CHG®

Luoyang Huigong Bearing Catalog

LUOYANG · CHINA

Brief Introduction

The CHG Company is a professional supplier of large-size and extra large-size bearings in China. We specialize in designing, developing and manufacturing bearings, and also have strong technical strength with senior engineers and technicians taking up 29% of the whole staff.

CHG can design and manufacture various types of rolling bearings ranging from 150mm to 4500mm, either standard or nonstandard, and the accuracy can reach Class 4. Our products are widely used in the fields of metallurgy, mining, petroleum, machinery, wind energy, etc.

CHG is located in Science and Technology Industry Park of Luolong District, Luoyang City, Henan Province. We have been certifying by Quality Management System in accordance with ISO 9001:2000 since 2002, and also have been authorized to operate import and export. We are really developing the stable and friendly cooperation with worldwide customers as our good reputation and pragmatic attitude.

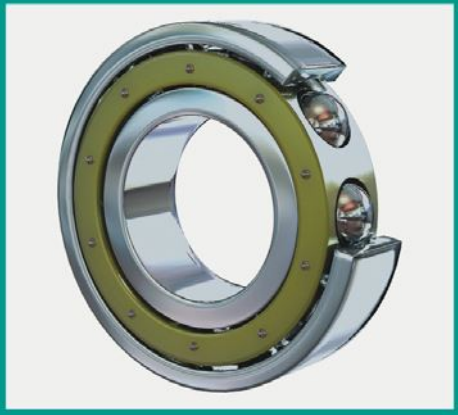
CHG was founded in 1998, and from the very beginning, we focused on the quality, technical development and marketing. We have been serving our customers for 10 years, and we are constantly devoting ourselves to become a manufacturing expert of large and extra large-size bearings in China.

Welcome to CHG!

Our competitive products are following:

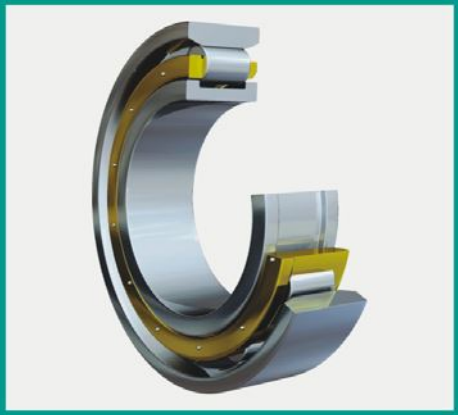
1. Thin-wall series deep groove ball bearings, four-point contact ball bearings and crossed cylindrical roller slewing bearings for robots;
2. Bearings for casting rolling mills, cold rolling mills, hot rolling mills and high precision foil rolling mills;
3. Large-size and extra large-size slewing bearings;
4. Large-size and extra large-size split bearings;
5. Bearings for wind turbines.

Models of CHG bearings



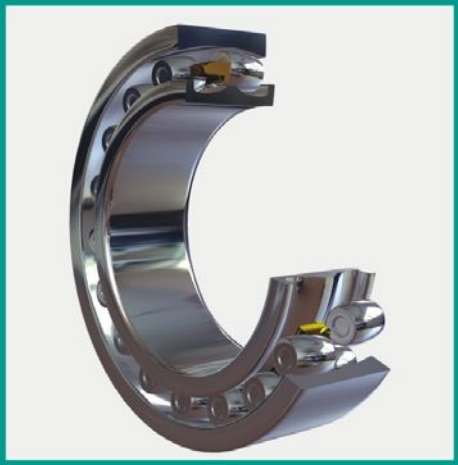
Deep groove ball bearing

Angular contact ball bearing



Cylindrical roller bearing

Tapered roller bearing

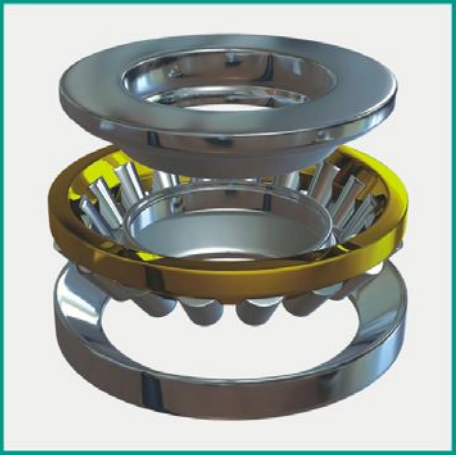


Spherical roller bearing

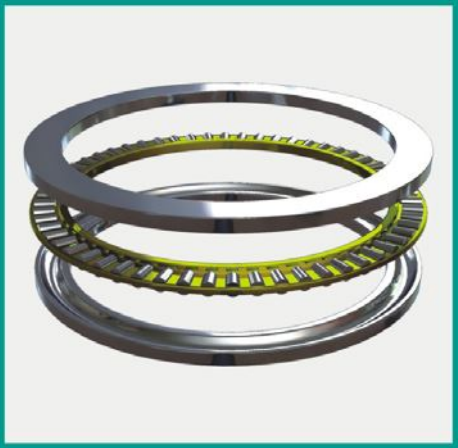
Self–aligning ball bearing

Models of CHG bearings

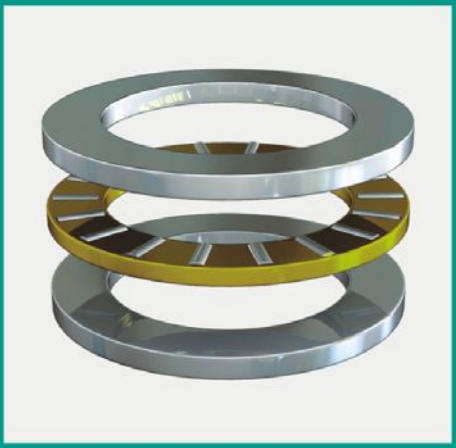
Thrust ball bearing



Spherical roller thrust bearing



Tapered roller thrust bearing



Cylindrical roller thrust bearing

Crossed cylindrical roller slewing bearing

Four–point contact ball slewing bearing

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Part I

Basic Knowledge of Bearings

Basic knowledge of bearings

1. Rolling bearing designations and main dimensions

1.1 Rolling bearing designations

Rolling bearing designations contain basic, prefix and suffix designation. They show bearing structures, main dimensions, running accuracy, internal clearance, etc.

Table 1.1 Arranging order of bearing designations

Bearing designations												
Prefix designation	Basic designations			Suffix designations								
				1	2	3	4	5	6	7	8
Subunit of bearing	Type designation	Dimension series designation	Bore diameter designation	Internal structure	Modification of seal and shield	Cage and its material	Bearing material	Tolerance class	Clearance	Arrangement	Others

Table 1.2 Type designations of bearings

Designation	Bearing type	Designation	Bearing type
0	Double-row angular contact ball bearing	7	Angular contact ball bearing
1	Self-aligning ball bearing	8	Cylindrical roller thrust bearing
2	Spherical roller and spherical roller thrust bearing	9	Tapered roller thrust bearing
		N	Cylindrical roller bearing
3	Tapered roller bearing	NN	Double-row or multi-row cylindrical roller bearing
4	Double-row deep groove ball bearing		
5	Thrust ball bearing	U	External aligning ball bearing
6	Deep groove ball bearing	QJ	Four-point contact ball bearing

Table 1.3 Common types and dimension series designations of bearings

Bearing type	Type designation	Dimension series designation	Bearing designation
Double-row angular contact ball bearing	(0)	32	3200
	(0)	33	3300
Self-aligning ball bearing	1	(0) 2	1200
	(1)	22	2200
	1	(0) 3	1300
	(1)	23	2300
Spherical roller bearing	2	13	21300C
	2	22	22200C
	2	23	22300C

Table 1.3 Common types and dimension series designations of bearings （continued）

Bearing type	Type designation	Dimension series designation	Bearing designation
Spherical roller bearing	2	30	23000C
	2	31	23100C
	2	32	23200C
	2	40	24000C
	2	41	24100C
Spherical roller thrust bearing	2	92	29200
	2	93	29300
	2	94	29400
Tapered roller bearing	3	02	30200
	3	03	30300
	3	13	31300
	3	20	32000
	3	22	32200
	3	23	32300
	3	29	32900
	3	30	33000
	3	31	33100
	3	32	33200
Double-row tapered roller bearing with double-cone	35	–	350000
Double-row tapered roller bearing with double-cup	37	–	370000
Four-row tapered roller bearing	38	–	380000
Double-row deep groove ball bearing	4	(2) 2	4200
	4	(2) 3	4300
Thrust ball bearing	5	11	51100
	5	12	51200
	5	13	51300
	5	14	51400
Double -direction thrust ball bearing	5	22	52200
	5	23	52300
	5	24	52400
Angular contact thrust ball bearing	56	–	560000
	76	–	760000
Double -direction angular contact thrust ball bearing	23	44	234400
	23	47	234700
	23	49	234900
Deep groove ball bearing	6	17	61700
	6	37	63700
	6	18	61800
	6	19	61900
	16	(0) 0	16000
	6	(1) 0	6000
	6	(0) 2	6200
	6	(0) 3	6300
	6	(0) 4	6400
Angular contact ball bearing	7	19	71900
	7	(1) 0	7000
	7	(0) 2	7200
	7	(0) 3	7300
	7	(0) 4	7400
Cylindrical roller thrust bearing	8	11	81100
	8	12	81200
Double-row or multi-row cylindrical roller thrust bearing	8	93	89300
	8	74	87400
	8	94	89400

Table 1.3 Common types and dimension series designations of bearings （continued）

Bearing type	Type designation	Dimension series designation	Bearing designation
Double- direction cylindrical roller thrust bearing	8	22	82200
	8	23	82300
Tapered roller thrust bearing	9	-	90000
Single-row cylindrical roller bearing with double ribbed outer rings	NU	10	NU1000
	NU	(0)2	NU200
	NU	22	NU2200
	NU	(0)3	NU300
	NU	23	NU2300
	NU	(0)4	NU400
Single-row cylindrical roller bearing with double ribbed inner rings	N	10	N1000
	N	(0)2	N200
	N	22	N2200
	N	(0)3	N300
	N	23	N2300
	N	(0)4	N400
Double-row cylindrical roller bearing	NN	30	NN3000
Double-row cylindrical roller bearing with double ribbed outer rings	NNU	49	NNU4900
Four- point contact ball bearing	QJ	(0)2	QJ200
	QJ	(0)3	QJ300
Four- point contact ball bearing with two- piece outer rings	QJF	-	QJF0000
Three- point contact ball bearing with two-piece outer rings	QJT	-	QJT0000
Three -point contact ball bearing with two-piece inner rings	QJS	-	QJS0000

