IJK

INOUE JIKUUKE KOGYO CO., LTD.

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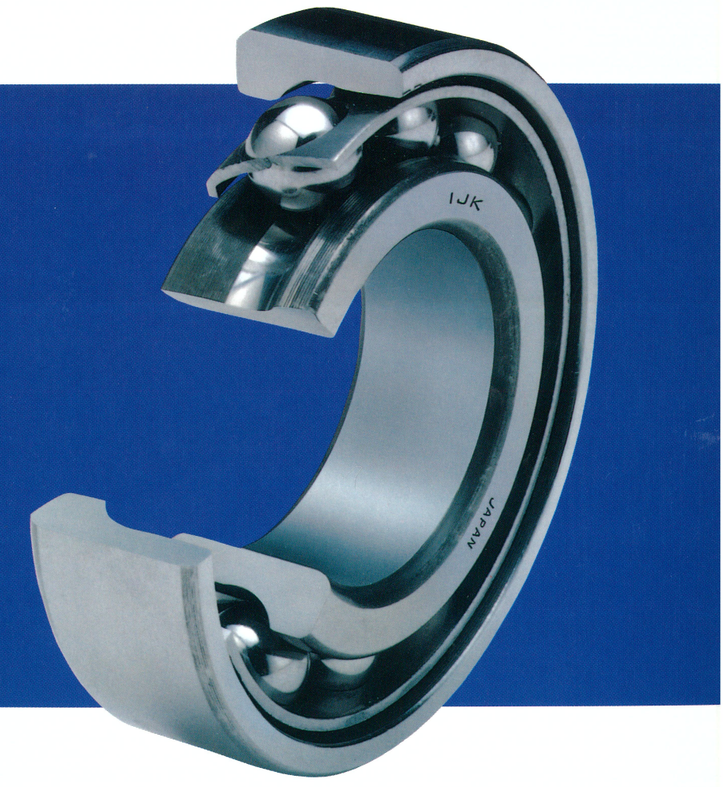
IJK
PRODUCTS GUIDE

ANGULAR CONTACT BALL BEARINGS



ISO 9002
DNV
QUALITY ASSURED FIRM
NATIONAL ACCREDITATION OF CERTIFICATION BODIES
We acquired ISO9002 certification from the International Organization for Standardization

INOUE JIKUUKE KOGYO CO., LTD.

Introduction

INOUE JIKUUKE KOGYO (IJK) has been producing many standard and special types of ball bearings as a professional manufacturer since 1938, which have enjoyed good quality reputations by their users.

This catalog is only intended to introduce the angular contact ball bearing among many products groups. It is also intended to facilitate changes or additions of the product to meet the technical developments of future.

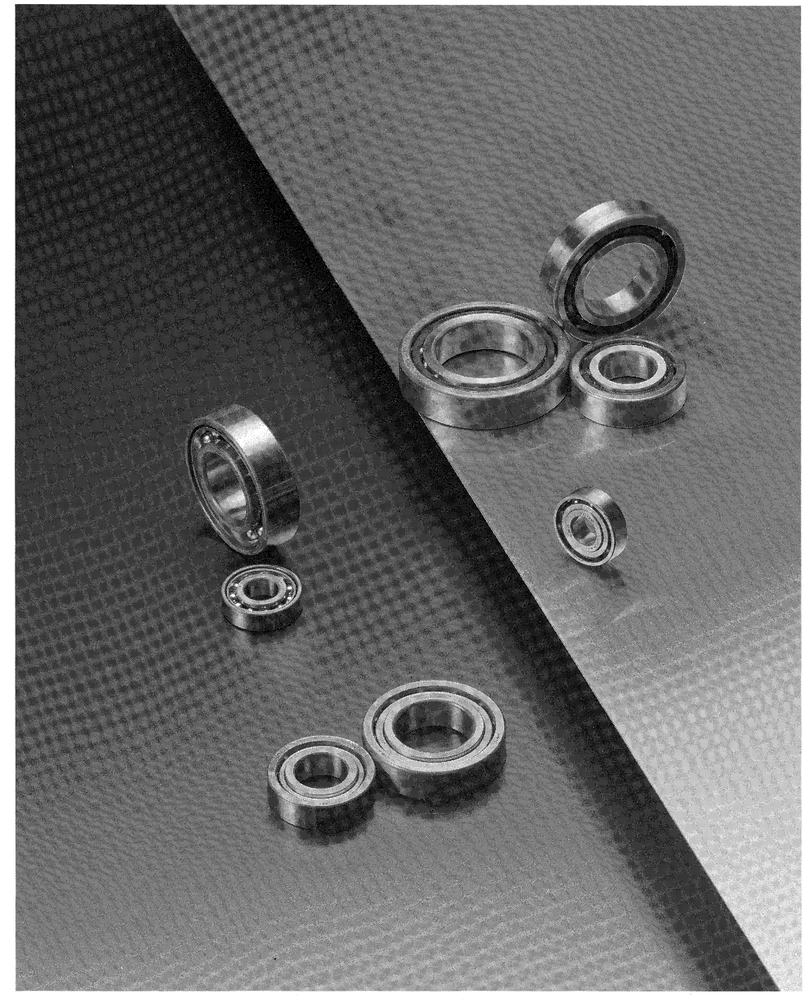
This catalog indicates standard types of products for the time being, however, special products are also available for production. For the contents of special specifications _____, contact IJK.

