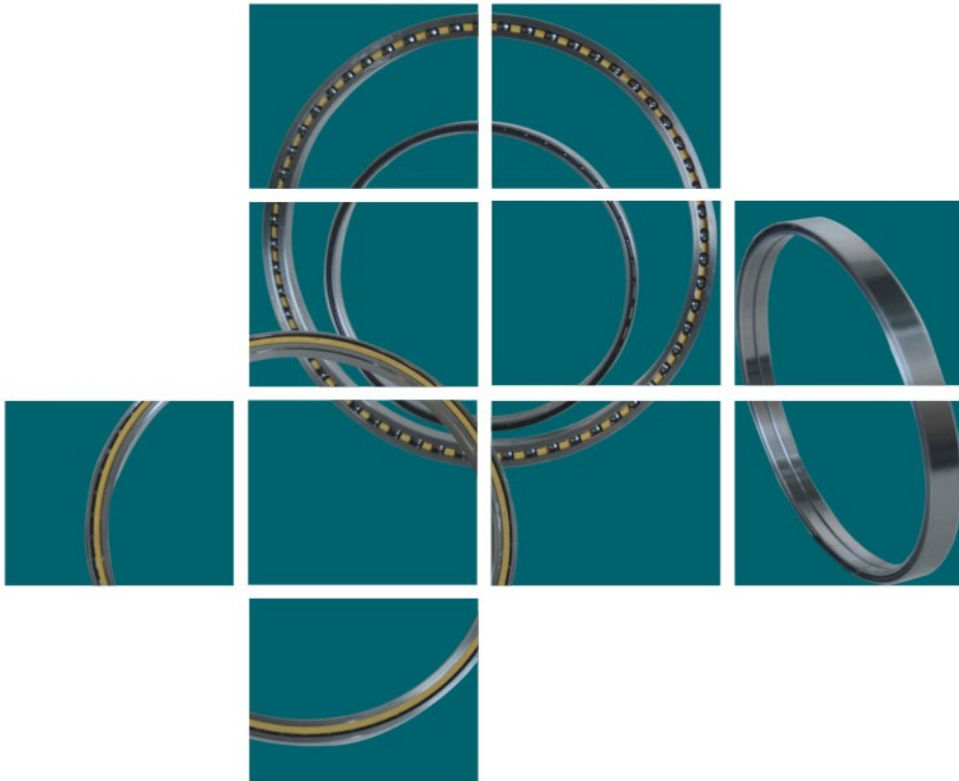


CHG[®]



Precision Thin-Section Bearings

LUOYANG HUIGONG BEARING TECHNOLOGY CO., LTD.

Company Profile

Luoyang Huigong Bearing Technology Co., Ltd (CHG) was established in 1998. It is a professional bearing company mainly engaged in design, development, manufacture and sales service for uniform-section thin-section bearings, thin-section cross-roller bearings, large precision high-speed ball bearings, and other high precision bearings. With the customer satisfaction as the goal and with the strict quality control as the product protection, CHG researchers have developed many types of high-precision, high-performance and high-quality bearings. Currently, the products have been widely used in industrial robotics, aviation, aerospace, national defense, medical equipment, radar antennas, optical device and other fields, and have won the praises from customers.

The uniform-section thin-section bearings produced by CHG can be divided into 7 opened series and 5 sealed series, with the inner diameter range from 1" to 40" and the cross-sectional dimension range from 0.1875" × 0.1875" to 1.000" × 1.000". The opened series include 3 types of radial contact (C-type), angular contact (A-type) and four-point contact (X-type), and the sealed series include 2 types of radial contact (C-type) and four-point contact (X-type).

The use of thin-section bearings can save the space, lower the weight, reduce significantly the friction, and provide the good rotation accuracy. Without affecting the performances and service lives of bearings, their use can reduce the external dimensions of the device and cut the production costs effectively.

Adhering to the concept of "Collect Elites and Develop Boutique", our company is committed to providing customers with high quality products. CHG has a technical team with more than ten years of research and development experiences for bearings, and they have achieved the outstanding results and more than 20 patents in design, manufacture and detection of uniform-section thin-section bearings, thin-section cross-roller bearings, large precision high-speed ball bearings, military bearings and other precision bearings. In 2008, CHG became the first private cooperation enterprise and teaching practice base for Henan University of science and technology in Luoyang. The computer design and analysis software system established after several tests and improvements has become a reliable guarantee, to develop the high-precision and high-performance bearings in our company.

The company's production technologies have passed through ISO9001: 2008 quality management system certification and can be tested by SGS, ASIA or other third-party international testing organizations according to the customer requirements.

After many years of accumulation and development, our company has been widely recognized on markets and in societies, and awarded with "Outstanding Private Enterprise", "Key Protection Enterprise", "Class A Taxpayer" in many times in Henan province and Luoyang city. With good reputation and pragmatic style, our company has been widely praised in the field.

With good product quality, integrity attitude, and continuous technological progress, our company has entered into a professional development path. Our company has owned a large number of customers with well-known brands, and our products have exported to more than thirty countries and regions, such as United States, Germany, Spain, Austria, Netherlands, Japan, India, with a steadily increasing of sales achievement.





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Structure and features of thin-section bearings

Product description

CHG products include 7 opened series (Fig. 1-1) and 5 sealed series (Fig. 1-2) of thin-section bearings with the inner diameter range from 1.000" to 40.000" and the sectional dimension range from 0.1875" × 0.1875" to 1.000" × 1.000" and 3 main types (A, C, X) of opened bearings and sealed bearings.

We can provide the products with different internal clearances, contact angles, lubrication methods, cage structures and other properties to meet the needs of most customers. Where the corrosion resistance is required, the bearings produced with the stainless steel 9Cr18 should be preferred, with a convenient and quick delivery.

Where there is no any severe pollution, the opened bearings should be preferred; where the cleaning and well lubrication are required, the sealed bearings should be preferred.

There are many bearing cage structures for selection, which are used to space evenly the rolling elements and prevent the friction from their mutual contacts. The common cage structures include overall "Crown", overall circular pockets, wire ring form, teflon spacers, isolation balls and so on.

Quality control standard

Nowadays, the product tracking is becoming more and more important. To meet this requirement, each series of bearings is numbered, for customers to confirm easily and quickly the company's products at any time.

C-type open bearings

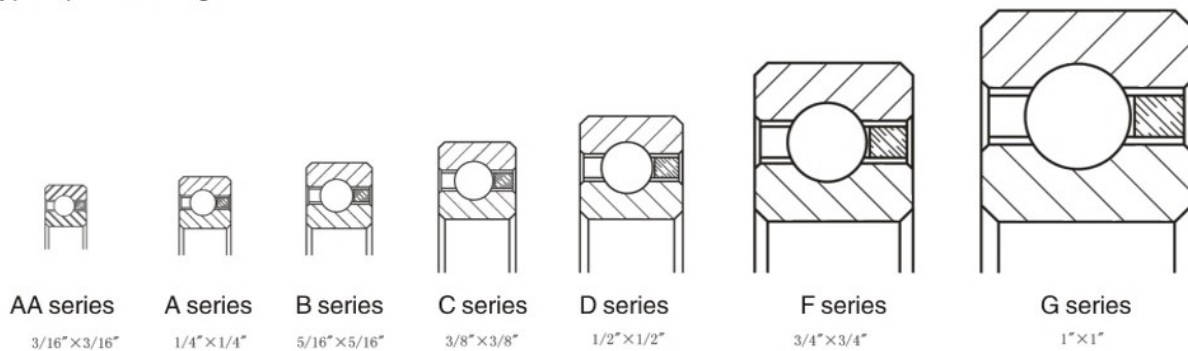


Figure 1-1 Open bearings

C-type closed bearings

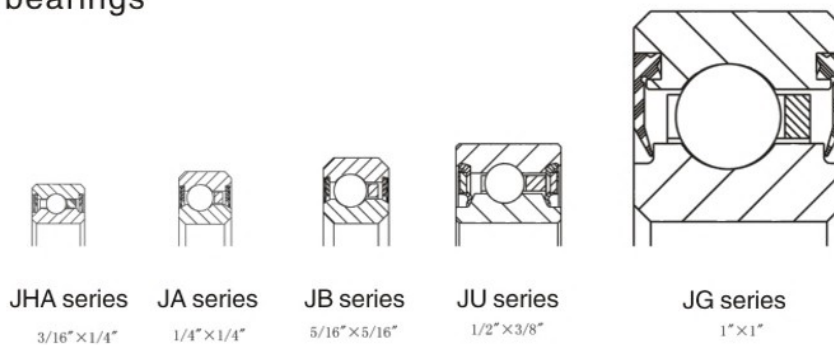
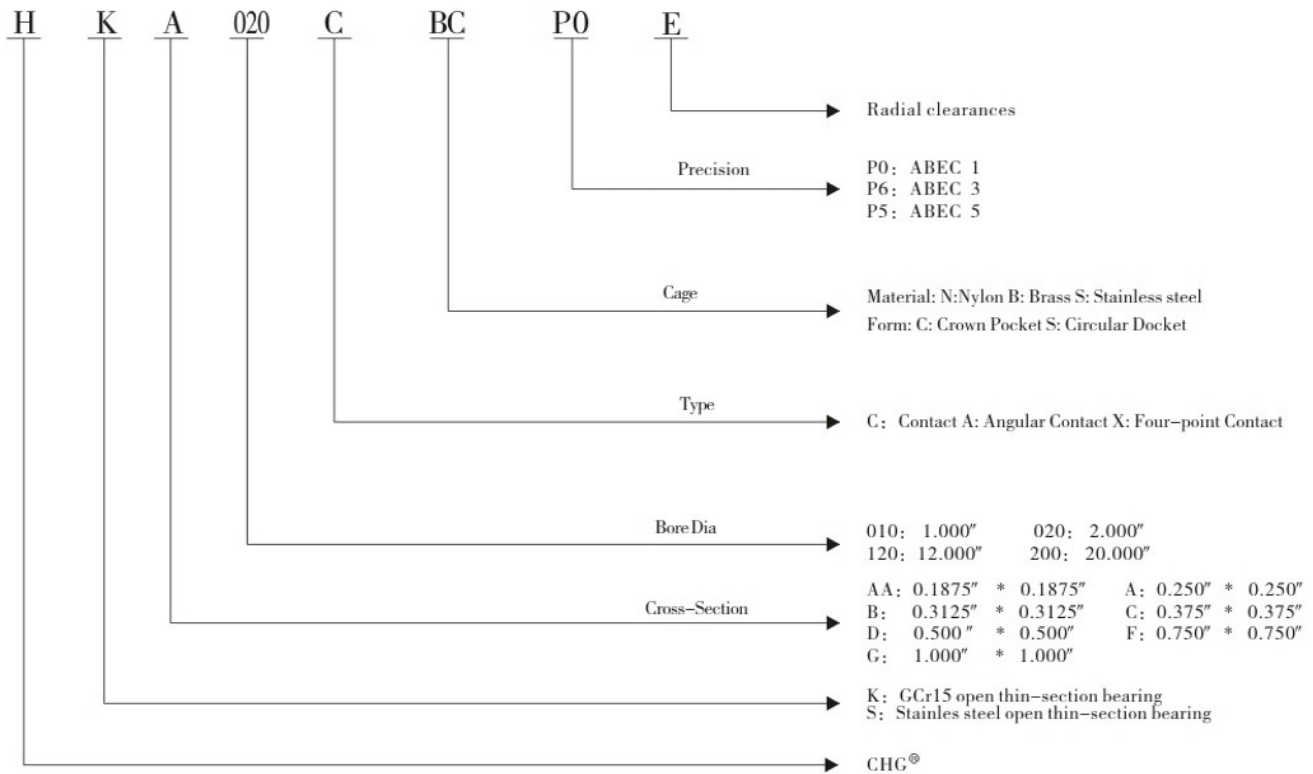


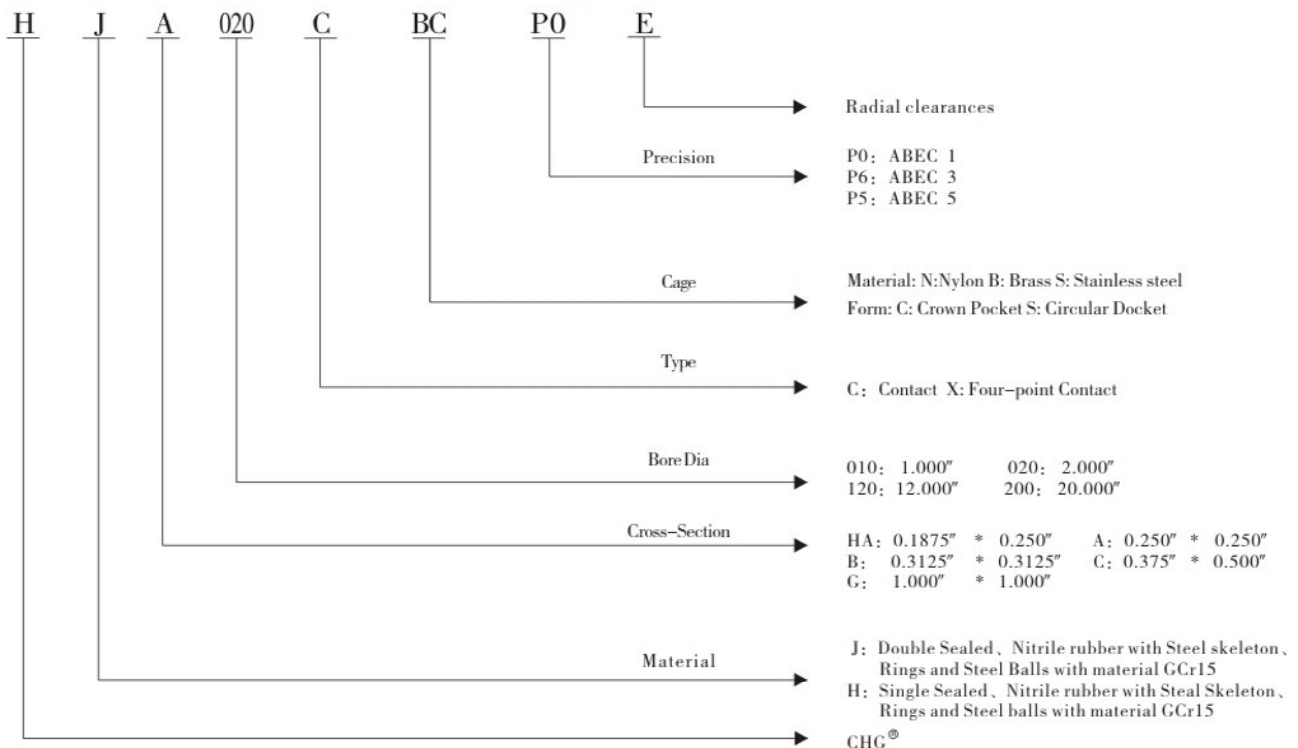
Figure 1-2 Sealed bearings

Type description of Thin-Section Bearings

Example of open Thin-Section Bearings



Example of Sealed Thin-Section Bearings



Bearing type selection

I. C-type – Deep groove ball bearing (see Fig. 1.1)

C-type deep groove ball bearing has an inner ring and an outer ring with super deep grooves (raceway groove depth = 25% of the ball diameter). Usually, during the assembling process, place eccentrically the inner ring into the outer ring, and place a half of the quantity of balls to fill fully the groove, place concentrically the inner and outer ring, and uniform distribute the balls, and then assemble the cage.

With the other assembling method, install the balls from the “counterbore” at one side or both sides of the raceway rib, with which more balls can be installed until the groove is filled fully. Such bearing can carry a heavier load, but its operating conditions are restricted certainly, which can be detailed in “Cage Type” section.

C-type bearing has the best performances when the clearance between the balls and the raceway (radial clearance) is smallest. The standard bearings with a certain clearance are used in the cases as follows:

- When there is interference fit between the bearing and its installation location;
- When the steel raceways have differential thermal expansions or contractions;
- When the clearance change is caused by misalignment between the shaft and the housing or other factors.

Under the conditions with a radial load and without any axial load, the force is applied at the center of ball and raceway contact area in C-type bearing. In order to adapt to the operation conditions, sometimes the clearance may be increased or decreased.

For C-type bearing without counterbore, in addition to the radial load, it can also carry the axial (thrust) load in either direction. However, its axial load carrying capacity depends on the bearing clearance installed. The clearance determines the contact angle of the ball and the raceway under axial load, and then determines the bearing axial load capacity. For the bearing with ball installation holes, under the axial load, the contact points between balls and the raceway are not continuous, which reduces the bearing axial load capacity. If there is an axial load, the carrying capacity at the side with counterbore may be restricted.