Table 1.4 Common prefix and suffix designations of bearings

Prefix designation		Suffix designations					
		Internal structure designation		Seal , shield and external configuration change		Cage designation	
Design -ation	Meaning	Design -ation	Meaning	Design -ation	Meaning	Design -ation	Meaning
L	Separable inner or outer ring of separable bearing	A、B C、D E	(1)Internal structure change (2)Standard design, the meaning varies with different types and structures	K	Tapered bore bearing, the taper is 1：12 (except for external aligning ball bearing)	F	Steel, nodular cast iron or powder metallurgy solid cage
R	Bearing without separable inner or outer ring	AC	Angular contact ball bearing,nominal contact angle is α =25°	K30	Tapered bore bearing, the taper is 1：30	Q	Bronze solid cage
WS	Shaft washer of cylindrical roller thrust bearing	D	Split bearing	-2K	Double-row tapered bore bearing, the taper is 1：12	M	Brass solid cage
GS	Housing washer of cylindrical roller thrust bearing			R	Bearing with flanged outer ring	L	Light alloy solid cage
KOW-	Thrust bearing without shaft washer			N	Bearing with snap ring groove	W	Welded cage
KIW-	Thrust bearing without housing washer			-RS	Bearing with one cased rubber seal (contact type)	R	Riveted cage (for large-size bearing)
				-2RS	Bearing with two cased rubber seals (contact type)	E	Phosphating cage
				-RZ	Bearing with one cased rubber seal (non-contact type)		
				-2RZ	Bearing with two cased rubber seals (non-contact type)		
				-Z	Bearing with one shield		

Table 1.4 Common prefix and suffix designations of bearings（continued）

Prefix designation		Suffix designations					
		Internal structure designation		Seal , shield and external configuration change		Cage designation	
Design -ation	Meaning	Design -ation	Meaning	Design -ation	Meaning	Design -ation	Meaning
				-2Z	Bearing with two shields		
				-FS	Bearing with one felt seal		
				-2FS	Bearing with two felt seals		
				-RSZ	Bearing with one cased rubber seal (contact type) and one shield		

Table 1.4 Common suffix designations of bearings（continued）

Suffix designations									
Bearing parts material		Tolerance class		Clearance		Arrangement		Other characteristics	
Designation	Meaning	Designation	Meaning	Designation	Meaning	Designation	Meaning	Designation	Meaning
/HE	Rings and rolling elements(and cages) are made of electroslag refined bearing steel ,ZGCr15	/P0	Class 0	/C1	Group 1	/DB	Back to back	/S0	Rings are through high tempering, working temperature is 150℃
/HV	Rings and rolling elements (and cages) are made of hardenable stainless bearing steel	/P6	Class 6	/C2	Group 2	/DF	Face to face	/S1	Rings are through high tempering, working temperature is 200℃
/HN	Rings and rolling elements are made of heat-resisting bearing steel	/P6X	Class 6X	/C3	Group 3	/DT	Paired mounting in tandem arrangement	/S2	Rings are through high tempering, working temperature is 250℃
/HC	Rings (and rolling elements) are made of carburized bearing steel	/P5	Class 5	/C4	Group 4	/TBT	3 bearings in tandem and back to back arrangement	/S3	Rings are through high tempering, working temperature is 300℃
/HQ	Rings and rolling elements are made of nonmetallic material	/P4	Class 4	/C5	Group 5	/TFT	3 bearings in tandem and face to face arrangement	/S4	Rings are through high tempering, working temperature is 350℃
/HG	Rings(and rolling elements) are made of other bearing steel	/P2	Class 2	/C9	Different from current standard	/TT	3 bearings in tandem arrangement	/W20	Outer ring with 3 oil holes
		/SP	Dimension accuracy is Class 5,running accuracy is Class 4					/W26	Inner ring with 6 oil holes
		/UP	Dimension accuracy is Class 4, running accuracy is higher than Class 4					/W33	Outer ring with oil groove and 3 oil holes
								/W33X	Outer ring with oil groove and 6 oil holes
								/W513	W26+W33
								/W518	W20+W26

1.2 Designations of nonstandard bearings

Nonstandard bearing designations are composed of basic, prefix and suffix designation. The type, prefix and suffix designation are the same as those mentioned above. The dimension series in basic designation is shown in table 1.5 and 1.6.

Table 1.5 Designations of nonstandard bearings

Letter	Meaning
X1	Nonstandard outside diameter
X2	Nonstandard width (height)
X3	Nonstandard outside diameter & width /height(standard bore diameter)

Table 1.6 Uncertain series designations

Bearing type	Uncertain series		Remarks
	Designation of width/height series	Designation of diameter series	
Radial bearing	0 (4)	6	1.46 is for double-row angular contact ball bearing 2. "0" should be omitted when uncertain series 06 combines with type designation (except for tapered roller bearings and double-row deep groove ball bearings.)
Thrust bearing	1 2	7	17 is for single-direction thrust bearings 27 is for double-direction thrust bearings

1.3 Designations of four-row cylindrical roller bearings for rolling mills

Designations of four-row cylindrical roller bearings are composed of type, dimension and suffix designation.

1.3.1 Type designations

Type designations, referred in table 1.7 are shown in capital Latin letters.

Table 1.7 Type designations of four-row cylindrical roller bearings

Type designation	Structure
FC	Four- row cylindrical roller bearing (one inner ring)
FCD	Four- row cylindrical roller bearing with double inner rings
FCDP	Four- row cylindrical roller bearing with loose ribbed outer ring and double inner rings

1.3.2 Dimension designations

Dimension designations referred in table 1.8 are shown in Arabic numbers.

Table 1.8 Dimension designations of four-row cylindrical roller bearings

Designation item	Representation
Designation of nominal bore diameter (d)	Nominal bore diameter(mm)/5
Designation of nominal outside diameter (D)	Nominal outside diameter(mm)/5
Designation of nominal width (B)	Nominal width(mm)

1.4 Comparisons of current type designations with original

The original designation consists of 7 numbers, the 4th number from the right is type designation. The differences are in table 1.9.

Table 1.9 Comparisons of current and original designations

Designation	Bearing type	
	Current	Original
0	Double–row angular contact ball bearing	Radial ball bearing
1	Self–aligning ball bearing	Self–aligning ball bearing
2	Spherical roller bearing and spherical roller thrust bearing	Cylindrical roller bearing
3	Tapered roller bearing	Spherical roller bearing
4	Double–row deep groove ball bearing	Long cylindrical roller bearing and needle roller bearing
5	Thrust Ball Bearing	Spiral roller bearing
6	Deep groove ball bearing	Angular contact ball bearing
7	Angular contact ball bearing	Tapered roller bearing
8	Cylindrical roller thrust bearing	Thrust ball bearing and angular contact thrust ball bearing
9	Tapered roller thrust bearing	Cylindrical roller thrust bearing
N	Cylindrical roller bearing	–
U	External aligning ball bearing	–
QJ	Four–point contact ball bearing	–

2. Rolling bearing accuracy

2.1 Rolling bearing accuracy and classes

Rolling bearing accuracy contains dimension tolerance and running accuracy. The tolerance classes have been standardized in 6 classes: class 0, class 6X, class 6, class 5, class 4, and class 2.

Tolerance classes go upwards from class 0, and class 0 is enough for general applications. But some applications require class 5 or higher.

Bearing tolerance classes and applicable standards are shown in table 2.1.

- Dimension tolerance (relating to the mounting of shafts and housings):
  - Allowable deviation of bore diameter, outside diameter, width and assemblage width.
  - Allowable deviation of under roller diameter and diameter over roller of roller set.
  - Allowable limiting of chamfer dimension.
  - Allowable variation of width.
  - Allowable deviation and variation of tapered bore.
- Running Accuracy:
  - Allowable axial and radial runout of inner and outer ring.
  - Allowable lateral runout of bore diameter.
  - Allowable variation of outside diameter surface obliquity.
  - Allowable variation of thickness of thrust bearing raceway.

Bearing dimension tolerance and running accuracy are shown in tables 2.2–2.15.

Limiting chamfer dimensions are referred in table 2.17.

Table 2.1 Bearing type and tolerance classes

Bearing type	Applicable tolerance classes						Applicable standard	Reference
Deep groove ball bearing	Class 0	–	Class 6	Class 5	Class 4	Class 2	GB/T307.1	Tables 2.2 & 2.3
Angular contact ball bearing	Class 0	–	Class 6	Class 5	Class 4	Class 2		
Self–aligning ball bearing	Class 0	–	–	–	–	–		
Cylindrical roller bearing	Class 0	–	Class 6	Class 5	Class 4	Class 2		
Spherical roller bearing	Class 0	–	Class 6	–	–	–		
Metric series tapered roller bearing (single–row)	Class0	Class6X	Class 6	Class 4	Class 4	–	GB/T307.1	Tables 2.4 & 2.5
Metric series tapered roller bearing (double–row&four–row)	Class 0	–	Class 6	Class 5	Class 4	–	JB/T10336 and JB/T5389.2	Tables 2.8–2.10
Inch series tapered roller bearing	Class 4	–	–	Class 3	Class 0	Class00	–	Tables2.11–2.14
Thrust roller bearing	Class 0	–	Class 6	Class 5	Class 4	–	GB/T307.4	Table 2.6
Thrust ball bearing	Class 0	–	Class 6	Class 5	Class 4	–		
Spherical roller thrust bearing	Class 0	–	–	–	–	–		

Table2.2 Radial bearing tolerance (except for tapered roller bearings) (GB/T307.1–2005)

Outer ring

μm

D mm		$\triangle D_{mp}$					$\triangle D_s$ [2]		VD_{sp}													Sealed bearing VD_{sp}		VD_{mp}				
									Diameter series 9				Diameter series 0、1				Diameter series 2、3、4				All diameter series	Diameter series 2、3、4	Diameter series 0、1、2、3、4					
		Class					Class		Class													Class		Class				
		0	6	5	4	2	4	2	0	6	5	4	0	6	5	4	0	6	5	4	2	0	6	0	6	5	4	2
Over	To	High Low	High Low	High Low	High Low	High Low	High Low	High Low	Max				Max				Max				Max	Max		Max				
2.5[1]	6	0 –8	0 –7	0 –5	0 –4	0 –2.5	0 –4	0 –2.5	10	9	5	4	8	7	4	3	6	5	4	3	2.5	10	9	6	5	3	2	1.5
6	18	0 –8	0 –7	0 –5	0 –4	0 –2.5	0 –4	0 –2.5	10	9	5	4	8	7	4	3	6	5	4	3	2.5	10	9	6	5	3	2	1.5
18	30	0 –9	0 –8	0 –6	0 –5	0 –4	0 –5	0 –4	12	10	6	5	9	8	5	4	7	6	5	4	4	12	10	7	6	3	2.5	2
30	50	0 –11	0 –9	0 –7	0 –6	0 –4	0 –6	0 –4	14	11	7	6	11	9	5	5	8	7	5	5	4	16	13	8	7	4	3	2
50	80	0 –13	0 –11	0 –9	0 –7	0 –4	0 –7	0 –4	16	14	9	7	13	11	7	5	10	8	7	5	4	20	16	10	8	5	3.5	2
80	120	0 –15	0 –13	0 –10	0 –8	0 –5	0 –8	0 –5	19	16	10	8	19	16	8	6	11	10	8	6	5	26	20	11	10	5	4	2.5
120	150	0 –18	0 –15	0 –11	0 –9	0 –5	0 –9	0 –5	23	19	11	9	23	19	8	7	14	11	8	7	5	30	25	14	11	6	5	2.5
150	180	0 –25	0 –18	0 –13	0 –10	0 –7	0 –10	0 –7	31	23	13	10	31	23	10	8	19	14	10	8	7	38	30	19	14	7	5	3.5
180	250	0 –30	0 –20	0 –15	0 –11	0 –8	0 –11	0 –8	38	25	15	11	38	25	11	8	23	15	11	8	8	–	–	23	15	8	6	4
250	315	0 –35	0 –25	0 –18	0 –13	0 –8	0 –13	0 –8	44	31	18	13	44	31	14	10	26	19	14	10	8	–	–	26	19	9	7	4
315	400	0 –40	0 –28	0 –20	0 –15	0 –10	0 –15	0 –10	50	35	20	15	50	35	15	11	30	21	15	11	10	–	–	30	21	10	8	5
400	500	0 –45	0 –33	0 –23	– –	– –	– –	– –	56	41	23	–	56	41	17	–	34	25	17	–	–	–	–	34	25	12	–	–
500	630	0 –50	0 –38	0 –28	– –	– –	– –	– –	63	48	28	–	63	48	21	–	38	29	21	–	–	–	–	38	29	14	–	–
630	800	0 –75	0 –45	0 –35	– –	– –	– –	– –	94	56	35	–	94	56	26	–	55	34	26	–	–	–	–	55	34	18	–	–
800	1000	0 –100	0 –60	– –	– –	– –	– –	– –	125	75	–	–	125	75	–	–	75	45	–	–	–	–	–	75	45	–	–	–
1000	1250	0 –125	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1250	1600	0 –160	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1600	2000	0 –200	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	2500	0 –250	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Remarks: 1) This dimension range includes 2.5mm;
2) Class 4 is applicable to dimension series 0,1,2,3 and 4.

