,800	64	64	190	90	380	113	0.043
71906C	15	30.00	47.00	9.00	8.30	6.25	29,900	45,500	42	27	125	38	250	49	0.049
71906AC	25	30.00	47.00	9.00	7.85	5.95	26,000	39,000	67	71	200	100	400	125	0.050
71907C	15	35.00	55.00	10.00	12.10	9.15	25,600	38,900	58	33	175	47	350	60	0.074
71907AC	25	35.00	55.00	10.00	11.40	8.70	22,300	33,400	93	87	280	121	560	152	0.075
71908C	15	40.00	62.00	12.00	15.10	11.70	22,600	34,400	74	37	220	53	440	68	0.109
71908AC	25	40.00	62.00	12.00	14.30	11.20	19,700	29,500	120	98	360	138	720	173	0.110
71909C	15	45.00	68.00	12.00	16.00	13.40	20,400	31,000	80	40	240	58	480	74	0.129
71909AC	25	45.00	68.00	12.00	15.10	12.70	17,700	26,600	125	107	370	150	740	189	0.130
71910C	15	50.00	72.00	12.00	16.90	15.00	18,900	28,700	100	47	300	68	600	86	0.130
71910AC	25	50.00	72.00	12.00	15.90	14.20	16,400	24,600	160	125	480	175	960	220	0.132
71911C	15	55.00	80.00	13.00	19.10	17.70	17,100	26,000	125	54	375	78	750	99	0.182
71911AC	25	55.00	80.00	13.00	18.10	16.80	14,900	22,300	200	144	600	201	1,200	253	0.184
71912C	15	60.00	85.00	13.00	19.40	18.70	15,900	24,200	130	58	390	84	780	106	0.195

➤719

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
71912AC	25	60.00	85.00	13.00	18.30	17.70	13,800	20,700	210	155	630	217	1,260	272	0.198
71913C	15	65.00	90.00	13.00	20.20	20.50	14,900	22,600	135	60	400	86	880	109	0.208
71913AC	25	65.00	90.00	13.00	19.10	19.40	13,000	19,400	210	159	630	224	1,260	281	0.211
71914C	15	70.00	100.00	16.00	28.10	27.80	13,600	20,600	185	69	550	99	1,100	126	0.338
71914AC	25	70.00	100.00	16.00	26.50	26.30	11,800	17,700	290	183	870	257	1,740	323	0.341
71915C	15	75.00	105.00	16.00	28.60	29.30	12,800	19,500	185	71	550	102	1,100	130	0.358
71915AC	25	75.00	105.00	16.00	26.90	27.70	11,200	16,700	300	189	900	266	1,800	334	0.355
71916C	15	80.00	110.00	16.00	29.00	30.50	12,200	18,500	190	73	570	106	1,140	134	0.377
71916AC	25	80.00	110.00	16.00	27.30	29.00	10,600	15,800	300	195	900	274	1,800	344	0.381
71917C	15	85.00	120.00	18.00	39.00	40.50	11,300	17,100	245	82	730	118	1,460	150	0.534
71917AC	25	85.00	120.00	18.00	36.50	38.50	9,800	14,700	390	219	1,170	307	2,340	386	0.541
71918C	15	90.00	125.00	18.00	41.50	46.00	10,700	16,300	250	84	750	122	1,500	154	0.568
71918AC	25	90.00	125.00	18.00	39.50	43.50	9,400	14,000	400	226	1,200	317	2,400	398	0.560
71919C	15	95.00	130.00	18.00	42.50	48.00	10,300	15,600	255	87	760	126	1,520	159	0.597
71919AC	25	95.00	130.00	18.00	40.00	45.50	8,900	13,400	400	233	1,200	327	2,400	410	0.603
71920C	15	100.00	140.00	20.00	50.00	54.00	9,600	14,600	320	95	960	138	1,900	175	0.800
71920AC	25	100.00	140.00	20.00	47.50	51.50	8,400	12,500	510	256	1,530	359	3,060	451	0.808
71921C	15	105.00	145.00	20.00	51.00	57.00	9,200	14,000	330	98	990	143	1,980	180	0.831
71921AC	25	105.00	145.00	20.00	48.00	54.00	8,000	12,000	520	264	1,560	371	3,120	466	0.820
71922C	15	110.00	150.00	20.00	52.00	59.50	8,900	13,500	330	101	990	147	1,980	186	0.867
71922AC	25	110.00	150.00	20.00	49.00	56.00	7,700	11,600	530	272	1,590	382	3,180	480	0.877
71924C	15	120.00	165.00	22.00	72.00	81.00	8,100	12,300	390	106	1,170	154	2,340	194	1.160
71924AC	25	120.00	165.00	22.00	67.50	77.00	7,100	10,600	620	285	1,860	399	3,720	502	1.150
71926C	15	130.00	180.00	24.00	78.50	91.00	7,500	11,300	400	112	1,200	163	2,400	206	1.580
71926AC	25	130.00	180.00	24.00	74.00	86.00	6,500	9,700	640	302	1,900	424	3,800	533	1.580
71928C	15	140.00	190.00	24.00	79.50	95.50	7,000	10,700	420	119	1,250	172	2,500	218	1.680
71928AC	25	140.00	190.00	24.00	75.00	90.00	6,100	9,100	660	320	2,000	449	4,000	564	1.680

➤719

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
71930C	15	150.00	210.00	28.00	102.00	122.00	6,400	9,800	630	129	1,900	188	3,800	237	2.480
71930AC	25	150.00	210.00	28.00	96.50	115.00	5,600	8,400	1,000	348	3,000	488	6,000	613	2.480
71932C	15	160.00	220.00	28.00	106.00	133.00	6,100	9,300	660	138	1,950	200	3,900	254	2.640
71932AC	25	160.00	220.00	28.00	100.00	125.00	5,300	7,900	1,050	372	3,100	522	6,200	656	2.640
71934C	15	170.00	230.00	28.00	113.00	148.00	5,800	8,800	670	142	2,000	207	4,000	261	2.770
71934AC	25	170.00	230.00	28.00	106.00	140.00	5,000	7,500	1,070	383	3,200	538	6,400	676	2.770
71936C	15	180.00	250.00	33.00	145.00	184.00	5,400	8,200	850	154	2,500	224	5,000	283	4.100
71936AC	25	180.00	250.00	33.00	137.00	174.00	4,700	7,000	1,350	415	4,000	583	8,000	733	4.100
71938C	15	190.00	260.00	33.00	147.00	192.00	5,200	7,800	870	159	2,600	231	5,200	292	4.290
71938AC	25	190.00	260.00	33.00	139.00	182.00	4,500	6,700	1,380	428	4,100	602	8,200	757	4.290
71940C	15	200.00	280.00	38.00	189.00	244.00	4,800	7,300	1,000	168	3,000	245	6,000	309	6.020
71940AC	25	200.00	280.00	38.00	178.00	231.00	4,200	6,300	1,690	454	5,000	637	10,000	801	6.020
71944C	15	220.00	300.00	38.00	190.00	256.00	4,500	6,800	1,100	180	3,300	261	6,600	330	6.520
71944AC	25	220.00	300.00	38.00	179.00	242.00	3,900	5,800	1,750	485	5,200	681	10,400	856	6.520
71948C	15	240.00	320.00	38.00	200.00	286.00	4,200	6,300	1,150	196	3,400	286	6,800	361	7.070
71948AC	25	240.00	320.00	38.00	189.00	270.00	3,600	5,400	1,850	531	5,500	746	11,000	938	7.070
71952C	15	260.00	360.00	46.00	256.00	365.00	3,800	5,700	1,500	213	4,500	311	9,000	393	12.000
71952AC	25	260.00	360.00	46.00	241.00	345.00	3,300	4,900	2,420	579	7,200	814	14,400	1,024	12.000
71956C	15	280.00	380.00	46.00	272.00	410.00	3,500	5,400	1,550	220	4,600	320	9,200	404	12.700
71956AC	25	280.00	380.00	46.00	256.00	390.00	3,100	4,600	2,440	597	7,300	839	14,600	1,054	12.700

H719

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B B		C C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H719/8C	15	8.00	19.00	6.00	1.70	0.70	100,000	170,000	9	7	27	11	55	18	0.010
H719/8AC	25	8.00	19.00	6.00	1.60	0.60	85,000	140,000	17	18	50	28	100	36	0.010
H71900C	15	10.00	22.00	6.00	2.10	0.90	85,000	140,000	11	8	33	12	65	19	0.010
H71900AC	25	10.00	22.00	6.00	2.00	0.90	75,000	120,000	18	21	54	32	105	41	0.010
H71901C	15	12.00	24.00	6.00	2.20	1.10	80,000	130,000	13	10	39	14	78	22	0.010
H71901AC	25	12.00	24.00	6.00	2.10	1.10	70,000	110,000	21	25	63	38	125	49	0.010
H71902C	15	15.00	28.00	7.00	3.20	1.70	70,000	110,000	19	12	57	18	115	28	0.010
H71902AC	25	15.00	28.00	7.00	3.10	1.60	60,000	90,000	31	30	93	46	185	60	0.010
H71903C	15	17.00	30.00	7.00	3.30	1.80	67,000	100,000	20	13	60	19	120	30	0.020
H71903AC	25	17.00	30.00	7.00	3.20	1.70	56,000	85,000	33	33	99	50	200	65	0.020
H71904C	15	20.00	37.00	9.00	5.00	2.90	53,000	80,000	29	16	87	24	175	38	0.040
H71904AC	25	20.00	37.00	9.00	4.80	2.70	45,000	67,000	48	41	145	63	290	82	0.040
H71905C	15	25.00	42.00	9.00	5.20	3.40	48,000	70,000	32	18	96	27	190	42	0.040
H71905AC	25	25.00	42.00	9.00	4.90	3.30	40,000	60,000	52	46	155	71	310	92	0.040
H71906C	15	30.00	47.00	9.00	5.80	3.80	43,000	63,000	36	21	105	31	210	49	0.050
H71906AC	25	30.00	47.00	9.00	5.40	3.60	36,000	53,000	57	54	170	83	340	107	0.050
H71907C	15	35.00	55.00	10.00	7.70	5.40	36,000	53,000	47	25	140	36	280	56	0.070
H71907AC	25	35.00	55.00	10.00	7.40	5.10	30,000	45,000	75	62	220	95	440	123	0.070
H71908C	15	40.00	62.00	12.00	9.80	7.00	30,000	45,000	51	28	150	40	300	64	0.120
H71908AC	25	40.00	62.00	12.00	9.30	6.60	26,000	40,000	82	70	240	108	480	140	0.120
H71909C	15	45.00	68.00	12.00	10.30	7.70	26,000	40,000	53	30	160	44	320	69	0.140
H71909AC	25	45.00	68.00	12.00	9.70	7.30	22,000	36,000	85	76	250	117	500	150	0.140
H71910C	15	50.00	72.00	12.00	13.20	10.00	22,000	36,000	69	34	205	49	410	78	0.140
H71910AC	25	50.00	72.00	12.00	12.50	9.50	19,000	32,000	110	88	330	131	660	170	0.140
H71911C	15	55.00	80.00	13.00	16.00	12.60	19,000	32,000	85	37	250	54	500	85	0.180
H71911AC	25	55.00	80.00	13.00	15.00	11.90	16,000	26,000	135	95	400	145	800	187	0.180
H71912C	15	60.00	85.00	13.00	16.60	13.80	18,000	30,000	90	40	270	58	540	92	0.200
H71912AC	25	60.00	85.00	13.00	15.70	13.10	15,000	24,000	140	102	420	156	840	202	0.200

H719

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B B		C C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H71913C	15	65.00	90.00	13.00	16.80	14.50	17,000	28,000	90	42	270	60	540	95	0.210
H71913AC	25	65.00	90.00	13.00	16.00	13.70	15,000	24,000	140	106	420	162	840	209	0.210
H71914C	15	70.00	100.00	16.00	20.90	17.80	16,000	26,000	110	46	330	67	660	105	0.350
H71914AC	25	70.00	100.00	16.00	19.70	16.90	13,000	20,000	170	117	510	179	1,020	231	0.350
H71915C	15	75.00	105.00	16.00	21.70	19.30	15,000	24,000	110	48	330	69	660	109	0.370
H71915AC	25	75.00	105.00	16.00	20.50	18.20	13,000	20,000	180	121	540	185	1,080	239	0.370
H71916C	15	80.00	110.00	16.00	22.40	20.80	14,000	22,000	115	50	345	71	690	113	0.390
H71916AC	25	80.00	110.00	16.00	21.20	19.60	12,000	19,000	185	125	550	191	1,100	248	0.390
H71917C	15	85.00	120.00	18.00	26.10	24.20	13,000	20,000	135	55	400	80	800	126	0.560
H71917AC	25	85.00	120.00	18.00	24.70	22.90	11,000	18,000	215	140	640	214	1,280	277	0.560
H71918C	15	90.00	125.00	18.00	27.00	26.00	13,000	20,000	140	57	420	83	840	130	0.590
H71918AC	25	90.00	125.00	18.00	25.50	24.60	11,000	18,000	225	145	670	222	1,340	286	0.590
H71919C	15	95.00	130.00	18.00	27.30	26.90	12,000	19,000	140	59	420	85	840	135	0.620
H71919AC	25	95.00	130.00	18.00	25.80	25.40	11,000	18,000	225	150	670	229	1,340	296	0.620
H71920C	15	100.00	140.00	20.00	40.10	37.60	11,000	18,000	210	65	630	94	1,260	148	0.820
H71920AC	25	100.00	140.00	20.00	37.90	35.50	9,000	15,000	330	164	990	251	1,980	325	0.820
H71921C	15	105.00	145.00	20.00	40.70	39.10	10,000	17,000	210	67	630	97	1,260	153	0.850
H71921AC	25	105.00	145.00	20.00	38.40	36.90	8,500	14,000	335	170	1,000	260	2,000	336	0.850
H71922C	15	110.00	150.00	20.00	41.30	40.50	9,000	15,000	215	69	640	100	1,280	158	0.890
H71922AC	25	110.00	150.00	20.00	39.00	38.50	7,500	12,000	340	175	1,020	269	2,040	347	0.890
H71924C	15	120.00	165.00	22.00	43.10	44.90	8,500	14,000	225	77	670	112	1,340	176	1.250
H71924AC	25	120.00	165.00	22.00	40.70	42.40	7,500	12,000	360	196	1,080	300	2,160	388	1.250
H71926C	15	130.00	180.00	24.00	53.10	56.60	8,000	13,000	240	82	720	118	1,440	187	1.580
H71926AC	25	130.00	180.00	24.00	50.10	53.40	7,500	12,000	380	208	1,140	319	2,280	412	1.580
H71928C	15	140.00	190.00	24.00	53.70	59.10	7,000	11,000	245	84	730	121	1,460	191	1.670
H71928AC	25	140.00	190.00	24.00	50.70	55.80	6,700	10,000	390	214	1,170	327	2,340	423	1.670
H71930C	15	150.00	210.00	28.00	65.20	72.80	6,700	10,000	300	93	900	134	1,800	211	2.640

H719

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B B		C C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H71930AC	25	150.00	210.00	28.00	61.50	68.70	6,000	9,000	480	236	1,440	361	2,880	467	2.640
H71932C	15	160.00	220.00	28.00	66.00	75.80	6,000	9,000	300	96	900	138	1,800	217	2.780
H71932AC	25	160.00	220.00	28.00	62.30	71.60	5,600	8,500	480	242	1,440	371	2,880	480	2.780
H71934C	15	170.00	230.00	28.00	66.70	78.70	5,600	8,500	310	98	930	141	1,860	222	2.920
H71934AC	25	170.00	230.00	28.00	63.00	74.30	5,000	7,500	500	249	1,500	381	3,000	492	2.920
H71936C	15	180.00	250.00	33.00	79.60	95.00	5,000	7,500	360	107	1,100	154	2,200	243	4.420
H71936AC	25	180.00	250.00	33.00	75.20	89.70	4,800	7,000	580	272	1,740	417	3,480	538	4.420
H71938C	15	190.00	260.00	33.00	80.60	98.60	4,800	7,000	370	110	1,110	158	2,220	249	4.620
H71938AC	25	190.00	260.00	33.00	76.10	93.10	4,300	6,300	590	279	1,770	427	3,540	552	4.620
H71940C	15	200.00	280.00	38.00	82.80	105.40	4,500	6,700	380	115	1,140	166	2,280	261	6.740
H71940AC	25	200.00	280.00	38.00	78.20	99.50	4,000	6,000	610	293	1,830	448	3,660	579	6.740
H71944C	15	220.00	300.00	38.00	96.90	125.40	4,300	6,300	440	125	1,320	180	2,640	283	7.120
H71944AC	25	220.00	300.00	38.00	91.50	118.40	3,800	5,600	700	318	2,100	486	4,200	629	7.120

H719.HQ1

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H719/8 C/HQ1	15	8.00	19.00	6.00	1.70	0.70	110,000	180,000	9	8	27	12	55	20	0.010
H719/8 AC/HQ1	25	8.00	19.00	6.00	1.60	0.60	95,000	160,000	17	21	50	33	100	42	0.010
H71900C/HQ1	15	10.00	22.00	6.00	2.10	0.90	95,000	160,000	11	9	33	13	65	21	0.010
H71900AC/HQ1	25	10.00	22.00	6.00	2.00	0.90	85,000	140,000	18	23	54	36	105	46	0.010
H71901C/HQ1	15	12.00	24.00	6.00	2.20	1.10	90,000	150,000	13	11	39	15	78	24	0.010
H71901AC/HQ1	25	12.00	24.00	6.00	2.10	1.10	80,000	130,000	21	28	63	42	125	55	0.010
H71902C/HQ1	15	15.00	28.00	7.00	3.20	1.70	80,000	130,000	19	13	57	19	115	31	0.010
H71902AC/HQ1	25	15.00	28.00	7.00	3.10	1.60	70,000	110,000	31	34	93	52	185	67	0.010
H71903C/HQ1	15	17.00	30.00	7.00	3.30	1.80	75,000	120,000	20	14	60	21	120	33	0.010
H71903AC/HQ1	25	17.00	30.00	7.00	3.20	1.70	63,000	95,000	33	36	99	56	200	73	0.010
H71904C/HQ1	15	20.00	37.00	9.00	5.00	2.90	63,000	95,000	29	18	87	27	175	42	0.030
H71904AC/HQ1	25	20.00	37.00	9.00	4.80	2.70	53,000	80,000	48	46	145	71	290	92	0.030
H71905QHQ1	15	25.00	42.00	9.00	5.20	3.40	53,000	80,000	32	20	96	29	190	46	0.040
H71905AC/HQ1	25	25.00	42.00	9.00	4.90	3.30	45,000	67,000	52	52	155	80	310	103	0.040
H71906C/HQ1	15	30.00	47.00	9.00	5.80	3.80	48,000	70,000	36	24	105	34	210	54	0.040
H71906AC/HQ1	25	30.00	47.00	9.00	5.40	3.60	40,000	60,000	57	60	170	93	340	120	0.040
H71907C/HQ1	15	35.00	55.00	10.00	7.70	5.40	40,000	60,000	47	27	140	40	280	62	0.070
H71907AC/HQ1	25	35.00	55.00	10.00	7.40	5.10	34,000	50,000	75	70	220	107	440	138	0.070
H71908C/HQ1	15	40.00	62.00	12.00	9.80	7.00	34,000	50,000	51	31	150	45	300	71	0.100
H71908AC/HQ1	25	40.00	62.00	12.00	9.30	6.60	28,000	43,000	82	79	240	121	480	156	0.100
H71909C/HQ1	15	45.00	68.00	12.00	10.30	7.70	28,000	43,000	53	34	160	49	320	77	0.120
H71909AC/HQ1	25	45.00	68.00	12.00	9.70	7.30	26,000	40,000	85	86	250	131	500	170	0.120
H71910C/HQ1	15	50.00	72.00	12.00	13.20	10.00	26,000	40,000	69	38	205	55	410	86	0.120
H71910AC/HQ1	25	50.00	72.00	12.00	12.50	9.50	22,000	36,000	110	96	330	147	660	190	0.120
H71911C/HQ1	15	55.00	80.00	13.00	16.00	12.60	22,000	36,000	85	42	250	60	500	94	0.150
H71911AC/HQ1	25	55.00	80.00	13.00	15.00	11.90	19,000	32,000	135	106	400	162	800	210	0.150
H71912C/HQ1	15	60.00	85.00	13.00	16.60	13.80	20,000	34,000	90	45	270	65	540	102	0.160