IJK

SPECIAL REQUIREMENTS

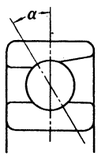
- CHAMFER
- FACE CONDITIONS
- PLATING
- WIDTH
- MATERIAL
- HEAT STABILIZATION, ETC.

CONTENS



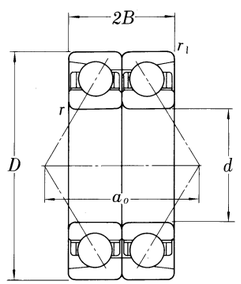
For the content of this catalog, we take every possible care for accuracy, but please excuse us in case of cierical error or omissions.
Regarding the extra or special specifications of the bearings, the usual manner is for applications to be sent to us and after approval, we produce it.

GENERAL DESCRIPTION

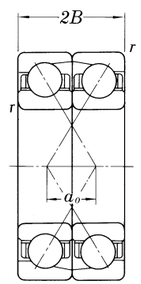


● Single Row Angular Contact Ball Bearings

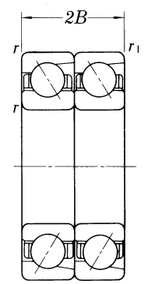
Since bearings of this type can receive a load only in the axial direction, it is used in combination with other bearing which receive axial loads in the opposite direction.



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

● Contact angle

The symbol at the end of row No. shows the contact.

Contact Angle 25° ..... End Symbol; A5
Contact Angle 30° ..... End Symbol; A
Contact Angle 40° ..... End Symbol; B
Contact Angle 15° ..... End Symbol; C

● Cage

The bearings shown in this catalog all use a cage.
Cages come in four types, depending on the type of material used, each of which is indicated by the mentioned end symbol.

Reinforced Phenolic Cage ..... End Symbol; T
Molded Plastics Cage ..... End Symbol; TY
Pressed Steel Cage ..... End Symbol; W
Machined Bronze Cage ..... End Symbol; Omitted

● Limiting Speeds

The limiting speeds shown in the dimensions table can be applied to the machined bronze cage.
The limiting speeds for the pressed steel cage are 80% of that value.
The limiting speeds for bearing with contact angles of 15° (end symbol; C) and those of 25° (end symbol; A5) are the values to be applied to high-accuracy bearings provided with molded plastics and machined phenolic cages.
The limiting speeds will be greatly influenced by the accuracy of the bearing fitting, lubrication conditions, use conditions, etc.

● Internal Clearance of Bearing

The high accuracy dupelex sets (P5 or over) are used often with machine tools.
Such bearings are applied with preloads for use, however, the internal clearance has been pre-adjusted to assure a "Slight preload", "Light preload", "Medium preload" or "Heavy preload" for selection convenience.
The clearance (or preload) of duplex sets can be assured by tightening until the inner ring/outer ring is tight against the inner ring/outer ring.