If C-type bearing has a radial clearance more than the standard value, under an axial load, it can obtain a greater contact angle, which can carry a greater thrust load. At this time, it should be adjusted with any other bearing on the same structure, to reduce the axial displacement under the alternating axial force. With this approach, the bearing is used exactly as an angular contact ball bearing instead of a radial contact bearing.

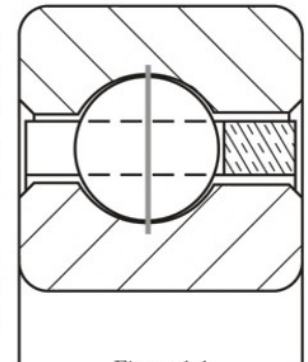


Figure 1.1

II. A-type – angular contact ball bearing (see Fig. 2.1)

Compared with C-type bearing, A-type angular contact ball bearing has an enough radial clearance to form a sufficient contact angle to carry the axial load. The contact angle for the standard bearing is 30° .

A notable feature of A-type bearing ring is its assembling method. There is a slope at the rib of either of the bearing ring, usually of the outer ring. With the temperature differences on inner and outer ring, the inner and outer ring, balls and the cage can be assembled together to form a non-separable bearing. The bearing can carry the axial load, as well as a greater radial load. Under a certain axial load, the inner and outer rings of bearing can be preload for adjusting. Compared with C-type bearing, more balls can be installed into A-type bearing, with this assembly method and a larger contact angle can be formed, to obtain a greater axial load carrying capacity.

Due to its bearing capacity in one direction, the bearing should be installed symmetrically in pairs with other bearing, to set and ensure the contact angle and the smallest axial movement under an alternating axial load.

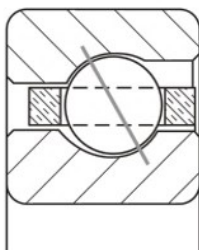


Figure 2.1

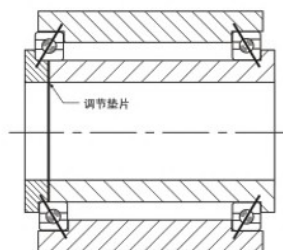


Figure 2.2

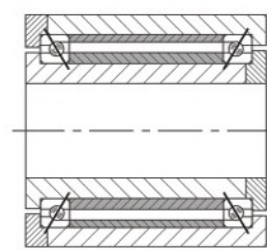


Figure 2.3

The typical installation method of A-type bearing are shown in Fig. 2.2 and Fig. 2.3. In the bearing installation shown in Fig. 2.2, the contact line is intersected with the exterior bearing axis, which is called as “Back to Back” installation. In the figure, use the pressing washer to adjust the bearing inner ring so as to adjust the bearing clearance. Initially, using a sufficiently thick washer to ensure the shaft movement along the bearing housing. Measure the full axial displacement and the washer thickness, and subtract the axial displacement and the preload displacement. When the two bearings are installed symmetrically, the internal clearance can be eliminated and the elastic deformation between the balls and the raceway can be formed, which is called as the preload bearings.

In Fig. 2.3, the bearings are “Face to Face” installed and the contact line is intersected with the inner bearing axis. Use the relative length of spacers between the inner and outer ring to adjust the bearing clearance. Generally, the inner and outer spacers have equal length, and there is a presetting clearance in the bearing pairing process. If the outer spacer is removed, the clearance can be adjusted with the washer of the outer ring.

When the A-bearings are installed in parallel or the inner and outer spacers with the same length are used, they should be directly paired in the factory. The bearing assembling shown in Fig. 2.4, Fig. 2.5 and Fig. 2.6 are called back to back, face to face and tandem paired bearings separately. If the radial space is not enough for a large bearing, a combination of 3, 4 or more paired bearings can also be configured to meet the requirements for the operating load.

There are critical internal control parameters and dimension tolerances for these paired bearings. The highest point of radial runout for each paired bearings is marked with “V” word, to identify the location recommended for the initial installation of the paired bearings. (Fig. 2.6)

For the paired bearings shown in Fig. 2.4 and Fig. 2.5, the bearing end faces are usually grinding processed, to ensure the preload after installation. For this purpose, a clearance should be preset between the inner ring shown in Fig. 2.4 and between the outer ring shown in Fig. 2.5. After the paired bearings are installed and pressed, the clearance should be disappeared and a preload should be generated on the paired bearings.

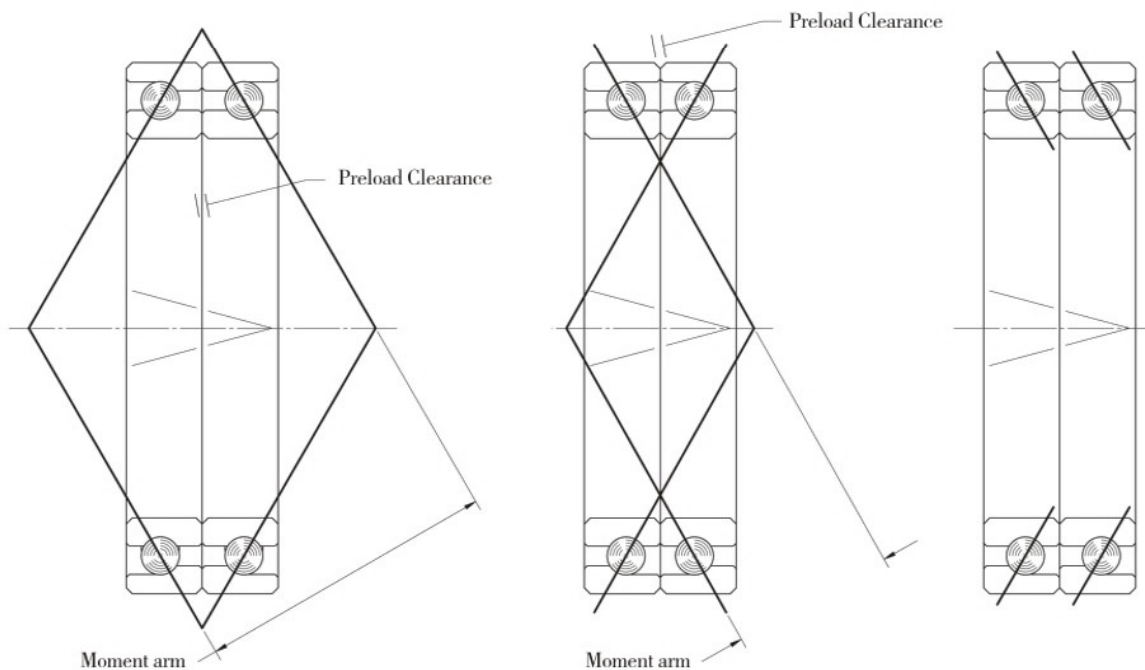
Higher torque load stiffness can be achieved on the back to back configuration of paired bearings shown in Fig. 2.2 and Fig. 2.3, which can be used on the conditions that there is a small axial clearance between individual bearings or single paired bearings are used.

The face to face configuration of paired bearings are used on the conditions that there is a large misalignment between the shaft and the housing or there are several paired bearings on a shaft. For the face to face configuration of individual bearings, there should be an enough space between the individual bearings to withstand the bending moment. If it is required for the structure, the face to face configuration of paired bearings can be used as a fixed end, together with other bearings, to form a “Fixed – Floating” combination.

Figure 2.4 Back to Back(DB series)

Figure 2.5 Face to Face(DF series)

Figure 2.6 Tandem(DT series)

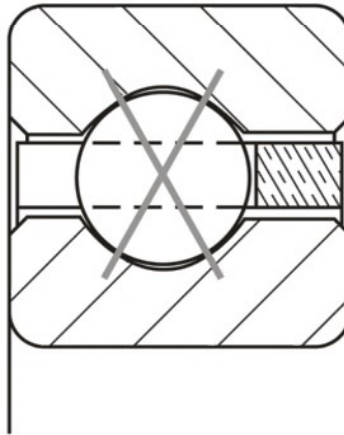


There is a larger single axial load bearing capacity on the tandem configuration of paired bearings, which must be used together with other bearing or paired bearings.

The total radial load on the paired bearings is evenly distributed on each individual bearing, multiply the load value by $n0.7$, and then check the results with the load rating in the catalogue. n is the number of bearings in the bearing combination. For the paired bearings under the thrust load, the load is evenly distributed in each bearing in the load direction.

Unless otherwise specified, the external face dimensions of the paired bearing are not controlled. If the external face dimensions are required for the preload purpose, the universal grinding paired bearings can be used. The inner and outer end faces of universal grinding bearing are configured with the specific clearances, in order to control the preload and provide the flexible installation.

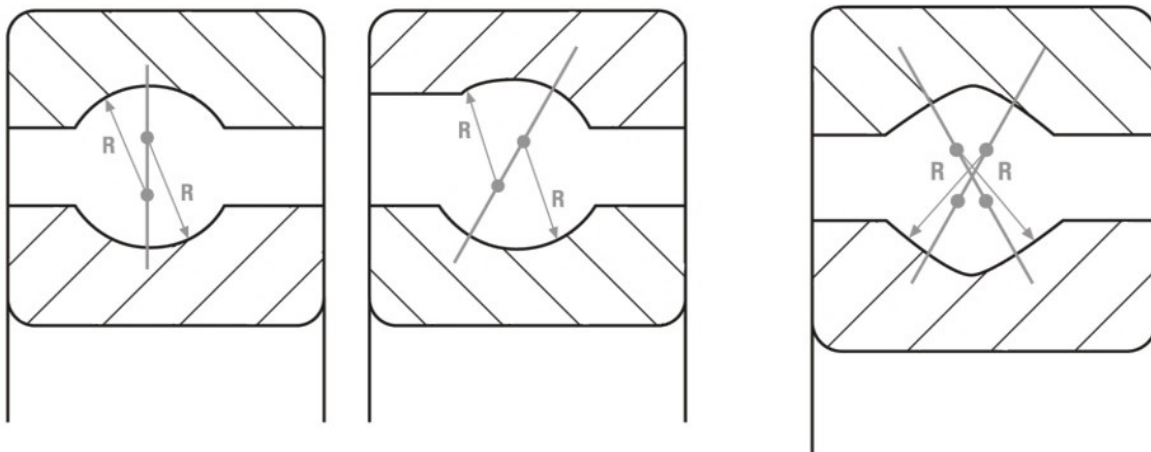
III X-type – Four-point contact ball bearings



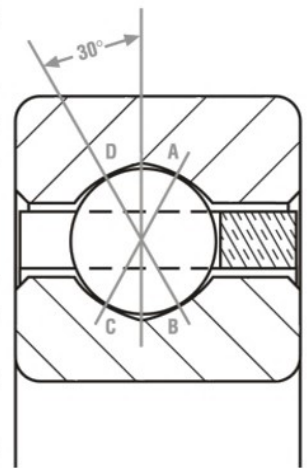
Compared with A-type and C-type bearings, the feature of X-type four-point contact ball bearings is its groove shape. For C-type bearings, its center of raceway radius is in the center line of balls. For A-type bearings, its raceway and ball is in an angular contact, the center of raceway radius is deviated from the centerline of balls and symmetrically distributed around the center line. For X-type bearings, there are 2 centers of raceway radius on each side of the raceway, both of which are deviated from the center line of balls. This structure forms a four point contact between the balls and the raceway of X-type bearings.

Like C-type bearings, if X-type bearings have the counterbore, because the contact path of the balls and the raceway is not continuous, the axial and radial loads capacity will be reduced, and the rotation speed will also be restricted certainly.

The groove depth of X-type bearings is same as ones of A-type and C-type bearings (25% of the ball diameter). The structures of the deep groove ball and the four-point contact allows the bearing to carry radial load, axial load and moment load, like a back to back configuration of paired bearings.



An axial force from right to left acted on the inner ring of the bearing is delivered to D point through the contact point B of raceway and balls and then to the outer ring and the support parts. There is a contact angle of approximately 30° between the action line BD and the radial center line of bearing. Since the balls and the raceway are in elastic deformation in the load delivery line, A point and C point are not under the load, the balls can be rotated freely, and the rotation shaft is vertical shaft to the line BD. When an axial force from left to right acted on the inner ring of the bearing, there is a similar force delivery process on A point and C point.



Torque or overturning moment load

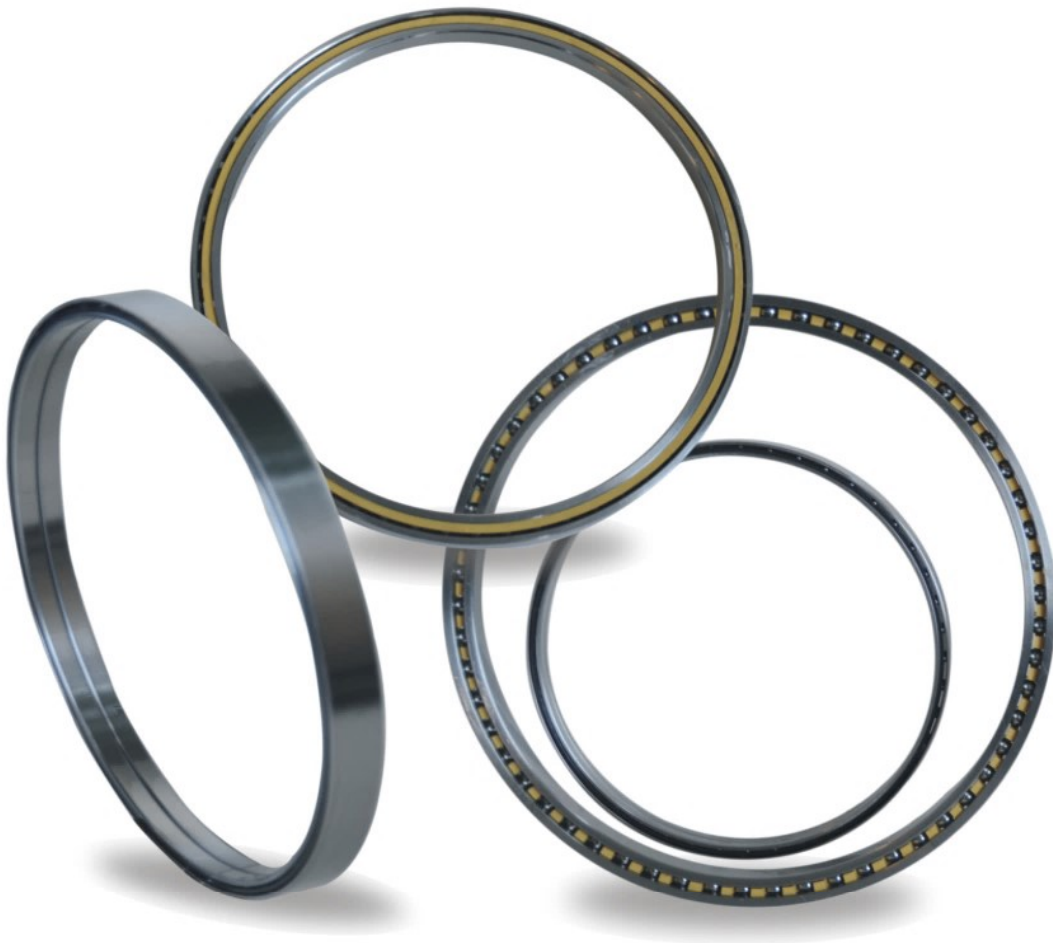
The action from a torque or an overturning moment is similar as the effect from the axial loads in opposite directions. Under a moment load, if B and D points at one side of the bearing are under the load, A and C points are not under the load; and vice versa.

The radial load is evenly distributed along CA and BD lines. Under a combination load, the bearing reaction forces can be generated on base of the individual load and its action line.

With the capacity to carry the combined loads of radial, axial, and moment, X-type bearings are often used instead of a combination of angular contact ball bearing, tapered roller paired bearings, and ball or roller thrust bearings and deep groove ball bearings.

Like C-type bearings, there is usually a certain radial clearance in X-type bearings. The contact angle and axial clearance of X-type bearings are independent. In contrast, under a great axial load or moment, the clearance should be reduced to avoid large contact angle. In many applications required for higher stiffness, a load may be applied on X-type bearings. The use of large balls more than the raceway dimension can get a preload. In this case, even if there is no an external load, there will be some elastic deformation between balls and raceway.

Note: X-type bearings are typically designed for a single use, and the use of 2 X-type bearings on a shaft may produce an additional friction torque.