H719.HQ1

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H71912AC/HQ1	25	60.00	85.00	13.00	15.70	13.10	18,000	30,000	140	114	420	175	840	227	0.160
H71913C/HQ1	15	65.00	90.00	13.00	16.80	14.50	19,000	32,000	90	47	270	67	540	105	0.170
H71913ADHQ1	25	65.00	90.00	13.00	16.00	13.70	17,000	28,000	140	118	420	181	840	235	0.170
H71914C/HQ1	15	70.00	100.00	16.00	20.90	17.80	18,000	30,000	110	51	330	74	660	116	0.280
H71914AOHQ1	25	70.00	100.00	16.00	19.70	16.90	15,000	24,000	170	131	510	200	1,020	259	0.280
H71915C/HQ1	15	75.00	105.00	16.00	21.70	19.30	17,000	28,000	110	53	330	77	660	121	0.300
H71915A&HQ1	25	75.00	105.00	16.00	20.50	18.20	15,000	24,000	180	135	540	207	1,080	268	0.300
H71916C/HQ1	15	80.00	110.00	16.00	22.40	20.80	16,000	26,000	115	55	345	80	690	125	0.310
H71916AOHQ1	25	80.00	110.00	16.00	21.20	19.60	14,000	22,000	185	140	550	215	1,100	278	0.310
H71917C/HQ1	15	85.00	120.00	18.00	26.10	24.20	15,000	24,000	135	62	400	89	800	139	0.440
H71917AC/HQ1	25	85.00	120.00	18.00	24.70	22.90	13,000	20,000	215	157	640	240	1,280	310	0.440
H71918C/HQ1	15	90.00	125.00	18.00	27.00	26.00	15,000	24,000	140	64	420	92	840	144	0.460
H71918AOHQ1	25	90.00	125.00	18.00	25.50	24.60	13,000	20,000	225	162	670	248	1,340	321	0.460
H71919C/HQ1	15	95.00	130.00	18.00	27.30	26.90	□000	22,000	140	66	420	95	840	149	0.480
H71919AOHQ1	25	95.00	130.00	18.00	25.80	25.40	13,000	20,000	225	168	670	257	1,340	332	0.480
H71920C/HQ1	15	100.00	140.00	20.00	40.10	37.60	13,000	20,000	210	72	630	104	1,260	163	0.660
H71920ACMQ1	25	100.00	140.00	20.00	37.90	35.50	11,000	18,000	330	184	990	282	1,980	364	0.660
H71921C/HQ1	15	105.00	145.00	20.00	40.70	39.10	12,000	19,000	210	75	630	108	1,260	169	0.690
H71921ACMQ1	25	105.00	145.00	20.00	38.40	36.90	10,000	17,000	335	190	1,000	291	2,000	377	0.690
H71922C/HQ1	15	110.00	150.00	20.00	41.30	40.50	11,000	18,000	215	77	640	111	1,280	174	0.710
H71922AC7HQ1	25	110.00	150.00	20.00	39.00	38.30	9,500	16,000	340	197	1,020	301	2,040	389	0.710
H71924C/HQ1	15	120.00	165.00	22.00	43.10	44.90	10,000	17,000	225	86	670	124	1,340	195	0.970
H71924AOHQ1	25	120.00	165.00	22.00	40.70	42.40	9,000	15,000	360	220	1,080	336	2,160	435	0.970
H71926C/HQ1	15	130.00	180.00	24.00	53.10	56.60	9,000	15,000	240	92	720	132	1,440	207	1.380
H71926AC/HQ1	25	130.00	180.00	24.00	50.10	53.40	8,500	14,000	380	233	1,140	357	2,280	462	1.380
H71928C/HQ1	15	140.00	190.00	24.00	53.70	59.10	8,000	13,000	245	94	730	135	1,460	212	1.460
H71928AOHQ1	25	140.00	190.00	24.00	50.70	55.80	7,500	12,000	390	240	1,170	367	2,340	474	1.460

H719.HQ1

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H71930C/HQ1	15	150.00	210.00	28.00	65.20	72.80	7,500	12,000	300	104	900	149	1,800	234	2.350
H71930AOHQ1	25	150.00	210.00	28.00	61.50	68.70	7,000	11,000	480	265	1,440	405	2,880	524	2.350
H71932C/HQ1	15	160.00	220.00	28.00	66.00	75.80	7,000	11,000	300	106	900	153	1,800	240	2.480
H71932AC/HQ1	25	160.00	220.00	28.00	62.30	71.60	6,700	10,000	480	272	1,440	416	2,880	538	2.480
H71934C/HQ1	15	170.00	230.00	28.00	66.70	78.70	6,700	10,000	310	109	930	157	1,860	246	2.610
H71934AC/HQ1	25	170.00	230.00	28.00	63.00	74.30	6,000	9,000	500	279	1,500	427	3,000	552	2.610
H71936C/HQ1	15	180.00	250.00	33.00	79.60	95.00	6,000	9,000	360	119	1,100	172	2,200	269	4.010
H71936AC/HQ1	25	180.00	250.00	33.00	75.20	89.70	5,600	8,500	580	305	1,740	467	3,480	604	4.010
H71938C/HQ1	15	190.00	260.00	33.00	80.60	98.60	5,600	8,500	370	122	1,110	176	2,220	276	4.200
H71938AC/HQ1	25	190.00	260.00	33.00	76.10	93.10	5,000	7,500	590	313	1,770	479	3,540	619	4.200
H71940C/HQ1	15	200.00	280.00	38.00	82.80	105.40	5,000	7,500	380	128	1,140	185	2,280	289	6.290
H71940AC/HQ1	25	200.00	280.00	38.00	78.20	99.50	4,500	6,700	610	329	1,830	503	3,660	650	6.290
H71944C/HQ1	15	220.00	300.00	38.00	96.90	125.40	5,000	7,500	440	139	1,320	200	2,640	314	6.540
H71944AC/HQ1	25	220.00	300.00	38.00	91.50	118.40	4,300	6,300	700	356	2,100	545	4,200	705	6.540

H70

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H708C	15	8.00	22.00	7.00	2.40	1.00	90,000	150,000	15	11	35	14	75	18	0.010
H708AC	25	8.00	22.00	7.00	2.30	0.90	80,000	130,000	24	28	72	42	145	54	0.010
H7000C	15	10.00	26.00	8.00	3.40	1.50	80,000	130,000	16	13	48	20	95	25	0.020
H7000AC	25	10.00	26.00	8.00	3.30	1.40	67,000	110,000	30	35	90	51	180	64	0.020
H7001C	15	12.00	28.00	8.00	3.80	1.70	70,000	110,000	21	14	63	22	125	28	0.020
H7001AC	25	12.00	28.00	8.00	3.60	1.60	60,000	90,000	34	39	100	56	200	70	0.020
H7002C	15	15.00	32.00	9.00	4.40	2.20	67,000	100,000	24	16	72	24	145	30	0.030
H7002AC	25	15.00	32.00	9.00	4.20	2.10	56,000	85,000	40	42	120	61	240	77	0.030
H7003C	15	17.00	35.00	10.00	5.20	2.50	56,000	85,000	27	17	80	26	160	33	0.040
H7003AC	25	17.00	35.00	10.00	5.00	2.40	50,000	75,000	43	46	130	66	260	83	0.040
H7004C	15	20.00	42.00	12.00	7.40	3.90	50,000	75,000	40	22	120	34	240	43	0.070
H7004AC	25	20.00	42.00	12.00	7.00	3.80	43,000	63,000	65	60	190	87	380	109	0.070
H7005C	15	25.00	47.00	12.00	8.40	4.80	43,000	63,000	50	26	150	39	300	49	0.080
H7005AC	25	25.00	47.00	12.00	8.00	4.60	36,000	53,000	75	69	210	99	420	125	0.080
H7006C	15	30.00	55.00	13.00	9.50	6.20	38,000	56,000	65	29	190	44	380	55	0.110
H7006AC	25	30.00	55.00	13.00	9.00	5.90	34,000	50,000	90	78	270	111	540	140	0.110
H7007C	15	35.00	62.00	14.00	11.20	7.90	34,000	50,000	65	34	190	52	380	65	0.150
H7007AC	25	35.00	62.00	14.00	10.70	7.50	30,000	45,000	100	92	300	131	600	165	0.150
H7008C	15	40.00	68.00	15.00	12.50	9.10	28,000	43,000	70	37	210	57	420	71	0.190
H7008AC	25	40.00	68.00	15.00	11.10	8.60	24,000	38,000	110	101	330	144	660	181	0.190
H7009C	15	45.00	75.00	16.00	13.10	10.20	24,000	38,000	80	41	240	62	480	78	0.240
H7009AC	25	45.00	75.00	16.00	12.50	9.70	22,000	36,000	125	109	370	157	740	198	0.240
H7010C	15	50.00	80.00	16.00	15.40	12.00	20,000	34,000	85	45	250	68	500	86	0.260
H7010AC	25	50.00	80.00	16.00	14.70	11.40	18,000	30,000	135	121	400	173	800	218	0.260
H7011C	15	55.00	90.00	18.00	17.00	14.50	19,000	32,000	95	48	280	73	560	92	0.410
H7011AC	25	55.00	90.00	18.00	16.00	13.70	17,000	28,000	155	130	460	187	920	235	0.410
H7012C	15	60.00	95.00	18.00	17.00	15.30	18,000	30,000	100	52	300	78	600	99	0.440

H70

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H7012AC	25	60.00	95.00	18.00	16.20	14.40	15,000	24,000	160	140	480	200	960	252	0.440
H7013C	15	65.00	100.00	18.00	20.20	18.60	16,000	26,000	115	56	340	86	680	108	0.450
H7013AC	25	65.00	100.00	18.00	19.00	17.60	13,000	20,000	185	106	550	162	1,100	209	0.450
H7014C	15	70.00	110.00	20.00	24.10	21.40	15,000	24,000	135	61	400	93	800	117	0.640
H7014AC	25	70.00	110.00	20.00	22.60	20.10	13,000	20,000	210	117	630	179	1,260	231	0.640
H7015C	15	75.00	115.00	20.00	26.20	25.50	14,000	22,000	140	63	420	96	840	121	0.680
H7015AC	25	75.00	115.00	20.00	24.70	24.20	12,000	19,000	225	121	670	185	1,340	239	0.680
H7016C	15	80.00	125.00	22.00	34.20	32.70	13,000	20,000	185	71	550	108	1,100	135	0.900
H7016AC	25	80.00	125.00	22.00	32.30	31.00	11,000	18,000	290	125	870	191	1,740	248	0.900
H7017C	15	85.00	130.00	22.00	35.00	35.20	12,000	19,000	190	73	570	111	1,140	140	0.950
H7017AC	25	85.00	130.00	22.00	33.00	33.40	10,000	17,000	300	140	900	214	1,800	277	0.950
H7018C	15	90.00	140.00	24.00	36.40	38.10	11,000	18,000	195	78	580	118	1,160	148	1.260
H7018AC	25	90.00	140.00	24.00	34.30	36.10	9,500	16,000	310	145	930	222	1,860	286	1.260
H7019C	15	95.00	145.00	24.00	44.40	45.20	10,000	17,000	240	83	720	126	1,440	158	1.270
H7019AC	25	95.00	145.00	24.00	41.90	42.90	8,500	14,000	390	150	1,170	229	2,340	296	1.270
H7020C	15	100.00	150.00	24.00	45.40	48.10	10,000	17,000	245	85	730	130	1,460	163	1.330
H7020AC	25	100.00	150.00	24.00	42.70	44.70	8,500	14,000	400	164	1,200	251	2,400	325	1.330
H7021C	15	105.00	160.00	26.00	46.10	49.20	9,500	16,000	250	88	750	133	1,500	168	1.720
H7021AC	25	105.00	160.00	26.00	43.30	46.60	8,000	13,000	400	170	1,200	260	2,400	336	1.720
H7022C	15	110.00	170.00	28.00	47.90	53.90	9,500	16,000	255	93	760	141	1,520	177	2.200
H7022AC	25	110.00	170.00	28.00	45.10	51.10	8,000	13,000	410	175	1,230	269	2,460	347	2.200
H7024C	15	120.00	180.00	28.00	58.30	64.90	8,500	14,000	315	101	940	153	1,880	193	2.300
H7024AC	25	120.00	180.00	28.00	54.80	61.50	7,500	12,000	500	196	1,500	300	3,000	388	2.300
H7026C	15	130.00	200.00	33.00	58.60	66.80	8,000	13,000	320	103	960	157	1,900	197	3.590
H7026AC	25	130.00	200.00	33.00	55.10	63.20	7,000	11,000	500	208	1,500	319	3,000	412	3.590
H7028C	15	140.00	210.00	33.00	60.70	72.50	7,500	12,000	330	109	990	165	2,000	208	3.810
H7028AC	25	140.00	210.00	33.00	57.10	68.70	6,700	10,000	520	214	1,560	327	3,120	423	3.810

H70

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H7030C	15	150.00	225.00	35.00	74.90	88.80	6,700	10,000	400	120	1,200	183	2,400	230	4.610
H7030AC	25	150.00	225.00	35.00	70.50	83.80	6,300	9,500	630	236	1,890	361	3,780	467	4.610
H7032C	15	160.00	240.00	38.00	76.20	94.50	6,000	9,000	410	126	1,230	192	2,460	241	5.780
H7032AC	25	160.00	240.00	38.00	71.60	89.50	5,600	8,500	650	344	1,950	492	3,900	620	5.780
H7034C	15	170.00	260.00	42.00	78.10	100.60	5,600	8,500	420	132	1,260	200	2,520	252	7.940
H7034AC	25	170.00	260.00	42.00	73.40	95.20	5,000	7,500	660	360	1,980	515	3,960	648	7.940
H7036C	15	180.00	280.00	46.00	79.80	106.70	5,300	8,000	430	137	1,290	209	2,580	262	10.570
H7036AC	25	180.00	280.00	46.00	75.00	101.00	4,800	7,000	680	375	2,040	537	4,080	676	10.570
H7038C	15	190.00	290.00	46.00	95.30	124.60	4,800	7,000	510	147	1,530	224	3,060	281	10.840
H7038AC	25	190.00	290.00	46.00	89.70	117.90	4,300	6,300	800	402	2,400	576	4,800	725	10.840
H7040C	15	200.00	310.00	51.00	96.50	132.00	4,500	6,700	520	153	1,560	233	3,120	293	14.320
H7040AC	25	200.00	310.00	51.00	90.80	124.90	4,000	6,000	820	420	2,460	601	4,920	756	14.320
H7044C	15	220.00	340.00	56.00	113.90	156.50	4,000	6,000	600	166	1,800	252	3,600	317	18.820
H7044AC	25	220.00	340.00	56.00	107.20	148.10	3,800	5,600	940	455	2,820	651	5,640	819	18.820

H70.HQ1

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H7000C/HQ1	15	10.00	26.00	8.00	3.40	1.50	90,000	150,000	16	14	48	22	95	28	0.020
H7000AC/HQ1	25	10.00	26.00	8.00	3.30	1.40	80,000	130,000	30	39	90	57	180	71	0.020
H7001C/HQ1	15	12.00	28.00	8.00	3.80	1.70	80,000	130,000	21	16	63	24	125	31	0.020
H7001AC/HQ1	25	12.00	28.00	8.00	3.60	1.60	70,000	110,000	34	44	100	62	200	79	0.020
H7002C/HQ1	15	15.00	32.00	9.00	4.40	2.20	75,000	120,000	24	17	72	27	145	34	0.030
H7002AC/HQ1	25	15.00	32.00	9.00	4.20	2.10	67,000	100,000	40	48	120	68	240	86	0.030
H7003C/HQ1	15	17.00	35.00	10.00	5.20	2.50	63,000	95,000	27	19	80	29	160	36	0.040
H7003AC/HQ1	25	17.00	35.00	10.00	5.00	2.40	60,000	90,000	43	52	130	74	260	94	0.040
H7004C/HQ1	15	20.00	42.00	12.00	7.40	3.90	60,000	90,000	40	25	120	38	240	48	0.060
H7004AC/HQ1	25	20.00	42.00	12.00	7.00	3.80	48,000	70,000	65	68	190	97	380	122	0.060
H7005C/HQ1	15	25.00	47.00	12.00	8.40	4.80	48,000	70,000	50	29	150	44	300	55	0.070
H7005AC/HQ1	25	25.00	47.00	12.00	8.00	4.60	43,000	63,000	75	78	210	111	420	140	0.070
H7006C/HQ1	15	30.00	55.00	13.00	9.50	6.20	45,000	67,000	65	32	190	49	380	62	0.110
H7006AQHQ1	25	30.00	55.00	13.00	9.00	5.90	38,000	56,000	90	87	270	125	540	157	0.110
H7007C/HQ1	15	35.00	62.00	14.00	11.20	7.90	38,000	56,000	65	38	190	58	380	73	0.140
H7007AC/HQ1	25	35.00	62.00	14.00	10.70	7.50	34,000	50,000	100	103	300	147	600	185	0.140
W008C/HQ1	15	40.00	68.00	15.00	12.50	9.10	34,000	50,000	70	41	210	63	420	79	0.180
H7008AC/HQ1	25	40.00	68.00	15.00	11.10	8.60	28,000	43,000	110	113	330	161	660	203	0.180
H7009C/HQ1	15	45.00	75.00	16.00	13.10	10.20	28,000	43,000	80	45	240	69	480	86	0.240
H7009AC/HQ1	25	45.00	75.00	16.00	12.50	9.70	26,000	40,000	125	123	370	176	740	221	0.240
H7010C/HQ1	15	50.00	80.00	16.00	15.40	12.00	24,000	38,000	85	50	250	76	500	95	0.240
H7010AC/HQ1	25	50.00	80.00	16.00	14.70	11.40	20,000	34,000	135	135	400	194	800	244	0.240
H7011C/HQ1	15	55.00	90.00	18.00	17.00	14.50	22,000	36,000	95	54	280	82	560	103	0.380
H7011AC7HQ1	25	55.00	90.00	18.00	16.00	13.70	19,000	32,000	155	146	460	209	920	263	0.380
H7012C/HQ1	15	60.00	95.00	18.00	17.00	15.30	20,000	34,000	100	57	300	87	600	110	0.410
H7012AC/HQ1	25	60.00	95.00	18.00	16.20	14.40	18,000	30,000	160	157	480	225	960	283	0.410
H7013C/HQ1	15	65.00	100.00	18.00	20.20	18.60	19,000	32,000	115	63	340	95	680	120	0.420
H7013AC/HQ1	25	65.00	100.00	18.00	19.00	17.60	15,000	24,000	185	171	550	245	1,100	309	0.420

H70.HQ1

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H7014C/HQ1	15	70.00	110.00	20.00	24.10	21.40	18,000	30,000	135	68	400	104	800	131	0.590
H7014AC/HQ1	25	70.00	110.00	20.00	22.60	20.10	15,000	24,000	210	186	630	266	1,260	335	0.590
H7015C/HQ1	15	75.00	115.00	20.00	26.20	25.50	16,000	26,000	140	70	420	107	840	135	0.630
H7015AC/HQ1	25	75.00	115.00	20.00	24.70	24.20	14,000	22,000	225	192	670	275	1,340	346	0.630
H7016C/HQ1	15	80.00	125.00	22.00	34.20	32.70	15,000	24,000	185	79	550	120	1,100	151	0.820
H7016AC/HQ1	25	80.00	125.00	22.00	32.30	31.00	13,000	20,000	290	215	870	308	1,740	388	0.820
H7017C/HQ1	15	85.00	130.00	22.00	35.00	35.20	14,000	22,000	190	81	570	124	1,140	155	0.860
H7017AC/HQ1	25	85.00	130.00	22.00	33.00	33.40	12,000	19,000	300	222	900	318	1,800	400	0.860
H7018C/HQ1	15	90.00	140.00	24.00	36.40	38.10	13,000	20,000	195	86	580	131	1,160	165	1.170
H7018AC/HQ1	25	90.00	140.00	24.00	34.30	36.10	11,000	18,000	310	236	930	338	1,860	426	1.170
H7019C/HQ1	15	95.00	145.00	24.00	44.40	45.20	12,000	19,000	240	92	720	140	1,440	176	1.180
H7019AC/HQ1	25	95.00	145.00	24.00	41.90	42.90	10,000	17,000	390	252	1,170	360	2,340	454	1.180
H7020C/HQ1	15	100.00	150.00	24.00	45.40	48.10	12,000	19,000	245	95	730	144	1,460	182	1.200
H7020AC/HQ1	25	100.00	150.00	24.00	42.70	44.70	10,000	17,000	400	260	1,200	372	2,400	468	1.200
H7021C/HQ1	15	105.00	160.00	26.00	46.10	49.20	11,000	18,000	250	98	750	148	1,500	187	1.580
H7021AC/HQ1	25	105.00	160.00	26.00	43.30	46.60	9,000	15,000	400	267	1,200	383	2,400	482	1.580
H7022C/HQ1	15	110.00	170.00	28.00	47.90	53.90	11,000	18,000	255	103	760	157	1,520	198	2.050
H7022AC/HQ1	25	110.00	170.00	28.00	45.10	51.10	9,000	15,000	410	283	1,230	405	2,460	510	2.050
H7024C/HQ1	15	120.00	180.00	28.00	58.30	64.90	10,000	17,000	315	112	940	171	1,880	215	2.070
H7024AC/HQ1	25	120.00	180.00	28.00	54.80	61.50	9,000	15,000	500	308	1,500	440	3,000	554	2.070
H7026C/HQ1	15	130.00	200.00	33.00	58.60	66.80	9,000	15,000	320	115	960	175	1,900	220	3.370
H7026AC/HQ1	25	130.00	200.00	33.00	55.10	63.20	8,000	13,000	500	315	1,500	451	3,000	567	3.370
H7028C/HQ1	15	140.00	210.00	33.00	60.70	72.50	8,500	14,000	330	121	990	184	2,000	231	3.570
H7028AC/HQ1	25	140.00	210.00	33.00	57.10	68.70	7,500	12,000	520	332	1,560	475	3,120	598	3.570
H703OC/HQ1	15	150.00	225.00	35.00	74.90	88.50	7,500	12,000	400	134	1,200	203	2,400	256	4.300
H7030AC/HQ1	25	150.00	225.00	35.00	70.50	83.80	7,000	11,000	630	367	1,890	526	3,780	662	4.300
H7032C/HQ1	15	160.00	240.00	38.00	76.20	94.50	6,700	10,000	410	141	1,230	213	2,460	268	5.450
H7032AC/HQ1	25	160.00	240.00	38.00	71.60	89.50	6,300	9,500	650	386	1,950	552	3,900	695	5.450

H70.HQ1

Designation	Contact Angle	Dimensions			Performance				Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	Oil-air	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
H7034C/HQ1	15	170.00	260.00	42.00	78.10	100.60	6,300	9,500	420	147	1,260	223	2,520	280	7.590
H7034AC/HQ1	25	170.00	260.00	42.00	73.40	95.20	5,600	8,500	660	404	1,980	578	3,960	727	7.590
H7036C/HQ1	15	180.00	280.00	46.00	79.80	106.70	6,000	9,000	430	153	1,290	233	2,580	292	10.200
H7036AC/HQ1	25	180.00	280.00	46.00	75.00	101.00	5,300	8,000	680	421	2,040	603	4,080	758	10.200
H7038C/HQ1	15	190.00	290.00	46.00	95.30	124.60	5,300	8,000	510	164	1,530	249	3,060	313	10.360
H7038AC/HQ1	25	190.00	290.00	46.00	89.70	117.90	4,800	7,000	800	451	2,400	646	4,800	813	10.360
H7040C/HQ1	15	200.00	310.00	51.00	96.50	132.00	5,000	7,500	520	171	1,560	260	3,120	326	13.810
H7040AC/HQ1	25	200.00	310.00	51.00	90.80	124.90	4,500	6,700	820	471	2,460	674	4,920	848	13.810
H7044C/HQ1	15	220.00	340.00	56.00	113.90	156.50	4,500	6,700	600	185	1,800	281	3,600	354	18.160
H7044AC/HQ1	25	220.00	340.00	56.00	107.20	148.10	4,000	6,000	940	510	2,820	730	5,640	919	18.160