Outer Ring (continued)

μm

D mm		K_{ea}					SD			S_{ea} [2]			$\triangle C_s$	VC_s			
		Class					Class			Class			Class	Class			
		0	6	5	4	2	5	4	2	5	4	2	0,6、5、4、2	0、6	5	4	2
Over	To	Max					Max			Max			Hihg low	Max			
2.5[1]	6	15	8	5	3	1.5	8	4	1.5	8	5	1.5	The same as the $\triangle B_s$ of the inner ring	The same as the VB_s of the inner ring	5	2.5	1.5
6	18	15	8	5	3	1.5	8	4	1.5	8	5	1.5			5	2.5	1.5
18	30	15	9	6	4	2.5	8	4	1.5	8	5	2.5			5	2.5	1.5
30	50	20	10	7	5	2.5	8	4	1.5	8	5	2.5			5	2.5	1.5
50	80	25	13	8	5	4	8	4	1.5	10	5	4			6	3	1.5
80	120	35	18	10	6	5	9	5	2.5	11	6	5			8	4	2.5
120	150	40	20	11	7	5	10	5	2.5	13	7	5			8	5	2.5
150	180	45	23	13	8	5	10	5	2.5	14	8	5			8	5	2.5
180	250	50	25	15	10	7	11	7	4	15	10	7			10	7	4
250	315	60	30	18	11	7	13	8	5	18	10	7			11	7	5
315	400	70	35	20	13	8	13	10	7	20	13	8			13	8	7
400	500	80	40	23	–	–	15	–	–	23	–	–			15	–	–
500	630	100	50	25	–	–	18	–	–	25	–	–			18	–	–
630	800	120	60	30	–	–	20	–	–	30	–	–			20	–	–
800	1000	140	75	–	–	–	–	–	–	–	–	–			–	–	–
1000	1250	160	–	–	–	–	–	–	–	–	–	–			–	–	–
1250	1600	190	–	–	–	–	–	–	–	–	–	–			–	–	–
1600	2000	220	–	–	–	–	–	–	–	–	–	–			–	–	–
2000	2500	250	–	–	–	–	–	–	–	–	–	–			–	–	–

Remarks: 1) This dimension range includes 2.5mm;
2) This is applicable to deep groove ball bearings and angular contact ball bearings.

Table2.3 Radial bearing tolerance (except for tapered roller bearings) (GB/T307.1–2005)

Inner ring

μm

d mm		Δd_{mp}					Δd_s [2]		Vd_{sp} Diameter series 9				Vd_{sp} Diameter series 0、1				Vd_{sp} Diameter series 2、3、4				Vd_{sp} All diameter series	Vd_{mp}				
		Class					Class		Class				Class				Class					Class				
		0	6	5	4	2	4	2	0	6	5	4	0	6	5	4	0	6	5	4	2	0	6	5	4	2
Over	To	High Low	High Low	High Low	High Low	High Low	High Low	High Low	Max				Max				Max				Max	Max				
0.6[1]	2.5	0 –8	0 –7	0 –5	0 –4	0 –2.5	0 –4	0 –2.5	10	9	5	4	8	7	4	3	6	5	4	3	2.5	6	5	3	2	1.5
2.5	10	0 –8	0 –7	0 –5	0 –4	0 –2.5	0 –4	0 –2.5	10	9	5	4	8	7	4	3	6	5	4	3	2.5	6	5	3	2	1.5
10	18	0 –8	0 –7	0 –5	0 –4	0 –2.5	0 –4	0 –2.5	10	9	5	4	8	7	4	3	6	5	4	3	2.5	6	5	3	2	1.5
18	30	0 –10	0 –8	0 –6	0 –5	0 –2.5	0 –5	0 –2.5	13	10	6	5	10	8	5	4	8	6	5	4	2.5	8	6	3	2.5	1.5
30	50	0 –12	0 –10	0 –8	0 –6	0 –2.5	0 –6	0 –2.5	15	13	8	6	12	10	6	5	9	8	6	5	2.5	9	8	4	3	1.5
50	80	0 –15	0 –12	0 –9	0 –7	0 –4	0 –7	0 –4	19	15	9	7	19	15	7	5	11	9	7	5	4	11	9	5	3.5	2
80	120	0 –20	0 –15	0 –10	0 –8	0 –5	0 –8	0 –5	25	19	10	8	25	19	8	6	15	11	8	6	5	15	11	5	4	2.5
120	150	0 –25	0 –18	0 –13	0 –10	0 –7	0 –10	0 –7	31	23	13	10	31	23	10	8	19	14	10	8	7	19	14	7	5	3.5
150	180	0 –25	0 –18	0 –13	0 –10	0 –7	0 –10	0 –7	31	23	13	10	31	23	10	8	19	14	10	8	7	19	14	7	5	3.5
180	250	0 –30	0 –22	0 –15	0 –12	0 –8	0 –12	0 –8	38	28	15	12	38	28	12	9	23	17	12	9	8	23	17	8	6	4
250	315	0 –35	0 –25	0 –18	– –	– –	– –	– –	44	31	18	–	44	31	14	–	26	19	14	–	–	26	19	9	–	–
315	400	0 –40	0 –30	0 –23	– –	– –	– –	– –	50	38	23	–	50	38	18	–	30	23	18	–	–	30	23	12	–	–
400	500	0 –45	0 –35	– –	– –	– –	– –	– –	56	44	–	–	56	44	–	–	34	26	–	–	–	34	26	–	–	–
500	630	0 –50	0 –40	– –	– –	– –	– –	– –	63	50	–	–	63	50	–	–	38	30	–	–	–	38	30	–	–	–
630	800	0 –75	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
800	1000	0 –100	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1000	1250	0 –125	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1250	1600	0 –160	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1600	2000	0 –200	– –	– –	– –	– –	– –	– –	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Remarks: 1) The dimension range includes 0.6mm;
2) Class 4 is applicable to dimension series 0,1,2,3 and 4.

Inner ring (continued)

μm

d mm		K_{ia}					Sd			S_{ia} [2]			ΔB_s					VB_s				
		Class					Class			Class			Class					Class				
		0	6	5	4	2	5	4	2	5	4	2	0	6	5	4	2	0	6	5	4	2
Over	To	Max					Max			Max			High Low					Max				
0.6[1]	2.5	10	5	4	2.5	1.5	7	3	1.5	7	3	1.5	0 –40	0 –40	0 –40	0 –40	0 –40	12	12	5	2.5	1.5
2.5	10	10	6	4	2.5	1.5	7	3	1.5	7	3	1.5	0 –120	0 –120	0 –40	0 –40	0 –40	15	15	5	2.5	1.5
10	18	10	7	4	2.5	1.5	7	3	1.5	7	3	1.5	0 –120	0 –120	0 –80	0 –80	0 –80	20	20	5	2.5	1.5
18	30	13	8	4	3	2.5	8	4	1.5	8	4	2.5	0 –120	0 –120	0 –120	0 –120	0 –120	20	20	5	2.5	1.5
30	50	15	10	5	4	2.5	8	4	1.5	8	4	2.5	0 –120	0 –120	0 –120	0 –120	0 –120	20	20	5	3	1.5
50	80	20	10	5	4	2.5	8	5	1.5	8	5	2.5	0 –150	0 –150	0 –150	0 –150	0 –150	25	25	6	4	1.5
80	120	25	13	6	5	2.5	9	5	2.5	9	5	2.5	0 –200	0 –200	0 –200	0 –200	0 –200	25	25	7	4	2.5
120	150	30	18	8	6	2.5	10	6	2.5	10	7	2.5	0 –250	0 –250	0 –250	0 –250	0 –250	30	30	8	5	2.5
150	180	30	18	8	6	5	10	6	4	10	7	5	0 –250	0 –250	0 –250	0 –250	0 –250	30	30	8	5	4
180	250	40	20	10	8	5	11	7	5	13	8	5	0 –300	0 –300	0 –300	0 –300	0 –300	30	30	10	6	5
250	315	50	25	13	–	–	13	–	–	15	–	–	0 –350	0 –350	0 –350	– –	– –	35	35	13	–	–
315	400	60	30	15	–	–	15	–	–	20	–	–	0 –400	0 –400	0 –400	– –	– –	40	40	15	–	–
400	500	65	35	–	–	–	–	–	–	–	–	–	0 –450	0 –450	– –	– –	– –	50	45	–	–	–
500	630	70	40	–	–	–	–	–	–	–	–	–	0 –500	0 –500	– –	– –	– –	60	50	–	–	–
630	800	80	–	–	–	–	–	–	–	–	–	–	0 –750	– –	– –	– –	– –	70	–	–	–	–
800	1000	90	–	–	–	–	–	–	–	–	–	–	0 –1000	– –	– –	– –	– –	80	–	–	–	–
1000	1250	100	–	–	–	–	–	–	–	–	–	–	0 –1250	– –	– –	– –	– –	100	–	–	–	–
1250	1600	120	–	–	–	–	–	–	–	–	–	–	0 –1600	– –	– –	– –	– –	120	–	–	–	–
1600	2000	140	–	–	–	–	–	–	–	–	–	–	0 –2000	– –	– –	– –	– –	140	–	–	–	–

Remarks: 1) The dimension range includes 0.6mm;
2) This is applicable to deep groove ball bearings and angular contact ball bearings.