Features of CHG standard bearings

Item	Description
Materials analysis	
Rings and balls	Gcr15 vacuum degassing steel 9Cr18 stainless steel
C-type and X type bearing cages	P-type – brass or non-metallic composite materials L-type – nylon or reinforced glass fiber
A-type bearing	R-type – brass or non-metallic composite materials G-type – nylon or reinforced glass fiber
Seals	Nitrile rubber, hardness 70HS, the steel skeleton
Heat treatment	
Rings	Hardened and dimensionally processed, used within the temperature range of $-54^{\circ}\text{C} \sim +121^{\circ}\text{C}$ ($-65^{\circ}\text{F} \sim +250^{\circ}\text{F}$) GCr15, hardness 62–64 HRC 9Cr18, hardness 58–62 HRC
Ball	
Accuracy	
Ring size	P6、P5
Ring face end runout	P6、P5
Ball	G10 G5
Radial clearance and contact angle	
C-type bearings X-type bearing A-type bearing	An enough radial clearance is presetted, to ensure that it is within the recommended range under its operation. The peach- raceway allows that two 30° contact angles can be generated under certain radial test load. An enough radial clearance is presetted, to ensure that it is within the recommended range under its operation. Under certain axial test load, 30° contact angle and a certain radial clearance can be generated in uninstalled bearing, and a broad preload or clearance range can be generated during the assembling process.
Cage design	
C-type and X-type bearings A-type bearing	Crown-shaped cage Overall cage with circular pocket
Others	
Quality control	CHG quality control process has been certified by the related authority
Identification	Marked on the outer bearing ring: “CHG” , type and batch code
Cleaning	Soaked and agitated in a solvent and/or cleaning fluid for several times
Corrosion resistance	Corrosion resistance oil
Packing	Heat sealing plastic belt and box

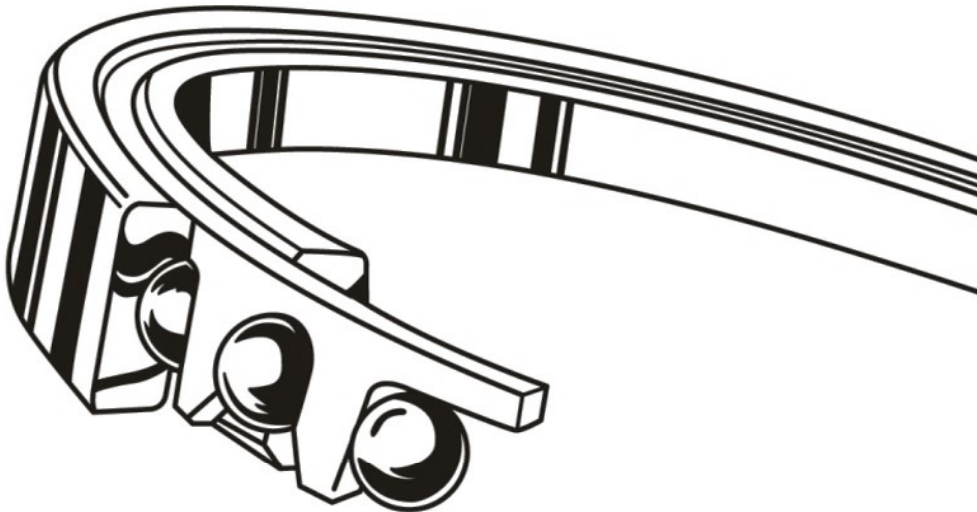
Note: Other packages, lubricants and facilities in “Clean Room” are allowed for selection.

Cage type

The most important role of bearing cage is to evenly space the rolling elements, avoid their mutual contact, and minimize the movement error of rolling elements due to different loads and the elastic deformation of bearings and related components. If there is no cage, the rolling elements will contact each other. Due to the shape of the rolling elements and its opposite movement direction with the contact surface, the relatively high contact stress and relative velocity may be generated. The friction produced between the rolling elements, and the friction particles in the raceway will affect the bearing service life and the friction torque characteristics. If a large friction torque change is allowed, the bearing can be full complement and be used at low speed.

A letter is used to identify each cage of CHG bearing in the code system, and the standard P, R, L and G type cages can be applied to wide applications. However, according to actual requirements, it can be made with different materials; for bearing selection, please contact CHG application engineers for help.

Crown-shaped cage



This type of cage is used for C-type and X-type bearings, and is installed after installation of inner ring and balls with the eccentrically assembling method. Then teeth in the crown-shaped cage pockets can generate the elastic deformation, to wrap the balls and fix the cage. At room temperature, the cage is in the center position of the balls; when it is expanded by the temperature differences, it may be positioned by the rib of inner ring or outer ring.

Strictly control the cage roundness and thickness difference, to ensure its accurate positioning in any case and to avoid “Whipping” in the cage, to contact with the bearing ring rib, to achieve a smooth operation.

Under special operation conditions, different cage materials can be selected, such as stainless steel or phenolic resin, polytetrafluoroethylene, polyester imide, polyether ether ketone, and other non-metallic materials.

- The Stainless steel cage is used in stainless steel bearings or under high temperature conditions, to achieve its corrosion resistance.
- The phenolic resin is used under the conditions of weight reduce and keeping the cage to absorb the oil.

The crown-shaped cage produced with non-metallic materials is used under the conditions that the bearing section is too small to use two-piece riveted cage (C-type bearing or a smaller cross-section) and at high speed, as well as the conditions with low torque at low speed.

For more details about the bearing applications, please contact CHG company.

CHG bearing cage type

Code	Description	Design features	Notes	Materials	Design
P	Overall crown-shaped cage	Standard number of balls, for C-type and X-type bearings with "HA" ~ "HG" sections	The common cage does not apply to low friction torque applications. If the temperature is lower than -54 °C or higher than 121 °C, please consult CHG	Brass or non-metallic composite materials	
R	Integral circular pocket cage	Standard number of balls, for A-type bearings with "HA" ~ "HG" sections	The common cage applies to low friction torque applications. If the temperature is lower than -54 °C or higher than 121 °C, please consult CHG	brass or non-metallic composite materials	
L	Overall crown-shaped cage	Standard number of balls, for C-type and X-type bearings with "HA" ~ "HG" sections	If the temperature is lower than -54 °C or higher than 121 °C, please consult CHG	Glass fiber reinforced nylon	
G	Integrally molded cage	Standard number of balls, for A-type bearings with "HM" sections	If the temperature is lower than -54 °C or higher than 121 °C, please consult CHG	Glass fiber reinforced nylon	
D	Overall mechanically manufactured crown cage	Standard number of balls, for C-type and X-type bearings in low friction torque, light load or vacuum applications	It is not recommended for the operating temperature above 121 °C, it has a longer service life than P-type cage, but its price is higher	Phenolic resin	
H	Overall mechanically manufactured circular pocket	Standard number of balls, for A-type bearings in low friction torque, light load or vacuum applications	It is not recommended for the operating temperature above 121 °C, it has a longer service life than P-type cage, but its price is	Phenolic resin	
N	Molded crown-shaped cage	A slight increase of the number of balls, for the C-type and X-type bearings, can be used for the bearings with the size of more than 4 inch..	The projection on the shaft or the bearing housing can clamp the cage and separate it from the bearing, and its maximum operating temperature is 82 °C.	Nylon	
J	Molded rounded pocket cage	A slight increase of the number of balls, for A-type bearings can be used for the bearings with the size of more than 4 inch.	Its recommended maximum operating temperature is 82 °C.	Nylon	
X	Integrally molded crown-shaped cage	Excellent performances in vacuum environment	Special order	Polyetheretherketone	
Q	Integrally molded circular pocket cage	Excellent performances in vacuum environment	Special order	Polyetheretherketone	
F	Full ball bearings	Maximum number of balls	Due to the friction among the balls, it has big friction torque and low speed, and it is not recommended for high-speed applications. There should be counterbore in C-type and X-type bearings.	GCr15/9Cr18 steel	
S	Helical coil spring cage	A decreased number of balls, for C-type and X-type bearings in low-friction torque and high temperature applications.	Increased assembling cost. It can be used only PTFE cage is unavailable. It is only used in low speed and light load applications.	Austenitic stainless steel	
Z	spacer slugs	Standard number of balls, for A-type bearings in low friction torque applications, to prevent spacer slugs	It is not recommended for use at the temperature higher than 121 °C or the pitch	PTEE tube	
Z	Toroid ball spacer	Increased number of balls, for X-type bearings in low friction torque applications, to prevent spacer skew.	It is not recommended for use at the pitch line speed of higher than 152m/min, PTFE temperature of lower than 121 °C or Vespel* temperature of lower than 260 °C.	Vesper P-I PTFE, Polyamide plastic.	
Z	spacer ball	There should be counterbore in C-type and X-type bearings and it is used in low speed and relatively high friction torque applications.	Increased number of balls, for A-type bearing in low friction applications.	Steels in line with the requirements of GB/T308 (spacer balls is slightly smaller than the carrying balls)	

Table 1 Tolerances :ABEC 1F –Type C bearings

Tolerance values in 0.0001 inches

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.		max.	min.	max.	min.	max.		max.	min.
-	1	0	-4	5		0	-50	0	-5	8			
1	1.5	0	-5	6		0	-50	0	-5	8			
1.5	2.5	0	-6	8		0	-50	0	-5	10			
2.5	3	0	-6	8		0	-50	0	-6	10			
3	4	0	-8	10		0	-50	0	-6	12			
4	4.5	0	-8	10		0	-50	0	-8	14			
4.5	5	0	-10	12		0	-50	0	-8	14			
5	6.5	0	-10	12		0	-50	0	-10	16			
6.5	7	0	-10	12		0	-50	0	-10	16			
7	9	0	-12	16		0	-50	0	-12	18			
9	12	0	-14	18		0	-50	0	-14	20			
12	14	0	-16	18		0	-100	0	-16	20			
14	16	0	-18	18		0	-100	0	-18	20			
16	18	0	-18	20		0	-100	0	-18	20			
18	20	0	-20	20		0	-100	0	-20	20			
20	30	0	-30	20		0	-100	0	-30	20			
30	40	0	-40	20		0	-100	0	-40	20			

Identical to ΔBs of inner ring of same bearing

Does not apply to bearings supplied by the manufacturer with internal preload.

Table2 Tolerances 1F–Type A and X Bearings

Tolerance values in 0.0001 inches

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.		max.	min.	max.	min.	max.		max.	min.
-	1	0	-4	3		0	-50	0	-5	4			
1	1.5	0	-5	4		0	-50	0	-5	4			
1.5	2	0	-6	5		0	-50	0	-5	5			
2	2.5	0	-6	5		0	-50	0	-6	5			
2.5	3	0	-8	6		0	-50	0	-6	6			
3	4	0	-8	6		0	-50	0	-6	6			
4	4.5	0	-8	6		0	-50	0	-8	8			
4.5	5	0	-10	8		0	-50	0	-8	8			
5	6.5	0	-10	10		0	-50	0	-10	10			
6.5	7	0	-10	10		0	-50	0	-12	10			
7	9	0	-12	12		0	-50	0	-12	12			
9	12	0	-14	14		0	-50	0	-14	14			
12	14	0	-14	14		0	-100	0	-14	14			
14	18	0	-16	16		0	-100	0	-16	16			
18	30	0	-18	18		0	-100	0	-18	18			
30	40	0	-20	20		0	-100	0	-20	20			

Identical to ΔBs of inner ring of same bearing

1) Does not apply to bearings supplied by the manufacturer with internal preload.

2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 3 Tolerances :ABEC 3F

Tolerance values in 0.0001 inches

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.		max.	min.	max.	min.	max.		max.	min.
-	1	0	-2	3		0	-50	0	-3	4			
1	1.5	0	-3	4		0	-50	0	-3	4			
1.5	2.5	0	-4	4		0	-50	0	-4	5			
2.5	3	0	-4	4		0	-50	0	-4	6			
3	4	0	-5	5		0	-50	0	-4	6			
4	4.5	0	-5	5		0	-50	0	-5	8			
4.5	5	0	-6	6		0	-50	0	-5	8			Identical to ΔBs of inner ring of same bearing
5	6.5	0	-6	6		0	-50	0	-6	9			
6.5	7	0	-6	6		0	-50	0	-7	10			
7	9	0	-4	8		0	-50	0	-7	10			
9	11	0	-8	10		0	-50	0	-8	12			
11	12	0	-8	10		0	-50	0	-9	14			
12	14	0	-8	12		0	-100	0	-9	14			
14	18	0	-9	14		0	-100	0	-10	16			
18	20	0	-10	16		0	-100	0	-12	18			

- 1) Does not apply to bearings supplied by the manufacturer with internal preload.
- 2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 4 Tolerances :ABEC 5F

Tolerance values in 0.0001 inches

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.	max.	max.	min.	max.	min.	max.	max.	max.	min.
-	1.5	0	-2	2	3	0	-50	0	-2	2	3		
1.5	2.5	0	-3	2	3	0	-50	0	-3	3	4		
2.5	3	0	-3	2	3	0	-50	0	-3	4	5		
3	4	0	-3	3	4	0	-50	0	-3	4	5		
4	4.5	0	-3	3	4	0	-50	0	-4	4	5		
4.5	5	0	-4	3	4	0	-50	0	-4	4	5		Identical to ΔBs of inner ring of same bearing
5	7	0	-4	3	4	0	-50	0	-5	5	6		
7	9	0	-5	4	5	0	-50	0	-5	5	6		
9	11	0	-5	5	6	0	-50	0	-5	6	7		
11	12	0	-5	5	6	0	-50	0	-6	7	8		
12	14	0	-6	5	7	0	-100	0	-6	7	8		
14	18	0	-6	7	8	0	-100	0	-7	8	9		
18	20	0	-7	8	9	0	-100	0	-8	9	10		

- 1) Does not apply to bearings supplied by the manufacturer with internal preload.
- 2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 5 Tolerances :ABEC 7F

Tolerance values in 0.0001 inches

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.	max.	min.	max.	min.	max.	max.	max.	min.	min.
-	1	0	-1.5	1.5	0	-50	0	-2	2				
1	2.5	0	-2	1.5	0	-50	0	-2	2				
2.5	3	0	-2	1.5	0	-50	0	-3	2				
3	4	0	-2.5	2	0	-50	0	-3	2				
4	4.5	0	-2.5	2	0	-50	0	-4	3				
4.5	6.5	0	-3	3	0	-50	0	-4	3				
6.5	7	0	-3	3	0	-50	0	-4	4				
7	9	0	-4	3	0	-50	0	-4	4				
9	11	0	-5	4	0	-50	0	-5	4				
11	12	0	-5	4	0	-50	0	-5	5				
12	14	0	-5	4	0	-100	0	-6	5				

Identical to ΔBs of inner ring of same bearing

- 1) Does not apply to bearings supplied by the manufacturer with internal preload.
- 2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 6 Width tolerances of modified type A bearings

Tolerance values in 0.0001 inches

d/in.		ΔBs 1)	
over	incl.	max.	min.
-	2	0	-200
2	5	0	-300
5	14	0	-400
14	40	0	-500

Applies to overall width deviation for a pair of Type A bearings modified for duplex mounting.
The outer ring width deviation limit, ΔCs is identical to ΔBs for the inner rings of the same bearing set.

Table 7 Chamfer dimension limits

Dimensions in inches

rs min	rs max		ras max
	radial	axial	
0.008	0.02	0.025	0.008
0.015	0.035	0.05	0.015
0.025	0.05	0.055	0.025
0.04	0.065	0.07	0.04
0.06	0.085	0.09	0.06
0.08	0.125	0.13	0.08

Applies to overall width deviation for a pair of Type A bearings modified for duplex mounting.
The outer ring width deviation limit, ΔCs is identical to ΔBs for the inner rings of the same bearing set.

Table 8 Normal radial internal clearance limits

Tolerance values in 0.0001 inches

d/in.		Gr 1)									
		C type		X Type		ABEC 3		ABEC 5		ABEC 7	
		ABEC 1		ABEC 3		ABEC 5		ABEC 7			
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
-	1	10	16	10	15	7	11	5	9	4	8
1	1.5	12	18	12	17	8	12	5	9	5	9
1.5	2.5	12	24	12	22	8	18	5	9	5	10
2.5	3	12	24	12	22	8	18	6	12	6	12
3	4	16	28	16	26	10	20	6	12	6	12
4	4.5	16	28	16	26	10	20	8	14	8	14
4.5	5	20	34	20	30	12	22	8	14	8	14
5	6.5	20	34	20	30	12	22	10	16	8	14
6.5	7	20	34	20	30	14	24	10	16	8	14
7	9	24	42	24	34	14	24	10	16	8	14
9	11	28	48	28	38	16	26	10	16	10	16
11	12	28	48	28	38	18	28	12	18	10	16
12	14	32	52	28	38	18	28	12	18	12	18
14	18	36	56	32	42	20	30	14	20	-	-
18	20	40	60	36	46	24	34	14	22	-	-
20	30	60	80	36	46	-	-	-	-	-	-
30	40	80	100	40	50	-	-	-	-	-	-

Does not apply to bearings supplied by the manufacturer with internal preload.