B719–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B71900C-2RZ	15	10.00	22.00	6.00	1.90	1.00	90,000	7	9	21	14	42	19	0.010
B71900AC-2RZ	25	10.00	22.00	6.00	1.80	1.00	75,000	11	22	33	33	66	43	0.010
B71901C-2RZ	15	12.00	24.00	6.00	2.00	1.10	80,000	7	9	21	15	42	20	0.010
B71901AC-2RZ	25	12.00	24.00	6.00	1.90	1.10	67,000	11	23	33	35	66	45	0.010
B71902C-2RZ	15	15.00	28.00	7.00	2.20	1.40	67,000	9	10	27	16	54	22	0.020
B71902AC-2RZ	25	15.00	28.00	7.00	2.10	1.30	56,000	15	26	45	39	90	50	0.020
B71903C-2RZ	15	17.00	30.00	7.00	2.30	1.50	60,000	10	11	30	18	60	24	0.020
B71903AC-2RZ	25	17.00	30.00	7.00	2.20	1.40	50,000	16	27	48	40	96	52	0.020
B71904C-2RZ	15	20.00	37.00	9.00	3.90	2.70	50,000	13	15	39	24	78	33	0.040
B71904AC-2RZ	25	20.00	37.00	9.00	3.70	2.50	43,000	21	38	63	57	125	74	0.040
B71905C-2RZ	15	25.00	42.00	9.00	4.20	3.20	43,000	14	18	42	28	84	38	0.050
B71905AC-2RZ	25	25.00	42.00	9.00	3.90	3.00	36,000	23	43	69	65	140	84	0.050
B71906C-2RZ	15	30.00	47.00	9.00	6.30	4.90	36,000	21	22	63	34	125	47	0.050
B71906AC-2RZ	25	30.00	47.00	9.00	6.00	4.60	32,000	35	54	105	80	210	104	0.050
B71907C-2RZ	15	35.00	55.00	10.00	6.90	6.00	32,000	24	25	72	40	145	54	0.080
B71907AC-2RZ	25	35.00	55.00	10.00	6.50	5.60	26,000	38	62	115	93	230	120	0.080
B71908C-2RZ	15	40.00	62.00	12.00	7.20	6.80	28,000	25	28	75	43	150	59	0.130
B71908AC-2RZ	25	40.00	62.00	12.00	6.80	6.40	24,000	40	68	120	101	240	132	0.130
B71909C-2RZ	15	45.00	68.00	12.00	10.00	9.30	24,000	34	32	102	50	205	68	0.150
B71909AC-2RZ	25	45.00	68.00	12.00	9.40	8.80	22,000	55	78	165	117	330	152	0.150
B71910C-2RZ	15	50.00	72.00	12.00	10.30	10.10	22,000	35	34	105	53	210	72	0.150
B71910AC-2RZ	25	50.00	72.00	12.00	9.70	9.50	20,000	58	83	175	124	350	161	0.150
B71911C-2RZ	15	55.00	80.00	13.00	13.20	12.90	20,000	46	38	138	59	275	80	0.200
B71911AC-2RZ	25	55.00	80.00	13.00	12.40	12.20	18,000	75	93	225	139	450	180	0.200
B71912C-2RZ	15	60.00	85.00	13.00	13.60	13.90	19,000	48	40	145	62	290	85	0.220
B71912AC-2RZ	25	60.00	85.00	13.00	12.80	13.20	17,000	78	98	235	147	470	190	0.220
B71913C-2RZ	15	65.00	90.00	13.00	14.00	15.00	18,000	49	42	147	65	295	89	0.230
B71913AC-2RZ	25	65.00	90.00	13.00	13.20	14.10	15,000	80	103	240	155	480	200	0.230

B719–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B71914C-2RZ	15	70.00	100.00	16.00	18.30	19.90	16,000	64	48	192	75	385	102	0.380
B71914AC-2RZ	25	70.00	100.00	16.00	17.30	18.60	14,000	103	118	310	177	620	229	0.380
B71915C-2RZ	15	75.00	105.00	16.00	18.80	21.20	16,000	65	50	195	79	395	107	0.410
B71915AC-2RZ	25	75.00	105.00	16.00	17.60	20.00	13,000	105	124	315	186	630	241	0.410
B71916C-2RZ	15	80.00	110.00	16.00	21.00	23.90	15,000	73	54	220	84	440	114	0.420
B71916AC-2RZ	25	80.00	110.00	16.00	19.60	22.40	13,000	120	132	360	197	720	255	0.420
B71917C-2RZ	15	85.00	120.00	18.00	21.90	26.00	14,000	76	57	228	89	455	121	0.620
B71917AC-2RZ	25	85.00	120.00	18.00	20.40	24.50	12,000	125	141	375	211	750	274	0.620
B71918C-2RZ	15	90.00	125.00	18.00	23.60	28.50	13,000	83	59	250	92	500	125	0.640
B71918AC-2RZ	25	90.00	125.00	18.00	22.40	26.50	11,000	130	145	390	217	780	282	0.640
B71919C-2RZ	15	95.00	130.00	18.00	24.50	30.00	12,000	85	62	255	96	510	131	0.670
B71919AC-2RZ	25	95.00	130.00	18.00	22.80	28.00	10,000	140	152	420	228	840	295	0.670
B71920C-2RZ	15	100.00	140.00	20.00	29.00	36.00	11,000	102	67	305	104	610	141	0.920
B71920AC-2RZ	25	100.00	140.00	20.00	27.50	33.50	9,500	165	164	490	246	980	319	0.920
B71921C-2RZ	15	105.00	145.00	20.00	30.00	38.00	11,000	104	70	310	108	620	147	0.960
B71921AC-2RZ	25	105.00	145.00	20.00	28.00	35.50	9,000	170	172	510	257	1,020	332	0.960
B71922C-2RZ	15	110.00	150.00	20.00	34.50	43.80	10,000	120	73	360	113	720	154	0.980
B71922AC-2RZ	25	110.00	150.00	20.00	32.50	40.50	9,000	195	180	580	269	1,160	349	0.980
B71924C-2RZ	15	120.00	165.00	22.00	36.50	48.00	9,000	127	79	380	123	760	168	1.370
B71924AC-2RZ	25	120.00	165.00	22.00	34.00	45.00	8,000	205	195	610	292	1,220	379	1.370
B71926C-2RZ	15	130.00	180.00	24.00	41.10	55.90	8,500	145	84	430	131	860	178	1.770
B71926AC-2RZ	25	130.00	180.00	24.00	38.60	52.00	7,000	240	207	720	310	1,440	402	1.770
B71928C-2RZ	15	140.00	190.00	24.00	41.90	60.00	7,000	150	87	450	136	900	184	1.880
B71928AC-2RZ	25	140.00	190.00	24.00	39.40	55.60	6,700	245	216	730	323	1,460	418	1.880
B71930C-2RZ	15	150.00	210.00	28.00	47.50	71.10	6,700	215	96	640	149	1,280	203	2.940
B71930AC-2RZ	25	150.00	210.00	28.00	44.70	67.00	6,000	350	237	1,050	354	2,100	459	2.940
B71932C-2RZ	15	160.00	220.00	28.00	50.10	74.80	6,000	220	99	650	154	1,300	210	3.110
B71932AC-2RZ	25	160.00	220.00	28.00	47.10	70.50	5,600	360	246	1,080	367	2,160	476	3.110

B719–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B71934C-2RZ	15	170.00	230.00	28.00	57.70	86.80	5,600	250	106	750	166	1,500	225	3.220
B71934AC-2RZ	25	170.00	230.00	28.00	54.30	81.80	5,000	410	264	1,230	394	2,460	511	3.220
B71936C-2RZ	15	180.00	250.00	33.00	59.20	93.10	5,000	260	112	780	174	1,560	237	4.930
B71936AC-2RZ	25	180.00	250.00	33.00	55.70	87.70	4,800	425	277	1,270	415	2,540	537	4.930
B71938C-2RZ	15	190.00	260.00	33.00	75.00	116.10	4,800	320	123	960	191	1,920	260	5.030
B71938AC-2RZ	25	190.00	260.00	33.00	70.60	109.40	4,300	520	305	1,560	456	3,120	591	5.030
B71940C-2RZ	15	200.00	280.00	38.00	75.00	120.70	4,500	330	127	990	198	1,980	268	7.260
B71940AC-2RZ	25	200.00	280.00	38.00	70.50	113.70	4,000	540	315	1,620	471	3,260	610	7.260
B71944C-2RZ	15	220.00	300.00	38.00	84.60	139.60	4,300	370	136	1,110	212	2,220	288	7.770
B71944AC-2RZ	25	220.00	300.00	38.00	79.60	131.50	3,800	600	339	1,800	507	3,600	656	7.770

B719.HQ1–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B71900C-2RZ/HQ1	15	10.00	22.00	6.00	1.90	1.00	100,000	7	10	21	16	42	21	0.010
B71900AC-2RZ/HQ1	25	10.00	22.00	6.00	1.80	1.00	85,000	11	25	33	37	66	48	0.010
B71901C-2RZ/HQ1	15	12.00	24.00	6.00	2.00	1.10	90,000	7	10	21	16	42	22	0.010
B71901AC-2RZ/HQ1	25	12.00	24.00	6.00	1.90	1.10	75,000	11	26	33	39	66	50	0.010
B71902C-2RZ/HQ1	15	15.00	28.00	7.00	2.20	1.40	75,000	9	11	27	18	54	25	0.020
B71902AC-2RZ/HQ1	25	15.00	28.00	7.00	2.10	1.30	63,000	15	29	45	43	90	56	0.020
B71903C-2RZ/HQ1	15	17.00	30.00	7.00	2.30	1.50	70,000	10	12	30	20	60	27	0.020
B71903AC-2RZ/HQ1	25	17.00	30.00	7.00	2.20	1.40	60,000	16	30	48	45	96	59	0.020
B71904C-2RZ/HQ1	15	20.00	37.00	9.00	3.90	2.70	56,000	13	17	39	27	78	37	0.040
B71904AC-2RZ/HQ1	25	20.00	37.00	9.00	3.70	2.50	48,000	21	43	63	64	125	83	0.040
B71905C-2RZ/HQ1	15	25.00	42.00	9.00	4.20	3.20	48,000	14	20	42	31	84	42	0.050
B71905AC-2RZ/HQ1	25	25.00	42.00	9.00	3.90	3.00	40,000	23	48	69	72	140	94	0.050
B71906C-2RZ/HQ1	15	30.00	47.00	9.00	6.30	4.90	43,000	21	24	63	38	125	52	0.050
B71906AC-2RZ/HQ1	25	30.00	47.00	9.00	6.00	4.60	36,000	35	60	105	90	210	117	0.050
B71907C-2RZ/HQ1	15	35.00	55.00	10.00	6.90	6.00	36,000	24	28	72	44	145	60	0.080
B71907AC-2RZ/HQ1	25	35.00	55.00	10.00	6.50	5.60	30,000	38	69	115	104	230	135	0.080
B71908C-2RZ/HQ1	15	40.00	62.00	12.00	7.20	6.80	32,000	25	31	75	48	150	66	0.120
B71908AC-2RZ/HQ1	25	40.00	62.00	12.00	6.80	6.40	28,000	40	76	120	114	240	147	0.120
B71909C-2RZ/HQ1	15	45.00	68.00	12.00	10.00	9.30	28,000	34	36	102	56	205	76	0.140
B71909AC-2RZ/HQ1	25	45.00	68.00	12.00	9.40	8.80	24,000	55	88	165	132	330	171	0.140
B71910C-2RZ/HQ1	15	50.00	72.00	12.00	10.30	10.10	26,000	35	38	105	59	210	80	0.140
B71910AC-2RZ/HQ1	25	50.00	72.00	12.00	9.70	9.50	22,000	58	93	175	139	350	181	0.140
B71911C-2RZ/HQ1	15	55.00	80.00	13.00	13.20	12.90	24,000	46	42	138	66	275	89	0.190
B71911AC-2RZ/HQ1	25	55.00	80.00	13.00	12.40	12.20	20,000	75	104	225	155	450	201	0.190
B71912C-2RZ/HQ1	15	60.00	85.00	13.00	13.60	13.90	22,000	48	44	145	69	290	94	0.200
B71912AC-2RZ/HQ1	25	60.00	85.00	13.00	12.80	13.20	19,000	78	110	235	164	470	213	0.200
B71913C-2RZ/HQ1	15	65.00	90.00	13.00	14.00	15.00	20,000	49	47	147	73	295	99	0.210
B71913AC-2RZ/HQ1	25	65.00	90.00	13.00	13.20	14.10	18,000	80	116	240	173	480	225	0.210

B719.HQ1–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B71914C-2RZ/HQ1	15	70.00	100.00	16.00	18.30	19.90	19,000	64	54	192	84	385	114	0.360
B71914AC-2RZ/HQ1	25	70.00	100.00	16.00	17.30	18.60	16,000	103	133	310	199	620	257	0.360
B71915C-2RZ/HQ1	15	75.00	105.00	16.00	18.80	21.20	18,000	65	56	195	88	395	119	0.390
B71915AC-2RZ/HQ1	25	75.00	105.00	16.00	17.60	20.00	15,000	105	140	315	209	630	271	0.390
B71916C-2RZ/HQ1	15	80.00	110.00	16.00	21.00	23.90	17,000	73	60	220	93	440	126	0.400
B71916AC-2RZ/HQ1	25	80.00	110.00	16.00	19.60	22.40	15,000	120	148	360	221	720	286	0.400
B71917C-2RZ/HQ1	15	85.00	120.00	18.00	21.90	26.00	16,000	76	64	228	99	455	135	0.580
B71917AC-2RZ/HQ1	25	85.00	120.00	18.00	20.40	24.50	13,000	125	158	375	237	750	307	0.580
B71918C-2RZ/HQ1	15	90.00	125.00	18.00	23.60	28.50	15,000	83	66	250	103	500	139	0.600
B71918AC-2RZ/HQ1	25	90.00	125.00	18.00	22.40	26.50	13,000	130	163	390	244	780	316	0.600
B71919C-2RZ/HQ1	15	95.00	130.00	18.00	24.50	30.00	14,000	85	69	255	107	510	146	0.620
B71919AC-2RZ/HQ1	25	95.00	130.00	18.00	22.80	28.00	12,000	140	171	420	255	840	331	0.620
B71920C-2RZ/HQ1	15	100.00	140.00	20.00	29.00	36.00	13,000	102	74	305	116	610	157	0.860
B71920AC-2RZ/HQ1	25	100.00	140.00	20.00	27.50	33.50	11,000	165	184	490	276	980	357	0.860
B71921C-2RZ/HQ1	15	105.00	145.00	20.00	30.00	38.00	12,000	104	77	310	121	620	164	0.890
B71921AC-2RZ/HQ1	25	105.00	145.00	20.00	28.00	35.50	11,000	170	192	510	288	1,020	373	0.890
B71922C-2RZ/HQ1	15	110.00	150.00	20.00	34.50	43.80	12,000	120	81	360	126	720	172	0.900
B71922AC-2RZ/HQ1	25	110.00	150.00	20.00	32.50	41.40	10,000	195	202	580	302	1,160	391	0.900
B71924C-2RZ/HQ1	15	120.00	165.00	22.00	36.50	48.00	11,000	127	88	380	137	760	187	1.280
B71924AC-2RZ/HQ1	25	120.00	165.00	22.00	34.00	45.00	9,000	205	219	610	328	1,220	425	1.280
B71926C-2RZ/HQ1	15	130.00	180.00	24.00	41.10	55.90	9,000	145	94	430	146	860	198	1.680
B71926AC-2RZ/HQ1	25	130.00	180.00	24.00	38.60	52.00	8,000	240	233	720	348	1,440	451	1.680
B71928C-2RZ/HQ1	15	140.00	190.00	24.00	41.90	60.00	8,000	150	97	450	151	900	205	1.790
B71928AC-2RZ/HQ1	25	140.00	190.00	24.00	39.40	55.60	7,500	245	242	730	362	1,460	469	1.790
B71930C-2RZ/HQ1	15	150.00	210.00	28.00	47.50	71.10	7,500	215	107	640	166	1,280	226	2.830
B71930AC-2RZ/HQ1	25	150.00	210.00	28.00	44.70	67.00	6,700	350	266	1,050	398	2,100	515	2.830
B71932C-2RZ/HQ1	15	160.00	220.00	28.00	50.10	74.80	6,700	220	110	650	172	1,300	234	2.980
B71932AC-2RZ/HQ1	25	160.00	220.00	28.00	47.10	70.50	6,300	360	275	1,080	412	2,160	534	2.980

B719.HQ1–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B71934C-2RZ/HQ1	15	170.00	230.00	28.00	57.70	86.80	6,300	250	119	750	185	1,500	251	3.070
B71934AC-2RZ/HQ1	25	170.00	230.00	28.00	54.30	81.80	5,600	410	296	1,230	442	2,460	573	3.070
B71936C-2RZ/HQ1	15	180.00	250.00	33.00	59.20	93.10	5,600	260	125	780	194	1,560	264	4.770
B71936AC-2RZ/HQ1	25	180.00	250.00	33.00	55.70	87.70	5,300	425	311	1,270	465	2,540	602	4.770
B71938C-2RZ/HQ1	15	190.00	260.00	33.00	75.00	116.10	5,300	320	137	960	213	1,920	290	4.800
B71938AC-2RZ/HQ1	25	190.00	260.00	33.00	70.60	109.40	4,800	520	342	1,560	512	3,120	663	4.800
B71940C-2RZ/HQ1	15	200.00	280.00	38.00	75.00	120.70	5,000	330	141	990	220	1,980	299	7.020
B71940AC-2RZ/HQ1	25	200.00	280.00	38.00	70.50	113.70	4,500	540	353	1,620	528	3,260	684	7.020
B71944C-2RZ/HQ1	15	220.00	300.00	38.00	84.60	139.60	4,800	370	152	1,110	237	2,220	322	7.470
B71944AC-2RZ/HQ1	25	220.00	300.00	38.00	79.60	131.50	4,300	600	380	1,800	568	3,600	736	7.470

➤B70–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B7000C-2RZ	15	10.00	26.00	8.00	2.20	1.20	80,000	9	9	27	14	54	19	0.020
B7000AC-2RZ	25	10.00	26.00	8.00	2.10	1.20	67,000	15	23	45	34	90	45	0.020
B7001C-2RZ	15	12.00	28.00	8.00	2.20	1.30	70,000	9	9	27	14	54	19	0.020
B7001AC-2RZ	25	12.00	28.00	8.00	2.00	1.20	60,000	15	23	45	34	90	45	0.020
B7002C-2RZ	15	15.00	32.00	9.00	3.60	2.30	60,000	13	12	39	20	78	27	0.030
B7002AC-2RZ	25	15.00	32.00	9.00	3.50	2.20	50,000	20	33	60	48	120	63	0.030
B7003C-2RZ	15	17.00	35.00	10.00	3.80	2.50	53,000	13	13	39	21	78	28	0.040
B7003AC-2RZ	25	17.00	35.00	10.00	3.60	2.30	45,000	21	34	63	51	125	66	0.040
B7004C-2RZ	15	20.00	42.00	12.00	6.10	4.30	45,000	21	18	63	28	125	39	0.080
B7004AC-2RZ	25	20.00	42.00	12.00	5.80	4.10	38,000	34	47	102	69	200	90	0.080
B7005C-2RZ	15	25.00	47.00	12.00	6.20	4.60	38,000	21	19	63	30	125	40	0.090
B7005AC-2RZ	25	25.00	47.00	12.00	5.80	4.40	34,000	35	48	105	72	210	93	0.090
B7006C-2RZ	15	30.00	55.00	13.00	8.60	6.60	32,000	29	22	87	35	175	48	0.130
B7006AC-2RZ	25	30.00	55.00	13.00	8.10	6.30	28,000	48	58	145	85	290	111	0.130
B7007C-2RZ	15	35.00	62.00	14.00	9.20	7.80	28,000	32	25	96	39	190	53	0.180
B7007AC-2RZ	25	35.00	62.00	14.00	8.70	7.40	24,000	51	65	150	96	300	124	0.180
B7008C-2RZ	15	40.00	68.00	15.00	9.80	8.90	26,000	34	27	108	43	215	59	0.220
B7008AC-2RZ	25	40.00	68.00	15.00	9.30	8.40	22,000	54	72	160	106	320	137	0.220
B7009C-2RZ	15	45.00	75.00	16.00	12.50	11.40	24,000	44	30	132	48	265	65	0.280
B7009AC-2RZ	25	45.00	75.00	16.00	11.80	10.70	20,000	71	80	210	118	420	153	0.280
B7010C-2RZ	15	50.00	80.00	16.00	12.90	12.40	22,000	46	32	138	51	275	69	0.300
B7010AC-2RZ	25	50.00	80.00	16.00	12.20	11.70	18,000	74	85	220	125	440	163	0.300
B7011C-2RZ	15	55.00	90.00	18.00	18.60	17.80	19,000	64	38	190	60	380	82	0.440
B7011AC-2RZ	25	55.00	90.00	18.00	17.50	16.80	17,000	105	100	310	147	620	191	0.440
B7012C-2RZ	15	60.00	95.00	18.00	19.30	19.30	18,000	67	41	200	64	400	87	0.470
B7012AC-2RZ	25	60.00	95.00	18.00	18.20	18.20	15,000	105	106	310	156	620	203	0.470
B7013C-2RZ	15	65.00	100.00	18.00	19.90	20.80	17,000	70	43	210	67	420	92	0.500