NUMBERING SYSTEM

Tipical Call-Out	7200	A	h	T	DB	C2	P6	B32	L	+K	+L
Code Positions	Series Size	Contact Angle	Material (Ball & Ring)	Cage	Matching	Preload	Precision	Lubrication	Amount of Grease	Spacer Outer Ring	Spacer Inner Ring
	1	2	3	4	5	6	7	8	9	10	11

EXAMPLES: 7200AhTDBC2P6B32-L+ KL10

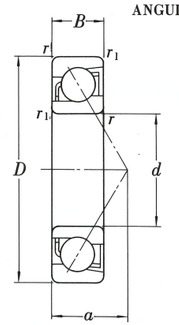
1	Basic Number	
2	Contact Angle:	A5 = Contact Angle = 25° A = Contact Angle = 30° B = Contact Angle = 40° C = Contact Angle = 15°
3	Material: (Ball & Rings)	h = AISI 440C Stainless steel Omitted = JIS SUJ2, SAE 52100
4	Cage:	T = Reinforced Phenolic of one piece construction, machned. TY = Molded Plastics. W = One piece Presseed Steel cage, ball pilotted. Omited = High strength machined Bronze cage.
5	Matching:	DB= Back-to-Back DF= Face-to-Face DT= Tandem G = Universal DU= Duplex Univesal
6	Preload:	C2 = Slight Preload C7 = Light Preload C8 = Medium Preload C9 = Heavy preload
7	Precision:	JIS P0 P6 P5 P4 P2 / ABEC PA1 PA6 PA5 PA7 PA9 / DIN P0 P6 P5 P4 P2 / ISO Normal class, class 6, class 5, class 4, class 2
8	Lubrication:	B32 = Beacon 325, AF2 = ASF12 (oil)
9	Amount of Grease:	Amount of Grease (%) −M = Medium
10	Spacer, Outer:	+K10 = Outer Ring Length 10
11	Spacer, Inner:	+K10 = Inner Ring Length 10

SINGLE ROW

Bore Diameter 10mm/0.3937inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

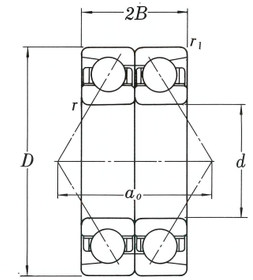
Dimensions mm / inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Ball complement Size Da	Ball complement No. W	Ball complement No. T (Cage Type)
10	22	6	0.3	0.15	6.7	2.9	1.5	40 000	56 000	3.175	-	11
0.3937	0.8661	0.2362	0.012	0.006	0.264	648	326			(1-8)		
						294	148					
	22	6	0.3	0.15	5.1	3.0	1.5	48 000	63 000	3.175	-	11
	0.8661	0.2362	0.012	0.006	0.201	672	342			(1-8)		
						305	155					
	26	8	0.3	0.15	8.2	5.1	2.3	39 000	50 000	4.762	-	9
	1.0236	0.3150	0.012	0.006	0.323	1157	514			(3-16)		
						525	233					
	26	8	0.3	0.15	9.2	5.4	2.6	32 000	43 000	4.762	10	9
	1.0236	0.3150	0.012	0.006	0.362	1213	586			(3-16)		
						550	266					
	26	8	0.3	0.15	11.6	4.6	2.2	22 000	32 000	4.762	10	9
	1.0236	0.3150	0.012	0.006	0.457	1043	489			(3-16)		
						473	222					
	26	8	0.3	0.15	6.4	5.3	2.5	45 000	63 000	4.762	-	9
	1.0236	0.3150	0.012	0.006	0.252	1190	560			(3-16)		
						540	254					
	30	9	0.6	0.3	9.2	5.2	2.5	35 000	45 000	4.762	-	9
	1.1811	0.3543	0.024	0.012	0.362	1168	564			(3-16)		
						530	256					
	30	9	0.6	0.3	10.3	5.4	2.7	28 000	38 000	4.762	10	9
	1.1811	0.3543	0.024	0.012	0.406	1224	608			(3-16)		
						555	276					
	30	9	0.6	0.3	12.9	5.0	2.5	20 000	28 000	4.762	10	9
	1.1811	0.3543	0.024	0.012	0.508	1124	562			(3-16)		
						510	255					
	30	9	0.6	0.3	7.2	5.3	2.6	40 000	56 000	4.762	-	9
	1.1811	0.3543	0.024	0.012	0.283	1213	586			(3-16)		
						550	266					
	35	11	0.6	0.3	12.0	9.3	4.3	20 000	26 000	7.144	8	8
	1.3780	0.4331	0.024	0.012	0.472	2094	970			(9-32)		
						950	440					
	35	11	0.6	0.3	14.9	8.7	4.0	18 000	24 000	7.144	8	8
	1.3780	0.4331	0.024	0.012	0.587	1962	904			(9-32)		
						890	410					
	35	11	0.6	0.3	8.5	9.7	4.5	35 000	44 000	7.144	-	8
	1.3780	0.4331	0.024	0.012	0.335	2180	1016			(9-32)		
						989	461					