Table2.4 Metric tapered roller bearing tolerance（GB/T307.1–2005）

(1) Outer ring

μm

D mm		$\triangle D_{mp}$						$\triangle D_s$	VD_{sp}			VD_{mp}			K_{ea}			SD		S_{ea}	$\triangle C_s$		
		Class						Class	Class			Class			Class			Class		Class	Class		
		0、6X		5		4		4	0、6X	5	4	0、6X	5	4	0、6X	5	4	5	4	4	6X	0、5、4	
Over	To	High	Low	High	Low	High	Low	High Low	Max			Max			Max			Max		Max	High Low	High Low	
18	30	0	−12	0	−8	0	−6	0 −6	12	6	5	9	5	4	18	6	4	8	4	5	0 −100	The same as the $\triangle B_s$ of the inner ring	
30	50	0	−14	0	−9	0	−7	0 −7	14	7	5	11	5	5	20	7	5	8	4	5	0 −100		
50	80	0	−16	0	−11	0	−9	0 −9	16	8	7	12	6	5	25	8	5	8	4	5	0 −100		
80	120	0	−18	0	−13	0	−10	0 −10	18	10	8	14	7	5	35	10	6	9	5	6	0 −100		
120	150	0	−20	0	−15	0	−11	0 −11	20	11	8	15	8	6	40	11	7	10	5	7	0 −100		
150	180	0	−25	0	−18	0	−13	0 −13	25	14	10	19	9	7	45	13	8	10	5	8	0 −100		
180	250	0	−30	0	−20	0	−15	0 −15	30	15	11	23	10	8	50	15	10	11	7	10	0 −100		
250	315	0	−35	0	−25	0	−18	0 −18	35	19	14	26	13	9	60	18	11	13	8	10	0 −100		
315	400	0	−40	0	−28	0	−20	0 −20	40	22	15	30	14	10	70	20	13	13	10	13	0 −100		
400	500	0	−45	0	−33	–	–	– –	45	26	–	34	17	–	80	24	–	17	–	–	0 −100		
500	630	0	−50	0	−38	–	–	– –	60	30	–	38	20	–	100	30	–	20	–	–	– –		

(2) Inner ring

μm

d mm		$\triangle d_{mp}$				$\triangle d_s$	Vd_{sp}			Vd_{mp}			K_{ia}			Sd		S_{ia}	$\triangle B_s$			
		Class				Class	Class			Class			Class			Class		Class	Class			
		0、6X		5		4	0、6X	5	4	0、6X	5	4	0、6X	5	4	5	4	4	0	6X	5	4
Over	To	High	Low	High	Low	High Low	Max			Max			Max			Max		Max	High Low	High Low	High Low	High Low
10	18	0	−12	0	−7	0 −5	12	5	4	9	5	4	15	5	3	7	3	3	0 −120	0 −50	0 −200	0 −200
18	30	0	−12	0	−8	0 −6	12	6	5	9	5	4	18	5	3	8	4	4	0 −120	0 −50	0 −200	0 −200
30	50	0	−12	0	−10	0 −8	12	8	6	9	5	5	20	6	4	8	4	4	0 −120	0 −50	0 −240	0 −240
50	80	0	−15	0	−12	0 −9	15	9	7	11	6	5	25	7	4	8	5	4	0 −150	0 −50	0 −300	0 −300
80	120	0	−20	0	−15	0 −10	20	11	8	15	8	5	30	8	5	9	5	5	0 −200	0 −50	0 −400	0 −400
120	180	0	−25	0	−18	0 −13	25	14	10	19	9	7	35	11	6	10	6	7	0 −250	0 −50	0 −500	0 −500
180	250	0	−30	0	−22	0 −15	30	17	11	23	11	8	50	13	8	11	7	8	0 −300	0 −50	0 −600	0 −600
250	315	0	−35	0	−25	0 −18	35	19	12	26	13	9	60	13	9	13	8	9	0 −350	0 −50	– −700	– −700
315	400	0	−40	0	−30	– –	– –	40	23	–	30	15	–	70	15	–	15	–	–	0 −400	0 −50	– −800	– –

Table 2.5 Metric tapered roller bearing tolerance（GB/T307.1–2005）

Assemblage width and effective width

μm

d mm		$\triangle T_s$								$\triangle T_{1s}$				$\triangle T_{2s}$			
		Class 0		Class 6X		Class 5		Class 4		Class 0		Class 6X		Class 0		Class 6X	
Over	To	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
10	18	+200	0	+100	0	+200	−200	+200	−200	+100	0	+50	0	+100	0	+50	0
18	30	+200	0	+100	0	+200	−200	+200	−200	+100	0	+50	0	+100	0	+50	0
30	50	+200	0	+100	0	+200	−200	+200	−200	+100	0	+50	0	+100	0	+50	0
50	80	+200	0	+100	0	+200	−200	+200	−200	+100	0	+50	0	+100	0	+50	0
80	120	+200	−200	+100	0	+200	−200	+200	−200	+100	−100	+50	0	+100	−100	+50	0
120	180	+350	−250	+150	0	+350	−250	+350	−250	+150	−150	+50	0	+200	−100	+100	0
180	250	+350	−250	+150	0	+350	−250	+350	−250	+150	−150	+50	0	+200	−100	+100	0
250	315	+350	−250	+200	0	+350	−250	+350	−250	+150	−150	+100	0	+200	−100	+100	0
315	400	+400	−400	+200	0	+400	−400	–	–	+200	−200	+100	0	+200	−200	+100	0

d:Nominal bore diameter

T_1:Nominal width of bearing consisted of inner ring with rollers and standard outer ring;

T_2:Nominal width of bearing consisted of outer ring and standard inner ring with rollers.

Table 2.6 Thrust bearing tolerance（GB/T307.4–2002）

（1）Shaft washer and center shaft washer

μm

d or d_2 mm		$\triangle d_{mp}$ or $\triangle d_{2mp}$				Vd_p or Vd_{2p}		S_i [1]			
		Class				Class		Class			
		0、6、5		4		0、6、5	4	0	6	5	4
Over	To	High	Low	High	Low	Max		Max			
–	18	0	–8	0	–7	6	5	10	5	3	2
18	30	0	–10	0	–8	8	6	10	5	3	2
30	50	0	–12	0	–10	9	8	10	6	3	2
50	80	0	–15	0	–12	11	9	10	7	4	3
80	120	0	–20	0	–15	15	11	15	8	4	3
120	180	0	–25	0	–18	19	14	15	9	5	4
180	250	0	–30	0	–22	23	17	20	10	5	4
250	315	0	–35	0	–25	26	19	25	13	7	5
315	400	0	–40	0	–30	30	23	30	15	7	5
400	500	0	–45	0	–35	34	26	30	18	9	6
500	630	0	–50	0	–40	38	30	35	21	11	7
630	800	0	–75	0	–50	55	40	40	25	13	8
800	1000	0	–100	–	–	75	–	45	30	15	–
1000	1250	0	–125	–	–	95	–	50	35	18	–

（2）Housing washer

μm

D mm		$\triangle D_{mp}$				VD_p		S_e [1]
		Class				Class		Class
		0、6、5		4		0、6、5	4	0、6、5、4
Over	To	High	Low	High	Low	Max		Max
10	18	0	–11	0	–7	8	5	The same as the S_i of the shaft washer
18	30	0	–13	0	–8	10	6	
30	50	0	–16	0	–9	12	7	
50	80	0	–19	0	–11	14	8	
80	120	0	–22	0	–13	17	10	
120	180	0	–25	0	–15	19	11	
180	250	0	–30	0	–20	23	15	
250	315	0	–35	0	–25	26	19	
315	400	0	–40	0	–28	30	21	
400	500	0	–45	0	–33	34	25	
500	630	0	–50	0	–38	38	29	
630	800	0	–75	0	–45	55	34	
800	1000	0	–100	–	–60	75	45	
1000	1250	0	–125	–	–	95	–	
1250	1600	0	–160	–	–	120	–	

Remarks: The variation of thickness S_i and S_e of double–direction bearing is the same as single–direction bearing which has the same outer diameter dimension. The diameter of bore is in GB/T 273.2.
d: Nominal bore diameter
d_2:Nominal bore diameter of center shaft washer
D:Nominal outside diameter

Table 2.7 Tolerance of four-row cylindrical roller bearing outer rings

μm

D mm		ΔD_{mp}				VD_p			VD_{mp}			$D_{1mpmax}-D_{2mpmin}$			K_{ea}			ΔC_s		VC_s		
		Tolerance class																				
		0、6、5	0	6	5	0	6	5	0	6	5	0	6	5	0	6	5	0、6、5		0	6	5
Over	To	High	Low			Max												High	Low	Max		
80	120	0	−15	−13	−10	15	13	9	11	10	5	8	7	5	35	18	10	0	−200	The same as the VB_s of the inner ring		8
120	150	0	−18	−15	−11	19	15	10	14	11	6	9	8	6	40	20	11	0	−250			8
150	180	0	−25	−18	−13	25	18	12	19	14	7	13	9	7	45	23	13	0	−250			8
180	250	0	−30	−20	−15	31	20	13	23	15	8	15	10	8	50	25	15	0	−300			10
250	315	0	−35	−25	−18	35	25	16	26	19	9	18	13	9	60	30	18	0	−350			11
315	400	0	−40	−28	−20	40	28	18	30	21	10	20	14	10	70	35	20	0	−400			13
400	500	0	−45	−33	−23	45	34	20	34	25	12	23	17	12	80	40	23	0	−450			15
500	630	0	−50	−38	−28	50	38	25	38	29	14	25	19	14	100	50	25	0	−500			18
630	800	0	−75	−45	−35	75	45	31	55	34	18	38	23	18	120	60	30	0	−750			20
800	1000	0	−100	−60	−40	100	60	35	75	45	20	50	30	20	140	75	30	0	−1000			25
1000	1250	0	−125	–	–	125	–	–	–	–	–	63	–	–	160	–	–	0	−1250			–
1250	1600	0	−160	–	–	160	–	–	–	–	–	80	–	–	190	–	–	0	−1600			–

Table 2.8 Tolerance of four-row cylindrical roller bearing inner rings

μm

d mm		Δd_{mp}				Vd_p			Vd_{mp}			K_{ia}			$d_{1mpmax}-d_{2mpmin}$			ΔB_s		VB_s		
		Tolerance class																				
		0、6、5	0	6	5	0	6	5	0	6	5	0	6	5	0	6	5	0、6、5		0	6	5
Over	To	High	Low			Max												High	Low	Max		
80	120	0	−20	−15	−10	20	15	9	15	11	5	25	13	6	10	8	5	0	−200	25	25	7
120	180	0	−25	−18	−13	25	18	12	19	14	7	30	18	8	13	9	7	0	−250	30	30	8
180	250	0	−30	−22	−15	30	23	14	23	17	8	40	20	10	15	11	8	0	−300	30	30	10
250	315	0	−35	−25	−18	35	25	16	26	19	9	50	25	13	18	13	9	0	−350	35	35	13
315	400	0	−40	−30	−23	40	31	21	30	23	12	60	30	15	20	15	12	0	−400	40	40	15
400	500	0	−45	−35	−27	45	35	24	34	26	14	65	35	18	23	18	14	0	−450	50	45	17
500	630	0	−50	−40	−30	50	40	27	38	30	15	70	40	20	25	20	15	0	−500	60	50	20
630	800	0	−75	–	–	75	–	–	–	–	–	80	–	–	38	–	–	0	−750	70	–	–
800	1000	0	−100	–	–	100	–	–	–	–	–	90	–	–	50	–	–	0	−1000	80	–	–
1000	1250	0	−125	–	–	125	–	–	–	–	–	100	–	–	63	–	–	0	−1250	100	–	–