➤B70–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B7013AC-2RZ	25	65.00	100.00	18.00	18.80	19.70	15,000	110	112	330	166	660	215	0.500
B7014C-2RZ	15	70.00	110.00	20.00	25.90	26.70	16,000	89	47	270	74	540	101	0.690
B7014AC-2RZ	25	70.00	110.00	20.00	24.40	25.20	13,000	145	124	430	182	860	237	0.690
B7015C-2RZ	15	75.00	115.00	20.00	26.20	27.80	15,000	91	49	270	76	540	104	0.730
B7015AC-2RZ	25	75.00	115.00	20.00	24.70	26.30	13,000	150	127	450	187	900	243	0.730
B7016C-2RZ	15	80.00	125.00	22.00	31.20	33.50	14,000	110	53	330	83	660	114	0.990
B7016AC-2RZ	25	80.00	125.00	22.00	29.50	31.70	12,000	175	139	520	205	1,040	266	0.990
B7017C-2RZ	15	85.00	130.00	22.00	31.60	34.90	13,000	110	55	330	86	660	117	1.030
B7017AC-2RZ	25	85.00	130.00	22.00	29.90	32.90	11,000	180	143	540	210	1,080	273	1.030
B7018C-2RZ	15	90.00	140.00	24.00	37.10	41.40	12,000	130	59	390	93	780	127	1.350
B7018AC-2RZ	25	90.00	140.00	24.00	35.10	39.10	10,000	210	155	630	229	1,260	297	1.350
B7019C-2RZ	15	95.00	145.00	24.00	37.60	43.00	11,000	130	61	390	96	780	130	1.400
B7019AC-2RZ	25	95.00	145.00	24.00	35.50	40.60	9,500	210	159	630	235	1,260	305	1.400
B7020C-2RZ	15	100.00	150.00	24.00	38.10	44.60	11,000	135	62	400	98	800	133	1.460
B7020AC-2RZ	25	100.00	150.00	24.00	36.00	42.10	9,000	215	163	640	241	1,280	313	1.460
B7021C-2RZ	15	105.00	160.00	26.00	49.10	56.30	10,000	170	69	510	108	1,020	147	1.820
B7021AC-2RZ	25	105.00	160.00	26.00	46.40	53.20	8,000	275	179	820	264	1,640	343	1.820
B7022C-2RZ	15	110.00	170.00	28.00	49.70	58.50	9,500	175	70	520	110	1,040	150	2.310
B7022AC-2RZ	25	110.00	170.00	28.00	46.90	55.30	8,000	280	184	840	271	1,680	352	2.310
B7024C-2RZ	15	120.00	180.00	28.00	51.00	62.80	8,500	180	74	540	116	1,080	158	2.470
B7024AC-2RZ	25	120.00	180.00	28.00	48.20	58.50	7,500	290	193	870	285	1,740	370	2.470
B7026C-2RZ	15	130.00	200.00	33.00	65.40	81.50	7,500	230	84	690	131	1,380	179	3.680
B7026AC-2RZ	25	130.00	200.00	33.00	61.80	77.00	6,700	360	219	1,080	323	2,160	420	3.680
B7028C-2RZ	15	140.00	210.00	33.00	67.10	87.00	6,700	235	88	700	138	1,400	187	3.910
B7028AC-2RZ	25	140.00	210.00	33.00	63.40	82.20	6,300	370	230	1,110	339	2,220	441	3.910
B7030C-2RZ	15	150.00	225.00	35.00	82.40	106.50	6,000	280	96	840	150	1,680	204	4.710
B7030AC-2RZ	25	150.00	225.00	35.00	77.80	100.60	5,600	440	251	1,320	370	2,640	481	4.710

➤B70–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B7032C-2RZ	15	160.00	240.00	38.00	84.30	113.40	5,600	310	100	930	157	1,860	214	5.900
B7032AC-2RZ	25	160.00	240.00	38.00	79.60	107.20	5,000	500	263	1,500	388	3,000	503	5.900
B7034C-2RZ	15	170.00	260.00	42.00	102.70	139.60	5,300	350	111	1,050	174	2,100	236	7.940
B7034AC-2RZ	25	170.00	260.00	42.00	97.00	131.90	4,800	550	291	1,650	429	3,300	557	7.940
B7036C-2RZ	15	180.00	280.00	46.00	104.80	148.30	4,800	380	116	1,140	181	2,280	246	10.570
B7036AC-2RZ	25	180.00	280.00	46.00	99.00	140.10	4,300	600	303	1,800	447	3,600	581	10.570
B7038C-2RZ	15	190.00	290.00	46.00	123.70	173.90	4,500	450	124	1,350	194	2,700	264	10.840
B7038AC-2RZ	25	190.00	290.00	46.00	116.90	164.30	4,000	700	325	2,100	479	4,200	623	10.840
B7040C-2RZ	15	200.00	310.00	51.00	126.40	184.40	4,000	460	129	1,380	202	2,760	275	14.320
B7040AC-2RZ	25	200.00	310.00	51.00	119.40	174.20	3,800	720	339	2,160	500	4,320	649	14.320
B7044C-2RZ	15	220.00	340.00	56.00	147.70	219.50	3,800	540	140	1,620	219	3,240	298	18.820
B7044AC-2RZ	25	220.00	340.00	56.00	139.50	207.40	3,600	850	367	2,550	542	5,100	703	18.820

B70.HQ1–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B7000C-2RZ/HQ1	15	10.00	26.00	8.00	2.20	1.20	90,000	9	10	27	15	54	21	0.020
B7000AC-2RZ/HQ1	25	10.00	26.00	8.00	2.10	1.20	75,000	15	26	45	38	90	50	0.020
B7001C-2RZ/HQ1	15	12.00	28.00	8.00	2.20	1.30	80,000	9	10	27	15	54	21	0.020
B7001AC-2RZ/HQ1	25	12.00	28.00	8.00	2.00	1.20	70,000	15	26	45	38	90	50	0.020
B7002C-2RZ/HQ1	15	15.00	32.00	9.00	3.60	2.30	70,000	13	14	39	22	78	30	0.030
B7002AC-2RZ/HQ1	25	15.00	32.00	9.00	3.50	2.20	60,000	20	30	60	54	120	70	0.030
B7003C-2RZ/HQ1	15	17.00	35.00	10.00	3.80	2.50	63,000	13	15	39	23	78	32	0.040
B7003AC-2RZ/HQ1	25	17.00	35.00	10.00	3.60	2.30	53,000	21	39	63	57	125	74	0.040
B7004C-2RZ/HQ1	15	20.00	42.00	12.00	6.10	4.30	53,000	21	20	63	31	125	43	0.080
B7004AC-2RZ/HQ1	25	20.00	42.00	12.00	5.80	4.10	45,000	34	52	102	78	200	101	0.080
B7005C-2RZ/HQ1	15	25.00	47.00	12.00	6.20	4.60	45,000	21	21	63	33	125	45	0.090
B7005AC-2RZ/HQ1	25	25.00	47.00	12.00	5.80	4.40	38,000	35	54	105	80	210	104	0.090
B7006C-2RZ/HQ1	15	30.00	55.00	13.00	8.60	6.60	38,000	29	25	87	39	175	53	0.130
B7006AC-2RZ/HQ1	25	30.00	55.00	13.00	8.10	6.30	32,000	48	65	145	96	290	124	0.130
B7007C-2RZ/HQ1	15	35.00	62.00	14.00	9.20	7.80	34,000	32	28	96	43	190	59	0.180
B7007AC-2RZ/HQ1	25	35.00	62.00	14.00	8.70	7.40	28,000	51	72	150	107	300	139	0.180
B7008C-2RZ/HQ1	15	40.00	68.00	15.00	9.80	8.90	30,000	34	31	108	48	215	66	0.200
B7008AC-2RZ/HQ1	25	40.00	68.00	15.00	9.30	8.40	26,000	54	80	160	119	320	154	0.200
B7009C-2RZ/HQ1	15	45.00	75.00	16.00	12.50	11.40	26,000	44	34	132	53	265	73	0.260
B7009AC-2RZ/HQ1	25	45.00	75.00	16.00	11.80	10.70	24,000	71	89	210	132	420	171	0.260
B7010C-2RZ/HQ1	15	50.00	80.00	16.00	12.90	12.40	24,000	46	36	138	57	275	77	0.280
B7010AC-2RZ/HQ1	25	50.00	80.00	16.00	12.30	11.70	22,000	74	95	220	140	440	182	0.280
B7011C-2RZ/HQ1	15	55.00	90.00	18.00	18.60	17.80	22,000	64	43	190	67	380	91	0.410
B7011AC-2RZ/HQ1	25	55.00	90.00	18.00	17.50	16.80	19,000	105	112	310	165	620	214	0.410
B7012C-2RZ/HQ1	15	60.00	95.00	18.00	19.30	19.30	20,000	67	45	200	71	400	97	0.430
B7012AC-2RZ/HQ1	25	60.00	95.00	18.00	18.20	18.20	18,000	105	119	310	175	620	228	0.430
B7013C-2RZ/HQ1	15	65.00	100.00	18.00	19.90	20.80	20,000	70	48	210	75	420	102	0.460

➤ B70.HQ1–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B7013AC-2RZ/HQ1	25	65.00	100.00	18.00	18.80	19.70	17,000	110	126	330	186	660	241	0.460
B7014C-2RZ/HQ1	15	70.00	110.00	20.00	25.90	26.70	18,000	89	53	270	83	540	113	0.640
B7014AC-2RZ/HQ1	25	70.00	110.00	20.00	24.40	25.20	15,000	145	138	430	204	860	266	0.640
B7015C-2RZ/HQ1	15	75.00	115.00	20.00	26.20	27.80	17,000	91	54	270	85	540	116	0.670
B7015AC-2RZ/HQ1	25	75.00	115.00	20.00	24.70	26.30	15,000	150	142	450	210	900	273	0.670
B7016C-2RZ/HQ1	15	80.00	125.00	22.00	31.20	33.50	16,000	110	59	330	93	660	127	0.900
B7016AC-2RZ/HQ1	25	80.00	125.00	22.00	29.50	31.70	13,000	175	156	520	230	1,040	299	0.900
B7017C-2RZ/HQ1	15	85.00	130.00	22.00	31.60	34.90	15,000	110	61	330	95	660	130	0.940
B7017AC-2RZ/HQ1	25	85.00	130.00	22.00	29.90	32.90	13,000	180	160	540	236	1,080	306	0.940
B7018C-2RZ/HQ1	15	90.00	140.00	24.00	37.10	41.40	14,000	130	66	390	104	780	141	1.240
B7018AC-2RZ/HQ1	25	90.00	140.00	24.00	35.10	39.10	12,000	210	174	630	256	1,260	333	1.240
B7019C-2RZ/HQ1	15	95.00	145.00	24.00	37.60	43.00	13,000	130	68	390	106	780	145	1.260
B7019AC-2RZ/HQ1	25	95.00	145.00	24.00	35.50	40.60	11,000	210	178	630	263	1,260	342	1.260
B7020C-2RZ/HQ1	15	100.00	150.00	24.00	38.10	44.60	12,000	135	70	400	109	800	148	1.340
B7020AC-2RZ/HQ1	25	100.00	150.00	24.00	36.00	42.10	11,000	215	183	640	270	1,280	350	1.340
B7021C-2RZ/HQ1	15	105.00	160.00	26.00	49.10	56.30	12,000	170	77	510	120	1,020	163	1.660
B7021AC-2RZ/HQ1	25	105.00	160.00	26.00	46.40	53.20	10,000	275	201	820	296	1,640	385	1.660
B7022C-2RZ/HQ1	15	110.00	170.00	28.00	49.70	58.50	11,000	175	78	520	123	1,040	167	2.160
B7022AC-2RZ/HQ1	25	110.00	170.00	28.00	46.90	55.30	9,000	280	206	840	304	1,680	395	2.160
B7024C-2RZ/HQ1	15	120.00	180.00	28.00	51.00	62.80	10,000	180	82	540	129	1,080	176	2.210
B7024AC-2RZ/HQ1	25	120.00	180.00	28.00	48.20	58.50	8,500	290	216	870	319	1,740	415	2.210
B7026C-2RZ/HQ1	15	130.00	200.00	33.00	65.40	81.50	9,000	230	93	690	146	1,380	199	3.520
B7026AC-2RZ/HQ1	25	130.00	200.00	33.00	61.00	77.00	7,500	360	246	1,080	363	2,160	471	3.520
B7028C-2RZ/HQ1	15	140.00	210.00	33.00	67.10	87.00	7,500	235	98	700	153	1,400	209	3.730
B7028AC-2RZ/HQ1	25	140.00	210.00	33.00	63.40	82.20	7,000	370	258	1,110	380	2,220	494	3.730
B7030C-2RZ/HQ1	15	150.00	225.00	35.00	82.40	106.50	6,700	280	107	840	167	1,680	228	4.460
B7030AC-2RZ/HQ1	25	150.00	225.00	35.00	77.80	100.60	6,300	440	281	1,320	415	2,640	539	4.460

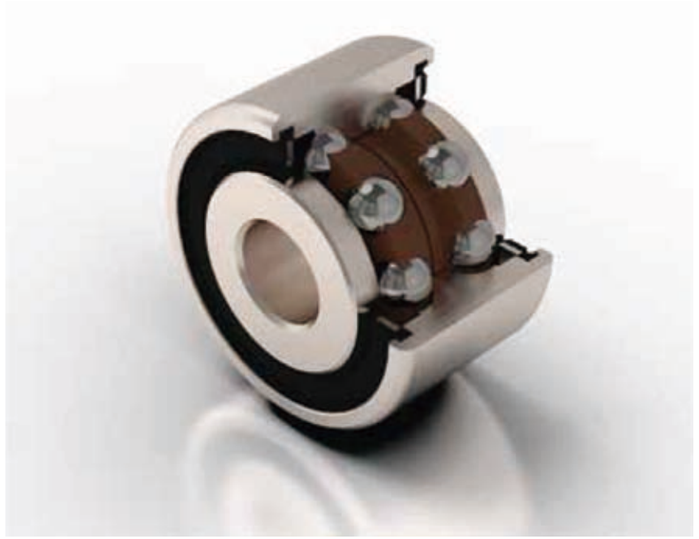
➤ B70.HQ1–2RZ

Designation	Contact Angle	Dimensions			Performance			Preload & Rigidity (Back to Back, Face to Face)						Mass
		Inner Ring Diameter	Outer Ring Diameter	Width	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)	A		B		C		(kg)
	α[°]	d[mm]	D[mm]	B[mm]	C (N)	C_0 (N)	Grease	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	F_{va}[N]	C_a[N/μm]	M≈
B7032C-2RZ/HQ1	15	160.00	240.00	38.00	84.30	113.40	6,300	310	112	930	175	1,860	238	5.640
B7032AC-2RZ/HQ1	25	160.00	240.00	38.00	79.60	107.20	5,600	500	295	1,500	435	3,000	564	5.640
B7034C-2RZ/HQ1	15	170.00	260.00	42.00	102.70	139.60	6,000	350	124	1,050	193	2,100	263	7.950
B7034AC-2RZ/HQ1	25	170.00	260.00	42.00	97.00	131.90	5,300	550	326	1,650	481	3,300	624	7.950
B7036C-2RZ/HQ1	15	180.00	280.00	46.00	104.80	148.30	5,300	380	129	1,140	202	2,280	275	10.200
B7036AC-2RZ/HQ1	25	180.00	280.00	46.00	99.00	140.10	4,800	600	340	1,800	501	3,600	651	10.200
B7038C-2RZ/HQ1	15	190.00	290.00	46.00	123.70	173.90	5,000	450	138	1,350	216	2,700	294	10.360
B7038AC-2RZ/HQ1	25	190.00	290.00	46.00	116.90	164.30	4,500	700	365	2,100	538	4,200	698	10.360
B7040C-2RZ/HQ1	15	200.00	310.00	51.00	126.40	184.40	4,500	460	144	1,380	225	2,760	307	13.810
B7040AC-2RZ/HQ1	25	200.00	310.00	51.00	119.40	174.20	4,300	720	380	2,160	561	4,320	728	13.810
B7044C-2RZ/HQ1	15	220.00	340.00	56.00	147.70	219.50	4,300	540	156	1,620	244	3,240	332	18.160
B7044AC-2RZ/HQ1	25	220.00	340.00	56.00	139.50	207.40	4,000	850	412	2,550	608	5,100	789	18.160

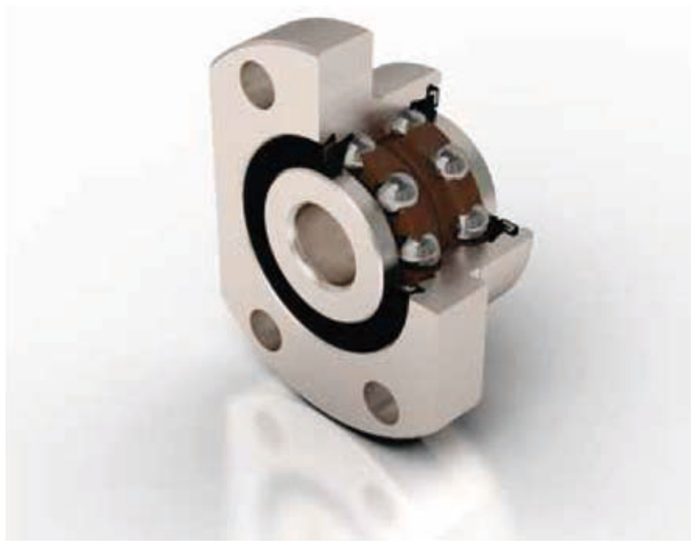
➤ Ball Screw Support Bearings

Design & Applications

Ball screw support bearings are manufactured specifically for high performance ball screw applications, where high rigidity requirements preclude the use of standard angular contact bearings. The internal configuration has been designed to provide an optimum combination of high rigidity, low drag torque, exceptional control of axial runout, higher running speeds and longer life.



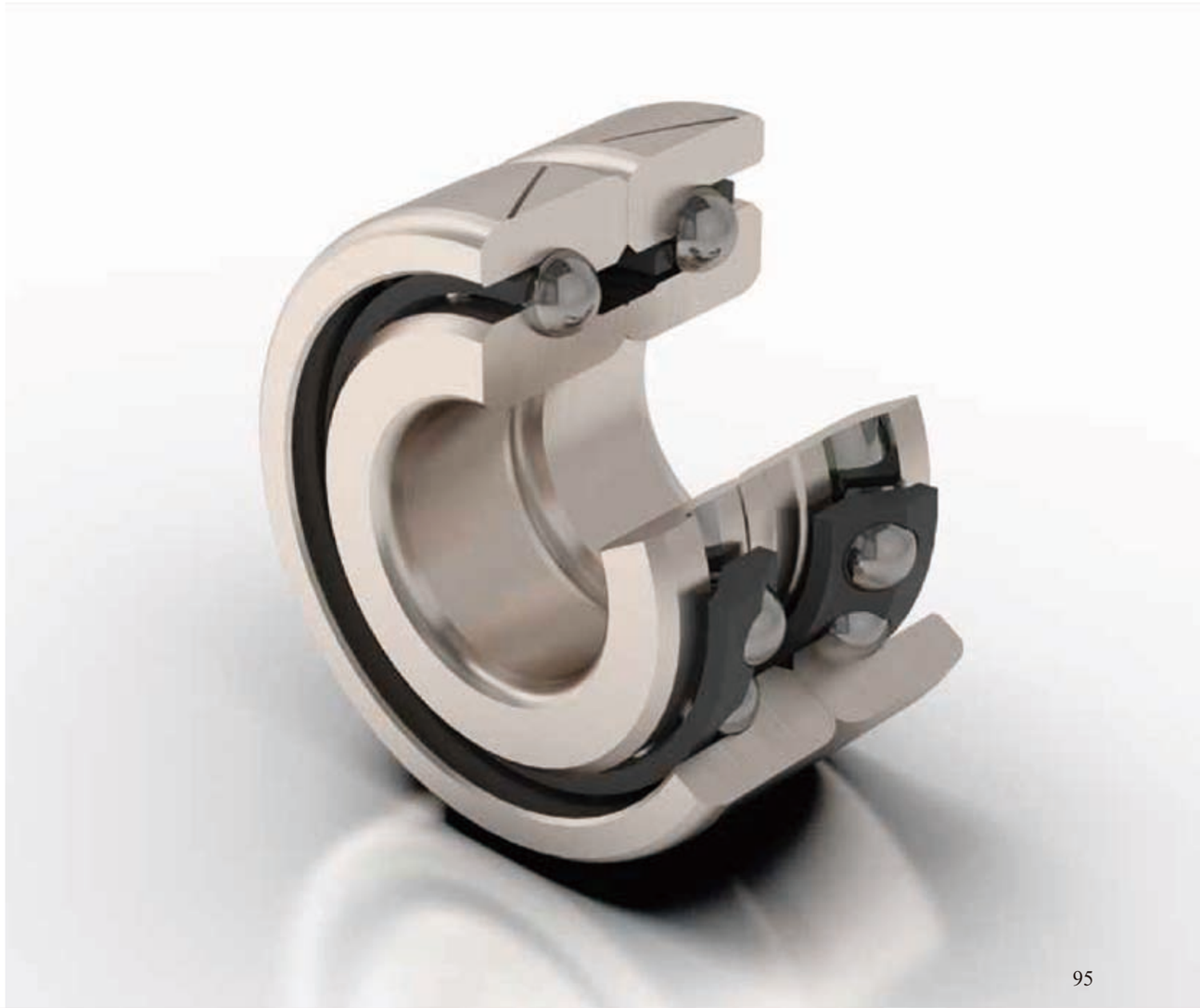
ZKLN bearing



ZKLF bearing

They are intended for special applications in machine tools, e.g., ball screw supports, cross slides, X-Y table positioners and transfer tables. They should not be used in place of standard angular contact spindle bearings. These bearings are available as single bearings or as standard duplex or quadruplex sets. In addition, we will supply custom combination sets to meet specialised application needs.

Series BNR * BER non-separable angular contact bearings have cutaway shoulders on both the inner and outer rings. They can support very high thrust loads in one direction or combinations of radial and thrust loads, but not radial loading alone.



➤Ball Screw Support Bearings

Limiting Speeds

Limiting speeds shown in the data table are useful guidelines. Actual speed limits must be based on the application characteristics. Life requirements, heat transfer conditions, loading and lubrication methods are typical influential factors on the attainable speed.

Preloads

Standard values shown will be supplied unless otherwise specified, recognizes that some applications do not require the full axial stiffness (compliance) of the standard preload and will supply bearings with custom-ground preloads if required.

Seals

Ball screw support bearings can also be supplied with closures such as seals or shields, please discuss your requirements with our sales engineers for details.

Cages

TN suffixed bearings have a molded, glass fiber reinforced polyamide cage with spherical ball pockets. All metric ball screw support bearings come with the molded polyamide cage, standard. Bearings with suffix TN feature a precision machined, land-piloted cage produced from reinforced phenolic material.

Mounting and Fitting

Normal fitting practice is line-to-line loosen for both shaft and housing fits, as shown in table. All bearing pairs and sets are match-marked on their outside diameter surfaces to indicate correct positioning of each bearing. Recommendations for shaft and housing shoulder diameters are based on maximum support of duplex-mounted bearings (see table). In circumstances with other mounting arrangements, consult Product Engineering.