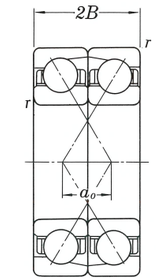
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%. The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

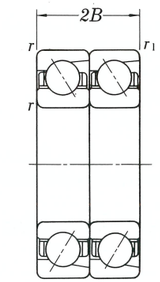
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm / inches

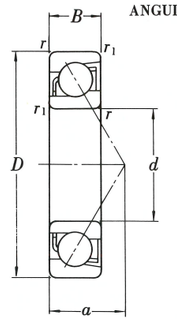
Basic Bearing Number Single	Basic Bearing Number Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7900 A5	DB DF DT	12	4.7	2.9	32 000	43 000	13.5	1.5
		0.4724	1047	653			0.531	0.059
			475	296				
7900 C	DB DF DT	12	4.9	3.0	38 000	53 000	10.3	1.7
		0.4724	1102	683			0.406	0.067
			500	310				
7000 A5	DB DF DT	16	8.4	4.8	31 000	40 000	16.4	0.4
		0.6299	1878	1080			0.646	0.016
			852	490				
7000 A	DB DF DT	16	8.7	5.2	24 000	34 000	18.4	2.4
		0.6299	1962	1168			0.724	0.094
			890	530				
7000 B	DB DF DT	16	7.5	4.4	17 000	25 000	23.2	7.2
		0.6299	1893	979			0.913	0.283
			768	444				
7000 C	DB DF DT	16	8.6	5.0	36 000	50 000	12.8	3.2
		0.6299	1940	1124			0.504	0.126
			880	510				
7200 A5	DB DF DT	18	8.4	5.0	28 000	36 000	18.3	0.3
		0.7087	1898	1129			0.720	0.012
			861	512				
7200 A	DB DF DT	18	8.8	5.4	22 000	30 000	20.5	2.5
		0.7087	1978	1224			0.807	0.098
			897	555				
7200 B	DB DF DT	18	8.1	5.0	16 000	22 000	25.8	7.8
		0.7087	1819	1124			1.016	0.307
			825	510				
7200 C	DB DF DT	18	8.8	5.2	32 000	45 000	14.4	3.6
		0.7087	1973	1168			0.567	0.138
			895	530				
7300 A	DB DF DT	22	15.1	8.6	16 000	22 000	24.0	2.0
		0.8661	3395	1940			0.945	0.079
			1540	880				
7300 B	DB DF DT	22	14.2	8.1	14 000	20 000	29.9	7.9
		0.8661	3192	1819			1.177	0.311
			1450	825				
7300 C	DB DF DT	22	15.8	8.9	28 000	35 000	17.0	5.0
		0.8661	3543	2002			0.669	0.197
			1607	908				