Table 2.9 Tolerance of four-row tapered roller bearing inner rings and combination width

μm

d mm		Δd_{mp}			Vd_p			Vd_{mp}			K_{ia}			$d_{1mpmax}-d_{2mpmin}$		ΔB_{4S} ΔC_{4S}	
		Tolerance class															
		0、6、5	0	6、5	0	6	5	0	6	5	0	6	5	0	6、5	0、6、5	
Over	To	High	Low		Max											High	Low
80	120	0	−20	−15	20	15	11	15	11	8	30	13	8	10	8	+400	−400
120	180	0	−25	−18	25	18	14	19	14	9	35	18	11	13	9	+500	−500
180	250	0	−30	−22	30	22	17	23	16	11	50	20	13	15	11	+600	−600
250	315	0	−35	−25	35	25	19	26	19	13	60	30	16	18	13	+700	−700
315	400	0	−40	−30	40	30	23	30	23	15	70	35	19	20	15	+800	−800
400	500	0	−45	–	45	–	–	34	–	–	70	–	–	23	–	+900	−900
500	630	0	−50	–	50	–	–	38	–	–	85	–	–	25	–	+1000	−1000
630	800	0	−75	–	75	–	–	56	–	–	100	–	–	38	–	+1200	−1200
800	1000	0	−100	–	100	–	–	75	–	–	120	–	–	50	–	+1500	−1500

Table 2.10 Tolerance of four–row tapered roller bearing outer rings

μm

D mm		ΔD_{mp}			VD_p			VD_{mp}			K_{ea}			$D_{1mpmax} - D_{2mpmin}$	
		Tolerance class													
		0、6、5	0	6、5	0	6	5	0	6	5	0	6	5	0	6、5
Over	To	High	Low		Max										
80	120	0	−18	−13	18	13	10	14	10	7	35	18	10	9	7
120	150	0	−20	−15	20	15	11	15	11	8	40	20	11	10	8
150	180	0	−25	−18	25	18	14	19	14	9	45	23	13	13	9
180	250	0	−30	−20	30	20	15	23	15	10	50	25	15	15	10
250	315	0	−35	−25	35	25	19	26	19	13	60	30	18	18	13
315	400	0	−40	−28	40	28	22	30	22	14	70	35	20	20	14
400	500	0	−45	−33	45	33	25	34	25	17	80	40	23	23	17
500	630	0	−50	−38	50	38	29	38	29	19	100	50	25	25	19
630	800	0	−75	–	75	–	–	55	–	–	120	–	–	38	–
800	1000	0	−100	–	100	–	–	75	–	–	140	–	–	50	–
1000	1250	0	−125	–	125	–	–	84	–	–	165	–	–	65	–
1250	1600	0	−160	–	160	–	–	120	–	–	190	–	–	80	–

Table 2.11 Tolerance of inch series tapered roller bearing outer rings

μm

Applicable type	D mm(1/25.4)		ΔD_s									
			Tolerance class									
			4		2		3		0		00	
	Over	To	High	Low	High	Low	High	Low	High	Low	High	Low
All types	–	266.7 (10.5)	+25	0	+25	0	+13	0	+13	0	+8	0
	266.7(10.5)	304.8 (12.0)	+25	0	+25	0	+13	0	+13	0	+8	0
	304.8(12.0)	609.6 (24.0)	+51	0	+51	0	+25	0	–	–	–	–
	609.6 (24.0)	914.4 (36.0)	+76	0	+76	0	+38	0	–	–	–	–
	914.4 (36.0)	1219.2 (48.0)	+102	0	–	–	+51	0	–	–	–	–
	1219.2 (48.0)	–	+127	0	–	–	+76	0	–	–	–	–

Table 2.12 Tolerance of inch series tapered roller bearing inner rings

μm

Applicable type	d mm(1/25.4)		Δd_s									
			Tolerance class									
			4		2		3		0		00	
	Over	To	High	Low	High	Low	High	Low	High	Low	High	Low
All types	–	76.2 (3.0)	+13	0	+13	0	+13	0	+13	0	+8	0
	76.2 (3.0)	266.7 (10.5)	+25	0	+25	0	+13	0	+13	0	+8	0
	266.7 (10.5)	304.8 (12.0)	+25	0	+25	0	+13	0	+13	0	+8	0
	304.8 (12.0)	609.6 (24.0)	–	–	+51	0	+25	0	–	–	–	–
	609.6 (24.0)	914.4 (36.0)	+76	0	–	–	+38	0	–	–	–	–
	914.4 (36.0)	1219.2 (48.0)	+102	0	–	–	+51	0	–	–	–	–
	1219.2 (48.0)	–	+127	0	–	–	+76	0	–	–	–	–

Table 2.13 Radial runout of inch series tapered roller bearings μm

Applicable type	D mm(1/25.4)		K_{ia} K_{ea} Tolerance class				
			4	2	3	0	00
	Over	To	Max	Max	Max	Max	Max
All types	–	266.7 (10.5)	51	38	8	4	2
	266.7 (10.5)	304.8 (12.0)	51	38	8	4	2
	304.8 (12.0)	609.6 (24.0)	51	38	18	–	–
	609.6 (24.0)	914.4 (36.0)	76	51	51	–	–
	914.4 (36.0)	1219.2 (48.0)	76	–	76	–	–
	1219.2 (48.0)	–	76	–	76	–	–

Table 2.14 Tolerance of assemblage and combination width for inch series tapered roller bearings μm

Applicable type	d mm(1/25.4)		D mm(1/25.4)		Deviation							
					Class 4		Class 2		Class 3		Classs 0	
	Over	To	Over	To	High	Low	High	Low	High	Low	High	Low
Single –row	–	101.6 (4.0)	–	–	+203	0	+203	0	+203	–203	+203	–203
	101.6 (4.0)	266.7 (10.5)	–	–	+356	–254	+203	0	+203	–203	+203	–203
	266.7 (10.5)	304.8 (12.0)	–	–	+356	–254	+203	0	+203	–203	+203	–203
	304.8 (12.0)	609.6 (24.0)	–	508.0 (20.0)	–	–	+381	–381	+203	–203	–	–
	304.8 (12.0)	609.6 (24.0)	508.0 (20.0)	–	–	–	+381	–381	+381	–381	–	–
	609.6 (24.0)		–	–	+381	–381	–	–	+381	–381	–	–
Double –row	–	101.6 (4.0)	–	–	+406	0	+406	0	+406	–406	+406	–406
	101.6 (4.0)	267.7 (10.5)	–	–	+711	–508	+406	–203	+406	–406	+406	–406
	267.7 (10.5)	304.8 (12.0)	–	–	+711	–508	+406	–203	+406	–406	+406	–406
	304.8 (12.0)	609.6 (24.0)	–	508.0 (20.0)	–	–	+762	–762	+406	–406	–	–
	304.8 (12.0)	609.6 (24.0)	508.0 (20.0)	–	–	–	+762	–762	+762	–762	–	–
	609.6 (24.0)		–	–	+762	–762	–	–	+762	–762	–	–
Double–row (Type TNA)	–	127.0 (5.0)	–	–	–	–	+254	0	+254	0	–	–
	127.0 (5.0)	–	–	–	–	–	+762	0	+762	0	–	–
Four–row	Full size range		–	–	+1524	–1524	+1524	–1524	+1524	–1524	+1524	–1524

Remark: This is applicable to Class 0.

Table 2.15 Tolerance of outer ring flange of radial bearings μm

D_1		$\triangle D_{1s}$			
		Locating flange		Non–locating flange	
Over	To	High	Low	High	Low
6	10	0	–36	+220	–36
10	18	0	–43	+270	–43
18	30	0	–52	+330	–52
30	50	0	–62	+390	–62
50	80	0	–74	+460	–74
80	120	0	–87	+540	–87
120	180	0	–100	+630	–100
180	250	0	–115	+720	–115
250	315	0	–130	+810	–130
315	400	0	–140	+890	–140
400	500	0	–155	+970	–155
500	630	0	–175	+1100	–175
630	800	0	–200	+1250	–200
800	1000	0	–230	+1400	–230
1000	1250	0	–260	+1650	–260
1250	1600	0	–310	+1950	–310
1600	2000	0	–370	+2300	–370
2000	2500	0	–440	+2800	–440

Table 2.16 Limiting chamfer dimensions （GB/T274–2000）

(1) Radial bearings（except for tapered roller bearings）

mm

r（Min）or r_1（Min）	d		Radial	Axial
	Over	To	r（Max）or r_1（Max）	
0.05	–	–	0.1	0.2
0.08	–	–	0.16	0.3
0.1	–	–	0.2	0.4
0.15	–	–	0.3	0.6
0.2	–	–	0.5	0.8
0.3	–	40	0.6	1
	40	–	0.8	1
0.6	–	40	1	2
	40	–	1.3	2
1	–	50	1.5	3
	50	–	1.9	3
1.1	–	120	2	3.5
	120	–	2.5	4
1.5	–	120	2.3	4
	120	–	3	5
2	–	80	3	4.5
	80	220	3.5	5
	220	–	3.8	6
2.1	–	280	4	6.5
	280	–	4.5	7
2.5	–	100	3.8	6
	100	280	4.5	6
	280	–	5	7
3	–	280	5	8
	280	–	5.5	8
4	–	–	6.5	9
5	–	–	8	10
6	–	–	10	13
7.5	–	–	12.5	17
9.5	–	–	15	19
12	–	–	18	24
15	–	–	21	30
19	–	–	25	38

Remark: For bearings whose nominal width ≤2mm, radial and axial values of r(max) or r1(max)are same.

（2）Metric tapered roller bearings

mm

r（Min）or r_1（Min）	d or D mm		Radial	Axial
	Over	To	r（Max）or r_1（Max）	
0.3	–	40	0.7	1.4
	40	–	0.9	1.6
0.6	–	40	1.1	1.7
	40	–	1.3	2
1	–	50	1.6	2.5
	50	–	1.9	3
1.5	–	120	2.3	3
	120	250	2.8	3.5
	250	–	3.5	4
2	–	120	2.8	4
	120	250	3.5	4.5
	250	–	4	5

(2) Metric tapered roller bearings (continued)

mm

r (Min) or r_1 (Min)	d or D mm		Radial	Axial
	Over	To	r (Max) or r_1 (Max)	
2.5	–	120	3.5	5
	120	250	4	5.5
	250	–	4.5	6
3	–	120	4	5.5
	120	250	4.5	6.5
	250	400	5	7
	400	–	5.5	7.5
4	–	120	5	7
	120	250	5.5	7.5
	250	400	6	8
	400	–	6.5	8.5
5	–	180	6.5	8
	180	–	7.5	9
6	–	180	7.5	10
	180	–	9	11

Remark: d is for inner rings, D is for outer rings.