Table 1 Tolerances :ABEC 1F –Type C bearings(Metric conversion value)

Tolerance values in micrometres

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.		max.	min.	max.	min.	max.		max.	min.
-	1	0	-10	13		0	-127	0	-13	20			
1	1.5	0	-13	15		0	-127	0	-13	20			
1.5	2.5	0	-15	20		0	-127	0	-13	25			
2.5	3	0	-15	20		0	-127	0	-15	25			
3	4	0	-20	25		0	-127	0	-15	30			
4	4.5	0	-20	25		0	-127	0	-20	36			
4.5	5	0	-25	30		0	-127	0	-20	36			
5	6.5	0	-25	30		0	-127	0	-25	41			
6.5	7	0	-25	30		0	-127	0	-25	41			
7	9	0	-30	41		0	-127	0	-30	46			
9	12	0	-36	46		0	-127	0	-36	51			
12	14	0	-41	46		0	-254	0	-41	51			
14	16	0	-46	46		0	-254	0	-46	51			
16	18	0	-46	51		0	-254	0	-46	51			
18	20	0	-51	51		0	-254	0	-51	51			
20	30	0	-76	51		0	-254	0	-76	51			
30	40	0	-102	51		0	-254	0	-102	51			

Identical to ΔBs of inner ring of same bearing

Does not apply to bearings supplied by the manufacturer with internal preload.

Table2 Tolernces 1F–Type A and X Bearings (Metric conversion value)

Tolerance values in micrometres

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.		max.	min.	max.	min.	max.		max.	min.
-	1	0	-10	8		0	-127	0	-13	10			
1	1.5	0	-13	10		0	-127	0	-13	10			
1.5	2	0	-15	13		0	-127	0	-13	13			
2	2.5	0	-15	13		0	-127	0	-13	13			
2.5	3	0	-15	15		0	-127	0	-15	15			
3	4	0	-20	15		0	-127	0	-15	15			
4	4.5	0	-20	15		0	-127	0	-20	20			
4.5	5	0	-25	20		0	-127	0	-20	20			
5	6.5	0	-25	25		0	-127	0	-25	25			
6.5	7	0	-25	25		0	-127	0	-30	25			
7	9	0	-30	30		0	-127	0	-30	30			
9	12	0	-36	36		0	-127	0	-36	36			
12	14	0	-36	36		0	-254	0	-36	36			
14	18	0	-41	41		0	-254	0	-41	41			
18	30	0	-46	46		0	-254	0	-46	46			
30	40	0	-51	51		0	-254	0	-51	51			

Identical to ΔBs of inner ring of same bearing

1) Does not apply to bearings supplied by the manufacturer with internal preload.

2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 3 Tolerances :ABEC 3F(Metric conversion value)

Tolerance values in micrometres

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.	max.	min.	max.	min.	max.	max.	max.	max.	min.
-	1	0	-5	8	0	-127	0	-8	10				
1	1.5	0	-8	10	0	-127	0	-8	10				
1.5	2.5	0	-10	10	0	-127	0	-10	13				
2.5	3	0	-10	10	0	-127	0	-10	15				
3	4	0	-13	13	0	-127	0	-10	15				
4	4.5	0	-13	13	0	-127	0	-13	20				
4.5	5	0	-15	15	0	-127	0	-13	20				Identical to ΔBs of inner ring of same bearing
5	6.5	0	-15	15	0	-127	0	-15	23				
6.5	7	0	-15	15	0	-127	0	-18	25				
7	9	0	-18	20	0	-127	0	-18	25				
9	11	0	-20	25	0	-127	0	-20	30				
11	12	0	-20	25	0	-127	0	-23	36				
12	14	0	-20	30	0	-254	0	-23	36				
14	18	0	-23	36	0	-254	0	-25	41				
18	20	0	-25	41	0	-254	0	-30	46				

- 1) Does not apply to bearings supplied by the manufacturer with internal preload.
- 2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 4 Tolerances :ABEC 5F(Metric conversion value)

Tolerance values in micrometres

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.	max.	min.	max.	min.	max.	max.	max.	max.	min.
-	1.5	0	-5	5	8	0	-127	0	-5	5	8		
1.5	2.5	0	-8	5	8	0	-127	0	-8	8	10		
2.5	3	0	-8	5	8	0	-127	0	-8	10	13		
3	4	0	-8	8	10	0	-127	0	-8	10	13		
4	4.5	0	-8	8	10	0	-127	0	-10	10	13		
4.5	5	0	-10	8	10	0	-127	0	-10	10	13		Identical to ΔBs of inner ring of same bearing
5	7	0	-10	8	10	0	-127	0	-13	13	15		
7	9	0	-13	10	13	0	-127	0	-13	13	15		
9	11	0	-13	13	15	0	-127	0	-13	15	18		
11	12	0	-13	13	15	0	-127	0	-15	18	20		
12	14	0	-15	13	18	0	-254	0	-15	18	20		
14	18	0	-15	18	20	0	-254	0	-18	20	23		
18	20	0	-18	20	23	0	-254	0	-20	23	25		

- 1) Does not apply to bearings supplied by the manufacturer with internal preload.
- 2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 5 Tolerances :ABEC 7F(Metric conversion value)

Tolerance values in micrometres

d/in.		Δdmp 1)		Kia	Sia	ΔBs		ΔDmp 1)		Kea	Sea	ΔCs	
over	incl.	max.	min.	max.	max.	min.	max.	min.	max.	max.	max.	min.	min.
-	1	0	-4	4	0	-127	0	-5	5				
1	2.5	0	-5	4	0	-127	0	-5	5				
2.5	3	0	-5	4	0	-127	0	-8	5				
3	4	0	-6	5	0	-127	0	-8	5				
4	4.5	0	-6	5	0	-127	0	-10	8				
4.5	6.5	0	-8	8	0	-127	0	-10	8				
6.5	7	0	-8	8	0	-127	0	-10	10				
7	9	0	-10	8	0	-127	0	-10	10				
9	11	0	-13	10	0	-127	0	-13	10				
11	12	0	-13	10	0	-127	0	-13	13				
12	14	0	-13	10	0	-254	0	-15	13				

Identical to ΔBs of inner ring of same bearing

- 1) Does not apply to bearings supplied by the manufacturer with internal preload.
- 2) See Table 6 for width tolerance for Type A bearings modified for duplex mounting.

Table 6 Width tolerances of modified type A bearings (Metric conversion value)

Tolerance values in micrometres

d/in.		ΔBs 1)	
over	incl.	max.	min.
-	2	0	-508
2	5	0	-762
5	14	0	-1,016
14	40	0	-1,270

Applies to overall width deviation for a pair of Type A bearings modified for duplex mounting.
The outer ring width deviation limit, ΔCs is identical to ΔBs for the inner rings of the same bearing set.

Table 7 Chamfer dimension limits (Metric conversion value)

mm

fs min		fs max		fas max
in.	min	radial	axial	
0.008	0.2	0.5	0.6	
0.015	0.4	0.9	1.3	0.4
0.025	0.6	1.3	1.4	0.6
0.04	1.0	1.7	1.8	1.0
0.06	1.5	2.2	2.3	1.5
0.08	2.0	3.2	3.3	2.0

Applies to overall width deviation for a pair of Type A bearings modified for duplex mounting.
The outer ring width deviation limit, ΔCs is identical to ΔBs for the inner rings of the same bearing set.

Table 8 Normal radial internal clearance limits(Metric conversion value)

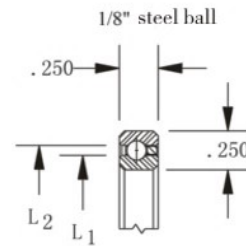
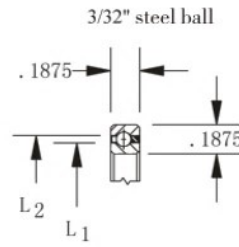
Tolerance values in micrometres

d/in.		Gr 1)									
		C Type		X Type		ABEC 3		ABEC 5		ABEC 7	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
-	1	25	41	25	38	18	28	13	23	10	20
1	1.5	30	46	30	43	20	30	13	23	13	23
1.5	2.5	30	61	30	56	20	46	13	23	13	25
2.5	3	30	61	30	56	20	46	15	30	15	30
3	4	41	71	41	66	25	51	15	30	15	30
4	4.5	41	71	41	66	25	51	20	36	20	36
4.5	5	51	86	51	76	30	56	20	36	20	36
5	6.5	51	86	51	76	30	56	25	41	20	36
6.5	7	51	86	51	76	36	61	25	41	20	36
7	9	61	107	61	86	36	61	25	41	20	36
9	11	71	122	71	97	41	66	25	41	25	41
11	12	71	122	71	97	46	71	30	46	25	41
12	14	81	132	71	97	46	71	30	46	30	46
14	18	91	142	81	107	51	76	36	51	-	-
18	20	102	152	91	117	61	86	36	56	-	-
20	30	152	203	91	117	-	-	-	-	-	-
30	40	203	254	102	127	-	-	-	-	-	-

Does not apply to bearings supplied by the manufacturer with internal preload.

Standard Size Thin-Section Bearing Selection Table

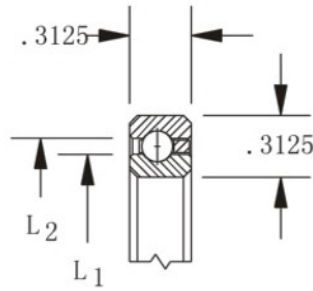
Open Series:
Radial Contact Type
(C Type)



HKAA series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HKAA010C	1.000	1.375	1.142	1.236	1290	670	0.012
	25.4	34.925	29.0	31.4			
HKAA015C	1.500	1.875	1.642	1.736	1780	800	0.018
	38.1	47.625	41.7	44.1			

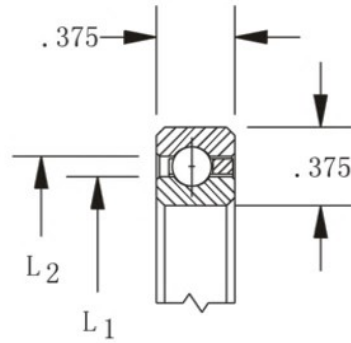
HKA series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HKA020C	2	2.5	2.186	2.134	3020	1420	0.048
	50.8	63.5	55.5	58.8			
HKA025C	2.5	3	2.686	2.814	3690	1600	0.059
	63.5	76.2	68.2	71.5			
HKA030C	3	3.5	3.186	3.314	4400	1820	0.068
	76.2	88.9	80.9	84.2			
HKA035C	3.5	4	3.686	3.814	5070	2000	0.082
	88.9	101.6	93.6	96.9			
HKA040C	4	4.5	4.186	4.314	5730	2130	0.09
	101.6	114.3	106.3	109.6			
HKA042C	4.25	4.75	4.436	4.564	6090	2220	0.095
	107.95	120.65	112.7	115.9			
HKA045C	4.5	5	4.686	4.814	6400	2310	0.1
	114.3	127	119	122.3			
HKA047C	4.75	5.250	4.936	5.064	6760	2400	0.104
	120.65	133.35	125.4	128.6			
HKA050C	5	5.500	5.186	5.314	7070	2490	0.109
	127	139.7	131.7	135.0			
HKA055C	5.500	6.000	5.686	5.814	7780	2620	0.118
	139.7	152.4	144.4	147.7			
HKA060C	6.000	6.500	6.186	6.314	8450	2800	0.130
	152.4	165.1	157.1	160.4			
HKA065C	6.500	7.000	6.686	6.814	9110	2930	0.140
	165.1	177.8	169.8	173.1			
HKA070C	7.000	7.500	7.186	7.314	9780	3070	0.150
	177.8	190.5	182.5	185.8			
HKA075C	7.500	8.000	7.686	7.814	10450	3200	0.160
	190.5	203.2	195.2	198.5			
HKA080C	8.000	8.500	8.186	8.314	11110	3330	0.172
	203.2	215.9	207.9	211.2			
HKA090C	9.000	9.500	9.186	9.314	12490	3600	0.200
	228.6	241.3	233.3	236.6			
HKA100C	10.000	10.500	10.186	10.314	13820	3870	0.227
	254	266.7	258.7	262.0			
HKA110C	11.000	11.500	11.186	11.314	15160	4130	0.236
	279.4	292.1	284.1	287.4			
HKA120C	12.000	12.500	12.186	12.314	16540	4360	0.254
	304.8	317.5	309.5	312.8			

5/32" steel ball



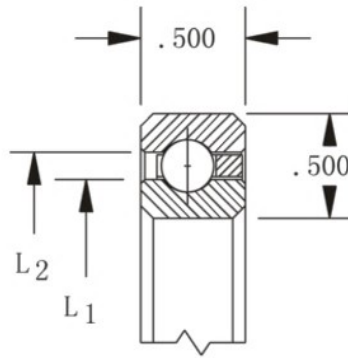
HKB series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HKB020C	2	2.625	2.231	2.393	4130	2000	0.073
	50.8	66.675	56.7	60.8			
HKB025C	2.5	3.125	2.731	2.893	5070	2310	0.091
	63.5	79.375	69.4	73.5			
HKB030C	3	3.625	3.231	3.393	5960	2580	0.109
	76.2	92.075	82.1	86.2			
HKB035C	3.5	4.125	3.731	3.893	6850	2800	0.125
	88.9	104.775	94.8	98.9			
HKB040C	4	4.625	4.432	4.393	7780	3070	0.14
	101.6	117.475	107.5	111.6			
HKB042C	4.2	4.875	4.481	4.643	8130	3160	0.147
	107.95	123.825	113.8	117.9			
HKB045C	4.5	5.125	4.731	4.893	8670	3290	0.16
	114.3	130.175	120.2	124.3			
HKB047C	4.75	5.375	4.981	5.143	9020	3380	0.163
	120.65	136.525	126.6	130.6			
HKB050C	5	5.625	5.231	5.393	9560	3510	0.172
	127	142.875	132.9	137			
HKB055C	5.5	6.125	5.731	5.893	10490	3730	0.186
	139.7	155.575	145.6	149.7			
HKB060C	6	6.625	6.231	6.393	11380	3960	0.205
	152.4	168.275	158.3	162.4			
HKB065C	6.5	7.125	6.731	6.893	12270	4130	0.216
	165.1	180.975	171	175.1			
HKB070C	7	7.625	7.231	7.393	13200	4360	0.232
	177.8	193.675	183.7	187.8			
HKB075C	7.5	8.125	7.731	7.893	14090	4530	0.25
	190.5	206.375	196.4	200.5			
HKB080C	8	8.625	8.231	8.393	14980	4670	0.262
	203.2	219.075	209.1	213.2			
HKB090C	9	9.625	9.231	9.393	16800	5110	0.3
	228.6	244.475	234.5	238.6			
HKB100C	10	10.625	10.231	10.393	18620	5470	0.331
	254	269.875	259.9	264			
HKB110C	11	11.625	11.231	11.393	20400	5820	0.36
	279.4	295.275	285.3	289.4			
HKB120C	12	12.625	12.231	12.393	22230	6180	0.39
	304.8	320.675	310.7	314.8			
HKB140C	14	14.625	14.231	14.393	25830	6800	0.476
	355.6	371.475	361.5	365.6			
HKB160C	16	16.625	16.231	16.393	29430	7420	0.544
	406.4	422.275	412.3	416.4			
HKB180C	18	18.625	18.231	18.393	33070	8050	0.612
	457.2	473.075	463.1	467.2			
HKB200C	20	20.625	20.231	20.393	36670	8620	0.68
	508	523.875	513.9	518			