Life Calculations

Most ball screw support bearing applications are subject to duty-cycle loading with constantly changing feeds, speeds, and operating loads. These factors, in combination with the high preloads built into the bearings, make life calculations difficult. Consult Product Engineering for information which can be used in specific cases.

Materials

All ball screw support bearings (rings and balls) are made from carbon chrome steel. Bearings are also available with rings produced from alternate materials such as corrosion resistant steel and balls from ceramic (Si3N4) for extreme environments.

Configurations

Standard configuration includes a cage; some sizes are also available in a full complement version (X205 suffix). Please consult our Engineering team.

Attainable Speeds

Limits given are for duplex pairs mounted with standard preload mounted sets with standard preload.

Duplexing

All bearings are supplied universally ground and can be mounted in pairs, DF (Face-to-Face), DB (Back-to-Back) or combinations of three, four or more bearings as required. Standard preloads for pairs are shown.

Tolerances

Standard precision class for Series L are ABEC 7, except for a tighter maximum raceway runout with side 2.5pm (0.0001").

Lubricant

Desired lubrication should be specified when ordering, based on torque, speed and temperature conditions of the application. Consult our Engineering team for details.

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Designation	Dimensions (mm)					Installation Dimensions (mm)			Perfomance				Calculation Data		Mass
	Inner Ring Diameter	Outer Ring Diameter	Height	Chamfer Dimension	Distance to Pressure Point	Shoulder Diameter		Radius of Housing Fillet	Basic Dynamic Load Rating	Basic Static Load Rating	limiting Speed (r/min)		Preload	Axial Rigidity	(kg)
	d	D	B	r_{smin}	a	d_a	D_a	r_a	C_a (kN)	C_{oa} (kN)	Grease	Oil-air	kN	N/μm	≈
760201TN1	12.00	32.00	10.00	0.60	24.00	17.00	27.00	0.60	11.6	12.5	17,000	24,000	1.4	470.0	0.040
760202TN1	15.00	35.00	11.00	0.60	27.00	20.50	30.00	0.60	12.5	15.0	15,000	20,000	1.4	510.0	0.050
760203TN1	17.00	40.00	12.00	0.60	31.00	23.00	34.50	0.60	16.6	20.0	13,000	18,000	1.7	590.0	0.070
760204TN1	20.00	47.00	14.00	1.00	36.00	27.50	39.50	1.00	19.3	25.0	12,000	17,000	2.3	700.0	0.130
760205TN1	25.00	52.00	15.00	1.00	41.00	32.00	45.00	1.00	22.0	30.5	11,000	16,000	2.5	770.0	0.160
760206TN1	30.00	62.00	16.00	1.00	48.00	39.50	52.50	1.00	26.0	39.0	9,000	13,000	2.9	890.0	0.240
760207TN1	35.00	72.00	17.00	1.10	55.00	46.50	60.50	1.10	30.0	50.0	8,000	11,000	3.3	1020.0	0.340
760208TN1	40.00	80.00	18.00	1.10	62.00	53.50	69.50	1.10	37.5	64.0	7,000	9,500	4.3	1180.0	0.440
760209TN1	45.00	85.00	19.00	1.10	66.00	57.00	73.00	1.10	38.0	68.0	6,700	9,000	4.5	1240.0	0.500
760210TN1	50.00	90.00	20.00	1.10	71.00	63.00	79.00	1.10	39.0	75.0	6,300	8,500	4.9	1360.0	0.570
760211TN1	55.00	100.00	21.00	1.50	78.00	69.50	85.50	1.50	40.5	81.5	6,000	8,000	5.6	1390.0	0.750
760212TN1	60.00	110.00	22.00	1.50	86.00	77.00	96.00	1.50	56.0	112.0	5,000	6,700	6.5	1620.0	0.960
760213TN1	65.00	120.00	23.00	1.50	92.00	84.00	103.00	1.50	57.0	122.0	4,800	6,300	7.0	1750.0	1.200
760214TN1	70.00	125.00	24.00	1.50	96.00	87.00	108.00	1.50	65.5	137.0	4,500	6,000	7.0	1750.0	1.320
760215TN1	75.00	130.00	25.00	1.50	101.00	93.50	114.50	1.50	67.0	150.0	4,300	5,600	7.6	1880.0	1.450
760216TN1	80.00	140.00	26.00	2.00	108.00	100.00	122.00	2.00	76.5	175.0	4,000	5,300	8.9	2040.0	1.760
760217TN1	85.00	150.00	28.00	2.00	116.00	107.00	131.00	2.00	86.5	196.0	3,800	5,000	10.5	2200.0	2.190
760218TN1	90.00	160.00	30.00	2.00	123.00	113.50	138.50	2.00	98.0	224.0	3,600	4,800	11.0	2270.0	2.690
760219TN1	95.00	170.00	32.00	2.10	131.00	119.50	146.50	2.10	110.0	255.0	3,400	4,500	12.5	2430.0	3.260
760220TN1	100.00	180.00	34.00	2.10	138.00	125.50	154.50	2.10	122.0	285.0	3,200	4,300	14.0	2590.0	3.910
760222TN1	110.00	200.00	38.00	2.10	153.00	139.00	171.00	2.10	146.0	355.0	2,800	3,800	16.4	2800.0	5.500
760224TN1	120.00	215.00	40.00	2.10	165.00	150.00	185.00	2.10	176.0	425.0	2,600	3,600	20.6	3130.0	6.500
760226TN1	130.00	230.00	40.00	3.00	176.00	162.50	197.00	3.00	180.0	455.0	2,400	3,400	20.6	3280.0	7.400

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Designation	Dimensions (mm)					Installation Dimensions (mm)			Perfomance				Calculation Data		Mass
	Inner Ring Diameter	Outer Ring Diameter	Height	Chamfer Dimension	Distance to Pressure Point	Shoulder Diameter		Radius of Housing Fillet	Basic Dynamic Load Rating	Basic Static Load Rating	limiting Speed (r/min)		Preload	Axial Rigidity	(kg)
	d	D	B	r_{smin}	a	d_a	D_a	r_a	C_a (kN)	C_{oa} (kN)	Grease	Oil-air	kN	N/μm	≈
760201-2RZTN1	12.00	32.00	10.00	0.60	24.00	17.00	27.00	0.60	11.6	12.5	17,000		1.4	470.0	0.040
760202-2RZTN1	15.00	35.00	11.00	0.60	27.00	20.50	30.00	0.60	12.5	15.0	15,000		1.4	510.0	0.050
760203-2RZTN1	17.00	40.00	12.00	0.60	31.00	23.00	34.50	0.60	16.6	20.0	13,000		1.7	590.0	0.070
760204-2RZTN1	20.00	47.00	14.00	1.00	36.00	27.50	39.50	1.00	19.3	25.0	12,000		2.3	700.0	0.130
760205-2RZTN1	25.00	52.00	15.00	1.00	41.00	32.00	45.00	1.00	22.0	30.5	11,000		2.5	770.0	0.160
760206-2RZTN1	30.00	62.00	16.00	1.00	48.00	39.50	52.50	1.00	26.0	39.0	9,000		2.9	890.0	0.240
760207-2RZTN1	35.00	72.00	17.00	1.10	55.00	46.50	60.50	1.10	30.0	50.0	8,000		3.3	1020.0	0.340
760208-2RZTN1	40.00	80.00	18.00	1.10	62.00	53.50	69.50	1.10	37.5	64.0	7,000		4.3	1180.0	0.440
760209-2RZTN1	45.00	85.00	19.00	1.10	66.00	57.00	73.00	1.10	38.0	68.0	6,700		4.5	1240.0	0.500
760210-2RZTN1	50.00	90.00	20.00	1.10	71.00	63.00	79.00	1.10	39.0	75.0	6,300		4.9	1360.0	0.570
760211-2RZTN1	55.00	100.00	21.00	1.50	78.00	69.50	85.50	1.50	40.5	81.5	6,000		5.6	1390.0	0.750
760212-2RZTN1	60.00	110.00	22.00	1.50	86.00	77.00	96.00	1.50	56.0	112.0	5,000		6.5	1620.0	0.960
760213-2RZTN1	65.00	120.00	23.00	1.50	92.00	84.00	103.00	1.50	57.0	122.0	4,800		7.0	1750.0	1.200
760214-2RZTN1I	70.00	125.00	24.00	1.50	96.00	87.00	108.00	1.50	65.5	137.0	4,500		7.0	1750.0	1.320
760215-2RZTN1	75.00	130.00	25.00	1.50	101.00	93.50	114.50	1.50	67.0	150.0	4,300		7.6	1880.0	1.450
760216-2RZTN1	80.00	140.00	26.00	2.00	108.00	100.00	122.00	2.00	76.5	175.0	4,000		8.9	2040.0	1.760
760217-2RZTN1	85.00	150.00	28.00	2.00	116.00	107.00	131.00	2.00	86.5	196.0	3,800		10.5	2200.0	2.190
760218-2RZTN1	90.00	160.00	30.00	2.00	123.00	113.50	138.50	2.00	98.0	224.0	3,600		11.0	2270.0	2.690
760219-2RZTN1	95.00	170.00	32.00	2.10	131.00	119.50	146.50	2.10	110.0	255.0	3,400		12.5	2430.0	3.260
760220-2RZTN1	100.00	180.00	34.00	2.10	138.00	125.50	154.50	2.10	122.0	285.0	3,200		14.0	2590.0	3.910
760222-2RZTN1	110.00	200.00	38.00	2.10	153.00	139.00	171.00	2.10	146.0	355.0	2,800		16.4	2800.0	5.500
760224-2RZTN1	120.00	215.00	40.00	2.10	165.00	150.00	185.00	2.10	176.0	425.0	2,600		20.6	3130.0	6.500
760226-2RZTN1	130.00	230.00	40.00	3.00	176.00	162.50	197.00	3.00	180.0	455.0	2,400		20.6	3280.0	7.400

7603

Designation	Dimensions (mm)					Installation Dimensions (mm)			Perfomance				Calculation Data		Mass
	Inner Ring Diameter	Outer Ring Diameter	Height	Chamfer Dimension	Distance to Pressure Point	Shoulder Diameter		Radius of Housing Fillet	Basic Dynamic Load Rating	Basic Static Load Rating	limiting Speed (r/min)		Preload	Axial Rigidity	(kg)
	d	D	B	r_{smin}	a	d_a	D_a	r_a	C_a (kN)	C_{oa} (kN)	Grease	Oil-air	kN	N/μm	≈
760304TN1	20.00	52.00	15.00	1.10	39.00	30.50	43.50	1.10	24.5	32.0	11,000	16,000	2.9	780.0	0.170
760305TN1	25.00	62.00	17.00	1.10	46.00	38.00	52.00	1.10	28.5	41.5	9,000	13,000	3.3	910.0	0.280
760306TN1	30.00	72.00	19.00	1.10	53.00	45.00	61.00	1.10	34.5	55.0	8,000	11,000	4.3	1070.0	0.410
760307TN1	35.00	80.00	21.00	1.50	60.00	51.00	67.00	1.50	36.5	61.0	7,000	9,500	4.8	1190.0	0.550
760307× 3TN1	35.00	90.00	23.00	1.50	68.00	56.50	75.70	1.50	50.0	83.0	6,300	8,500	5.6	1290.0	0.810
760308TN1	40.00	90.00	23.00	1.50	68.00	56.50	75.70	1.50	50.0	83.0	6,300	8,500	5.6	1290.0	0.760
760309TN1	45.00	100.00	25.00	1.50	75.00	64.50	85.50	1.50	58.5	104.0	5,600	7,500	7.0	1470.0	1.020
760309× 3TN1	45.00	110.00	27.00	2.00	83.00	72.00	94.00	2.00	69.5	127.0	5,000	6,700	7.6	1600.0	1.410
760310TN1	50.00	110.00	27.00	2.00	83.00	72.00	94.00	2.00	69.5	127.0	5,000	6,700	7.6	1600.0	1.330
760311TN1	55.00	120.00	29.00	2.00	90.00	77.00	101.00	2.00	78.0	146.0	4,800	6,300	8.8	1720.0	1.690
760312TN1	60.00	130.00	31.00	2.10	98.00	82.50	107.50	2.10	88.0	166.0	4,500	6,000	10.0	1840.0	2.120
760313TN1	65.00	140.00	33.00	2.10	105.00	91.50	118.50	2.10	100.0	196.0	4,000	5,300	12.0	2050.0	2.600
760314TN1	70.00	150.00	35.00	2.10	113.00	95.50	124.50	2.10	110.0	220.0	3,800	5,000	12.0	2100.0	3.160
760315TN1	75.00	160.00	37.00	2.10	120.00	105.50	135.50	2.10	125.0	255.0	3,600	4,800	14.5	2330.0	3.790
760316TN1	80.00	170.00	39.00	2.10	128.00	111.00	143.00	2.10	137.0	285.0	3,400	4,500	16.0	2460.0	4.500
760317TN1	85.00	180.00	41.00	3.00	135.00	116.00	151.00	3.00	160.0	325.0	3,200	4,300	17.5	2530.0	5.290
760318TN1	90.00	190.00	43.00	3.00	143.00	122.50	157.50	3.00	163.0	345.0	3,000	4,000	18.0	2650.0	6.170
760319TN1	95.00	200.00	45.00	3.00	150.00	130.00	165.00	3.00	163.0	360.0	3,000	4,000	19.0	2770.0	7.150
760320TN1	100.00	215.00	47.00	3.00	160.00	140.00	178.00	3.00	193.0	430.0	2,600	3,600	21.5	2960.0	8.730
760322TN1	110.00	240.00	50.00	3.00	176.00	154.50	200.00	3.00	250.0	560.0	2,400	3,400	29.3	3360.0	11.800
760324TN1	120.00	260.00	55.00	3.00	192.00	165.00	210.00	3.00	265.0	620.0	2,200	3,200	31.3	3550.0	14.600
760326TN1	130.00	280.00	58.00	3.00	206.00	181.00	229.00	3.00	290.0	695.0	2,000	3,000	33.7	3800.0	18.700

7603

Designation	Dimensions (mm)					Installation Dimensions (mm)			Perfomance			Calculation Data		Mass
	Inner Ring Diameter	Outer Ring Diameter	Height	Chamfer Dimension	Distance to Pressure Point	Shoulder Diameter		Radius of Housing Fillet	Basic Dynamic Load Rating	Basic Static Load Rating	limiting Speed (r/min)	Preload	Axial Rigidity	(kg)
	d	D	B	rsmin	a	da	Da	ra	Ca (kN)	Coa (kN)	Grease	kN	N/μm	≈
760304-2RZTN1	20.00	52.00	15.00	1.10	39.00	30.50	43.50	1.10	24.5	32.0	11,000	2.9	780.0	0.170
760305-2RZTN1	25.00	62.00	17.00	1.10	46.00	38.00	52.00	1.10	28.5	41.5	9,000	3.3	910.0	0.280
760306-2RZTN1	30.00	72.00	19.00	1.10	53.00	45.00	61.00	1.10	34.5	55.0	8,000	4.3	1070.0	0.410
760307-2RZTN1	35.00	80.00	21.00	1.50	60.00	51.00	67.00	1.50	36.5	61.0	7,000	4.8	1190.0	0.550
760307X3-2RZTN1	35.00	90.00	23.00	1.50	68.00	56.50	75.70	1.50	50.0	83.0	6,300	5.6	1290.0	0.810
760308-2RZTN1	40.00	90.00	23.00	1.50	68.00	56.50	75.70	1.50	50.0	83.0	6,300	5.6	1290.0	0.760
760309-2RZTN1	45.00	100.00	25.00	1.50	75.00	64.50	85.50	1.50	58.5	104.0	5,600	7.0	1470.0	1.020
760309X3-2RZTN1	45.00	110.00	27.00	2.00	83.00	72.00	94.00	2.00	69.5	127.0	5,000	7.6	1600.0	1.140
760310-2RZTN1	50.00	110.00	27.00	2.00	83.00	72.00	94.00	2.00	69.5	127.0	5,000	7.6	1600.0	1.330
760311-2RZTN1	55.00	120.00	29.00	2.00	90.00	77.00	101.00	2.00	78.0	146.0	4,800	8.8	1720.0	1.690
760312-2RZTN1	60.00	130.00	31.00	2.10	98.00	82.50	107.50	2.10	88.0	166.0	4,500	10.0	1840.0	2.120
760313-2RZTN1	65.00	140.00	33.00	2.10	105.00	91.50	118.50	2.10	100.0	196.0	4,000	12.0	2050.0	2.600
760314-2RZTN1	70.00	150.00	35.00	2.10	113.00	95.50	124.50	2.10	110.0	220.0	3,800	12.0	2100.0	3.160
760315-2RZTN1	75.00	160.00	37.00	2.10	120.00	105.50	135.50	2.10	125.0	255.0	3,600	14.5	2330.0	3.790
760316-2RZTN1	80.00	170.00	39.00	2.10	128.00	111.00	143.00	2.10	137.0	285.0	3,400	16.0	2460.0	4.500
760317-2RZTN1	85.00	180.00	41.00	3.00	135.00	116.00	151.00	3.00	160.0	325.0	3,200	17.5	2530.0	5.290
760318-2RZTN1	90.00	190.00	43.00	3.00	143.00	122.50	157.50	3.00	163.0	345.0	3,000	18.0	2650.0	6.170
760319-2RZTN1	95.00	200.00	45.00	3.00	150.00	130.00	165.00	3.00	163.0	360.0	3,000	19.0	2770.0	7.150
760320-2RZTN1	100.00	215.00	47.00	3.00	160.00	140.00	178.00	3.00	193.0	430.0	2,600	21.5	2960.0	8.730
760322-2RZTN1	110.00	240.00	50.00	3.00	176.00	154.50	200.00	3.00	250.0	560.0	2,400	29.3	3360.0	11.800
760324-2RZTN1	120.00	260.00	55.00	3.00	192.00	165.00	210.00	3.00	265.0	620.0	2,200	31.3	3550.0	14.600
760326-2RZTN1	130.00	280.00	58.00	3.00	206.00	181.00	229.00	3.00	290.0	695.0	2,000	33.7	3800.0	18.700

➤ TAC...B&2RZ

Designation	Dimensions (mm)					Installation Dimensions (mm)			Perfomance				Calculation Data		Mass
	Inner Ring Diameter	Outer Ring Diameter	Height	Chamfer Dimension	Distance to Pressure Point	Shoulder Diameter		Radius of Housing Fillet	Basic Dynamic Load Rating	Basic Static Load Rating	limiting Speed (r/min)		Preload	Axial Rigidity	(kg)
	d	D	B	r_{smin}	a	d_a	D_a	r_a	C_a (kN)	C_{oa} (kN)	Grease	Oil-air	kN	N/μm	≈
15TAC47BTN1	15.00	47.00	15.00	1.00	35.00	27.50	39.50	1.00	21.50	27.00	12,000	17,000	2.60	720.00	0.140
17TAC47BTN1	17.00	47.00	15.00	1.00	35.00	27.50	39.50	1.00	21.50	27.00	12,000	17,000	2.60	720.00	0.140
20TAC47BTN1	20.00	47.00	15.00	1.00	37.00	27.50	39.50	1.00	19.30	25.00	12,000	17,000	2.30	700.00	0.130
25TAC62BTN1	25.00	62.00	15.00	1.00	46.00	38.00	52.00	1.00	28.50	41.50	9,000	13,000	3.30	910.00	0.240
30TAC62BTN1	30.00	62.00	15.00	1.00	48.00	39.50	52.50	1.00	26.00	39.00	9,000	13,000	2.90	890.00	0.230
30TAC72BTN1	30.00	72.00	15.00	1.00	52.00	45.00	61.00	1.10	31.00	54.00	8,000	11,000	3.40	1040.00	0.350
35TAC72BTN1	35.00	72.00	15.00	1.00	54.00	46.50	60.50	1.10	30.00	50.00	8,000	11,000	3.30	1020.00	0.300
40TAC72BTN1	40.00	72.00	15.00	1.00	56.00	49.00	62.50	1.10	28.00	49.00	8,000	11,000	2.90	1010.00	0.260
40TAC90BTN1	40.00	90.00	20.00	1.50	67.00	56.50	75.50	1.50	50.00	83.00	6,300	8,500	5.60	1290.00	0.650
45TAC75BTN1	45.00	75.00	15.00	1.00	60.00	52.00	68.00	1.00	28.50	52.00	7,500	10,000	3.10	1070.00	0.260
45TAC100BTN1	45.00	100.00	20.00	1.50	74.00	64.50	85.50	1.50	58.50	104.00	5,600	7,500	6.90	1470.00	0.810
50TAC100BTN1	50.00	100.00	20.00	1.50	76.00	64.50	85.50	1.50	58.50	104.00	5,600	7,500	7.00	1470.00	0.750
55TAC90BTN1	55.00	90.00	15.00	1.00	70.00	65.00	80.00	1.00	32.50	65.50	6,300	8,500	3.60	1240.00	0.380
55TAC100BTN1	55.00	100.00	20.00	1.50	77.00	69.50	85.50	1.50	40.50	81.50	6,000	8,000	4.60	1390.00	0.750
55TAC120BTN1	55.00	120.00	20.00	1.50	86.00	77.00	97.50	2.00	60.00	116.00	5,000	6,700	6.80	1550.00	1.180
60TAC120BTN1	60.00	120.00	20.00	1.50	88.00	79.50	100.50	1.50	61.00	120.00	4,800	6,300	7.00	1620.00	1.110
75TAC110BTN1	75.00	110.00	15.00	1.50	88.00	85.00	99.50	1.50	35.50	83.00	5,000	6,700	4.60	1530.00	0.750
100TAC150BTN1	100.00	150.00	22.50	2.00	120.00	114.50	135.00	2.00	69.50	173.00	3,800	5,000	7.50	2050.00	1.370