(3) Thrust bearings

mm

r (Min) or r_1 (Min)	Radial and axial r (Max) or r_1 (Max)
0.05	0.1
0.08	0.16
0.1	0.2
0.15	0.3
0.2	0.5
0.3	0.8
0.6	1.5
1	2.2
1.1	2.7
1.5	3.5
2	4
2.1	4.5
3	5.5
4	6.5
5	8
6	10
7.5	12.5
9.5	15
12	18
15	21
19	25

Table 2.17 Basic tolerance

μm

Basic dimension mm		Basic tolerance classes									
Over	To	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10
–	3	0.8	1.2	2	3	4	6	10	14	25	40
3	6	1	1.5	2.5	4	5	8	12	18	30	48
6	10	1	1.5	2.5	4	6	9	15	22	36	58
10	18	1.2	2	3	5	8	11	18	27	43	70
18	30	1.5	2.5	4	6	9	13	21	33	52	84
30	50	1.5	2.5	4	7	11	16	25	39	62	100
50	80	2	3	5	8	13	19	30	46	74	120

Table 2.17 Basic tolerance（continued） μm

Basic dimension mm		Basic tolerance classes									
Over	To	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10
80	120	2.5	4	6	10	15	22	35	54	87	140
120	180	3.5	5	8	12	18	25	40	63	100	160
180	250	4.5	7	10	14	20	29	46	72	115	185
250	315	6	8	12	16	23	32	52	81	130	210
315	400	7	9	13	18	25	36	57	89	140	230
400	500	8	10	15	20	27	40	63	97	155	250
500	630	9	11	16	22	30	44	70	110	175	280
630	800	10	13	18	25	35	50	80	125	200	320
800	1000	11	15	21	29	40	56	90	140	230	360
1000	1250	13	18	24	34	46	66	105	165	260	420
1250	1600	15	21	29	40	54	78	125	195	310	500
1600	2000	18	25	35	48	65	92	150	230	370	600
2000	2500	22	30	41	57	77	110	175	280	440	700
2500	3150	26	36	50	69	93	135	210	330	540	860

3. Bearing clearance

Bearing clearance includes radial and axial clearance. Before mounting, keeping the inner or outer ring stationary then moving the unfixed ring, the moving distance is called bearing clearance.

The running clearance is also called working clearance. It has great effects on the load distribution, fatigue life, temperature rise, noise, vibration, etc.

According to National or Industry Standard, measuring loads should be added before measuring the clearance to get an accurate value.

For the reasons above, measuring value is bigger than original clearance (we call it theoretical clearance) , namely, the measuring loads cause elastic deformation. However, for the roller bearings, the elastic deformation is little and can be neglected.

The internal clearance is the same as theoretical clearance before mounting.

Before mounting, the internal clearance is called original clearance (Δ_0) ; the clearance after mounting is called mounting clearance (Δ_t) ; effective clearance (Δ_u) means the clearance of bearing working without any loads. Due to the effects of temperature rising and heat elimination condition at work, inner ring temperature is usually 3–10 ℃ higher than outer ring, therefore, the swell increment of inner ring is larger than outer ring, the effective clearance (Δ_u) is smaller than mounting clearance (Δ_t) . If bearing worked with loads, the elastic deformation will be formed in the contact area between rollers and raceway, the clearance will be bigger, and called operating clearance (Δ) .The relationships of clearance above are following:

$$\Delta = \Delta_0 - (\delta_f + \delta_t) + \delta_w$$

$$\delta_{fi} = \Delta de \frac{de}{Di} \cdot \frac{1-(\frac{d_0}{d})^2}{1-(\frac{d_0}{Di})^2}$$

$$\delta_{fo} = \Delta De \frac{de}{D} \cdot \frac{1-\left(\frac{D}{D_h}\right)^2}{1-\left(\frac{de}{D_h}\right)^2}$$

Therein, $\delta_f = \delta_{fi} + \delta_{fo}$

$$\delta_t = a \Delta_t D_0$$

Δde: Magnitude of interference of inner ring and shaft fits (mm)

ΔDe: Magnitude of interference of outer ring and housing fits (mm)

d, D: Bore diameter and outside diameter of bearing (mm)

de, Di: Mean bore diameter of outer ring and mean outside diameter of inner ring (mm)

δ_f: Clearance variation caused by temperature difference between inner ring and outer ring

δ_{fi}: Clearance reduction caused by inner ring and shaft fits

δ_w: Clearance increase caused by radial deformation

δ_{fo}: Clearance reduction caused by outer ring and housing fits

Table 3.1 Radial clearance of deep groove ball bearings (cylindrical bore) (GB/T4604-2006) μm

d mm		Radial clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2.5	6	0	7	2	13	8	23	–	–	–	–
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	2	35	25	85	75	140	125	195	175	265
225	250	2	40	30	95	85	160	145	225	205	300
250	280	2	45	35	105	90	170	155	245	225	340
280	315	2	55	40	115	100	190	175	270	245	370
315	355	3	60	45	125	110	210	195	300	275	410
355	400	3	70	55	145	130	240	225	340	315	460

Table 3.2 Radial clearance of self-aligning ball bearings (GB/T4604-2006) μm

d mm		Radial clearance of bearing with cylindrical bore										Radial clearance of bearing with tapered bore									
		Group 2		Group 0		Group 3		Group 4		Group 5		Group 2		Group 0		Group 4		Group 3		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2.5	6	1	8	5	15	10	20	15	25	21	33	–	–	–	–	–	–	–	–	–	–
6	10	2	9	6	17	12	25	19	33	27	42	–	–	–	–	–	–	–	–	–	–
10	14	2	10	6	19	13	26	21	35	30	48	–	–	–	–	–	–	–	–	–	–
14	18	3	12	8	21	15	28	23	37	32	50	–	–	–	–	–	–	–	–	–	–
18	24	4	14	10	23	17	30	25	39	34	52	7	17	13	26	20	33	28	42	37	55
24	30	5	16	11	24	19	35	29	46	40	58	9	20	15	28	23	39	33	50	44	62
30	40	6	18	13	29	23	40	34	53	46	66	12	24	19	35	29	46	40	59	52	72
40	50	6	19	14	31	25	44	37	57	50	71	14	27	22	39	33	52	45	65	58	79

Table 3.2 Radial clearance of self-aligning ball bearings (GB/T4604-2006) (continued) μm

d mm		Radial clearance of bearing with cylindrical bore										Radial clearance of bearing with tapered bore									
		Group 2		Group 0		Group 3		Group 4		Group 5		Group 2		Group 0		Group 4		Group 3		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
50	65	7	21	16	36	30	50	45	69	62	88	18	32	27	47	41	61	56	80	73	99
65	80	8	24	18	40	35	60	54	83	76	108	23	39	35	57	50	75	69	98	91	123
80	100	9	27	22	48	42	70	64	96	89	124	29	47	42	68	62	90	84	116	109	144
100	120	10	31	25	56	50	83	75	114	105	145	35	56	50	81	75	108	100	139	130	170
120	140	10	38	30	68	60	100	90	135	125	175	40	68	60	98	90	130	120	165	155	205
140	160	15	44	35	80	70	120	110	161	150	210	45	74	65	110	100	150	140	191	180	240

Table 3.3 Recommended axial clearance of double-row angular contact ball bearings μm

d (mm)		Group 2		Normal group	
Over	To	Min	Max	Min	Max
100	140	70	140	120	180
140	180	80	160	140	200
180	220	100	180	160	220
220	260	120	200	180	240
260	300	140	220	200	280
300	355	160	240	220	300
355	400	180	270	250	330
400	450	200	290	270	360
450	500	220	310	290	390
500	560	240	330	310	420
560	630	260	360	340	450
630	710	280	390	370	490
710	800	300	420	400	540
800	900	330	420	440	590
900	1000	360	500	480	630

Table 3.4 Radial clearance of cylindrical roller bearings (cylindrical bore) (GB/T4604-2006) μm

d mm		Radial clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
–	10	0	25	20	45	35	60	50	75	–	–
10	24	0	25	20	45	35	60	50	75	65	90
24	30	0	25	20	45	35	60	50	75	70	95
30	40	5	30	25	50	45	70	60	85	80	105
40	50	5	35	30	60	50	80	70	100	95	125
50	65	10	40	40	70	60	90	80	110	110	140
65	80	10	45	40	75	65	100	90	125	130	165
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485
315	355	65	145	145	225	225	305	305	385	455	535
355	400	100	190	190	280	280	370	370	460	510	600
400	450	110	210	210	310	310	410	410	510	565	665
450	500	110	220	220	330	330	440	440	550	625	735

Table 3.5 Radial clearance of spherical roller bearings （GB/T4604–2006）

(1) Cylindrical bore

μm

d mm		Radial clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
14	18	10	20	20	35	35	45	45	60	60	75
18	24	10	20	20	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95
30	40	15	30	30	45	45	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	80	110	110	145	145	180
80	100	35	60	60	100	100	135	135	180	180	225
100	120	40	75	75	120	120	160	160	210	210	260
120	140	50	95	95	145	145	190	190	240	240	300
140	160	60	110	110	170	170	220	220	280	280	350
160	180	65	120	120	180	180	240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	140	140	220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	550	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	500	140	260	260	410	410	550	550	720	720	900
500	560	150	280	280	440	440	600	600	780	780	1000
560	630	170	310	310	480	480	650	650	850	850	1100
630	710	190	350	350	530	530	700	700	920	920	1190
710	800	210	390	390	580	580	770	770	1010	1010	1300
800	900	230	430	430	650	650	860	860	1120	1120	1440
900	1000	260	480	480	710	710	930	930	1220	1220	1570

(2) Tapered bore

μm

d mm		Radial clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
18	24	15	25	25	35	35	45	45	60	60	75
24	30	20	30	30	40	40	55	55	75	75	95
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
80	100	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910

(2) Tapered bore (continued) μm

d mm		Radial clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
450	500	260	370	370	490	490	630	630	790	790	1000
500	560	290	410	410	540	540	680	680	870	870	1100
560	630	320	460	460	600	600	760	760	980	980	1230
630	710	350	510	510	670	670	850	850	1090	1090	1360
710	800	390	570	570	750	750	960	960	1220	1220	1500
800	900	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	490	710	710	930	930	1190	1190	1520	1520	1860

Table 3.6 Radial clearance of four-row cylindrical roller bearings (JB/T5389.1-2005) μm

d mm		Radial clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485
315	355	65	145	145	225	225	305	305	385	455	535
355	400	100	190	190	280	280	370	370	460	510	600
400	450	110	210	210	310	310	410	410	510	565	665
450	500	110	220	220	330	330	440	440	550	625	735
500	560	120	240	240	360	360	480	480	600	–	–
560	630	140	260	260	380	380	500	500	620	–	–
630	710	145	285	285	425	425	565	565	705	–	–
710	800	150	310	310	470	470	630	630	790	–	–
800	900	180	350	350	520	520	690	690	860	–	–
900	1000	200	390	390	580	580	770	770	960	–	–
1000	1120	220	430	430	640	640	850	850	1060	–	–
1120	1250	230	470	470	710	710	950	950	1190	–	–
1250	1400	270	530	530	790	790	1050	1050	1310	–	–