SINGLE ROW

Bore Diameter 12mm/0.4724inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

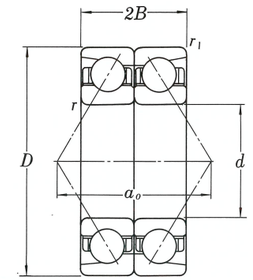
Dimensions mm / inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Size Da	Ball complement No. W (Cage Type)	Ball complement No. T (Cage Type)
12	24	6	0.3	0.15	7.2	3.2	1.8	38 000	53 000	3.175	-	13
0.4724	0.9449	0.2362	0.012	0.006	0.283	717 325	399 181			(1-8)		
	24	6	0.3	0.15	5.4	3.3	1.9	45 000	63 000	3.175	-	13
	0.9449	0.2362	0.012	0.006	0.213	750 340	417 189			(1-8)		
	28	8	0.6	0.3	8.7	5.6	2.8	35 000	45 000	4.762	-	10
	1.1024	0.3150	0.012	0.006	0.343	1257 570	628 285			(3-16)		
	28	8	0.6	0.3	9.8	5.8	3.0	28 000	38 000	4.762	11	10
	1.1024	0.3150	0.012	0.006	0.386	1301 590	672 305			(3-16)		
	28	8	0.6	0.3	12.4	5.0	2.2	20 000	28 000	4.762	11	10
	1.1024	0.3150	0.012	0.006	0.488	1124 510	500 227			(3-16)		
	28	8	0.6	0.3	6.7	5.8	2.9	40 000	56 000	4.762	-	10
	1.1024	0.3150	0.012	0.006	0.264	1301 590	653 296			(3-16)		
	28	10	0.6	0.3	10.1	7.6	3.7	30 000	40 000	5.953	-	9
	1.1024	0.3937	0.024	0.012	0.398	1720 780	838 380			(15-64)		
	32	10	0.6	0.3	11.4	8.0	4.0	26 000	34 000	5.953	11	10
	1.2598	0.3937	0.024	0.012	0.449	1797 815	904 410			(15-64)		
	32	10	0.6	0.3	14.2	7.5	3.7	18 000	26 000	5.953	11	10
	1.2598	0.3937	0.024	0.012	0.559	1676 760	838 380			(15-64)		
	32	10	0.6	0.3	7.9	7.9	3.9	36 000	50 000	5.953	-	9
	1.2598	0.3937	0.024	0.012	0.311	1775 805	871 395			(15-64)		
	37	12	1	0.6	13.1	9.5	4.5	18 000	24 000	7.144	9	8
	1.4567	0.4724	0.039	0.024	0.516	2127 965	1014 460			(9-32)		
	37	12	1	0.6	16.3	8.8	4.2	16 000	22 000	7.144	9	8
	1.4567	0.4724	0.039	0.024	0.642	1984 900	937 425			(9-32)		
	37	12	1	0.6	9.3	10.0	4.7	35 000	40 000	7.144	9	8
	1.4567	0.4724	0.039	0.024	0.366	2249 1020	1058 480			(9-32)		

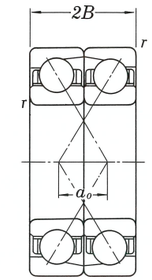
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%. The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

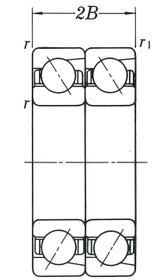
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm / inches

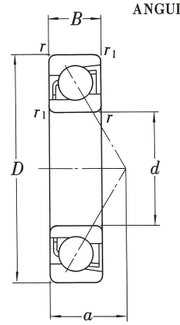
Basic Bearing Number Single	Basic Bearing Number Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7901 A5	DB DF DT	12	5.2	3.5	30 000	43 000	14.4	2.4
		0.4724	1168 530	794 360			0.567	0.094
7901 C	DB DF DT	12	5.4	3.7	36 000	50 000	10.8	1.2
		0.4724	1224 555	838 380			0.425	0.047
7001 A5	DB DF DT	16	9.3	5.1	28 000	36 000	17.3	1.3
		0.6299	2099 952	1157 525			0.681	0.051
7001 A	DB DF DT	16	9.4	6.0	22 000	30 000	19.5	3.5
		0.6299	2105 955	1345 610			0.768	0.138
7001 B	DB DF DT	16	8.1	5.0	16 000	22 000	24.8	8.8
		0.6299	1817 824	1124 510			0.976	0.346
7001 C	DB DF DT	16	9.4	5.8	32 000	45 000	13.4	2.6
		0.6299	2116 960	1301 590			0.528	102
7201 A5	DB DF DT	20	12.4	7.5	24 000	32 000	20.3	0.3
		0.7874	2795 1268	1676 760			0.799	0.012
7201 A	DB DF DT	20	13.0	6.1	20 000	28 000	22.7	2.7
		0.7874	2932 1330	1367 620			0.894	0.106
7201 B	DB DF DT	20	12.1	7.5	15 000	20 000	28.5	8.5
		0.7874	2712 1230	1687 765			1.112	0.335
7201 C	DB DF DT	20	12.8	7.7	30 000	42 000	15.9	4.1
		0.7874	2888 1310	1731 785			0.622	0.161
7301 A	DB DF DT	24	15.4	9.0	15 000	20 000	26.1	2.1
		0.9449	3461 1570	2017 915			1.028	0.083
7301 B	DB DF DT	24	14.3	8.4	13 000	18 000	32.6	8.6
		0.9449	3219 1460	1885 855			1.283	0.339
7301 C	DB DF DT	24	16.2	9.5	28 000	32 000	18.6	5.4
		0.9449	3640 1651	2136 969			0.732	0.213