3/16"steel ball



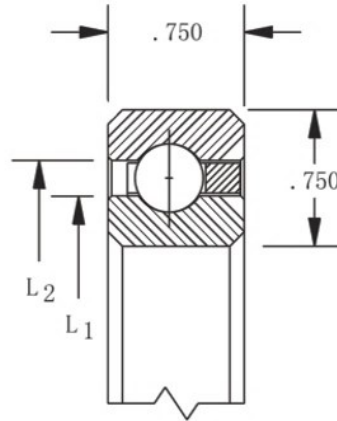
HKC series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HKC040C	4.00	4.75	4.277	4.473	9330	3910	0.204
	101.60	120.65	108.6	113.6			
HKC042C	4.25	5	4.527	4.723	9780	4090	0.213
	107.95	127	115	120			
HKC045C	4.50	5.25	4.777	4.973	10400	4220	0.225
	114.30	133.35	121.3	126.3			
HKC047C	4.75	5	5.027	5.223	10930	4360	0.235
	120.65	139.7	127.7	132.7			
HKC050C	5.00	5.75	5.277	5.473	11510	4490	0.263
	127.00	146.05	134	139			
HKC055C	5.50	6.25	5.777	5.973	12580	4800	0.268
	139.70	158.75	146.7	151.7			
HKC060C	6.00	6.75	6.277	6.473	13650	5070	0.295
	152.40	171.45	159.4	164.4			
HKC065C	6.50	7.25	6.777	6.973	14710	5330	0.312
	165.10	184.15	172.1	177.1			
HKC070C	7.00	7.75	7.277	7.473	15780	5560	0.34
	177.80	196.85	184.8	189.8			
HKC075C	7.50	8.25	7.777	7.973	16850	5820	0.36
	190.50	209.55	197.5	202.5			
HKC080C	8.00	8.75	8.277	8.473	17910	6050	0.387
	203.20	222.25	210.2	215.2			
HKC090C	9.00	9.75	9.277	9.473	20050	6530	0.45
	228.60	247.65	235.6	240.6			
HKC100C	10.00	10.75	10.277	10.473	22180	6980	0.481
	254.00	273.05	261	266			
HKC110C	11.00	11.75	11.277	11.473	24310	7420	0.526
	279.40	298.45	286.4	291.4			
HKC120C	12.00	12.75	12.277	12.473	26450	7870	0.567
	304.80	323.85	311.8	316.8			
HKC140C	14.00	14.75	14.277	14.473	30720	8670	0.689
	355.60	374.65	362.6	367.6			
HKC160C	16.00	16.75	16.277	16.473	35030	9470	0.785
	406.40	425.45	413.4	418.4			
HKC180C	18.00	18.75	18.277	18.473	39290	10220	0.88
	457.20	476.25	464.2	469.2			
HKC200C	20.00	20.75	20.277	20.473	43560	10980	0.98
	508	527.05	515.0	520.0			

1/4"steel ball



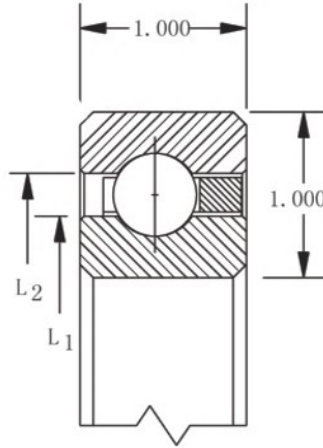
HKD series							
Type	Dimension(inch/mm)				Basic Load Ratings(N)		Weight(kg)
	d	D	L1	L2	Cor	Cr	
HKD040C	4	5	4.37	4.63	13690	6270	0.366
	101.6	127	111	117.6			
HKD042C	4.25	5.25	4.62	4.88	14180	6400	0.386
	107.95	133.35	117.3	124			
HKD045C	4.5	5.5	4.87	5.13	15200	6710	0.405
	114.3	139.7	123.7	130.3			
HKD047C	4.75	5.75	5.12	5.38	15690	6850	0.426
	120.65	146.05	130	136.7			
HKD050C	5	6	5.37	5.63	16710	7160	0.454
	127	152.4	136.4	143			
HKD055C	5.5	6.5	5.87	6.13	18230	7560	0.485
	139.7	165.1	149.1	155.7			
HKD060C	6	7	6.37	6.63	19780	8000	0.526
	152.4	177.8	161.8	168.4			
HKD065C	6.5	7.5	6.87	7.13	21290	8400	0.566
	165.1	190.5	174.5	181.1			
HKD070C	7	8	7.37	7.63	22800	8800	0.606
	177.8	203.2	187.2	193.8			
HKD075C	7.5	8.5	7.87	8.13	24310	9160	0.65
	190.5	215.9	199.9	206.5			
HKD080C	8	9	8.37	8.63	25830	9560	0.694
	203.2	228.6	212.6	219.2			
HKD090C	9	10	9.37	9.63	28890	10310	0.78
	228.6	254	238	244.6			
HKD100C	10	11	10.37	10.63	31920	10980	0.853
	254	279.4	263.4	270			
HKD110C	11	12	11.37	11.63	34980	11690	0.934
	279.4	304.8	288.8	295.4			
HKD120C	12	13	12.37	12.63	38010	12360	1.02
	304.8	330.2	314.2	320.8			
HKD140C	14	15	14.37	14.63	44090	13650	1.24
	355.6	381	365	371.6			
HKD160C	16	17	16.37	16.63	50180	14890	1.41
	406.4	431.8	415.8	422.4			
HKD180C	18	19	18.37	18.63	56230	16050	1.58
	457.2	482.6	466.6	473.2			
HKD200C	20	21	20.37	20.63	62320	17200	1.75
	508	533.4	517.4	524			

3/8"steel ball



HKF series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HKF040C	4	5.5	4.555	4.945	23830	12130	0.875
	101.6	139.7	115.7	125.6			
HKF042C	4.25	5.75	4.805	5.195	25070	12580	0.93
	107.95	146.05	122	132			
HKF045C	4.5	6	5.055	5.445	26360	12980	0.975
	114.3	152.4	128.4	138.3			
HKF047C	4.75	6.25	5.305	5.695	27600	13380	1.04
	120.65	158.75	134.7	144.7			
HKF050C	5	6.5	5.555	5.945	28850	13780	1.09
	127	165.1	141.1	151			
HKF055C	5.5	7	6.055	6.445	31340	14580	1.18
	139.7	177.8	153.8	163.7			
HKF060C	6	7.5	6.555	6.945	33870	15340	1.24
	152.4	190.5	166.5	176.4			
HKF065C	6.5	8	7.055	7.445	36360	16090	1.35
	165.1	203.2	179.2	189.1			
HKF070C	7	8.5	7.555	7.945	38890	16850	1.45
	177.8	215.9	191.9	201.8			
HKF075C	7.5	9	8.055	8.445	41380	17560	1.56
	190.5	228.6	204.6	214.5			
HKF080C	8	9.5	8.555	8.945	43920	18230	1.66
	203.2	241.3	217.3	227.2			
HKF090C	9	10.5	9.555	9.945	48900	19600	1.81
	228.6	266.7	242.7	252.6			
HKF100C	10	11.5	10.555	10.945	53920	20940	2.02
	254	292.1	268.1	278			
HKF110C	11	12.5	11.555	11.945	58940	22230	2.18
	279.4	317.5	293.5	303.4			
HKF120C	12	13.5	12.555	12.945	63960	23470	2.38
	304.8	342.9	318.9	328.8			
HKF140C	14	15.5	14.555	14.945	74010	25830	2.72
	355.6	393.7	369.7	379.6			
HKF160C	16	17.5	16.555	16.945	84010	28140	3.22
	406.4	444.5	420.5	430.4			
HKF180C	18	19.5	18.555	18.945	94060	30320	3.58
	457.2	495.3	471.3	481.2			
HKF200C	20	21.5	20.555	20.945	104100	32450	4.04
	508	546.1	522.1	532			

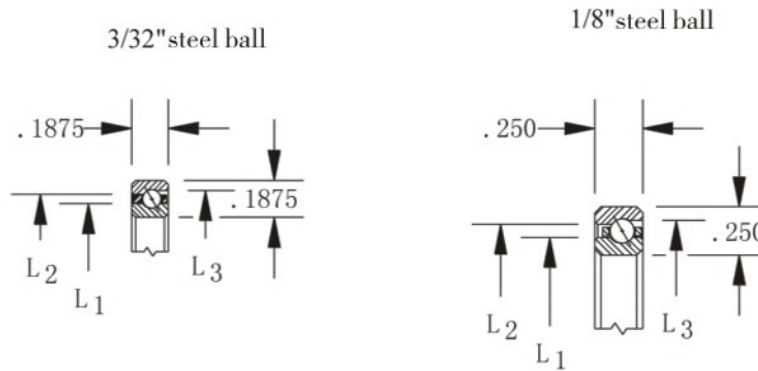
1/2"steel ball



HKG series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HKG040C	4	6	4.742	5.258	36490	200000	1.65
	101.6	152.4	120.4	133.6			
HKG042C	4.25	6.25	4.992	5.508	36490	20000	1.75
	107.95	158.75	126.8	139.9			
HKG045C	4.5	6.5	5.242	5.758	38940	20900	1.81
	114.3	165.1	133.1	146.3			
HKG047C	4.75	6.75	5.492	6.008	41340	21740	1.91
	120.65	171.45	139.5	152.6			
HKG050C	5	7	5.742	6.258	43780	22580	2.02
	127	177.8	145.8	159			
HKG055C	5.5	7.5	6.242	6.758	46230	23430	2.17
	139.7	190.5	158.5	171.7			
HKG060C	6	8	6.742	7.258	51070	25030	2.31
	152.4	203.2	171.2	184.4			
HKG065C	6.5	8.5	7.242	7.758	53520	25830	2.47
	165.1	215.9	183.9	197.1			
HKG070C	7	9	7.742	8.258	58360	27380	2.67
	177.8	228.6	196.6	209.8			
HKG075C	7.5	9.5	8.242	8.758	60810	28140	2.83
	190.5	241.3	209.3	222.5			
HKG080C	8	10	8.742	9.258	65650	29600	3
	203.2	254	222	235.2			
HKG090C	9	11	9.742	10.258	72990	31780	3.3
	228.6	279.4	247.4	260.6			
HKG100C	10	12	10.742	11.258	80280	33870	3.65
	254	304.8	272.8	286			
HKG110C	11	13	11.742	12.258	87570	35870	3.96
	279.4	330.2	298.2	311.4			
HKG120C	12	14	12.742	13.258	94860	37830	4.32
	304.8	355.6	323.6	336.8			
HKG140C	14	16	14.742	15.258	109440	41610	4.96
	355.6	406.4	374.4	387.6			
HKG160C	16	18	16.742	17.258	124060	45250	5.65
	406.4	457.2	425.2	438.4			
HKG180C	18	20	18.742	19.258	138640	48720	6.28
	457.2	508	476	489.2			
HKG200C	20	22	20.742	21.258	153220	52100	7.53
	508	558.8	526.8	540			

Open Series:

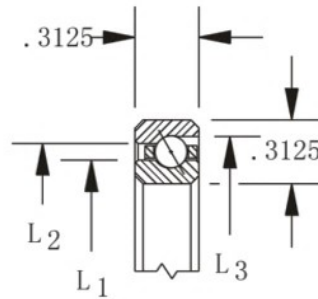
Angular Contact Series
(A Type)



HKAA series										
Type	Dimension(inch/mm)					Basic Load Ratings(N)				Weight(kg)
	d	D	L1	L2	L3	Radial		Axial		
						Cor	Cr	Coa	Ca	
HKAA010A	1.000	1.375	1.142	1.236	1.274	1510	670	4310	2000	0.011
	25.4	34.925	29.0	31.4	32.4					
HKAA015A	1.5	1.875	1.642	1.736	1.774	2130	890	6130	3250	0.017
	38.1	47.625	41.7	44.1	45.1					

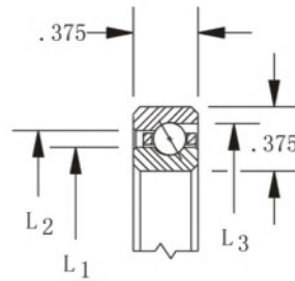
HKA series										
Type	Dimension(inch/mm)					Basic Load Ratings(N)				Weight(kg)
	d	D	L1	L2	L3	Radial		Axial		
						Cor	Cr	Coa	Ca	
HKA020A	2	2.5	2.186	2.134	2.369	3510	1470	10140	4270	0.045
	50.8	63.5	55.5	58.8	60.2					
HKA025A	2.5	3	2.686	2.814	2.869	4270	1690	12360	4890	0.054
	63.5	76.2	68.2	71.5	72.9					
HKA030A	3	3.5	3.186	3.314	3.367	5070	1910	14620	5470	0.064
	76.2	88.9	80.9	84.2	85.6					
HKA035A	3.5	4	3.686	3.814	3.867	5830	2090	16850	6000	0.077
	88.9	101.6	93.6	96.9	98.2					
HKA040A	4	4.5	4.186	4.314	4.367	6630	2270	19110	6530	0.086
	101.6	114.3	106.3	109.6	110.9					
HKA042A	4.25	4.75	4.436	4.564	4.615	7020	2360	20230	6800	0.091
	107.95	120.65	112.7	115.9	117.2					
HKA045A	4.5	5	4.686	4.814	4.865	7380	2450	21380	7020	0.095
	114.3	127	119	122.3	123.6					
HKA047A	4.75	5.250	4.936	5.064	5.115	7780	2530	22490	7290	0.1
	120.65	133.35	125.4	128.6	129.9					
HKA050A	5	5.500	5.186	5.314	5.365	8180	2620	23600	7510	0.104
	127	139.7	131.7	135.0	136.3					
HKA055A	5.500	6.000	5.686	5.814	5.863	8980	2760	25870	8000	0.113
	139.7	152.4	144.4	147.7	148.9					
HKA060A	6.000	6.500	6.186	6.314	6.363	9740	2930	28090	8450	0.127
	152.4	165.1	157.1	160.4	161.6					
HKA065A	6.500	7.000	6.686	6.814	6.861	10540	3070	30360	8890	0.136
	165.1	177.8	169.8	173.1	172.3					
HKA070A	7.000	7.500	7.186	7.314	7.361	11290	3250	32630	9340	0.145
	177.8	190.5	182.5	185.8	187					
HKA075A	7.500	8.000	7.686	7.814	7.861	12090	3380	34850	9740	0.154
	190.5	203.2	195.2	198.5	199.7					
HKA080A	8.000	8.500	8.186	8.314	8.359	12850	3510	37120	10140	0.163
	203.2	215.9	207.9	211.2	212.3					
HKA090A	9.000	9.500	9.186	9.314	9.357	14400	3780	41610	10980	0.186
	228.6	241.3	233.3	236.6	237.7					
HKA100A	10.000	10.500	10.186	10.314	10.355	15960	4050	46100	11740	0.204
	254	266.7	258.7	262.0	263					
HKA110A	11.000	11.500	11.186	11.314	11.353	17510	4310	50580	12490	0.227
	279.4	292.1	284.1	287.4	288.4					
HKA120A	12.000	12.500	12.186	12.314	12.349	19070	4580	55070	13200	0.245
	304.8	317.5	309.5	312.8	313.7					

5/32" steel ball



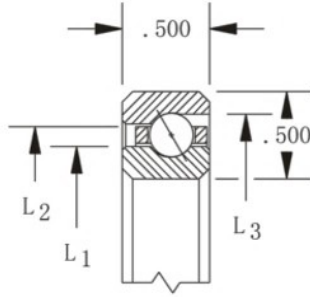
HKB series										Weight(kg)
Type	Dimension(inch/mm)					Basic Load Ratings(N)				
	d	D	L1	L2	L3	Cor	Cr	Coa	Ca	
HKB020A	2	2.625	2.231	2.393	2.464	4850	2130	14000	6130	0.068
	50.8	66.675	56.7	60.8	62.6					
HKB025A	2.5	3.125	2.731	2.893	2.964	5960	2450	17160	7070	0.086
	63.5	79.375	69.4	73.5	75.3					
HKB030A	3	3.625	3.231	3.393	3.462	6890	2710	19870	7780	0.1
	76.2	92.075	82.1	86.2	87.9					
HKB035A	3.5	4.125	3.731	3.893	3.962	7960	2980	23030	8580	0.122
	88.9	104.775	94.8	98.9	100.6					
HKB040A	4	4.625	4.432	4.393	4.46	9070	3250	26180	9340	0.136
	101.6	117.475	107.5	111.6	113.3					
HKB042A	4.25	4.875	4.481	4.643	4.71	9560	3330	27560	9650	0.141
	107.95	123.825	113.8	117.9	119.6					
HKB045A	4.5	5.125	4.731	4.893	4.96	10000	3470	28890	9960	0.154
	114.3	130.175	120.2	124.3	126					
HKB047A	4.75	5.375	4.981	5.143	5.21	10620	3600	30720	10400	0.159
	120.65	136.525	126.6	130.6	132.3					
HKB050A	5	5.625	5.231	5.393	5.46	11110	3690	32050	10710	0.168
	127	142.875	132.9	137	138.7					
HKB055A	5.5	6.125	5.731	5.893	5.958	12180	3960	35200	11380	0.181
	139.7	155.575	145.6	149.7	151.3					
HKB060A	6	6.625	6.231	6.393	6.458	13290	4180	38360	12050	0.2
	152.4	168.275	158.3	162.4	164					
HKB065A	6.5	7.125	6.731	6.893	6.958	14220	4360	41070	12620	0.213
	165.1	180.975	171	175.1	176.7					
HKB070A	7	7.625	7.231	7.393	7.456	15340	4580	44270	13250	0.227
	177.8	193.675	183.7	187.8	189.4					
HKB075A	7.5	8.125	7.731	7.893	7.955	16450	4800	27230	13870	0.245
	190.5	206.375	196.4	200.5	202.1					
HKB080A	8	8.625	8.231	8.393	8.453	17510	5020	50580	14490	0.259
	203.2	219.075	209.1	213.2	214.7					
HKB090A	9	9.625	9.231	9.393	9.451	19560	5420	56450	15600	0.29
	228.6	244.475	234.5	238.6	240					
HKB100A	10	10.625	10.231	10.393	10.449	21740	5780	62760	16710	0.322
	254	269.875	259.9	264	265.4					
HKB110A	11	11.625	11.231	11.393	11.447	23780	6130	68630	17780	0.354
	279.4	295.275	285.3	289.4	290.8					
HKB120A	12	12.625	12.231	12.393	12.445	25960	6530	74940	18850	0.386
	304.8	320.675	310.7	314.8	316.1					
HKB140A	14	14.625	14.231	14.393	14.439	30050	7200	86680	20760	0.445
	355.6	371.475	361.5	365.6	366.8					
HKB160A	16	16.625	16.231	16.393	16.433	34270	7870	98900	22670	0.509
	406.4	422.275	412.3	416.4	417.4					
HKB180A	18	18.625	18.231	18.393	18.425	38490	8490	111080	24490	0.572
	457.2	473.075	463.1	467.2	468					
HKB200A	20	20.625	20.231	20.393	20.416	42720	9110	123260	26230	0.635
	508	523.875	513.9	518	518.6					