➤ TAC...B&2RZ

Designation	Dimensions (mm)					Installation Dimensions (mm)			Perfomance				Calculation Data		Mass
	Inner Ring Diameter	Outer Ring Diameter	Height	Chamfer Dimension	Distance to Pressure Point	Shoulder Diameter		Radius of Housing Fillet	Basic Dynamic Load Rating	Basic Static Load Rating	limiting Speed (r/min)		Preload	Axial Rigidity	(kg)
	d	D	B	r_{asmin}	a	d_a	D_a	r_a	C_a (kN)	C_{oa} (kN)	Grease	Oil-air	kN	N/μm	≈
15TAC47B-2RZTN1	15.00	47.00	15.00	1.00	35.00	27.50	39.50	1.00	21.50	27.00	12,000		2.60	720.00	0.140
17TAC47B-2RZTN1	17.00	47.00	15.00	1.00	35.00	27.50	39.50	1.00	21.50	27.00	12,000		2.60	720.00	0.140
20TAC47B-2RZTN1	20.00	47.00	15.00	1.00	37.00	27.50	39.50	1.00	19.30	25.00	12,000		2.30	700.00	0.130
25TAC62B-2RZTN1	25.00	62.00	15.00	1.00	46.00	38.00	52.00	1.00	28.50	41.50	9,000		3.30	910.00	0.240
30TAC62B-2RZTN1	30.00	62.00	15.00	1.00	48.00	39.50	52.50	1.00	26.00	39.00	9,000		2.90	890.00	0.230
30TAC72B-2RZTN1	30.00	72.00	15.00	1.00	52.00	45.00	61.00	1.10	31.00	54.00	8,000		3.40	1040.00	0.350
35TAC72B-2RZTN1	35.00	72.00	15.00	1.00	54.00	46.50	60.50	1.10	30.00	50.00	8,000		3.30	1020.00	0.300
40TAC72B-2RZTN1	40.00	72.00	15.00	1.00	56.00	49.00	62.50	1.10	28.00	49.00	8,000		2.90	1010.00	0.260
40TAC90B-2RZTN1	40.00	90.00	20.00	1.50	67.00	56.50	75.50	1.50	50.00	83.00	6,300		5.60	1290.00	0.650
45TAC75B-2RZTN1	45.00	75.00	15.00	1.00	60.00	52.00	68.00	1.00	28.50	52.00	7,500		3.10	1070.00	0.260
45TAC100B-2RZTN1	45.00	100.00	20.00	1.50	74.00	64.50	85.50	1.50	58.50	104.00	5,600		6.90	1470.00	0.810
50TAC100B-2RZTN1	50.00	100.00	20.00	1.50	76.00	64.50	85.50	1.50	58.50	104.00	5,600		7.00	1470.00	0.750
55TAC90B-2RZTN1	55.00	90.00	15.00	1.00	70.00	65.00	80.00	1.00	32.50	65.50	6,300		3.60	1240.00	0.380
55TAC100B-2RZTN1	55.00	100.00	20.00	1.50	77.00	69.50	85.50	1.50	40.50	81.50	6,000		4.60	1390.00	0.750
55TAC120B-2RZTN1	55.00	120.00	20.00	1.50	86.00	77.00	97.50	2.00	60.00	116.00	5,000		6.80	1550.00	1.180
60TAC120B-2RZTN1	60.00	120.00	20.00	1.50	88.00	79.50	100.50	1.50	61.00	120.00	4,800		7.00	1620.00	1.110
75TAC110B-2RZTN1	75.00	110.00	15.00	1.50	88.00	85.00	99.50	1.50	35.50	83.00	5,000		4.60	1530.00	0.750
100TAC150B-2RZTN1	100.00	150.00	22.50	2.00	120.00	114.50	135.00	2.00	69.50	173.00	3,800		7.50	2050.00	1.370

BNR&BER10

Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
30BNR10S	18	30.00	55.00	13.00	1.00	0.60	13.30	8.65	5.75	33,000	47,100	8.20	0.124
30BNR10H	18	30.00	55.00	13.00	1.00	0.60	13.30	8.65	5.75	42,400	65,900	5.35	0.116
30BNR10X	18	30.00	55.00	13.00	1.00	0.60	13.30	8.65	5.75	49,500	77,700	5.35	0.116
30BER10S	25	30.00	55.00	13.00	1.00	0.60	16.30	8.30	5.50	28,300	40,000	9.65	0.124
30BER10H	25	30.00	55.00	13.00	1.00	0.60	16.30	8.30	5.50	37,700	58,900	6.50	0.116
30BER10X	25	30.00	55.00	13.00	1.00	0.60	16.30	8.30	5.50	44,800	70,600	6.50	0.116
35BNR10S	18	35.00	62.00	14.00	1.00	0.60	14.80	10.10	7.10	28,900	41,300	10.20	0.164
35BNR10H	18	35.00	62.00	14.00	1.00	0.60	14.80	10.10	7.10	37,200	57,800	6.70	0.154
35BNR10X	18	35.00	62.00	14.00	1.00	0.60	14.80	10.10	7.10	43,300	68,100	6.70	0.154
35BER10S	25	35.00	62.00	14.00	1.00	0.60	18.20	9.70	6.85	24,800	35,100	12.00	0.164
35BER10H	25	35.00	62.00	14.00	1.00	0.60	18.20	9.70	6.85	33,000	51,600	8.10	0.154
35BER10X	25	35.00	62.00	14.00	1.00	0.60	18.20	9.70	6.85	39,200	61,900	8.10	0.154
40BNR10S	18	40.00	68.00	15.00	1.00	0.60	16.20	10.60	7.95	26,000	37,100	11.50	0.204
40BNR10H	18	40.00	68.00	15.00	1.00	0.60	16.20	10.60	7.95	33,400	51,900	7.50	0.193
40BNR10X	18	40.00	68.00	15.00	1.00	0.60	16.20	10.60	7.95	38,900	61,200	7.50	0.193
40BER10S	25	40.00	68.00	15.00	1.00	0.60	19.90	10.10	7.65	22,300	31,500	13.50	0.204
40BER10H	25	40.00	68.00	15.00	1.00	0.60	19.90	10.10	7.65	29,700	46,300	9.10	0.193
40BER10X	25	40.00	68.00	15.00	1.00	0.60	19.90	10.10	7.65	35,200	55,600	9.10	0.193
45BNR10S	18	45.00	75.00	16.00	1.00	0.60	17.60	11.70	9.00	23,400	33,400	12.70	0.259
45BNR10H	18	45.00	75.00	16.00	1.00	0.60	17.60	11.70	9.00	30,000	46,700	8.35	0.246
45BNR10X	18	45.00	75.00	16.00	1.00	0.60	17.60	11.70	9.00	35,000	55,000	8.35	0.246
45BER10S	25	45.00	75.00	16.00	1.00	0.60	21.80	11.20	8.60	20,000	28,400	15.00	0.259
45BER10H	25	45.00	75.00	16.00	1.00	0.60	21.80	11.20	8.60	26,700	41,700	10.10	0.246
45BER10X	25	45.00	75.00	16.00	1.00	0.60	21.80	11.20	8.60	31,700	50,000	10.10	0.246
50BNR10S	18	50.00	80.00	16.00	1.00	0.60	18.40	12.20	9.90	21,600	30,800	14.00	0.281
50BNR10H	18	50.00	80.00	16.00	1.00	0.60	18.40	12.20	9.90	27,700	43,100	9.20	0.266
50BNR10X	18	50.00	80.00	16.00	1.00	0.60	18.40	12.20	9.90	32,400	50,800	9.20	0.266
50BER10S	25	50.00	80.00	16.00	1.00	0.60	23.00	11.60	9.50	18,500	26,200	16.50	0.281
50BER10H	25	50.00	80.00	16.00	1.00	0.60	23.00	11.60	9.50	24,700	38,500	11.10	0.266

BNR&BER10

Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
50BER10X	25	50.00	80.00	16.00	1.00	0.60	23.00	11.60	9.50	29,300	46,200	11.10	0.266
55BNR10S	18	55.00	90.00	18.00	1.10	0.60	20.60	15.10	12.50	19,400	27,600	17.80	0.414
55BNR10H	18	55.00	90.00	18.00	1.10	0.60	20.60	15.10	12.50	24,900	38,700	11.70	0.393
55BNR10X	18	55.00	90.00	18.00	1.10	0.60	20.60	15.10	12.50	2,900	45,600	11.70	0.393
55BER10S	25	55.00	90.00	18.00	1.10	0.60	25.70	14.40	12.00	16,600	23,500	21.00	0.414
55BER10H	25	55.00	90.00	18.00	1.10	0.60	25.70	14.40	12.00	22,100	34,500	14.10	0.393
55BER10X	25	55.00	90.00	18.00	1.10	0.60	25.70	14.40	12.00	26,300	41,400	14.10	0.393
60BNR10S	18	60.00	95.00	18.00	1.10	0.60	21.50	15.60	13.70	18,100	25,900	19.50	0.443
60BNR10H	18	60.00	95.00	18.00	1.10	0.60	21.50	15.60	13.70	23,300	36,200	12.80	0.419
60BNR10X	18	60.00	95.00	18.00	1.10	0.60	21.50	15.60	13.70	27,100	42,600	12.80	0.419
60BER10S	25	60.00	95.00	18.00	1.10	0.60	26.90	15.00	13.10	15,500	22,000	22.90	0.443
60BER10H	25	60.00	95.00	18.00	1.10	0.60	26.90	15.00	13.10	20,700	32,300	15.50	0.419
60BER10X	25	60.00	95.00	18.00	1.10	0.60	26.90	15.00	13.10	24,600	38,800	15.50	0.419
65BNR10S	18	65.00	100.00	18.00	1.10	0.60	22.30	16.20	14.80	17,000	24,300	21.10	0.472
65BNR10H	18	65.00	100.00	18.00	1.10	0.60	22.30	16.20	14.80	21,900	34,000	13.90	0.447
65BNR10X	18	65.00	100.00	18.00	1.10	0.60	22.30	16.20	14.80	25,500	40,000	13.90	0.447
65BER10S	25	65.00	100.00	18.00	1.10	0.60	28.00	15.50	14.20	14,600	20,700	24.90	0.472
65BER10H	25	65.00	100.00	18.00	1.10	0.60	28.00	15.50	14.20	19,400	30,400	16.80	0.447
65BER10X	25	65.00	100.00	18.00	1.10	0.60	28.00	15.50	14.20	23,100	36,400	16.80	0.447
70BNR10S	18	70.00	110.00	20.00	1.10	0.60	24.50	22.30	19.80	15,600	22,300	28.60	0.645
70BNR10H	18	70.00	110.00	20.00	1.10	0.60	24.50	22.30	19.80	20,000	31,200	18.80	0.605
70BNR10X	18	70.00	110.00	20.00	1.10	0.60	24.50	22.30	19.80	23,400	36,700	18.80	0.605
70BER10S	25	70.00	110.00	20.00	1.10	0.60	30.80	21.30	18.90	13,400	18,900	33.50	0.645
70BER10H	25	70.00	110.00	20.00	1.10	0.60	30.80	21.30	18.90	17,800	27,800	22.60	0.605
70BER10X	25	70.00	110.00	20.00	1.10	0.60	30.80	21.30	18.90	21,200	33,400	22.60	0.605
75BNR10S	18	75.00	115.00	20.00	1.10	0.60	25.30	22.60	20.70	14,800	21,100	30.00	0.679
75BNR10H	18	75.00	115.00	20.00	1.10	0.60	25.30	22.60	20.70	19,000	29,500	19.70	0.638
75BNR10X	18	75.00	115.00	20.00	1.10	0.60	25.30	22.60	20.70	22,200	34,800	19.70	0.638
75BER10S	25	75.00	115.00	20.00	1.10	0.60	31.90	21.60	19.80	12,700	17,900	35.00	0.679
75BER10H	25	75.00	115.00	20.00	1.10	0.60	31.90	21.60	19.80	16,900	26,400	23 7	0.638

BNR&BER10

Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
75BER10X	25	75.00	115.00	20.00	1.10	0.60	31.90	21.60	19.80	20,000	31,600	23 7	0.638
80BNR10S	18	80.00	125.00	20.00	1.10	0.60	27.50	26.50	24.50	13,700	19,600	35.50	0.921
80BNR10H	18	80.00	125.00	20.00	1.10	0.60	27.50	26.50	24.50	17,600	27,400	23.40	0.867
80BNR10X	18	80.00	125.00	20.00	1.10	0.60	27.50	26.50	24.50	20,500	32,200	23.40	0.867
80BER10S	25	80.00	125.00	20.00	1.10	0.60	34.60	25.30	23.50	11,800	16,600	42.00	0.921
80BER10H	25	80.00	125.00	20.00	1.10	0.60	34.60	25.30	23.50	15,700	24,400	28.20	0.867
80BER10X	25	80.00	125.00	20.00	1.10	0.60	34.60	25.30	23.50	18,600	29,300	28.20	0.867
85BNR10S	18	85.00	130.00	22.00	1.10	0.60	28.40	26.80	25.70	13,100	18,700	37.50	0.962
85BNR10H	18	85.00	130.00	22.00	1.10	0.60	28.40	26.80	25.70	16,800	26,100	24.50	0.906
85BNR10X	18	85.00	130.00	22.00	1.10	0.60	28.40	26.80	25.70	19,600	30,700	24.50	0.906
85BER10S	25	85.00	130.00	22.00	1.10	0.60	36.10	25.60	24.60	11,200	15,900	43.50	0.962
85BER10H	25	85.00	130.00	22.00	1.10	0.60	36.10	25.60	24.60	14,900	23,300	29.50	0.906
85BER10X	25	85.00	130.00	22.00	1.10	0.60	36.10	25.60	24.60	17,700	28,000	29.50	0.906
90BNR10S	18	90.00	140.00	24.00	1.50	1.00	30.70	35.00	33.00	12,200	17,400	48.00	1.241
90BNR10H	18	90.00	140.00	24.00	1.50	1.00	30.70	35.00	33.00	15,700	24,400	31.50	1.155
90BNR10X	18	90.00	140.00	24.00	1.50	1.00	30.70	35.00	33.00	18,300	28,700	31.50	1.155
90BER10S	25	90.00	140.00	24.00	1.50	1.00	38.80	33.50	31.50	10,500	14,800	56.00	1.241
90BER10H	25	90.00	140.00	24.00	1.50	1.00	38.80	33.50	31.50	14,000	21,800	38.00	1.155
90BER10X	25	90.00	140.00	24.00	1.50	1.00	38.80	33.50	31.50	16,600	26,100	38.00	1.155
95BNR10S	18	95.00	145.00	24.00	1.50	1.00	31.30	35.50	34.50	11,700	16,700	50.00	1.298
95BNR10H	18	95.00	145.00	24.00	1.50	1.00	31.30	35.50	34.50	15,000	23,400	32.50	1.209
95BNR10X	18	95.00	145.00	24.00	1.50	1.00	31.30	35.50	34.50	17,500	27,500	32.50	1.209
95BER10S	25	95.00	145.00	24.00	1.50	1.00	39.70	34.00	33.00	10,000	14,200	58.50	1.298
95BER10H	25	95.00	145.00	24.00	1.50	1.00	39.70	34.00	33.00	13,400	20,900	39.50	1.209
95BER10X	25	95.00	145.00	24.00	1.50	1.00	39.70	34.00	33.00	15,900	25,000	39.50	1.209
100BNR10S	18	100.00	150.00	24.00	1.50	1.00	32.30	36.00	36.00	11,200	16,000	52.00	1.245
100BNR10H	18	100.00	150.00	24.00	1.50	1.00	32.30	36.00	36.00	14,400	22,400	34.00	1.253
100BNR10X	18	100.00	150.00	24.00	1.50	1.00	32.30	36.00	36.00	16,800	26,400	34.00	1.253
100BER10S	25	100.00	150.00	24.00	1.50	1.00	41.20	34.50	34.50	9,600	13,600	61.00	1.245
100BER10H	25	100.00	150.00	24.00	1.50	1.00	41.20	34.50	34.50	12,800	20,000	41.00	1.253

BNR&BER10

Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
100BER10X	25	100.00	150.00	24.00	1.50	1.00	41.20	34.50	34.50	15,200	24,000	41.00	1.253
105BNR10S	18	105.00	160.00	26.00	2.00	1.00	34.50	41.00	41.00	10,600	15,100	59.50	1.698
105BNR10H	18	105.00	160.00	26.00	2.00	1.00	34.50	41.00	41.00	13,600	21,200	39.00	1.585
105BNR10X	18	105.00	160.00	26.00	2.00	1.00	34.50	41.00	41.00	15,900	25,000	39.00	1.585
105BER10S	25	105.00	160.00	26.00	2.00	1.00	43.90	39.00	39.50	9,100	12,900	70.00	1.698
105BER10H	25	105.00	160.00	26.00	2.00	1.00	43.90	39.00	39.50	12,100	18,900	47.50	1.585
105BER10X	25	105.00	160.00	26.00	2.00	1.00	43.90	39.00	39.50	14,400	22,700	47.50	1.585
110BNR10S	18	110.00	170.00	28.00	2.00	1.00	36.70	46.00	47.00	10,000	14,300	68.00	2.133
110BNR10H	18	110.00	170.00	28.00	2.00	1.00	36.70	46.00	47.00	12,900	20,000	44.50	1.996
110BNR10X	18	110.00	170.00	28.00	2.00	1.00	36.70	46.00	47.00	15,000	23,600	44.50	1.996
110BER10S	25	110.00	170.00	28.00	2.00	1.00	46.70	44.00	45.00	8,600	12,200	79.50	2.133
110BER10H	25	110.00	170.00	28.00	2.00	1.00	46.70	44.00	45.00	11,500	17,900	54.00	1.996
110BER10X	25	110.00	170.00	28.00	2.00	1.00	46.70	44.00	45.00	13,600	21,500	54.00	1.996
120BNR10S	18	120.00	180.00	28.00	2.00	1.00	38.40	47.50	50.50	9,400	13,400	73.50	2.286
120BNR10H	18	120.00	180.00	28.00	2.00	1.00	38.40	47.50	50.50	12,000	18,700	48.00	2.139
120BNR10X	18	120.00	180.00	28.00	2.00	1.00	38.40	47.50	50.50	14,000	22,000	48.00	2.139
120BER10S	25	120.00	180.00	28.00	2.00	1.00	49.00	45.50	48.50	8,000	11,400	86.00	2.286
120BER10H	25	120.00	180.00	28.00	2.00	1.00	49.00	45.50	48.50	10,700	16,700	58.00	2.139
120BER10X	25	120.00	180.00	28.00	2.00	1.00	49.00	45.50	48.50	12,700	20,000	58.00	2.139
130BNR10S	18	130.00	200.00	33.00	2.00	1.00	43.00	60.00	61.50	8,500	12,200	89.50	3.408
130BNR10H	18	130.00	200.00	33.00	2.00	1.00	43.00	60.00	61.50	11,000	17,000	58.50	3.194
130BER10S	18	130.00	200.00	33.00	2.00	1.00	54.60	57.50	59.00	7,300	10,400	105.00	3.408
130BER10H	25	130.00	200.00	33.00	2.00	1.00	54.60	57.50	59.00	9,700	15,200	70.50	3.194
140BNR10S	25	140.00	210.00	33.00	2.00	1.00	44.60	62.50	66.50	8,000	11,500	97.00	3.647
140BNR10H	25	140.00	210.00	33.00	2.00	1.00	44.60	62.50	66.50	10,300	16,000	63.50	3.419
140BER10S	18	140.00	210.00	33.00	2.00	1.00	56.90	59.50	64.00	6,900	9,800	113.00	3.647
140BER10H	18	140.00	210.00	33.00	2.00	1.00	56.90	59.50	64.00	9,200	14,300	76.50	3.419
150BNR10S	18	150.00	225.00	35.00	2.10	1.00	47.60	73.50	78.00	7,500	10,700	114.00	4.405
150BNR10H	25	150.00	225.00	35.00	2.10	1.00	47.60	73.50	78.00	9,600	15,000	74.50	4.129
150BER10S	25	150.00	225.00	35.00	2.10	1.00	60.80	70.00	75.00	6,400	9,100	99.50	4.405
150BER10H	25	150.00	225.00	35.00	2.10	1.00	60.80	70.00	75.00	8,600	13,400	90.00	4.129

BNR&BER19

Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
25BNR19S	18	25.00	42.00	9.00	0.30	0.15	5.95	3.50	4.95	9.90	41,800	59,800	0.042
25BNR19H	18	25.00	42.00	9.00	0.30	0.15	5.95	3.50	3.25	9.90	53,800	83,600	0.038
25BNR19X	18	25.00	42.00	9.00	0.30	0.15	5.95	3.50	3.25	9.90	62,700	98,600	0.038
25BER19S	25	25.00	42.00	9.00	0.30	0.15	5.70	3.40	5.90	12.30	35,900	50,800	0.042
25BER19H	25	25.00	42.00	9.00	0.30	0.15	5.70	3.40	3.95	12.30	47,800	74,700	0.038
25BER19X	25	25.00	42.00	9.00	0.30	0.15	5.70	3.40	3.95	12.30	56,800	89,600	0.038
30BNR19S	18	30.00	47.00	9.00	0.30	0.15	6.30	4.05	5.75	10.80	36,400	52,000	0.048
30BNR19H	18	30.00	47.00	9.00	0.30	0.15	6.30	4.05	3.80	10.80	46,800	72,800	0.043
30BNR19X	18	30.00	47.00	9.00	0.30	0.15	6.30	4.05	3.80	10.80	54,600	85,800	0.043
30BER19S	25	30.00	47.00	9.00	0.30	0.15	6.00	3.90	6.80	13.50	31,200	44,200	0.048
30BER19H	25	30.00	47.00	9.00	0.30	0.15	6.00	3.90	4.60	13.50	41,600	65,000	0.043
30BER19X	25	30.00	47.00	9.00	0.30	0.15	6.00	3.90	4.60	13.50	49,400	78,000	0.043
35BNR19S	18	35.00	55.00	10.00	0.60	0.30	9.20	6.00	8.55	12.30	31,200	44,500	0.072
35BNR19H	18	35.00	55.00	10.00	0.60	0.30	9.20	6.00	5.60	12.30	40,000	62,300	0.063
35BNR19X	18	35.00	55.00	10.00	0.60	0.30	9.20	6.00	5.60	12.30	46,700	73,400	0.063
35BER19S	25	35.00	55.00	10.00	0.60	0.30	8.80	5.75	10.00	15.50	26,700	37,800	0.072
35BER19H	25	35.00	55.00	10.00	0.60	0.30	8.80	5.75	6.80	15.50	35,600	55,600	0.063
35BER19X	25	35.00	55.00	10.00	0.60	0.30	8.80	5.75	6.80	15.50	42,300	66,700	0.063
40BNR19S	18	40.00	62.00	12.00	0.60	0.30	11.50	7.65	10.80	14.30	27,500	39,300	0.105
40BNR19H	18	40.00	62.00	12.00	0.60	0.30	11.50	7.65	7.10	14.30	35,300	55,000	0.092
40BNR19X	18	40.00	62.00	12.00	0.60	0.30	11.50	7.65	7.10	14.30	41,200	64,800	0.092
40BER19S	25	40.00	62.00	12.00	0.60	0.30	11.00	7.35	12.80	17.90	23,600	33,400	0.105
40BER19H	25	40.00	62.00	12.00	0.60	0.30	11.00	7.35	8.65	17.90	31,400	49,100	0.092
40BER19X	25	40.00	62.00	12.00	0.60	0.30	11.00	7.35	8.65	17.90	37,300	58,900	0.092
45BNR19S	18	45.00	68.00	12.00	0.60	0.30	12.10	8.70	12.40	15.20	24,800	35,400	0.125
45BNR19H	18	45.00	68.00	12.00	0.60	0.30	12.10	8.70	8.10	15.20	31,900	49,600	0.111
45BNR19X	18	45.00	68.00	12.00	0.60	0.30	12.10	8.70	8.10	15.20	37,200	58,500	0.111
45BER19S	25	45.00	68.00	12.00	0.60	0.30	11.60	8.35	14.60	19.20	21,300	30,100	0.125