SINGLE ROW

Bore Diameter 15mm/0.5906inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

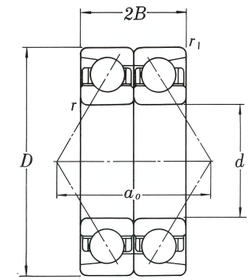
Dimensions mm / inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Size Da	Ball complement No. W (Cage Type)	Ball complement No. T (Cage Type)
15	28	7	0.3	0.15	8.5	4.6	2.5	32 000	43 000	3.969	-	12
0.5906	1.1024	0.2756	0.012	0.0[illegible]	0.335	1025 465	569 258			(5-32)		
	28	7	0.3	0.15	6.4	4.8	2.6	38 000	53 000	3.969	-	12
	1.1024	0.2756	0.012	0.006	0.252	1069 485	592 270			(5-32)		
	32	9	0.3	0.15	10.0	6.0	3.2	29 000	38 000	4.762	-	11
	1.2598	0.3543	0.012	0.006	0.394	1340 608	719 326			(3-16)		
	32	9	0.3	0.15	11.3	6.1	3.4	24 000	32 000	4.762	12	11
	1.2598	0.3543	0.012	0.006	0.445	1378 625	772 350			(3-16)		
	32	9	0.3	0.15	14.4	5.3	2.9	17 000	24 000	4.762	12	11
	1.2598	0.3543	0.012	0.006	0.567	1182 536	646 293			(3-16)		
	32	9	0.3	0.3	7.6	6.2	3.4	34 000	48 000	4.762	-	11
	1.2598	0.3543	0.012	0.012	0.299	1400 635	761 345			(3-16)		
	35	11	0.6	0.3	11.3	8.3	4.0	28 000	36 000	5.953	-	10
	1.3780	0.4331	0.024	0.012	0.445	1874 850	904 410			(15-64)		
	35	11	0.6	0.3	12.7	8.6	4.7	22 000	30 000	5.953	11	10
	1.3780	0.4331	0.024	0.012	0.500	1940 880	1047 475			(15-64)		
	35	11	0.6	0.3	16.0	7.9	4.3	16 000	22 000	5.953	11	10
	1.3780	0.4331	0.024	0.012	0.630	1786 810	970 440			(15-64)		
	35	11	0.6	0.3	8.8	8.7	4.5	32 000	45 000	5.953	-	10
	1.3780	0.4331	0.024	0.012	0.346	1951 885	1014 460			(15-64)		
	42	13	1	0.6	14.7	13.4	7.1	16 000	22 000	7.938	-	9
	1.6535	0.5118	0.039	0.024	0.579	3020 1370	1587 720			(5-16)		
	42	13	1	0.6	18.5	12.5	6.6	14 000	19 000	7.938	10	9
	1.6535	0.5118	0.039	0.024	0.728	2800 1270	1477 670			(5-16)		
	42	13	1	0.6	10.3	13.1	6.6	28 000	35 000	7.938	-	9
	1.6535	0.5118	0.039	0.024	0.406	2954 1340	1488 675			(5-16)		

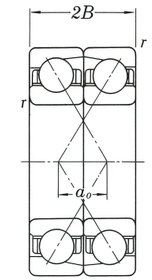
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%.
The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

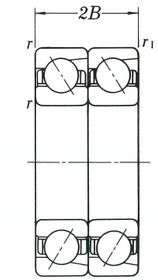
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm / inches