3/16"steel ball



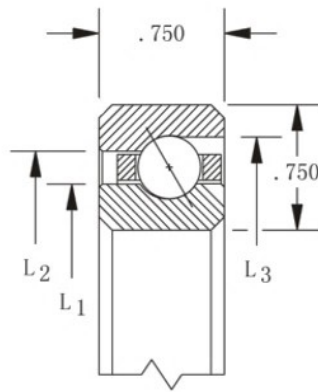
HKC series										Weight (kg)
Type	Dimension(inch/mm)					Basic Load Ratings(N)				
	d	D	L1	L2	L3	Cor	Cr	Coa	Ca	
HKC040A	4	4.75	4.277	4.473	4.554	11340	4270	32720	12310	0.2
	101.6	120.65	108.6	113.6	115.7					
HKC042A	4.25	5	4.527	4.723	4.804	12050	4450	34760	12800	0.209
	107.9	127	115	120	122					
HKC045A	4.5	5.25	4.777	4.973	5.052	12710	4620	36760	13290	0.222
	114.3	133.35	121.3	126.3	128.3					
HKC047A	4.75	5	5.027	5.223	5.302	13420	4760	38760	13780	0.231
	120.65	139.7	127.7	132.7	134.7					
HKC050A	5	5.75	5.277	5.473	5.552	14140	4930	40760	14220	0.245
	127	146.05	134	139	141					
HKC055A	5.5	6.25	5.777	5.973	6.052	15290	5200	44090	14980	0.263
	139.7	158.75	146.7	151.7	153.7					
HKC060A	6	6.75	6.277	6.473	6.55	16670	5510	48100	15910	0.29
	152.4	171.45	159.4	164.4	166.4					
HKC065A	6.5	7.25	6.777	6.973	7.05	18050	5820	52100	16760	0.308
	165.1	184.15	172.1	177.1	179					
HKC070A	7	7.75	7.277	7.473	7.55	19200	6050	55430	17490	0.336
	177.8	196.85	184.8	189.8	191.8					
HKC075A	7.5	8.25	7.777	7.973	8.048	20580	6360	59470	18310	0.354
	190.5	209.55	197.5	202.5	204.4					
HKC080A	8	8.75	8.277	8.473	8.548	22010	6620	63480	19110	0.381
	203.2	222.3	210.2	215.2	217.1					
HKC090A	9	9.75	9.277	9.473	9.546	24540	7110	70810	20580	0.445
	228.6	247.65	235.6	240.6	242.5					
HKC100A	10	10.75	10.277	10.473	10.544	27290	7650	78810	22090	0.472
	254	273.05	261	266	267.8					
HKC110A	11	11.75	11.277	11.473	11.542	29870	8130	86190	23470	0.517
	279.4	298.45	286.4	291.4	293.2					
HKC120A	12	12.75	12.277	12.473	12.54	32400	8580	93520	24800	0.558
	304.8	323.85	311.8	316.8	318.5					
HKC140A	14	14.75	14.277	14.473	14.535	37740	9510	108900	27430	0.649
	355.6	374.65	362.6	367.6	369.2					
HKC160A	16	16.75	16.277	16.473	16.529	43030	10360	124240	29920	0.739
	406.4	425.45	413.4	418.4	419.8					
HKC180A	18	18.75	18.277	18.473	18.523	48360	11200	139620	32360	0.83
	457.2	476.25	464.2	469.2	470.5					
HKC200A	20	20.75	20.277	20.473	20.517	53470	11960	154330	34580	0.921
	508	527.05	515	520	521.1					

1/4" steel ball



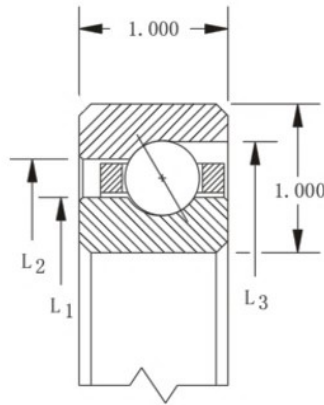
HKD series										Weight (kg)
Type	Dimension(inch/mm)					Basic Load Ratings(N)				
	d	D	L1	L2	L3	Cor	Cr	Coa	Ca	
HKD040A	4	5	4.37	4.63	4.741	15780	6580	45610	18940	0.363
	101.6	127	111	117.6	120.4					
HKD042A	4.25	5.25	4.62	4.88	4.991	16670	6800	48140	19650	0.381
	107.95	133.35	117.3	124	126.8					
HKD045A	4.5	5.5	4.87	5.13	5.241	17560	7020	50670	20310	0.4
	114.3	139.7	123.7	130.3	133.1					
HKD047A	4.75	5.75	5.12	5.38	5.49	18450	7290	53210	20980	0.422
	120.65	146.05	130	136.7	139.4					
HKD050A	5	6	5.37	5.63	5.74	19290	7510	55740	21650	0.445
	127	152.4	136.4	143	145.8					
HKD055A	5.5	6.5	5.87	6.13	6.238	21070	7960	60810	22940	0.481
	139.7	165.1	149.1	155.7	158.4					
HKD060A	6	7	6.37	6.63	6.738	22800	8400	65880	24180	0.522
	152.4	177.8	161.8	168.4	171.1					
HKD065A	6.5	7.5	6.87	7.13	7.236	24580	8800	70940	25430	0.562
	165.1	190.5	174.5	181.1	183.8					
HKD070A	7	8	7.37	7.63	7.736	26310	9200	76010	26630	0.603
	177.8	203.2	187.2	193.8	196.5					
HKD075A	7.5	8.5	7.87	8.13	8.236	28090	9650	81080	27780	0.644
	190.5	215.9	199.9	206.5	209.2					
HKD080A	8	9	8.37	8.63	8.734	29830	10050	86140	28940	0.689
	203.2	228.6	212.6	219.2	221.8					
HKD090A	9	10	9.37	9.63	9.732	33340	10800	96280	31160	0.767
	228.6	254	238	244.6	247.2					
HKD100A	10	11	10.37	10.63	10.732	36850	11560	106410	33340	0.848
	254	279.4	263.4	270	272.6					
HKD110A	11	12	11.37	11.63	11.73	40360	12270	116550	35380	0.93
	279.4	304.8	288.8	295.4	298					
HKD120A	12	13	12.37	12.63	12.728	43870	12980	126680	37430	1.01
	304.8	330.2	314.2	320.8	323.3					
HKD140A	14	15	14.37	14.63	14.724	50900	14310	146950	41290	1.17
	355.6	381	365	371.6	374					
HKD160A	16	17	16.37	16.63	16.718	57920	15600	167220	45030	1.33
	406.4	431.8	415.8	422.4	424.6					
HKD180A	18	19	18.37	18.63	18.712	64940	16850	187490	48580	1.49
	457.2	482.6	466.6	473.2	475.3					
HKD200A	20	21	20.37	20.63	20.705	71970	18050	207760	52050	1.66
	508	533.4	517.4	524	525.9					

3/8"steel ball



HKF series										Weight (kg)
Type	Dimension(inch/mm)					Basic Load Ratings(N)				
	d	D	L1	L2	L3	Cor	Cr	Coa	Ca	
HKF040A	4	5.5	4.555	4.945	5.115	28230	12980	81520	37430	0.875
	101.6	139.7	115.7	125.6	129.9					
HKF042A	4.25	5.75	4.805	5.195	5.365	29340	13290	84680	38360	0.93
	107.95	146.05	122	132	136.3					
HKF045A	4.5	6	5.055	5.445	5.615	31520	13960	90950	40230	0.975
	114.3	152.4	128.4	138.3	142.6					
HKF047A	4.75	6.25	5.305	5.695	5.865	32580	14270	94060	41160	1.04
	120.65	158.75	134.7	144.7	149					
HKF050A	5	6.5	5.555	5.945	6.115	33650	14580	97210	42050	1.09
	127	165.1	141.1	151	155.3					
HKF055A	5.5	7	6.055	6.445	6.613	36940	15510	106590	44720	1.18
	139.7	177.8	153.8	163.7	168					
HKF060A	6	7.5	6.555	6.945	7.113	40180	16400	116020	47340	1.24
	152.4	190.5	166.5	176.4	180.7					
HKF065A	6.5	8	7.055	7.445	7.613	43430	17290	125440	49870	1.35
	165.1	203.2	179.2	189.1	193.4					
HKF070A	7	8.5	7.555	7.945	8.113	46720	18140	134820	52320	1.45
	177.8	215.9	191.9	201.8	206.1					
HKF075A	7.5	9	8.055	8.445	8.61	48900	18670	141080	53920	1.56
	190.5	228.6	204.6	214.5	218.7					
HKF080A	8	9.5	8.555	8.945	9.11	52140	19510	150510	56320	1.66
	203.2	241.3	217.3	227.2	231.4					
HKF090A	9	10.5	9.555	9.945	10.108	58630	21110	169310	60900	1.81
	228.6	266.7	242.7	252.6	256.7					
HKF100A	10	11.5	10.555	10.945	11.106	64100	22360	185000	64590	2.02
	254	292.1	268.1	278	282.1					
HKF110A	11	12.5	11.555	11.945	12.106	70590	23870	203800	68900	2.18
	279.4	317.5	293.5	303.4	307.5					
HKF120A	12	13.5	12.555	12.945	13.104	76010	25070	219490	72410	2.38
	304.8	342.9	318.9	328.8	332.8					
HKF140A	14	15.5	14.555	14.945	15.102	87970	27650	253990	79790	2.72
	355.6	393.7	369.7	379.6	383.6					
HKF160A	16	17.5	16.555	16.945	17.098	99920	30100	288440	86860	3.22
	406.4	444.5	420.5	430.4	434.3					
HKF180A	18	19.5	18.555	18.945	19.096	112950	32670	326090	94280	3.58
	457.2	495.3	471.3	481.2	485					
HKF200A	20	21.5	20.555	20.945	21.092	124910	34940	360580	100810	4.04
	508	546.1	522.1	532	535.7					

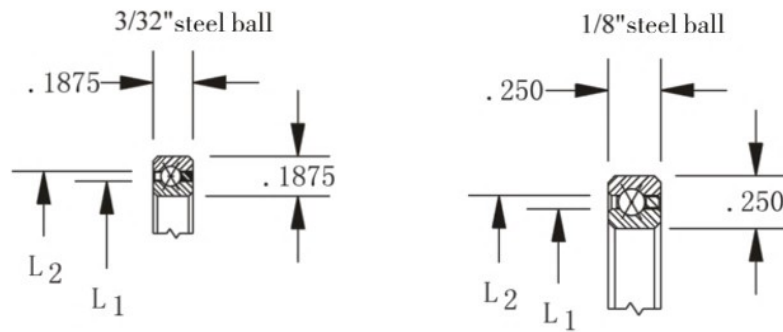
1/2" steel ball



HKG series										Weight (kg)
Type	Dimension(inch/mm)					Basic Load Ratings(N)				
	d	D	L1	L2	L3	Cor	Cr	Coa	Ca	
HKG040A	4	6	4.742	5.258	5.491	42140	20980	121620	60590	1.64
	101.6	152.4	120.4	133.6	139.5					
HKG042A	4.25	6.25	4.992	5.508	5.741	44230	21690	227710	62630	1.74
	107.95	158.75	126.8	139.9	145.8					
HKG045A	4.5	6.5	5.242	5.758	5.989	46360	22360	133800	64590	1.79
	114.3	165.1	133.1	146.3	152.1					
HKG047A	4.75	6.75	5.492	6.008	6.239	48450	23030	139840	66540	1.89
	120.65	171.45	139.5	152.6	158.5					
HKG050A	5	7	5.742	6.258	6.489	50540	23690	145930	68450	2
	127	177.8	145.8	159	164.8					
HKG055A	5.5	7.5	6.242	6.758	6.989	54760	25030	158110	72190	2.15
	139.7	190.5	158.5	171.7	177.5					
HKG060A	6	8	6.742	7.258	7.489	58990	3040	170240	75830	2.3
	152.4	203.2	171.2	184.4	190.2					
HKG065A	6.5	8.5	7.242	7.758	7.987	63210	27520	182420	79430	2.45
	165.1	215.9	183.9	197.1	202.9					
HKG070A	7	9	7.742	8.258	8.487	67390	28720	194600	829000	2.66
	177.8	228.6	196.6	209.8	215.6					
HKG075A	7.5	9.5	8.242	8.758	8.987	71610	29920	206740	86320	2.81
	190.5	241.3	209.3	222.5	228.3					
HKG080A	8	10	8.742	9.258	9.485	75830	31070	218920	89700	2.97
	203.2	254	222	235.2	240.9					
HKG090A	9	11	9.742	10.258	10.485	84280	33340	243230	96190	3.27
	228.6	279.4	247.4	260.6	266.3					
HKG100A	10	12	10.742	11.258	11.483	92680	35520	367550	102500	3.63
	254	304.8	272.8	286	291.7					
HKG110A	11	13	11.742	12.258	12.481	101120	37650	291860	108640	3.94
	279.4	330.2	298.2	311.4	317					
HKG120A	12	14	12.742	13.258	13.481	109530	39690	316220	114590	4.3
	304.8	355.6	323.6	336.8	342.4					
HKG140A	14	16	14.742	15.258	15.478	126370	43650	364850	126060	4.94
	355.6	406.4	374.4	387.6	393.1					
HKG160A	16	18	16.742	17.258	17.474	143220	47470	413470	137040	5.62
	406.4	457.2	425.2	438.4	443.8					
HKG180A	18	20	18.742	19.258	19.472	160110	51120	462280	147570	6.26
	457.2	508	476	489.2	494.6					
HKG200A	20	22	20.742	21.258	21.468	176960	54670	510730	157750	6.89
	508	558.8	526.8	540	545.3					

Open Series :

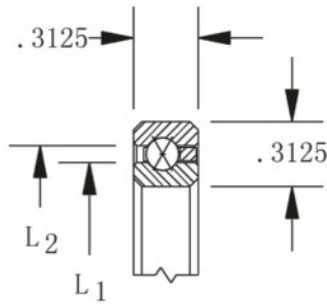
Four-point Contact Series
(X Type)



HCAA series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HCAA010X	1.000	1.375	1.142	1.236	1290	670	3250	1650	0.012
	25.4	34.925	29.0	31.4					
HCAA015X	1.500	1.875	1.642	1.736	1780	800	4450	2050	
	38.1	47.625	41.7	44.1					