Table 3.7 Radial clearance of double-row and four-row tapered roller bearings (JB/T8236-1996) μm

d mm		Group 1		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
–	30	0	10	10	20	20	30	40	50	50	60	70	80
30	40	0	12	12	25	25	40	45	60	60	75	80	95
40	50	0	15	15	30	30	45	50	65	65	80	90	110
50	65	0	15	15	30	30	50	50	70	70	90	90	120
65	80	0	20	20	40	40	60	60	80	80	110	110	150
80	100	0	20	20	45	45	70	70	100	100	130	130	170
100	120	0	25	25	50	50	80	80	110	110	150	150	200
120	140	0	30	30	60	60	90	90	120	120	170	170	230
140	160	0	30	30	65	65	100	100	140	140	190	190	260

Table 3.7 Radial clearance of double-row and four-row tapered roller bearings （JB/T8236-1996）（continued） μm

d mm		Group 1		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
160	180	0	35	35	70	70	110	110	150	150	210	210	280
180	200	0	40	40	80	80	120	120	170	170	230	230	310
200	225	0	40	40	90	90	140	140	190	190	260	260	340
225	250	0	50	50	100	100	150	150	210	210	290	290	380
250	280	0	50	50	110	110	170	170	230	230	320	320	420
280	315	0	60	60	120	120	180	180	250	250	350	350	460
315	355	0	70	70	140	140	210	210	280	280	390	390	510
355	400	0	70	70	150	150	230	230	310	310	440	440	580
400	450	0	80	80	170	170	260	260	350	350	490	490	650
450	500	0	90	90	190	190	290	290	390	390	540	540	720
500	560	0	100	100	210	210	320	320	430	430	590	590	790
560	630	0	110	110	230	230	350	350	480	480	660	660	880
630	710	0	130	130	260	260	400	400	540	540	740	740	910
710	800	0	140	140	290	290	450	450	610	610	830	830	1100
800	900	0	160	160	330	330	500	500	670	670	920	920	1240
900	1000	0	180	180	360	360	540	540	720	720	980	980	1300
1000	1120	0	200	200	400	400	600	600	820	–	–	–	–
1120	1250	0	220	220	450	450	670	670	900	–	–	–	–
1250	1400	0	250	250	500	500	750	750	980	–	–	–	–

Table 3.8 Recommended axial clearance of double-direction tapered roller thrust bearings μm

d/mm	Min	Max
160 ~ 200	50	100
200 ~ 300	60	120
300 ~ 400	80	150
400 ~ 500	90	160
>500	100	180

Part Ⅱ

Catalog

Single-row angular contact ball bearings

Single-row angular contact ball bearings can only carry pure axial loads in one direction,and the capacity increases with contact angle. The nominal contact angles are 15° , 25° and 40° . When the bearings carry radial loads, the inner and outer rings will be separated because of additional axial force. They are normally mounted in pairs.

Single-row angular contact ball bearings have two structures:separable and nonseparable, because of more balls in bearings, high loading capacity and stiffness can be gained.

The basic type of separable angular contact ball bearings is type S70000. Type SN70000 has separable inner ring, and the inner and outer ring can be mounted respectively when the installation conditions are restricted.

There are several basic types of nonseparable angular contact ball bearings as follows:

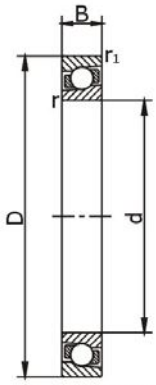
Type 70000C,in which, contact angle is 15° ,and the counter bore is in outer ring.

Type 70000AC,in which, contact angle is 25° ,and the counter bore is in outer ring.

Type 70000B,in which, contact angle is 40° ,and the counter bore is in outer ring.

Metal solid cages are mainly used in single-row angular contact ball bearings. Phenolic cloth laminated tube solid cages are usually used for high speed applications, and the maximum temperature is 120℃.

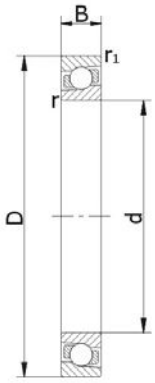
Single–row angular contact ball bearings



Type 70000
(Type 6000)

Boundary dimensions					Basic load ratings		Designations		Mass	Limiting speeds	
mm					kN					r/min	
d	D	B	r_{min}	r_{1min}	Cr	Cor	Current	Original	kg	Grease	Oil
150	190	20	1.1	0.6	53.5	74.5	71830AC	–	1.32	2400	3400
	210	28	2	1	90	120	71930AC	–	3	2400	3400
	225	35	2.1	1.1	153	130	7030AC	46130	4.83	2000	3000
	270	45	3	1.1	241	218	7230AC	46230	12.1	1800	2600
	320	65	4	1.5	360	375	7330AC	46330	25.8	1700	2400
	320	65	4	1.5	310	310	7330B	66330	25.8	1600	2200
160	240	38	2.1	1.1	161	139	7032AC	46132	5.81	2000	3000
	279	40	2.1	1.1	204	182	–	46932	11.6	2000	2800
	290	48	3	1.1	262	247	7232C	36232	14.5	1800	2600
	290	48	3	1.1	249	232	7232AC	46232	14.5	1700	2400
170	215	22	1.1	0.6	80	110	71834C	–	2	2000	2800
	230	28	2	1	110	140	71934C	–	3.3	2000	3000
	260	42	2.1	1.1	193	171	7034AC	46134	8.25	2000	2800
	310	52	4	1.5	282	275	7234AC	46234	17.4	1600	2200
	310	52	4	1.5	320	325	7234C	36234	17.2	1700	2400
180	280	46	2.1	1.1	194	230	7036AC	46136	9.8	1600	2200
	320	52	4	1.5	335	345	7236C	36236	18.1	1500	2000
	320	52	4	1.5	315	325	7236AC	46236	18.1	1500	2000
	380	75	4	1.5	405	445	7336B	66336	37	1300	1800
190	260	33	2	1	139	177	71938AC	1046938	4.45	1800	2200
	290	46	2.1	1.1	214	200	7038AC	46138	10.7	1600	2200
	340	55	4	1.5	280	370	7238B	–	23	1500	2000
200	250	24	1.5	1	90	130	71840C	–	2.5	1800	2200
	280	38	2.1	1.1	150	210	71940AC	–	7.1	1600	2200
	310	51	2.1	1.1	253	248	7040AC	46140	14	1500	2000
	360	58	4	1.5	375	410	7240C	36240	25.2	1400	1900
	360	58	4	1.5	355	385	7240AC	46240	25.2	1300	1800
	360	58	4	1.5	310	325	7240B	66240	25.8	1200	1700
210	240	15	1.1	1.1	30	50	70842X3	–	1	1800	2200
220	300	38	2.1	1.1	200	250	71944AC	–	7.2	1800	2200
	400	65	4	1.5	358	482	7244AC	46244	38.5	1100	1600
240	320	38	2.1	1.1	203	285	71948C	1036948	8.37	1200	1700
	320	38	2.1	1.1	181	260	71948AC	1046948	8.37	1100	1600
	320	38	2.1	1.1	161	233	71948B	1066948	8.43	1000	1500
	320	48	2.1	1.1	184	190	72948AC	2046948	10	1100	1600
	440	72	4	1.5	420	490	7248B	66248	50.9	1000	1500
260	320	28	2	1	127	190	71852AC	1046852	4.85	1400	1900
	360	46	2.1	1.1	242	345	71952AC	1046952	13.5	1300	1800

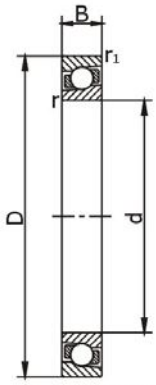
Single-row angular contact ball bearings



Type 70000
(Type 6000)

Boundary dimensions					Basic load ratings		Designations		Mass	Limiting speeds	
mm					kN					r/min	
d	D	B	r_{min}	r_{1min}	Cr	Cor	Current	Original	kg	Grease	Oil
260	320	28	2	1	127	190	71852AC	1046852	4.85	1400	1900
	360	46	2.1	1.1	242	345	71952AC	1046952	13.5	1300	1800
	400	65	4	1.5	291	431	7052B	66152	28.5	1000	1500
	480	80	5	2	456	702	7252B	66252	66	900	1300
270	330	30	2.1	1.1	90.8	144	7654B	66754	5.75	1300	1700
280	350	33	2	1	140	216	71856AC	1046856	7.2	1200	1700
	380	46	2.1	1.1	226	337	71956AC	1046956	15	1100	1600
	420	65	4	1.5	287	450	7056B	66156	30	900	1400
320	400	38	2.1	1.1	190	290	71864	–	10	800	1000
	440	56	3	1.1	350	550	71964	–	25.5	800	1000
340	460	56	3	1.1	292	510	71968B	1066968	27.5	800	1000
	520	82	5	2	410	700	7068B	66168	63	800	1000
360	480	56	3	1.1	350	600	71972	–	29	800	1000
	540	82	5	2	530	960	7072C	36172	62.4	800	1000
	540	82	5	2	468	855	7072AC	46172	62.5	850	1200
	650	95	6	3	585	1125	7272B	66272	145	700	950
380	440	25	3	1.1	110	178	7676B	66776	7.1	960	1200
	480	31	2	1	171	310.5	70876AC	7046876	13.5	850	1200
	480	46	2.1	1.1	261.9	450	71876AC	1046876	18	1700	2400
	520	65	4	1.5	369	661.5	71976AC	1046976	40.5	850	1200
	520	82	4	1.5	407	733	72976AC	2046976	48.9	700	900
	560	82	5	2	456	855	7076AC	46176	65.5	800	1100
	560	82	5	2	421	792	7076B	66176	65.5	750	1000
400	540	65	4	1.5	380.7	702	71980AC	1046980	42	800	1100
	600	90	5	2	544.5	1062	7080AC	46180	90.5	750	1000
	600	90	5	2	474	918	7080B	66180	90.5	700	950
	720	103	6	3	656.2	1350	7280B	66280	190	600	800
420	560	65	4	1.5	380.7	720	71984AC	1046984	44.5	750	1000
	560	65	4	1.5	327	603	71984B	1066984	44.5	700	950
	620	90	5	2	544.5	1062	7084AC	46184	95	750	1000
	620	90	5	2	486	954	7084B	66184	95	670	900
440	600	74	4	3	456.3	936	71988AC	1046988	61	750	1000
	650	94	6	3	585	1186	7088AC	46188	100	700	950
	650	94	6	3	514	1060	7088B	66188	100	630	850
460	540	35	2.1	1.5	280	520	S7692	6792	14	750	1000
	580	37	2.1	1	230	504	70892AC	7046892	24.5	750	1000
	580	56	3	3	334	689	71892AC	1046892	34.5	750	1000
	620	74	4	1.5	456	936	71992AC	1046992	58	850	1200
	680	100	6	3	620	1314	7092AC	46192	120	670	900
	680	100	6	3	556	1160	7092B	66192	120	600	800