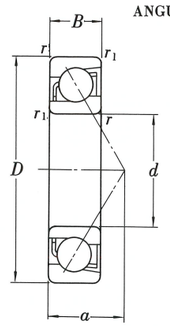
Basic Bearing Number Single	Basic Bearing Number Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7902 A5	DB DF DT	14	7.4	5.1	26 000	34 000	17.0	3.0
		0.5512	1664 755	1135 515			0.669	0.118
7902 C	DB DF DT	14	7.7	5.3	30 000	43 000	12.8	1.2
		0.5512	1742 790	1190 540			0.504	0.047
7002 A5	DB DF DT	18	9.7	6.4	23 000	30 000	20.0	2.0
		0.7087	2183 990	1435 651			0.787	0.079
7002 A	DB DF DT	18	9.9	6.9	19 000	26 000	22.6	4.6
		0.7087	2227 1010	1543 700			0.890	0.181
7002 B	DB DF DT	18	8.5	5.7	13 000	19 000	28.8	10.8
		0.7087	1920 871	1292 586			1.134	0.425
7002 C	DB DF DT	18	10.1	6.8	28 000	38 000	15.3	2.7
		0.7087	2271 1030	1521 690			0.602	0.106
7202 A5	DB DF DT	22	13.5	8.0	22 000	29 000	20.0	2.0
		0.7874	3042 1380	1805 820			0.787	0.079
7202 A	DB DF DT	22	14.0	9.3	18 000	24 000	25.4	3.4
		0.7874	3153 1430	2094 950			1.000	0.134
7202 B	DB DF DT	22	12.8	8.6	13 000	18 000	32.0	10.0
		0.7874	2888 1310	1929 875			1.260	0.394
7202 C	DB DF DT	22	14.1	9.1	26 000	36 000	17.7	4.3
		0.7874	3175 1440	2039 925			0.697	0.169
7302 A	DB DF DT	26	21.8	14.1	13 000	17 000	29.5	3.5
		1.0236	4894 2220	3175 1440			1.161	0.138
7302 B	DB DF DT	26	20.2	13.1	11 000	15 000	36.9	10.9
		1.0236	4542 2060	2954 1340			1.453	0.429
7302 C	DB DF DT	26	21.6	13.5	22 000	28 000	37.0	11
		1.0236	4857 2203	3031 1375			1.457	0.433

SINGLE ROW

Bore Diameter 17mm/0.6693inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

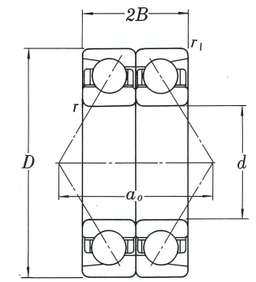
Dimensions mm / inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Size Da	Ball complement No. W	Ball complement No. T (Cage Type)
17	30	7	0.3	0.15	9.0	4.8	2.8	30 000	40 000	3.969	-	13
0.6693	1.1811	0.2756	0.012	0.006	0.354	1069	631			(5-32)		
						485	286					
	30	7	0.3	0.15	6.6	5.0	2.9	34 000	48 000	3.969	-	13
	1.1811	0.2756	0.012	0.006	0.260	1124	659			(5-32)		
						510	299					
	35	10	0.3	0.15	11.1	6.3	3.6	26 000	34 000	4.762	-	12
	1.3780	0.3937	0.012	0.006	0.437	1422	816			(3-16)		
						645	370					
	35	10	0.3	0.15	12.5	6.4	3.8	22 000	30 000	4.762	13	12
	1.3780	0.3937	0.012	0.006	0.492	1444	860			(3-16)		
						655	390					
	35	10	0.3	0.15	15.9	5.6	3.2	15 000	22 000	4.762	13	12
	1.3780	0.3937	0.012	0.006	0.626	1252	721			(3-16)		
						568	327					
	35	10	0.3	0.15	8.5	6.6	3.5	32 000	43 000	4.762	-	12
	1.3780	0.3937	0.012	0.006	0.335	1488	794			(3-16)		
						675	360					
	40	12	0.6	0.3	12.6	10.5	5.6	24 000	31 000	6.747	-	10
	1.5748	0.4724	0.024	0.012	0.496	2359	1257			(17-64)		
						1070	570					
	40	12	0.6	0.3	14.2	10.8	6.0	20 000	28 000	6.747	11	10
	1.5748	0.4724	0.024	0.012	0.559	2425	1345			(17-64)		
						1100	610					
	40	12	0.6	0.3	18.0	9.9	5.5	14 000	19 000	6.747	11	10
	1.5748	0.4724	0.024	0.012	0.709	2227	1246			(17-64)		
						1010	565					
	40	12	1	0.3	9.8	10.9	5.8	28 000	38 000	6.747	-	10
	1.548	0.4724	0.039	0.012	0.386	2447	1312			(17-64)		
						1110	595					
	47	14	1	0.6	16.2	16.0	8.6	14 000	19 000	8.731	10	9
	1.8504	0.5512	0.039	0.024	0.638	3594	1940			(11-32)		
						1630	880					
	47	14	1	0.6	20.4	14.8	8.0	13 000	17 000	8.731	10	9
	1.8504	0.5512	0.039	0.024	0.803	3228	1808			(11-32)		
						1510	820					
	47	14	1	0.6	11.3	15.7	8.2	25 000	31 000	8.731	10	9
	1.8504	0.5512	0.039	0.024	0.445	3527	1852			(11-32)		
						1600	840					