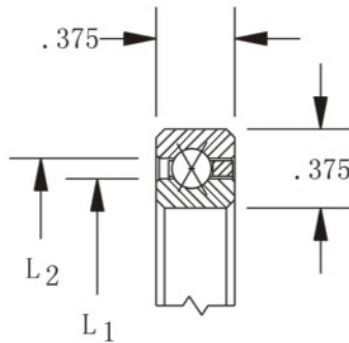
HKA series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HKA020X	2	2.5	2.186	2.314	1650	1420	7600	3510	0.048
	50.8	63.5	55.5	58.8					
HKA025X	2.5	3	2.686	2.814	690	1600	9290	4050	
	63.5	76.2	68.2	71.5					
HKA030X	3	3.5	3.186	3.314	4400	1820	10980	4490	0.068
	76.2	88.9	80.9	84.2					
HKA035X	3.5	4	3.686	3.814	5070	2000	12670	4930	
	88.9	101.6	93.6	96.9					
HKA040X	4	4.5	4.186	4.314	5730	2130	14310	5380	0.09
	101.6	114.3	106.3	109.6					
HKA042X	4.25	4.75	4.436	4.564	6090	2220	15160	5600	
	107.95	120.65	112.7	115.9					
HKA045X	4.5	5	4.686	4.814	6400	2310	16000	5820	0.1
	114.3	127	119	122.3					
HKA047X	4.75	5.250	4.936	5.064	6760	2400	16850	6000	
	120.65	133.35	125.4	128.6					
HKA050X	5	5.500	5.186	5.314	7070	2490	17690	6220	0.109
	127	139.7	131.7	135.0					
HKA055X	5.500	6.000	5.686	5.814	7780	2620	19380	6580	
	139.7	152.4	144.4	147.7					
HKA060X	6.000	6.500	6.186	6.314	8450	2800	21070	6980	0.130
	152.4	165.1	157.1	160.4					
HKA065X	6.500	7.000	6.686	6.814	9110	2930	22760	7330	
	165.1	177.8	169.8	173.1					
HKA070X	7.000	7.500	7.186	7.314	9780	3070	24450	7690	0.150
	177.8	190.5	182.5	185.8					
HKA075X	7.500	8.000	7.686	7.814	10450	3200	26140	8050	
	190.5	203.2	195.2	198.5					
HKA080X	8.000	8.500	8.186	8.314	11110	3330	27830	8400	0.172
	203.2	215.9	207.9	211.2					
HKA090X	9.000	9.500	9.186	9.314	12490	3600	31200	9070	
	228.6	241.3	233.3	236.6					
HKA100X	10.000	10.500	10.186	10.314	13820	3870	34580	9690	0.227
	254	266.7	258.7	262.0					
HKA110X	11.000	11.500	11.186	11.314	15160	4130	37960	10310	
	279.4	292.1	284.1	287.4					
HKA120X	12.000	12.500	12.186	12.314	16540	4360	41340	10890	0.254
	304.8	317.5	309.5	312.8					

5/32" steel ball



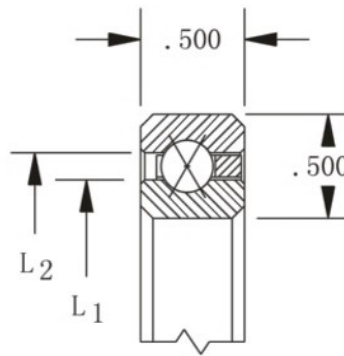
HKB series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Cor	Cr	Coa	Ca	
HKB020X	2	2.625	2.231	2.393	4130	2000	10400	5020	0.073
	50.8	66.675	56.7	60.8					
HKB025X	2.5	3.125	2.731	2.893	5070	2310	12620	5730	0.091
	63.5	79.375	69.4	73.5					
HKB030X	3	3.625	3.231	3.393	5960	2580	14890	6400	0.109
	76.2	92.075	82.1	86.2					
HKB035X	3.5	4.125	3.731	3.893	6850	2800	17160	7070	0.125
	88.9	104.775	94.8	98.9					
HKB040X	4	4.625	4.231	4.393	7780	3070	19430	7650	0.14
	101.6	117.475	107.5	111.6					
HKB042X	4.25	4.875	4.481	4.643	8130	3160	20310	7910	0.147
	107.95	123.825	113.8	117.9					
HKB045X	4.5	5.125	4.731	4.893	8670	3290	21690	8220	0.16
	114.3	130.175	120.2	124.3					
HKB047X	4.75	5.375	4.981	5.143	9020	3380	22580	8450	0.163
	120.65	136.525	126.6	130.6					
HKB050X	5	5.625	5.231	5.393	9560	3510	23910	8800	0.172
	127	142.875	132.9	137					
HKB055X	5.5	6.125	5.731	5.893	10490	3730	26180	9340	0.186
	139.7	155.575	145.6	149.7					
HKB060X	6	6.625	6.231	6.393	11380	3960	28450	9870	0.205
	152.4	168.275	158.3	162.4					
HKB065X	6.5	7.125	6.731	6.893	12270	4130	30720	10400	0.216
	165.1	180.975	171	175.1					
HKB070X	7	7.625	7.231	7.393	13200	4360	32980	10890	0.232
	177.8	193.675	183.7	187.8					
HKB075X	7.5	8.125	7.731	7.893	14090	4530	35200	11380	0.25
	190.5	206.375	196.4	200.5					
HKB080X	8	8.625	8.231	8.393	14980	4670	37470	11870	0.262
	203.2	219.075	209.1	213.2					
HKB090X	9	9.625	9.231	9.393	16800	5110	42000	12800	0.3
	228.6	244.475	234.5	238.6					
HKB100X	10	10.625	10.231	10.393	18620	5470	46500	13690	0.331
	254	269.875	259.9	264					
HKB110X	11	11.625	11.231	11.393	20400	5820	51030	14580	0.36
	279.4	295.275	285.3	289.4					
HKB120X	12	12.625	12.231	12.393	22230	6180	55560	15420	0.39
	304.8	320.675	310.7	314.8					
HKB140X	14	14.625	14.231	14.393	25830	6800	64590	17070	0.476
	355.6	371.475	361.5	365.6					
HKB160X	16	16.625	16.231	16.393	29430	7420	73610	18630	0.544
	406.4	422.275	412.3	416.4					
HKB180X	18	18.625	18.231	18.393	33070	8050	82630	20090	0.612
	457.2	473.075	463.1	467.2					
HKB200X	20	20.625	20.231	20.393	36670	8620	91660	21560	0.68
	508	523.875	513.9	518					

3/16" steel ball



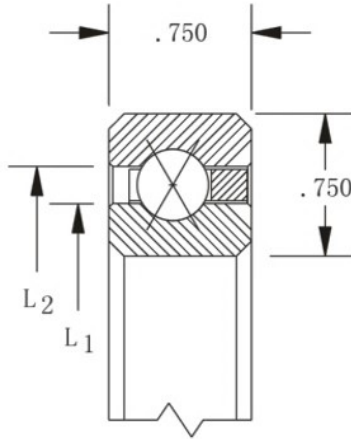
HKC series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Cor	Cr	Coa	Ca	
HKC040X	4	4.625	4.432	4.393	9340	3910	23380	9820	0.204
	101.6	117.475	107.5	111.6					
HKC042X	4.2	4.875	4.481	4.643	9870	4090	24710	10180	0.213
	107.95	123.825	113.8	117.9					
HKC045X	4.5	5.125	4.731	4.893	10400	4220	26050	10580	0.225
	114.3	130.175	120.2	124.3					
HKC047X	4.75	5.375	4.981	5.143	10940	4360	27380	10940	0.235
	120.65	136.525	126.6	130.6					
HKC050X	5	5.625	5.231	5.393	11510	4490	28720	11290	0.263
	127	142.875	132.9	137					
HKC055X	5.5	6.125	5.731	5.893	12580	4800	31380	11960	0.268
	139.7	155.575	145.6	149.7					
HKC060X	6	6.625	6.231	6.393	13650	5070	34050	12620	0.295
	152.4	168.275	158.3	162.4					
HKC065X	6.5	7.125	6.731	6.893	14710	5330	36760	13290	0.312
	165.1	180.975	171	175.1					
HKC070X	7	7.625	7.231	7.393	15780	5560	39430	13910	0.34
	177.8	193.675	183.7	187.8					
HKC075X	7.5	8.125	7.731	7.893	16850	5820	42090	14540	0.36
	190.5	206.375	196.4	200.5					
HKC080X	8	8.625	8.231	8.393	17910	6050	44760	15160	0.387
	203.2	219.075	209.1	213.2					
HKC090X	9	9.625	9.231	9.393	20050	6530	50100	16310	0.45
	228.6	244.475	234.5	238.6					
HKC100X	10	10.625	10.231	10.393	22180	6980	55430	17470	0.481
	254	269.875	259.9	264					
HKC110X	11	11.625	11.231	11.393	24310	7420	60810	18580	0.526
	279.4	295.275	285.3	289.4					
HKC120X	12	12.625	12.231	12.393	26450	7870	66140	19650	0.567
	304.8	320.675	310.7	314.8					
HKC140X	14	14.625	14.231	14.393	30720	8670	76810	21740	0.689
	355.6	371.475	361.5	365.6					
HKC160X	16	16.625	16.231	16.393	35030	9470	87520	23690	0.785
	406.4	422.275	412.3	416.4					
HKC180X	18	18.625	18.231	18.393	39290	10220	98190	25600	0.88
	457.2	473.075	463.1	467.2					
HKC200X	20	20.625	20.231	20.393	43560	10980	108900	27430	0.98
	508	527.05	515	520					

1/4"steel ball



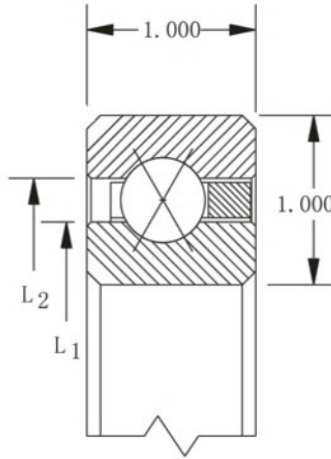
HKD series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Cor	Cr	Coa	Ca	
HKD040X	4	5	4.37	4.63	13690	6270	34230	15650	0.366
	101.6	127	111	117.6					
HKD042X	4.25	5.25	4.62	4.88	14180	6400	35470	16000	0.386
	107.95	133.35	117.3	124					
HKD045X	4.5	5.5	4.87	5.13	15200	6710	38010	16760	0.405
	114.3	139.7	123.7	130.3					
HKD047X	4.75	5.75	5.12	5.38	15690	6850	39290	17160	0.426
	120.65	146.05	130	136.7					
HKD050X	5	6	5.37	5.63	16710	7160	41830	17870	0.454
	127	152.4	136.4	143					
HKD055X	5.5	6.5	5.87	6.13	18230	7560	45610	18940	0.485
	139.7	165.1	149.1	155.7					
HKD060X	6	7	6.37	6.63	19780	8000	49430	19960	0.526
	152.4	177.8	161.8	168.4					
HKD065X	6.5	7.5	6.87	7.13	21290	8400	53210	20980	0.566
	165.1	190.5	174.5	181.1					
HKD070X	7	8	7.37	7.63	22800	8800	57020	21960	0.606
	177.8	203.2	187.2	193.8					
HKD075X	7.5	8.5	7.87	8.13	24310	9160	60810	22940	0.65
	190.5	215.9	199.9	206.5					
HKD080X	8	9	8.37	8.63	25830	9560	64630	23870	0.694
	203.2	228.6	212.6	219.2					
HKD090X	9	10	9.37	9.63	28890	10310	72230	25740	0.78
	228.6	254	238	244.6					
HKD100X	10	11	10.37	10.63	31920	10980	79830	27520	0.853
	254	279.4	263.4	270					
HKD110X	11	12	11.37	11.63	34980	11690	87430	29200	0.934
	279.4	304.8	288.8	295.4					
HKD120X	12	13	12.37	12.63	38010	12360	95030	30890	1.02
	304.8	330.2	314.2	320.8					
HKD140X	14	15	14.37	14.63	44090	13650	110240	34090	1.24
	355.6	381	365	371.6					
HKD160X	16	17	16.37	16.63	50180	14890	125440	37160	1.41
	406.4	431.8	415.8	422.4					
HKD180X	18	19	18.37	18.63	56230	16050	140640	40140	1.58
	457.2	482.6	466.6	473.2					
HKD200X	20	21	20.37	20.63	62320	17200	155840	42980	1.75
	508	533.4	517.4	524					

3/8"steel ball



HKF series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Cor	Cr	Coa	Ca	
HKF040X	4	5.5	4.555	4.945	23830	12140	59560	30360	0.875
	101.6	139.7	115.7	125.6					
HKF042X	4.25	5.75	4.805	5.195	25070	12580	62720	31430	0.93
	107.95	146.05	122	132					
HKF045X	4.5	6	5.055	5.445	26360	12980	65830	32450	0.975
	114.3	152.4	128.4	138.3					
HKF047X	4.75	6.25	5.305	5.695	27600	13380	68990	33470	1.04
	120.65	158.75	134.7	144.7					
HKF050X	5	6.5	5.555	5.945	28850	13780	72100	34490	1.09
	127	165.1	141.1	151					
HKF055X	5.5	7	6.055	6.445	31340	14580	78370	36450	1.18
	139.7	177.8	153.8	163.7					
HKF060X	6	7.5	6.555	6.945	33870	15340	84680	38360	1.24
	152.4	190.5	166.5	176.4					
HKF065X	6.5	8	7.055	7.445	36360	16090	909050	40230	1.35
	165.1	203.2	179.2	189.1					
HKF070X	7	8.5	7.555	7.945	38890	16850	97210	42050	1.45
	177.8	215.9	191.9	201.8					
HKF075X	7.5	9	8.055	8.445	41380	17560	103480	43870	1.56
	190.5	228.6	204.6	214.5					
HKF080X	8	9.5	8.555	8.945	43920	18230	109750	456010	1.66
	203.2	241.3	217.3	227.2					
HKF090X	9	10.5	9.555	9.945	48900	19600	122280	49030	1.81
	228.6	366.7	242.7	252.6					
HKF100X	10	11.5	10.555	10.945	53920	20940	134820	52320	2.02
	254	292.1	268.1	278					
HKF110X	11	12.5	11.555	11.945	58940	22230	147350	55520	2.18
	279.4	317.5	293.5	303.4					
HKF120X	12	13.5	12.555	12.945	64960	23470	159890	58630	2.38
	304.8	342.9	318.9	328.8					
HKF140X	14	15.5	14.555	14.945	74010	25830	185000	64590	2.72
	355.6	393.7	369.7	379.6					
HKF160X	16	17.5	16.555	16.945	84010	28140	210070	70320	3.22
	406.4	444.5	420.5	430.4					
HKF180X	18	19.5	18.555	18.945	94060	30320	235140	75830	3.58
	457.2	495.3	471.3	481.2					
HKF200X	20	21.5	20.555	20.945	104100	32450	260260	81120	4.04
	508	546.1	522.1	532					

1/2" steel ball

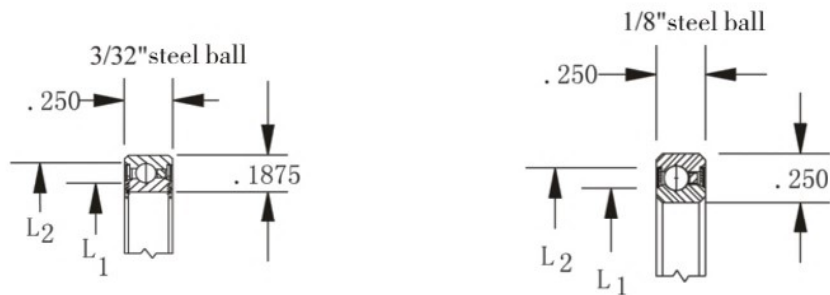


HKG series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Cor	Cr	Coa	Ca	
HKG040X	4	6	4.742	5.258	36490	200000	91210	50050	1.65
	101.6	152.4	120.4	133.6					
HKG042X	4.25	6.25	4.992	5.508	36490	20000	91210	50050	1.75
	107.95	158.75	126.8	139.9					
HKG045X	4.5	6.5	5.242	5.758	38940	20890	97300	52230	1.81
	114.3	165.1	133.1	146.3					
HKG047X	4.75	6.75	5.492	6.008	41340	21740	103390	54360	1.91
	120.65	171.45	139.5	152.6					
HKG050X	5	7	5.742	6.258	43780	22580	109440	56500	2.02
	127	177.8	145.8	159					
HKG055X	5.5	7.5	6.242	6.758	46230	23430	115530	58590	2.17
	139.7	190.5	158.5	171.7					
HKG060X	6	8	6.742	7.258	51070	25030	127710	62630	2.31
	152.4	203.2	171.2	184.4					
HKG065X	6.5	8.5	7.242	7.758	53520	25830	133800	64590	2.47
	165.1	215.9	183.9	197.1					
HKG070X	7	9	7.742	8.258	58360	27380	145930	68450	2.67
	177.8	228.6	196.6	209.8					
HKG075X	7.5	9.5	8.242	8.758	60810	28140	152020	70320	2.83
	190.5	241.3	209.3	222.5					
HKG080X	8	10	8.742	9.258	65650	29600	164200	74010	3
	203.2	254	222	235.2					
HKG090X	9	11	9.742	10.258	72990	31780	182420	79430	3.3
	228.6	279.4	247.4	260.6					
HKG100X	10	12	10.742	11.258	80230	33870	200650	84630	3.65
	254	304.8	272.8	286					
HKG110X	11	13	11.742	12.258	87570	35870	218920	89700	3.96
	279.4	330.2	298.2	311.4					
HKG120X	12	14	12.742	13.258	94860	37830	237140	94590	4.32
	304.8	355.6	323.6	336.8					
HKG140X	14	16	14.742	15.258	109440	41610	273630	104060	4.96
	355.6	406.4	374.4	387.6					
HKG160X	16	18	16.742	17.258	124060	45250	310130	113130	5.65
	406.4	457.2	425.2	438.4					
HKG180X	18	20	18.742	19.258	138640	48720	346620	121840	6.28
	457.2	508	476	489.2					
HKG200X	20	22	20.742	21.258	153220	52100	383070	130240	7.53
	508	558.8	526.8	540					