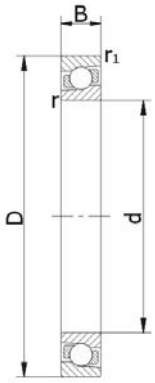
Single–row angular contact ball bearings



Type 70000
(Type 6000)

Boundary dimensions					Basic load ratings		Designations		Mass	Limiting speeds	
mm					kN					r/min	
d	D	B	r_{min}	r_{1min}	Cr	Cor	Current	Original	kg	Grease	Oil
480	600	56	3	1.1	415	820	71896	–	35.5	850	1200
	700	100	6	3	632	1377	7096AC	46196	125	630	850
	700	100	6	3	561	1200	7096B	66196	125	560	750
500	620	37	2.1	1.1	248	558	708/500AC	70468/500	27	670	900
	620	56	3	1.1	351	765	718/500AC	10468/500	38	670	900
	670	78	5	2	498	1098	719/500AC	10469/500	78	630	850
	720	100	6	3	644	1440	70/500AC	461/500	130	600	800
	720	100	6	3	573	1260	70/500B	661/500	130	560	750
508	600	30	2.1	1.5	150	320	76/508	–	16.5	670	900
530	650	56	3	1.1	369	837	718/530AC	10468/530	39.5	1100	1600
	650	56	3	1.1	351	810	718/530B	10668/530	39.5	630	850
	710	82	5	2	556	1206	719/530AC	10469/530	92	1000	1500
	760	100	6	6	680	1500	307368B	–	150	560	750
	780	112	6	3	813	1944	70/530AC	461/530	175	560	750
	780	112	6	3	666	1530	70/530B	661/530	175	500	670
560	680	56	3	1.1	341	837	718/560AC	10468/560	41.5	600	800
	750	85	5	2	533	1161	719/560AC	10469/560	105	560	750
	820	115	6	3	814	1944	70/560AC	461/560	195	530	700
600	730	42	3	1.1	304	662	708/600AC	70468/600	38.5	560	750
	730	60	3	1.1	421	1044	718/600AC	10468/600	47	560	750
	800	90	5	2	644	1557	719/600AC	10469/600	125	900	1300
	870	118	6	3	796	1944	70/600AC	461/600	230	480	630
630	920	128	7.5	4	860	2205	70/630AC	461/630	270	430	560
670	820	69	4	1.5	498	1161	718/670AC	10468/670	77	850	1200
	980	136	7.5	4	1053	2790	70/670AC	461/670	340	430	560
710	870	74	4	1.5	546	1467	718/710AC	10468/710	93.5	800	1100
	950	106	6	3	767	1980	719/710AC	10469/710	195	800	1100
	1030	140	7.5	4	1071	2925	70/710AC	461/710	370	400	530
750	920	78	5	2	585	1620	718/750AC	10468/750	110	400	530
	1090	150	7.5	4	1170	3285	70/750AC	461/750	445	360	480
800	1150	155	7.5	4	1197	3420	70/800AC	461/800	500	340	450
850	1030	82	5	2	620	1674	718/850AC	10468/850	140	340	450
	1220	165	7.5	4	1377	4185	70/850AC	461/850	595	300	400
900	1180	122	6	3	940	2670	719/900	–	350	300	400
	1280	170	7.5	4	1404	4410	70/900AC	461/900	665	280	380
950	1360	180	7.5	4	1467	4680	70/950AC	461/950	805	240	340
980	1100	60	4	2	515	1450	719/980X1	–	65.6	240	340
1000	1220	100	6	3	831	2475	718/1000AC	10468/1000	245	260	360
	1420	185	7.5	4	1467	4860	70/1000AC	461/1000	890	220	320

Single–row angular contact ball bearings



Type 70000
(Type 6000)

Boundary dimensions					Basic load ratings		Designations		Mass	Limiting speeds	
mm					kN					r/min	
d	D	B	r_{min}	r_{1min}	Cr	Cor	Current	Original	kg	Grease	Oil
1060	1500	195	9.5	5	1512	5130	70/1060AC	461/1060	1050	200	300
1120	1360	106	6	3	954	3375	718/1120AC	10468/1120	320	200	300
	1580	200	9.5	5	1548	5265	70/1120AC	461/1120	1150	190	280
1140	1380	106	6	3	1180	3830	718/1140AC	10468/1140	318	190	280
1180	1660	212	9.5	5	1566	5580	70/1180AC	461/1180	1350	170	240
1250	1500	80	6	3	725	2430	708/1250AC	70468/1250	295	180	260
	1500	112	6	3	1026	3510	718/1250AC	10468/1250	390	180	260
	1750	218	9.5	5	1602	5895	70/1250AC	461/1250	1600	160	220

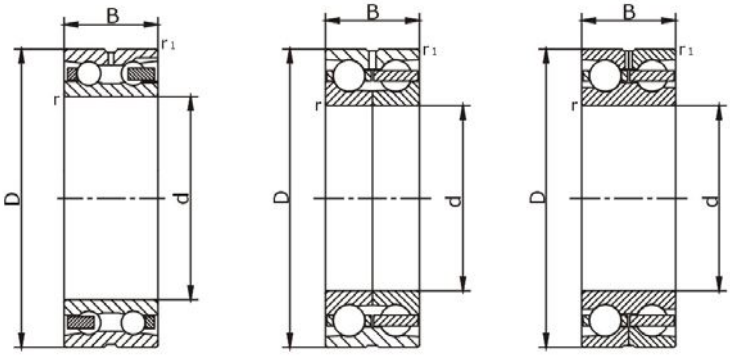
Double-row angular contact ball bearings

Double-row angular contact ball bearings are nonseparable. They can carry combined loads which is main in radial and moment loads, and limit axial displacement of shafts or housings in two directions, the nominal contact angle is 30° ,they have higher stiffness comparing with single-row angular contact ball bearings. They correspond to a pair of single-row angular contact ball bearings mounted back to back, but the width is narrower.Therefore, they are especially suitable for applications required high stiffness.

Double-row angular contact ball bearings usually have fitting slot, the side of the raceway without fitting slot must carry main loads when bearings are in use.

The obliquity is limited between inner and outer rings of double-row angular contact ball bearings, the permissible slant angles depend on the internal clearance, dimensions, internal design, the forces and the moments of the bearings. It must be ensured that higher additional stress can't be formed in bearings when the permissible slant angle is maximum. The bearing life will be shortened ,the running accuracy will be reduced and the noise will be increased if there was slant angle between inner and outer rings.Nylon or brass solid cages are generally used in double-row angular contact ball bearings.

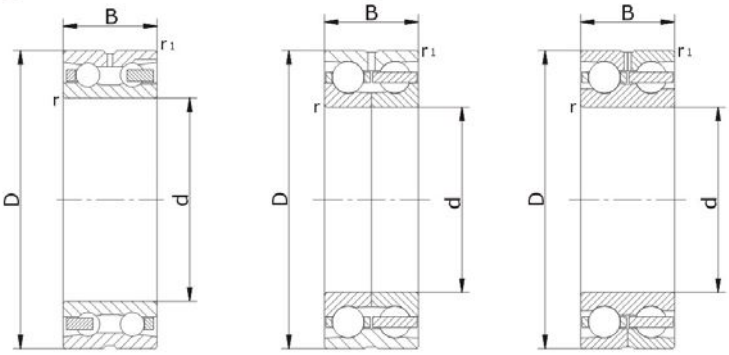
Double-row angular contact ball bearings



Type 00000 (Type 3056000) | Type 00000 D (Type 86000) | Type 00000 DC (Type 56000)

Boundary dimensions					Basic load ratings		Designations		Mass	Limiting speeds	
mm					kN					r/min	
d	D	B	r_{min}	r_{1min}	Cr	Cor	Current	Original	kg	Grease	Oil
100	180	60.3	2.1	2.1	142	220	3220	3056220	6.1	2000	3000
	215	82.6	3	3	230	355	3320	3056320	13.5	1800	2600
110	200	69.8	2.1	2.1	170	270	3222	3056222	8.8	1900	2800
	240	92.1	3	3	262	425	3322	3056322	19	1700	2400
140	210	69	2	2	178	237	4028D	4086128	8.2	1700	2400

Double-row angular contact ball bearings



Type 00000 (Type 3056000) | Type 00000 D (Type 86000) | Type 00000 DC (Type 56000)

Boundary dimensions					Basic load ratings		Designations		Mass	Limiting speeds	
mm					kN					r/min	
d	D	B	r_{min}	r_{1min}	Cr	Cor	Current	Original	kg	Grease	Oil
150	209.5	55	2	2	160	250	–	86930	6	1700	2400
	225	73	2	2	180	255	4030X2D	86730	10.7	1600	2200
	230	70	2	2	212	325	4030X3D	86830	11.5	1600	2200
160	240	76	2.1	1.1	230	320	4032X2D	305183	10.6	1600	2200
	240	58	2.1	2.1	185	286	3032X2D	3086132	9.6	1600	2200
	240	80	2.1	2.1	224	306	4032D	4086132	12.6	1600	2200
170	230	56	2.1	2.1	165	255	4934X3D	86734	7.5	1600	2200
	260	90	2.1	2.1	228	385	4034X2D	4086134	18	1400	1900
180	280	92	2.1	2.1	290	440	4036X2D	4086136	22	1300	1800
	280	100	2.1	2.1	290	440	4036D	4086136	24	1400	1900
190	290	92	2.1	2.1	284	424	4038X2D	15638	22.4	1200	1700
	290	100	2.1	2.1	284	424	4038D	4086138	22.3	1300	1800
200	310	109	2.1	2.1	340	538	4040D	4086140	29.5	1200	1700
	310	96	2.1	2.1	340	538	4040X2DC	4056140	29.5	1300	1800
220	309.5	76	2.1	2.1	259	400	4944X3D	86744	17.2	1000	1500
	340	118	3	3	361	591	4044D	4086144	37.2	1000	1500
230	330	80	2.1	2.1	110	500	4946X1D	86746	11	1000	1500
240	360	118	3	3	383	661	4048D	4086148	43.5	950	1400
	440	144	4	4	576	1060	3248X2D	86748	101	800	1100
260	359.5	92	2.1	2.1	650	1100	4952X2D	86952	28	800	1100
	369.5	92	4	4	325	560	4952X3D	86752	32.9	850	1200
	400	140	3	3	410	720	4052D	4086152	69.9	950	1300
280	389.5	92	4	4	367	658	4956X3D	86756K	35.3	850	1200
	420	140	3	3	441	892	4056D	4086156	82.5	800	1100
300	460	160	3	3	475	1090	4060D	4086160	101	800	1100
320	459.5	140	4	4	504	1010	4064X3D	86764	73.9	750	1000
	480	160	3	3	496	1200	4064D	4086164	120	750	1000
340	520	180	3	3	525	1360	4068D	4086168	132	700	950

You global bearing expert !

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