BNR&BER19

Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
45BER19H	25	45.00	68.00	12.00	0.60	0.30	11.60	8.35	9.85	19.20	28,400	44,300	0.111
45BER19X	25	45.00	68.00	12.00	0.60	0.30	11.60	8.35	9.85	19.20	33,700	53,100	0.111
50BNR19S	18	50.00	72.00	12.00	0.60	0.30	12.80	9.75	13.90	15.90	23,000	32,800	0.127
50BNR19H	18	50.00	72.00	12.00	0.60	0.30	12.80	9.75	9.10	15.90	29,600	46,000	0.111
50BNR19X	18	50.00	72.00	12.00	0.60	0.30	12.80	9.75	9.10	15.90	34,500	54,100	0.111
50BER19S	25	50.00	72.00	12.00	0.60	0.30	12.30	9.35	16.30	20.20	19,700	27,900	0.127
50BER19H	25	50.00	72.00	12.00	0.60	0.30	12.30	9.35	11.00	20.20	26,300	41,000	0.111
50BER19X	25	50.00	72.00	12.00	0.60	0.30	12.30	9.35	11.00	20.20	31,200	49,200	0.111
55BNR19S	18	55.00	80.00	13.00	1.00	0.60	14.40	11.40	16.20	17.50	20,800	29,700	0.178
55BNR19H	18	55.00	80.00	13.00	1.00	0.60	14.40	11.40	10.60	17.50	26,700	41,500	0.158
55BNR19X	18	55.00	80.00	13.00	1.00	0.60	14.40	11.40	10.60	17.50	31,200	48,900	0.158
55BER19S	25	55.00	80.00	13.00	1.00	0.60	13.80	10.90	16.10	22.20	17,800	25,200	0.178
55BER19H	25	55.00	80.00	13.00	1.00	0.60	13.80	10.90	12.90	22.20	23,800	37,100	0.158
55BER19X	25	55.00	80.00	13.00	1.00	0.60	13.80	10.90	12.90	22.20	28,200	44,500	0.158
60BNR19S	18	60.00	85.00	13.00	1.00	0.60	14.60	12.00	17.10	18.30	19,400	27,600	0.190
60BNR19H	18	60.00	85.00	13.00	1.00	0.60	14.60	12.00	11.20	18.30	24,900	38,700	0.170
60BNR19X	18	60.00	85.00	13.00	1.00	0.60	14.60	12.00	11.20	18.30	29,000	45,600	0.170
60BER19S	25	60.00	85.00	13.00	1.00	0.60	14.00	11.50	20.10	23.40	16,600	23,500	0.190
60BER19H	25	60.00	85.00	13.00	1.00	0.60	14.00	11.50	13.60	23.40	22,100	34,500	0.170
60BER19X	25	60.00	85.00	13.00	1.00	0.60	14.00	11.50	13.60	23.40	26,300	41,400	0.170
65BNR19S	18	65.00	90.00	13.00	1.00	0.60	15.20	13.20	18.70	19.10	18,100	25,900	0.204
65BNR19H	18	65.00	90.00	13.00	1.00	0.60	15.20	13.20	12.30	19.10	23,300	36,200	0.181
65BNR19X	18	65.00	90.00	13.00	1.00	0.60	15.20	13.20	12.30	19.10	27,100	42,600	0.181
65BER19S	25	65.00	90.00	13.00	1.00	0.60	14.50	12.60	22.10	24.60	15,500	22,000	0.204
65BER19H	25	65.00	90.00	13.00	1.00	0.60	14.50	12.60	14.90	24.60	20,700	32,300	0.181
65BER19X	25	65.00	90.00	13.00	1.00	0.60	14.50	12.60	14.90	24.60	24,600	38,800	0.181
70BNR19S	18	70.00	100.00	16.00	1.00	0.60	21.30	18.10	26.10	21.80	16,500	23,600	0.328
70BNR19H	18	70.00	100.00	16.00	1.00	0.60	21.30	18.10	17.10	21.80	21,200	33,000	0.292
70BNR19X	18	70.00	100.00	16.00	1.00	0.60	21.30	18.10	17.10	21.80	24,800	38,900	0.292
70BER19S	25	70.00	100.00	16.00	1.00	0.60	20.40	17.30	30.50	27.80	14,200	20,000	0.328

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Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
70BER19H	25	70.00	100.00	16.00	1.00	0.60	20.40	17.30	20.70	27.80	18,900	29,500	0.292
70BER19X	25	70.00	100.00	16.00	1.00	0.60	20.40	17.30	20.70	27.80	22,400	35,300	0.292
75BNR19S	18	75.00	105.00	16.00	1.00	0.60	21.60	19.00	27.50	22.60	15,600	22,300	0.348
75BNR19H	18	75.00	105.00	16.00	1.00	0.60	21.60	19.00	18.00	22.60	20,000	31,200	0.310
75BNR19X	18	75.00	105.00	16.00	1.00	0.60	21.60	19.00	18.00	22.60	23,400	36,700	0.310
75BER19S	25	75.00	105.00	16.00	1.00	0.60	20.70	18.20	32.50	29.00	13,400	18,900	0.348
75BER19H	25	75.00	105.00	16.00	1.00	0.60	20.70	18.20	21.70	29.00	17,800	27,800	0.310
75BER19X	25	75.00	105.00	16.00	1.00	0.60	20.70	18.20	21.70	29.00	21,200	33,400	0.310
80BNR19S	18	80.00	110.00	16.00	1.00	0.60	22.00	19.90	28.90	23.40	14,800	21,100	0.366
80BNR19H	18	80.00	110.00	16.00	1.00	0.60	22.00	19.90	18.90	23.40	19,000	29,500	0.326
80BNR19X	18	80.00	110.00	16.00	1.00	0.60	22.00	19.90	18.90	23.40	22,200	34,800	0.326
80BER19S	25	80.00	110.00	16.00	1.00	0.60	21.00	19.10	34.00	30.10	12,700	17,900	0.366
80BER19H	25	80.00	110.00	16.00	1.00	0.60	21.00	19.10	22.80	30.10	16,900	26,400	0.326
80BER19X	25	80.00	110.00	16.00	1.00	0.60	21.00	19.10	22.80	30.10	20,000	31,600	0.326
85BNR19S	18	85.00	120.00	18.00	1.10	0.60	29.40	26.30	38.00	25.70	13,700	19,600	0.527
85BNR19H	18	85.00	120.00	18.00	1.10	0.60	29.40	26.30	24.80	25.70	17,600	27,400	0.456
85BNR19X	18	85.00	120.00	18.00	1.10	0.60	29.40	26.30	24.80	25.70	20,500	32,200	0.456
85BER19S	25	85.00	120.00	18.00	1.10	0.60	28.10	25.20	35.50	32.90	11,800	16,600	0.527
85BER19H	25	85.00	120.00	18.00	1.10	0.60	28.10	25.20	30.00	32.90	15,700	24,400	0.456
85BER19X	25	85.00	120.00	18.00	1.10	0.60	28.10	25.20	30.00	32.90	18,600	29,300	0.456
90BNR19S	18	90.00	125.00	18.00	1.10	0.60	31.50	29.70	43.00	26.50	13,100	18,700	0.552
90BNR19H	18	90.00	125.00	18.00	1.10	0.60	31.50	29.70	28.10	26.50	16,800	26,100	0.480
90BNR19X	18	90.00	125.00	18.00	1.10	0.60	31.50	29.70	28.10	26.50	19,600	30,700	0.480
90BER19S	25	90.00	125.00	18.00	1.10	0.60	30.00	28.50	50.50	34.10	11,200	15,900	0.552
90BER19H	25	90.00	125.00	18.00	1.10	0.60	30.00	28.50	34.00	34.10	14,900	23,300	0.480
90BER19X	25	90.00	125.00	18.00	1.10	0.60	30.00	28.50	34.00	34.10	17,700	28,000	0.480
95BNR19S	18	95.00	130.00	18.00	1.10	0.60	32.00	31.00	50.00	28.30	12,500	17,800	0.571
95BNR19H	18	95.00	130.00	18.00	1.10	0.60	32.00	31.00	32.50	28.30	16,000	24,900	0.497
95BNR19X	18	95.00	130.00	18.00	1.10	0.60	32.00	31.00	32.50	28.30	18,700	29,400	0.497
95BER19S	25	95.00	130.00	18.00	1.10	0.60	30.50	29.70	58.50	36.70	10,700	15,200	0.571

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Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
95BER19H	25	95.00	130.00	18.00	1.10	0.60	30.50	29.70	39.50	36.70	14,300	22,300	0.497
95BER19X	25	95.00	130.00	18.00	1.10	0.60	30.50	29.70	39.50	36.70	16,900	26,700	0.497
100BNR19S	18	100.00	140.00	20.00	1.10	0.60	38.00	35.00	50.50	29.50	11,700	16,700	0.571
100BNR19H	18	100.00	140.00	20.00	1.10	0.60	38.00	35.00	33.00	29.50	15,000	23,400	0.497
100BNR19X	18	100.00	140.00	20.00	1.10	0.60	38.00	35.00	33.00	29.50	17,500	27,500	0.497
100BER19S	25	100.00	140.00	20.00	1.10	0.60	36.00	33.50	59.50	38.00	10,000	14,200	0.770
100BER19H	25	100.00	140.00	20.00	1.10	0.60	36.00	33.50	40.00	38.00	13,400	20,900	0.673
100BER19X	25	100.00	140.00	20.00	1.10	0.60	36.00	33.50	40.00	38.00	15,900	25,000	0.673
105BNR19S	18	105.00	145.00	20.00	1.10	0.60	38.50	36.50	53.00	31.50	11,200	16,000	0.795
105BNR19H	18	105.00	145.00	20.00	1.10	0.60	38.50	36.50	39.00	31.50	14,400	22,400	0.693
105BNR19X	18	105.00	145.00	20.00	1.10	0.60	38.50	36.50	39.00	31.50	16,800	26,400	0.693
105BER19S	25	105.00	145.00	20.00	1.10	0.60	37.00	35.00	62.00	40.90	9,600	13,600	0.795
105BER19H	25	105.00	145.00	20.00	1.10	0.60	37.00	35.00	42.00	40.90	12,800	20,000	0.693
105BER19X	25	105.00	145.00	20.00	1.10	0.60	37.00	35.00	42.00	40.90	15,200	24,000	0.693
110BNR19S	18	110.00	150.00	20.00	1.10	0.60	39.00	38.00	55.50	31.10	10,800	15,400	0.838
110BNR19H	18	110.00	150.00	20.00	1.10	0.60	39.00	38.00	42.00	31.10	13,900	21,600	0.733
110BNR19X	18	110.00	150.00	20.00	1.10	0.60	39.00	38.00	42.00	31.10	16,200	25,400	0.733
110BER19S	25	110.00	150.00	20.00	1.10	0.60	37.50	36.50	65.00	40.30	9,300	13,100	0.838
110BER19H	25	110.00	150.00	20.00	1.10	0.60	37.50	36.50	44.00	40.30	12,400	19,300	0.733
110BER19X	25	110.00	150.00	20.00	1.10	0.60	37.50	36.50	44.00	40.30	14,700	23,100	0.733
120BNR19S	18	120.00	165.00	22.00	1.10	0.60	54.00	52.00	75.00	34.20	9,900	14,100	1.124
120BNR19H	18	120.00	165.00	22.00	1.10	0.60	54.00	52.00	49.00	34.20	12,700	19,700	0.949
120BNR19X	18	120.00	165.00	22.00	1.10	0.60	54.00	52.00	49.00	34.20	14,800	23,200	0.949
120BER19S	25	120.00	165.00	22.00	1.10	0.60	51.50	50.00	88.00	44.20	8,500	12,000	1.124
120BER19H	25	120.00	165.00	22.00	1.10	0.60	51.50	50.00	59.50	44.20	11,300	17,600	0.949
120BER19X	25	120.00	165.00	22.00	1.10	0.60	51.50	50.00	59.50	44.20	13,400	21,100	0.949
130BNR19S	18	130.00	180.00	24.00	1.50	1.00	59.50	58.50	85.00	37.20	9,100	13,000	1.477
130BNR19H	18	130.00	180.00	24.00	1.50	1.00	59.50	58.50	56.00	37.20	11,700	18,100	1.265
130BER19S	18	130.00	180.00	24.00	1.50	1.00	57.00	56.50	100.00	48.10	7,800	11,000	1.477
130BER19H	25	130.00	180.00	24.00	1.50	1.00	57.00	56.50	67.50	48.10	10,400	16,200	1.265

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Designation	Dimensions							Performance					Mass
	Contact Angle	Inner Ring Diameter	Outer Ring Diameter	Width	Chamfer dimension		Distance Side Face to Pressure Point	Basic Dynamic Load Rating	Basic Static Load Rating	Limiting Speed (r/min)		Fatigue load limit (Kn)	(kg)
	°	d	D	B	r_{min}	r_{1min}	a	C (N)	C_0 (N)	Grease	Oil-air	P_u	≈
140BNR19S	25	140.00	190.00	24.00	1.50	1.00	60.00	61.50	89.50	38.80	8,500	12,200	1.567
140BNR19H	25	140.00	190.00	24.00	1.50	1.00	60.00	61.50	58.50	38.80	1,100	17,000	1.353
140BER19S	18	140.00	190.00	24.00	1.50	1.00	57.50	59.00	105.00	50.50	7,300	10,400	1.567
140BER19H	18	140.00	190.00	24.00	1.50	1.00	57.50	59.00	70.50	50.50	9,700	15,200	1.353
150BNR19S	18	150.00	210.00	28.00	2.00	1.00	77.00	78.50	114.00	43.20	7,800	11,200	2.459
150BNR19H	25	150.00	210.00	28.00	2.00	1.00	77.00	78.50	75.00	43.20	10,000	15,600	2.139
150BER19S	25	150.00	210.00	28.00	2.00	1.00	73.50	75.50	134.00	55.90	6,700	9,500	2.459
150BER19H	25	150.00	210.00	28.00	2.00	1.00	73.50	75.50	90.50	55.90	8,900	13,900	2.139

Bearing Preload

Preloading is the take up of internal clearance in a bearing by the application of a thrust load. Spindle bearings are matched and mounted with preload.

Preloading:

- **Minimizes axial and radial displacement under load.**
- **Increases system rigidity.**
- **Reduces non-repetitive run-out.**
- **Lessens the difference in contact angles between the balls and raceways at very high speeds.**
- **Prevents ball skidding under very high acceleration.**
- **Improves the rolling of the balls (spin/roll ratio).**
- **Ensures even loading of the balls.**
- **Enables faster speeds.**

In most cases, two types of preloads are sufficient - spring preload and rigid preload. In individual cases, hydraulic preload is used. This uses hydraulic pressure to set the preload during operation, depending on the speed of the bearing.

Spring Preload

Springs are often the simplest method for bearing preload and should be considered first. They are typically coil springs, disc springs, wave and finger spring washers which load the non-rotating ring of the bearing, typically the outer ring. The selected ring must maintain a floating clearance fit with the shaft and/or housing under all operating conditions (temperatures, high centrifugal forces, etc.).

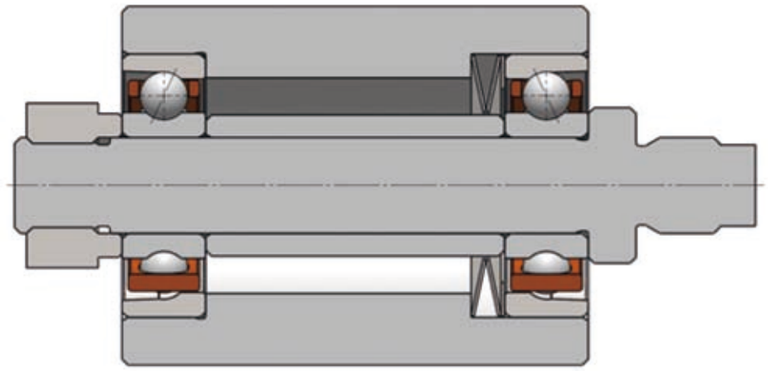
The advantage of a spring preload, compared with a rigid preload, is that it provides a constant preload on account of its lower sensitivity to different thermal expansions.

Ball or sliding bushes can be used to avoid misalignment from occurring at high speeds.

Properties:

- **Resistant to different thermal expansions between shaft and housing.**
- **Suitable for the highest speeds.**
- **Continuous preload, even with changes of temperature or speed.**
- **Limited axial rigidity.**

It should be noted that spring preloading cannot typically accommodate reversing thrust loads. Space must also be provided to accommodate both the springs and spring travel.



Spring preload

Rigid Preload with Paired/Duplexed Bearings

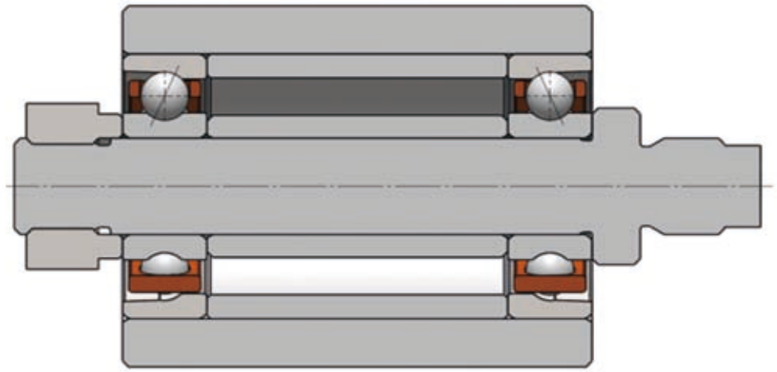
Matched pairs of bearings (duplex bearings) have a built-in means of preloading. The inner or outer ring faces of these bearings have been selectively relieved of a precise amount called the ‘preload offset’. When the bearings are clamped together during installation, the offset faces meet, establishing a permanent preload in the bearing set.

The design of a rigid bearing arrangement is less complex than a spring preload, as there is no floating bearing to consider, or any allowance made for the sliding movement of the bearing. Mounting of the bearing is also significantly easier. The preload can be determined using paired bearings and they must only be preloaded in sets.

Properties:

- **Significantly higher rigidity in both axial directions compared with spring preload.**
- **Fewer design constraints as preload is already integrated in the system.**
- **Easier to assemble and mount.**
- **Lower maximum speeds due to higher sensitivity to thermal expansion.**

The preload force should be determined depending on the desired performance. An excessive preload will lead to increased heating of the bearing, which makes it unsuitable for high speeds and will reduce the lifetime. An insufficient preload can lead to a slipping movement (sliding) between ball and raceway during operation, which also reduces the bearing life. A specific minimum bearing preload is thus required, and the preload classes L, M or H can be found in the spindle bearing tables.



Rigid preload

Speed Reduction with Rigid Bearing Arrangement

The high rigidity in these systems, compared with spring adjustment, means that it is not possible to compensate for expansion caused by temperature differences or centrifugal forces to the same extent. With the rigid bearing arrangement, maximum speeds can deviate from the values indicated in the table. Our bearing specialists are on hand to provide technical advice.

Axial Bearing Stiffness

The data tables reference the axial stiffness of the bearings when mounted as preloaded pairs under the defined preload levels.

Where a specific stiffness is required, axial, radial or moment the preload can be adjusted, or internal design adapted. Consult our engineering team with your requirements.

Unloading Force

Unloading force is an important consideration in the design of the bearing. If high axial forces on the shaft are expected, it is important to check the ratio of axial force to unloading force. If the axial force exceeds the unloading force, this may lead to increased noise and vibration, and therefore a reduced lifetime.

Abutment Bearings

Duplexing is used to greatly increase radial and axial rigidity. Bearing pairs can be arranged back-to-back (DB) or face-to-face (DF) to withstand bi-directional thrust loads, or tandem (DT) to withstand heavy uni-directional thrust loads.

Back–to–back arrangement (DB):

When the bearings are mounted and the inner rings clamped together, the load lines (lines through points of ball contact) converge outside the bearings (forming an ‘O’), resulting in increased moment rigidity. The axial force is absorbed in both directions.

This configuration is suited for most applications having good alignment of bearing housings and shafts. It is also preferable where high moment rigidity is required, and where the shaft runs warmer than the housing.

Face–to–face arrangement (DF):

When the bearings are mounted and the outer rings clamped together, the load lines converge toward the bore (forming an ‘X’). The axial force is absorbed in both directions.

DF mounting is used in few applications — mainly where misalignment must be accommodated. This arrangement has less tilting rigidity and as such, speed capability is usually lower than a DB pair of identical preloads.

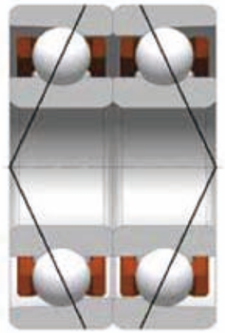
Tandem arrangement (DT):

Abutting faces of DT pairs have equal offsets, creating parallel load lines. When mounted and preloaded by thrust forces, both bearings share the load equally.