Sealed Series :

Radial Contact Series

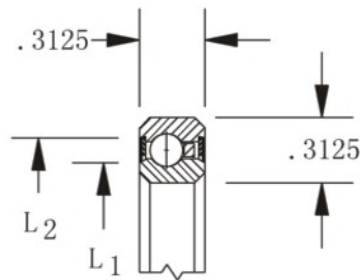
(C Type)



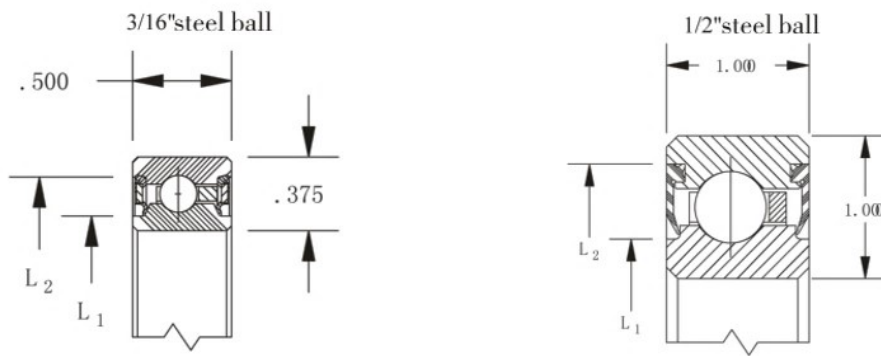
HJHA series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HJHA010C	1.000	1.375	1.108	1.274	1290	670	0.016
	25.4	34.925	28.1	32.4			
HJHA015C	1.500	1.875	1.608	1.771	1780	800	0.024
	38.1	47.625	40.8	45.1			

HJA series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HJA020C	2	2.5	2.148	2.356	3020	1420	0.045
	50.8	63.5	54.6	59.8			
HJA025C	2.5	3	2.648	2.856	3690	1600	0.054
	63.5	76.2	62.7	72.5			
HJA030C	3	3.5	3.148	3.356	4400	1820	0.064
	76.2	88.9	80	85.2			
HJA035C	3.5	4	3.648	3.856	5070	2000	0.077
	88.9	101.6	92.7	98			
HJA040C	4	4.5	4.148	4.356	5730	2130	0.086
	101.6	114.3	105.4	110.6			
HJA042C	4.25	4.75	4.398	4.606	6090	2220	0.091
	107.95	120.65	111.7	117			
HJA045C	4.5	5	4.684	4.856	6400	2310	0.095
	114.3	127	118	123.3			
HJA047C	4.75	5.25	4.898	5.106	6760	2400	0.1
	120.65	133.35	124.4	129.7			
HJA050C	5	5.5	5.148	5.356	7070	2490	0.104
	127	139.7	130.8	136			
HJA055C	5.500	6.000	5.648	5.856	7780	2620	0.113
	139.7	152.4	143.5	148.7			
HJA060C	6.000	6.500	6.148	6.356	8450	2800	0.127
	152.4	165.1	156.2	161.4			
HJA065C	6.500	7.000	6.648	6.856	9110	2930	0.136
	165.1	177.8	168.9	174.1			

5/32" steel ball



HJB series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HJB020C	2	2.625	2.136	2.362	4130	2000	0.068
	50.8	66.7	54.3	60			
HJB025C	2.5	3.125	2.636	2.862	5070	2310	0.086
	63.5	79.375	67	72.7			
HJB030C	3	3.625	3.136	3.362	5960	2580	0.1
	76.2	92.075	79.7	85.4			
HJB035C	3.5	4.125	3.636	3.862	6850	2800	0.122
	88.9	104.775	92.4	98.1			
HJB040C	4	4.625	4.136	4.362	7780	3070	0.136
	101.6	117.475	105	110.8			
HJB042C	4.25	4.875	4.386	4.662	8130	3160	0.141
	107.95	123.825	111.4	118.4			
HJB045C	4.5	5.125	4.636	4.862	8670	3290	0.154
	114.3	130.175	117.8	123.5			
HJB047C	4.75	5.375	4.886	5.162	9020	3380	0.159
	120.65	136.525	124.1	131.1			
HJB050C	5	5.625	5.136	5.362	9560	3510	0.168
	127	142.875	130.5	136.2			
HJB055C	5.5	6.125	5.636	5.862	10490	3730	0.181
	139.7	155.575	143.2	148.9			
HJB060C	6	6.625	6.136	6.362	11380	3960	0.2
	152.4	168.275	155.9	161.6			
HJB065C	6.5	7.125	6.638	6.862	12270	4130	0.213
	165.1	180.975	168.6	174.3			



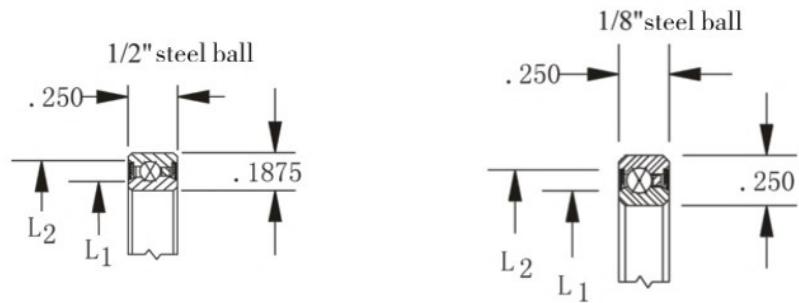
HJU series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HJU040C	4	4.75	4.15	4.547	9340	3910	0.249
	101.6	120.65	105.4	115.5			
HJU042C	4.25	5	4.4	4.797	9870	4090	0.263
	107.95	127	111.76	121.8			
HJU045C	4.5	5.25	4.65	5.047	10400	4220	0.277
	114.3	133.35	118.1	128.2			
HJU047C	4.75	5.5	4.9	5.295	10940	4360	0.295
	120.65	139.7	124.5	134.5			
HJU050C	5	5.75	5.15	5.545	11510	4490	0.308
	127	146.05	130.8	140.8			
HJU055C	5.5	6.25	5.56	6.042	12580	4800	0.336
	139.7	158.75	143.5	153.5			
HJU060C	6	6.75	6.15	6.542	13650	5070	0.367
	152.4	171.45	156.2	166.2			
HJU065C	6.5	7.25	6.65	7.037	14710	5330	0.395
	165.1	184.15	168.9	178.7			
HJU070C	7	7.75	7.15	7.537	15780	5560	0.422
	177.8	196.85	181.6	191.4			
HJU075C	7.5	8.25	7.65	8.037	16850	5820	0.449
	190.5	209.55	194.3	204.1			
HJU080C	8	8.75	8.15	8.537	17910	6050	0.481
	203.2	222.25	207	216.8			
HJU090C	9	9.75	9.15	9.535	20050	6530	0.535
	228.6	247.65	232.4	242.2			
HJU100C	10	10.75	10.15	10.535	22180	6980	0.594
	254	273.05	257.8	267.6			
HJU110C	11	11.75	11.15	11.535	24310	7420	0.649
	279.4	298.45	283.2	293			
HJU120C	12	12.75	12.15	12.535	26450	7870	0.708
	304.8	323.85	308.6	318.4			

HJG series							Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)		
	d	D	L1	L2	Cor	Cr	
HJG120C	12	14	12.554	13.602	94860	37830	4.218
	304.8	355.6	318.9	345.5			
HJG140C	14	16	14.554	15.602	109440	41610	4.899
	355.6	406.4	369.7	396.3			
HJG160C	16	18	16.554	17.602	124060	45250	5.579
	406.4	457.2	420.5	447.1			
HJG180C	18	20	18.554	19.602	138640	48720	6.214
	457.2	508	471.3	497.9			
HJG200C	20	22	20.554	21.602	153220	52100	7.167
	508	558.8	522.1	548.7			

Sealed Series:

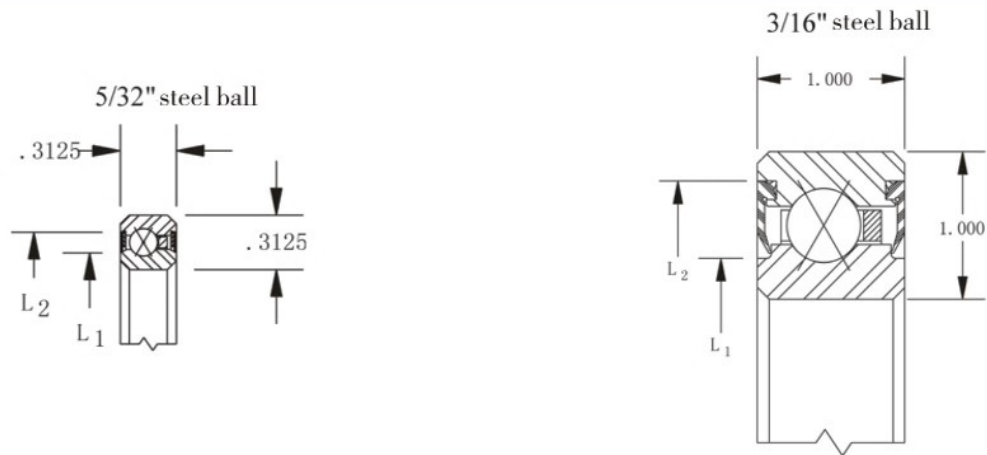
Four-point Contact Series

(X Type)



HJHA series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HJHA010X	1.000	1.375	1.108	1.274	1290	670	3250	1650	0.016
	25.4	34.925	28.1	32.4					
HJHA015X	1.500	1.875	1.608	1.774	1780	800	4450	2050	
	38.1	47.625	40.8	45.1					

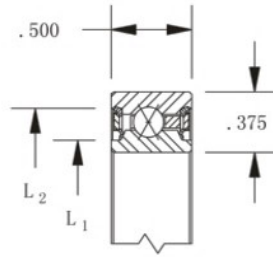
HJA series									Weight (kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HJA020X	2	2.5	2.148	2.356	3020	1420	7600	3510	0.045
	50.8	63.5	54.6	59.8					
HJA025X	2.5	3	2.648	2.856	3690	1600	9290	4050	
	63.5	76.2	62.7	72.5					
HJA030X	3	3.5	3.148	3.356	4400	1820	10980	4490	
	76.2	88.9	80	85.2					
HJA035X	3.5	4	3.648	3.856	5070	2000	12670	4930	
	88.9	101.6	92.7	98					
HJA040X	4	4.5	4.148	4.356	5730	2130	14310	5380	
	101.6	114.3	105.4	110.6					
HJA042X	4.25	4.75	4.398	4.606	6090	2220	15160	5600	
	107.95	120.65	111.7	117					
HJA045X	4.5	5	4.648	4.856	6400	2310	16000	5820	
	114.3	127	118	123.3					
HJA047X	4.75	5.250	4.898	5.106	6760	2400	16850	6000	
	120.65	133.35	124.4	129.7					
HJA050X	5	5.500	5.148	5.365	7070	2490	17690	6220	
	127	139.7	130.8	136					
HJA055X	5.500	6.000	5.648	5.856	7780	2620	19380	6580	
	139.7	152.4	143.5	148.7					
HJA060X	6.000	6.500	6.148	6.356	8450	2800	21070	6980	
	152.4	165.1	156.2	161.4					
HJA065X	6.500	7.000	6.648	6.856	9110	2930	22760	7330	
	165.1	177.8	168.9	174.1					



HJB series									Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HJB020X	2	2.625	2.136	2.362	4130	2000	10400	5020	0.068
	50.8	66.675	54.3	60					
HJB025X	2.5	3.125	2.636	2.862	5070	2310	12620	5730	0.086
	63.5	79.375	67	72.7					
HJB030X	3	3.625	3.136	3.362	5960	2580	14890	6400	0.1
	76.2	92.075	79.7	85.4					
HJB035X	3.5	4.125	3.636	3.862	6850	2800	17160	7070	0.122
	88.9	104.775	92.4	98.1					
HJB040X	4	4.625	4.136	4.362	7780	3070	19430	7650	0.136
	101.6	117.475	105	110.8					
HJB042X	4.25	4.875	4.386	4.662	8130	3160	20310	7910	0.141
	107.95	123.825	111.4	118.4					
HJB045X	4.5	5.125	4.636	4.862	8670	3290	21690	8220	0.154
	114.3	130.175	117.8	123.5					
HJB047X	4.75	5.375	4.886	5.162	9020	3380	22580	8450	0.159
	120.65	136.525	124.1	131.1					
HJB050X	5	5.625	5.136	5.362	9560	3510	23910	8800	0.168
	127	142.875	130.5	136.2					
HJB055X	5.500	6.125	5.636	5.862	10490	3730	26180	9340	0.181
	139.7	155.575	143.2	148.9					
HJB060X	6.000	6.625	6.136	6.362	11380	3960	28450	9870	0.2
	152.4	168.275	155.9	161.6					
HJB065X	6.500	7.125	6.638	6.862	12270	4130	30720	10400	0.213
	165.1	180.975	168.6	174.3					

HJG series									Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HJG120X	12	14	12.554	13.602	94860	37830	237140	94590	4.218
	304.8	355.6	318.9	345.5					
HJG140X	14	16	14.554	15.602	109440	41610	273630	104060	4.899
	355.6	406.4	369.7	396.3					
HJG160X	16	18	16.554	17.602	124060	45250	310130	113130	5.579
	406.4	457.2	420.5	447.1					
HJG180X	18	20	18.554	19.602	138640	48720	346620	121840	6.214
	457.2	508	471.3	497.9					
HJG200X	20	22	20.554	21.602	153220	52100	383070	130240	7.167
	508	558.8	522.1	548.7					

3/16" steel ball



HJU series									Weight(kg)
Type	Dimension(inch/mm)				Basic Load Ratings(N)				
	d	D	L1	L2	Radial		Axial		
					Cor	Cr	Coa	Ca	
HJU040X	4	4.75	4.15	4.547	9340	3910	23380	9820	0.249
	101.6	120.65	105.4	115.5					
HJU042X	4.25	5	4.4	4.797	9870	4090	24710	10180	0.263
	107.95	127	111.76	121.8					
HJU045X	4.5	5.25	4.65	5.047	10400	4220	26050	10580	0.277
	114.3	133.35	118.1	128.2					
HJU047X	4.75	5	4.9	5.295	10940	4360	27380	10940	0.295
	120.65	139.7	124.5	134.5					
HJU050X	5	5.75	5.15	5.545	11510	4490	28720	11290	0.308
	127	146.05	130.8	140.8					
HJU055X	5.5	6.25	5.56	6.042	12580	4800	31380	11960	0.336
	139.7	158.75	143.5	153.5					
HJU060X	6	6.75	6.15	6.542	13650	5070	34050	12620	0.367
	152.4	171.45	156.2	166.2					
HJU065X	6.5	7.25	6.65	7.037	14710	5330	36760	13290	0.395
	165.1	184.15	168.9	178.7					
HJU070X	7	7.75	7.15	7.537	15780	5560	39430	13910	0.422
	177.8	196.85	181.6	191.4					
HJU075X	7.5	8.25	7.65	8.037	16850	5820	42090	14540	0.449
	190.5	209.55	194.3	204.1					
HJU080X	8	8.75	8.15	8.537	17910	6050	44760	15160	0.481
	203.2	222.25	207	216.8					
HJU090X	9	9.75	9.15	9.535	20050	6530	50100	16310	0.535
	228.6	247.65	232.4	242.2					
HJU100X	10	10.75	10.15	10.535	22180	6980	55430	17470	0.594
	254	273.05	257.8	267.6					
HJU110X	11	11.75	11.15	11.535	24310	7420	60810	18580	0.649
	279.4	298.45	283.2	293					
HJU120X	12	12.75	12.15	12.535	26450	7870	66140	19650	0.708
	304.8	323.85	308.6	318.4					

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