DT pairs offer greater capacity without increasing bearing size, through load sharing - the axial load capacity is twice that of a single bearing. They can counter heavy thrust loads but only from one direction and they cannot take reversing loads as DB and DF pairs can. To combat this, DT pairs are usually opposed by another DT pair or a single bearing.

Universal design:

Universally preloaded bearings have equal face offsets on both sides of the bearings allowing them to be assembled in all configurations. Such bearings may be ordered as singles (DS) or in sets of two or more bearings. When ordered as universal sets this means the bore and outer diameter are in the same calibration group to ensure each bearing bears the same load.



Back-to-back arrangement (DB)

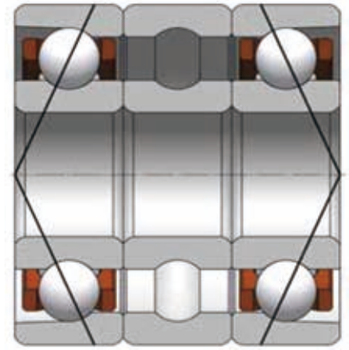
Face-to-face arrangement (DF)

Tandem arrangement (DT)

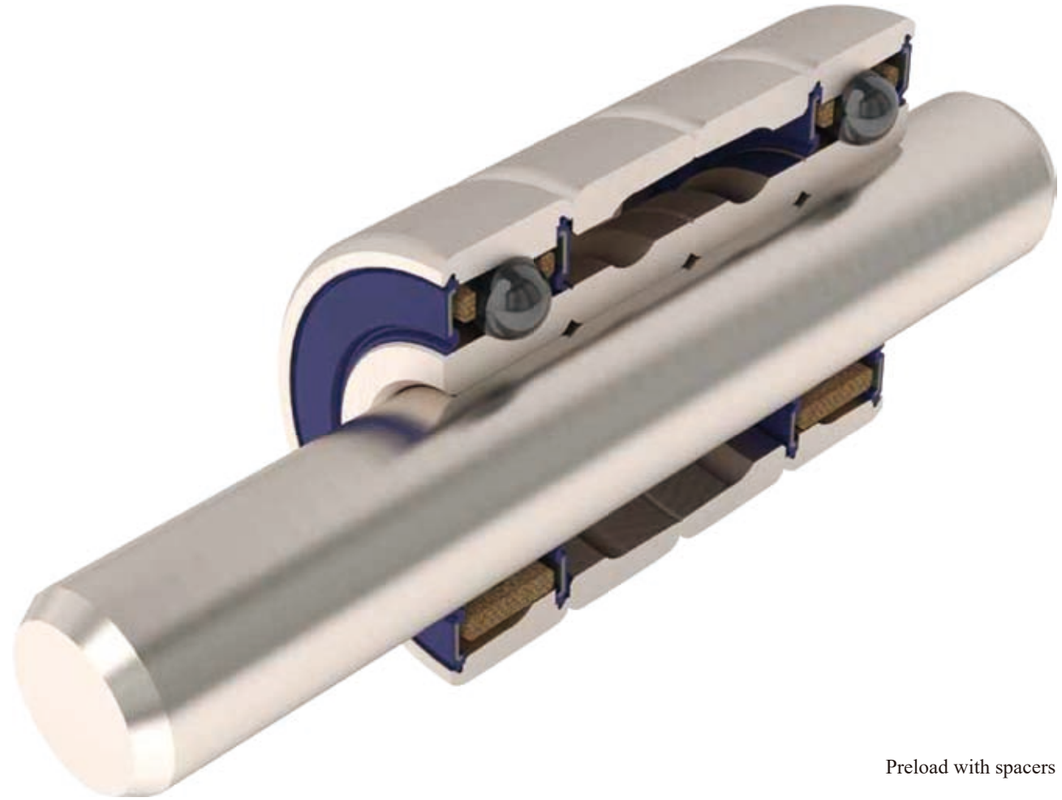
Spacers

All duplex pairs can be separated by equal-width spacers to increase moment rigidity. Spacers should ideally be machined as sets to ensure that inner and outer rings spacers are equal in length to preserve the factory preload levels. Care should be given to spacer parallelism and face runout to avoid any misalignment of the bearings when installed.

The diagram below shows two spindle bearings which are preloaded against each other with a defined force. In this instance two bearing inner and outer rings are used to provide a wide spacer. We also offer custom designed spacers and complete assemblies consisting of spindle bearings, spacers, and shaft.



Bearing inner and outer ring as spacer



Preload with spacers

➤ Sizes, Tolerances and Geometric Accuracy

Our spindle bearings are manufactured in compliance with the current ISO (International Organization for Standardization) or ABEC (Annular Bearing Engineering Committee) standards.

Among the ISO standards, PO corresponds to the standard accuracy precision with classes P6 through P2 indicating increasing precision. The ABEC classes for precision ball bearings define tolerances for major bearing dimensions and characteristics. ABEC1 corresponds with the lowest tolerance class and ABEC9 to the highest level of precision. The tables on the following pages represent tolerance values for both specifications and we produce spindle bearings to these tolerance classes as standard.

Internal Standards

While ISO/ABEC classes are useful, they are not all inclusive and they do not address many factors which affect performance and life (such as materials, ball complement, radial play or contact angle, cage design). To maintain a consistent level of precision in all aspects of its bearings, we apply internally developed standards to these factors. As part of these standards, all spindle bearings are 100% noise tested to ensure quiet operation.

➤ Mounting and Fitting

The efficiency of our spindle bearings is determined largely by the precision of the mating parts and the accuracy of the fit will affect the performance of the bearing. Therefore, careful attention should be paid to the mounting and fitting. Bearing seats on shafts and housings must be accurately machined and should match the bearing ring width to provide maximum seating surface. The appropriate fit may vary according to the specific operating requirements and mounting design, and it may have moderate interference, moderate looseness or even a transitional nature.

For example, high speeds will result in increased centrifugal forces, leading to expansion of the inner ring which may result in it sliding on the shaft causing fretting, corrosion, and vibration. To prevent this, a tighter fit should be selected. The fit can also be selected using tables “Shaft Tolerances” and “Housing Tolerances”.

To ensure a proper fit, assemble only clean, burr-free parts. Even small amounts of dirt on the shaft or housing can cause severe bearing misalignment problems.

➤ Handling of Spindle Bearings

All our spindle bearings are manufactured, assembled, and packaged in strictly controlled environments. If the full potential of these precision bearings is to be realized, then the same degree of care and attention must be used in installing them.

The first rule for handling bearings is to keep them clean. Consider every kind of foreign material — dust, moisture, fingerprints, solvents, lint, dirty grease — to be abrasive, corrosive or otherwise potentially damaging to the bearing precision.

We recommend following the guidelines below when handling our precision bearings, paying particular attention when installing or removing the bearings from shaft or housing assemblies.

- **Ensure that the workplace is extremely clean and keep bearings in their original packaging until ready for use.**
- **Once unpacked, handle the bearings with clean, dry, talc-free gloves. Note that material incompatibility between the gloves and any cleaning solvents could result in contaminant films being transferred to the bearings during subsequent handling.**
- **Protect unwrapped bearings by keeping them always covered. Use a clean dry cover that will not shed fibrous or particulate contamination into the bearings.**
- **Avoid knocks and any impact to the bearings.**
- **Bearings should not be spun by hand or with an airline, as this can cause the balls to run over the retaining dam causing cuts and subsequent noise/ reliability issues.**
- **Do not wash or treat the bearings. We take great care in cleaning our bearings and properly pre-lubricating them before packaging.**
- **Use only bearing-quality lubricants, and keep them clean during application, and covered between uses. For greased bearings, apply only the proper quantity of grease with a clean applicator. Ensure that all lubricants are within the recommended shelf life before application.**
- **Assemble using only clean, burr-free tools. Housing interiors and shaft seats should be thoroughly cleaned before fitting. Do not use tools that are painted, or chrome plated as these can provide a source of particulate contamination.**
- **For high-speed applications perform a grease distribution run.**
- **Bearing pairs in O, X or tandem arrangement (labelled with DB, DF or DT) are not interchangeable and may only be installed with the delivered spindle bearing of the corresponding type; labelling is carried out by means of arrow symbols on the outer diameter (<>, ><, », «)**
- **The marking indicates the load direction of the outer ring.**
- **Bearings supplied as universal can be installed as required e.g., with bearings from other batches. The load direction is indicated by arrow symbols on the outer ring.**

➤ Inner Ring Tolerances

			d [mm]		P4 / ABEC7		P2 / ABEC9		P4S	
			over	incl.	max.	min.	max.	min.	max.	min.
Deviation of mean bore diameter in a single plane / Deviation of a single bore diameter		Δ_{dmp}/ Δ_{ds}	-	18	0	-4	0	-2.5	0	-4
			18	30	0	-5	0	-2.5	0	-5
			30	50	0	-6	0	-2.5	0	-6
			50	80	0	-7	0	-4	0	-7
			80	120	0	-8	0	-5	0	-8
			120	180	0	-10	0	-7	0	-10
Variation of bore diameter in a single plane	Diameter series 718/719	V_{dsp}	-	18	4		2.5		2.5	
			18	30	5		2.5		2.5	
			30	50	6		2.5		2.5	
			50	80	7		4		4	
			80	120	8		5		5	
			120	180	10		7		7	
	70/72	V_{dsp}	-	18	3		2.5		2.5	
			18	30	4		2.5		2.5	
			30	50	5		2.5		2.5	
			50	80	5		4		4	
			80	120	6		5		5	
			120	180	8		7		7	
	2/3/5	V_{dsp}	-	18	3		2.5		2.5	
			18	30	4		2.5		2.5	
			30	50	5		2.5		2.5	
			50	80	5		4		4	
			80	120	6		5		5	
			120	180	8		7		7	
Variation of mean bore diameter		V_{dmp}	-	18	2		1.5		1.5	
			18	30	2.5		1.5		1.5	
			30	50	3		1.5		1.5	
			50	80	3.5		2		2	
			80	120	4		2.5		2.5	
			120	180	5		3.5		3.5	
Radial runout of inner ring of assembled bearing		K_{ia}	0.6	2.5	2.5		1.5		1.5	
			2.5	10	2.5		1.5		1.5	
			10	18	2.5		1.5		1.5	
			18	30	3		2.5		2.5	
			30	50	4		2.5		2.5	
			50	80	4		2.5		2.5	
			80	120	5		2.5		2.5	
			120	150	6		2.5		2.5	
			150	180	6		5		5	
Perpendicularity of inner ring face with respect to the bore		S_d	0.6	18	3		1.5		1.5	
			18	30	4		1.5		1.5	
			30	50	4		1.5		1.5	
			50	80	5		1.5		1.5	
			80	120	5		2.5		2.5	
			120	150	6		2.5		2.5	
			150	180	6		4		4	
Axial runout of inner ring of assembled bearing		S_{ia}	-	2.5	3		1.5		1.5	
			2.5	10	3		1.5		1.5	
			10	18	3		1.5		1.5	
			18	30	4		2.5		2.5	
			30	50	4		2.5		2.5	
			50	80	5		2.5		2.5	
			80	120	5		2.5		2.5	
			120	150	7		2.5		2.5	
			150	180	7		5		5	
Deviation of a single inner ring width		Δ_{Bs} normal	-	2.5	0	-40	0	-40	0	-40
			2.5	10	0	-40	0	-40	0	-40
			10	18	0	-80	0	-80	0	-80
			18	30	0	-120	0	-120	0	-120
			30	50	0	-120	0	-120	0	-120
			50	80	0	-150	0	-150	0	-150
			80	120	0	-200	0	-200	0	-200
			120	180	0	-250	0	-250	0	-250
Deviation of the total inner ring width for duplexed bearings		Δ_{Bs} modified[a]	-	2.5	0	-250	0	-250	0	-250
			2.5	50	0	-250	0	-250	0	-250
			50	80	0	-250	0	-250	0	-250
			80	120	0	-380	0	-250	0	-250
			120	180	0	-380	0	-250	0	-250
Variation of inner ring width		V_{Bs}	-	2.5	2.5		1.5		1.5	
			2.5	10	2.5		1.5		1.5	
			10	30	2.5		1.5		1.5	
			30	50	3		1.5		1.5	
			50	80	4		1.5		1.5	
			80	120	4		2.5		2.5	
			120	150	5		2.5		2.5	
			150	180	5		4		4	

All figures in μm.

➤ Outer Ring Tolerances

			D [mm]		P4 / ABEC7		P2 / ABEC9		P4S	
			over	incl.	max.	min.	max.	min.	max.	min.
Deviation of mean outside diameter in a single plane / Deviation of a single outside diameter		Δ_{dmp}/ Δ_{ds}	-	18	0	-4		-2.5	0	-4
			18	30	0	-5		-4	0	-5
			30	50	0	-6		-4	0	-6
			50	80	0	-7		-4	0	-7
			80	120	0	-8		-5	0	-8
			120	150	0	-9		-5	0	-9
			150	180	0	-10		-7	0	-10
Variation of outside diameter in a single plane	Diameter series 718/719	V_{dsp}	-	18	4				2.5	
			18	30	5				4	
			30	50	6				4	
			50	80	7				4	
			80	120	8				5	
			120	150	9				5	
			150	180	10				7	
	70/72	V_{dsp}	-	18	3				2.5	
			18	30	4				4	
			30	50	5				4	
			50	80	5				4	
			80	120	6				5	
			120	150	7				5	
			150	180	8				7	
	2/3/5	V_{dsp}	-	18	3				2.5	
			18	30	4				4	
			30	50	5				4	
			50	80	5				4	
			80	120	6				5	
			120	150	7				5	
			150	180	8				7	
Variation of mean outside diameter		V_{dmp}	-	18	2				1.5	
			18	30	2.5				2	
			30	50	3				2	
			50	80	3.5				2	
			80	120	4				2.5	
			120	150	5				2.5	
			150	180	5				3.5	
Radial runout of outer ring of assembled bearing		K_{ia}	-	2.5	3				1.5	
			2.5	18	3				1.5	
			18	30	4				2.5	
			30	50	5				2.5	
			50	80	5				4	
			80	120	6				5	
			120	150	7				5	
			150	180	8				5	
Perpendicularity of outer ring outside surface with respect to the face		S_d	-	80	4				1.5	
			80	120	5				2.5	
			120	150	5				2.5	
Axial runout of outer ring of assembled bearing		S_{ia}	-	6	5				1.5	
			6	18	5				1.5	
			18	30	5				2.5	
			30	50	5				2.5	
			50	80	5				4	
			80	120	6				5	
			120	150	7				5	
			150	180	8				5	
Axial runout of outer ring flange back face of assembled bearing		S_{ea1}	-	18	7				3	
			18	50	7				4	
			50	80	7				6	
			80	120	8				7	
			120	150	10				7	
			150	180	11				7	
Deviation of a single outer ring width		ΔC_s normal	-	18	Identical with ΔB_s for inner ring of the same bearing					
			18	50						
			50	80						
			80	180						
Deviation of the total outer ring width for duplexed bearings		ΔC_s modified[b]	-	180	Identical with ΔB_s for inner ring of the same bearing					
Variation of outer ring width		VC_s	-	18	2.5				1.5	
			18	30	2.5				1.5	
			30	50	2.5				1.5	
			50	80	3				1.5	
			80	120	4				2.5	
			120	180	5				2.5	
			120	150	5				2.5	
			150	180	5				4	

All figures in μm.

➤ Shaft Tolerances

				d [mm]		P4 / ABEC7		P2 / ABEC9		P4S	
				over	incl.	max.	min.	max.	min.	max.	min.
Deviation of mean bore diameter in a single plane / Deviation of a single outside diameter	Δ_{dmp}/ Δ_{ds}			-	18	0	-4	0	-2.5	0	-4
				18	30	0	-5	0	-2.5	0	-5
				30	50	0	-6	0	-2.5	0	-6
				50	80	0	-7	0	-4	0	-7
				80	120	0	-8	0	-5	0	-8
				120	180	0	-10	0	-7	0	-10
Deviation of the shaft diameter	Operating Conditions	Clearance	Little load Medium speeds No vibration	-	18	-5	-9	-4	-7	-5	-9
				18	30	-6	-11	-4	-7	-6	-11
				30	50	-7	-13	-4	-7	-7	-13
				50	80	-8	-15	-5	-9	-8	-15
				80	120	-9	-17	-6	-11	-9	-17
				120	180	-11	-21	-8	-15	-11	-21
		Transfer	Medium load Medium speed	-	18	0	-4	0	-2.5	0	-4
				18	30	0	-5	0	-2.5	0	-5
				30	50	0	-6	0	-2.5	0	-6
				50	80	0	-7	0	-4	0	-7
				80	120	0	-8	0	-5	0	-8
				120	180	0	-10	0	-7	0	-10
		Oversize	High load High speeds Large vibration	-	18	5	1	4	1	5	1
				18	30	6	1	4	1	6	1
				30	50	7	1	4	1	7	1
				50	80	8	1	5	1	8	1
				80	120	9	1	6	1	9	1
				120	180	11	1	8	1	11	1
Variation of the shaft diameter on a radial plane (roundness)	Diameter series 718/719			-	18	2		1.5		1.5	
				18	30	2.5		1.5		1.5	
				30	50	3		1.5		1.5	
				50	80	4		2		2	
				80	120	4		2.5		2.5	
				120	180	5		4		4	
	70/72			-	18	1.5		1.5		1.5	
				18	30	2		1.5		1.5	
				30	50	2.5		1.5		1.5	
				50	80	2.5		2		2	
				80	120	3		2.5		2.5	
				120	180	4		4		4	
	2/3/5			-	18	1.5		1.5		1.5	
				18	30	2		1.5		1.5	
				30	50	2.5		1.5		1.5	
				50	80	2.5		2		2	
				80	120	3		2.5		2.5	
				120	180	4		4		4	
Variation of the average shaft diameter (conicity)				-	18	1		0.8		0.8	
				18	30	1.5		0.8		0.8	
				30	50	1.5		0.8		0.8	
				50	80	2		1		1	
				80	120	2		1.5		1.5	
				120	180	2.5		2		2.5	
Concentricity of the shaft				-	2.5	1.5		0.8		0.8	
				2.5	10	1.5		0.8		0.8	
				10	18	1.5		0.8		0.8	
				18	30	1.5		1.5		1.5	
				30	50	2		1.5		1.5	
				50	80	2		1.5		1.5	
				80	120	2.5		1.5		1.5	
				120	150	3		1.5		1.5	
				150	180	3		2.5		2.5	
Axial runout of the face in relation to the shaft				-	18	1.5		0.8		0.8	
				18	30	2		0.8		0.8	
				30	50	2		0.8		0.8	
				50	80	2.5		0.8		0.8	
				80	120	2		1.5		1.5	
				120	150	3		1.5		1.5	
				150	180	3		2		2	

All figures in µm.
Axial securing of the inner ring is required (tight fit).

➤ Housing Tolerances

				D [mm]		P4 / ABEC7		P2 / ABEC9		P4S	
				over	incl.	max.	min.	max.	min.	max.	min.
Deviation of mean outside diameter in a single plane / Deviation of a single outside diameter	Δ_{dmp}/ Δ_{ds}			-	18	0	-4	0	-2.5	0	
				18	30	0	-5	0	-4	0	
				30	50	0	-6	0	-4	0	
				50	80	0	-7	0	-4	0	
				80	120	0	-8	0	-5	0	
				120	150	0	-9	0	-5	0	
				150	180	0	-10	0	-7	0	
Deviation of the housing diameter	Operating Conditions	Clearance	Little load Medium speeds No vibration	-	18	5	1	4	1	5	
				18	30	6	1	5	1	6	
				30	50	7	1	5	1	7	
				50	80	8	1	5	1	8	
				80	120	9	1	6	1	9	
				120	150	10	1	6	1	10	
				150	180	11	1	8	1	11	
		Transfer	Medium load Medium speed Little vibration	-	18	0	-4	0	-3	0	
				18	30	0	-5	0	-4	0	
				30	50	0	-6	0	-4	0	
				50	80	0	-7	0	-4	0	
				80	120	0	-8	0	-4	0	
				120	150	0	-9	0	-5	0	
				150	180	0	-10	0	-7	0	
		Oversize	High load High speeds Large vibration	-	18	-5	-9	-4	-7	-5	
				18	30	-6	-11	-5	-9	-6	
				30	50	-7	-13	-5	-9	-7	
				50	80	-8	-15	-5	-9	-8	
				80	120	-9	-17	-6	-11	-9	
				120	150	-10	-19	-6	-11	-10	
				150	180	-11	-21	-8	-15	-11	
Variation of the housing borehole on a radial plane (roundness)	Diameter series 718/719			-	18	2		1.5		1.5	
				18	30	2.5		2		2	
				30	50	3		2		2	
				50	80	4		2		2	
				80	120	4		2.5		2.5	
				120	150	5		2.5		2.5	
				150	180	5		4		4	
	70/72			-	18	1.5		1.5		1.5	
				18	30	2		2		2	
				30	50	2.5		2		2	
				50	80	2.5		2		2	
				80	120	3		2.5		2.5	
				120	150	4		2.5		2.5	
				150	180	4		4		4	
	2/3/5			-	18	1.5		1.5		1.5	
				18	30	2		2		2	
				30	50	2.5		2		2	
				50	80	2.5		2		2	
				80	120	3		2.5		2.5	
				120	150	4		2.5		2.5	
				150	180	4		4		4	
Variation of the average housing borehole (conicity)				-	18	1		0.8		0.8	
				18	30	1.5		1		1	
				30	50	1.5		1		1	
				50	80	2		1		1	
				80	120	2		1.5		1.5	
				120	150	2.5		1.5		1.5	
				150	180	2.5		2		2	
Runout of the housing borehole (concentricity)				-	2.5	1.5		0.8		0.8	
				2.5	18	1.5		0.8		0.8	
				18	30	2		0.8		1.5	
				30	50	2.5		1.5		1.5	
				50	80	2.5		2		2	
				80	120	3		2.5		2.5	
				120	150	4		2.5		2.5	
				150	180	4		2.5		2.5	
Axial runout of the face in relation to the housing borehole				-	6	2.5		0.8		0.8	
				6	18	2.5		0.8		0.8	
				18	30	2.5		1.5		1.5	
				30	50	2.5		1.5		1.5	
				50	80	2.5		2		2	
				80	120	3		2.5		2.5	
				120	150	4		2.5		2.5	
				150	180	4		2.5		2.5	

All figures in µm.
Axial securing of the outer ring is required (tight fit).

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