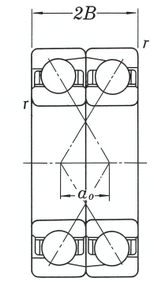
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%.
The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

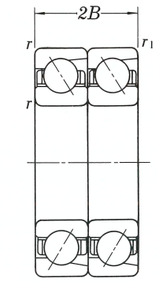
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm / inches

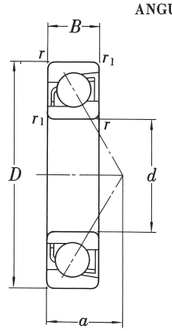
Basic Bearing Number Single	Basic Bearing Number Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7903 A5	DB DF DT	14	7.7	5.6	24 000	32 000	18.0	4.0
		0.5512	1742	1257			0.709	0.157
			790	570				
7903 C	DB DF DT	14	8.1	5.9	28 000	38 000	13.3	0.7
		0.5512	1830	1323			0.524	0.028
			830	600				
7003 A5	DB DF DT	20	10.2	6.4	20 000	27 000	22.1	2.1
		0.7874	2293	1433			0.870	0.083
			1040	650				
7003 A	DB DF DT	20	10.4	7.6	17 000	24 000	25.0	5.0
		0.7874	2337	1720			0.984	0.197
			1060	780				
7003 B	DB DF DT	20	9.0	6.4	12 000	17 000	31.8	11.8
		0.7874	2015	1442			1.252	0.465
			914	654				
7003 C	DB DF DT	20	10.8	7.6	26 000	34 000	17.0	3.0
		0.7874	2425	1709			0.669	0.118
			1100	775				
7203 A5	DB DF DT	24	17.0	11.2	19 000	25 000	25.3	1.3
		0.9449	3814	2513			0.996	0.051
			1730	1140				
7203 A	DB DF DT	24	17.6	12.0	16 000	22 000	28.5	4.5
		0.9449	3946	2690			1.122	0.177
			1790	1220				
7203 B	DB DF DT	24	16.2	11.1	11 000	15 000	35.9	11.9
		0.9449	3638	2491			1.413	0.469
			1650	1130				
7203 C	DB DF DT	24	17.7	11.7	11 000	32 000	19.6	4.4
		0.9449	3968	2624			0.772	0.173
			1800	1190				
7303 A	DB DF DT	28	25.9	17.3	11 000	15 000	32.5	4.5
		1.1024	5820	3880			1.280	0.177
			2640	1760				
7303 B	DB DF DT	28	24.0	16.1	10 000	14 000	40.9	12.9
		1.1024	5401	3616			1.610	0.508
			2450	1640				
7303 C	DB DF DT	28	25.2	16.5	20 000	25 000	22.6	5.4
		1.1024	5957	3702			0.890	0.213
			2566	1679				

SINGLE ROW

Bore Diameter 20mm/0.7874inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

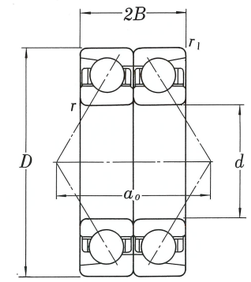
Dimensions mm/inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN/lbs/Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Size Da	Ball complement No. W	Ball complement No. T (Cage Type)
20	37	9	0.3	0.15	11.1	6.6	4.0	24 000	32 000	4.762	-	13
0.7874	1.4567	0.3543	0.012	0.006	0.437	1488	904			(3-16)		
						675	410					
	37	9	0.3	0.15	8.3	7.0	4.2	28 000	38 000	4.762	-	13
	1.4567	0.3543	0.012	0.006	0.327	1565	984			(3-16)		
						710	430					
	42	12	0.6	0.3	13.2	10.6	5.6	22 000	30 000	6.350	-	12
	1.6535	0.4724	0.024	0.012	0.520	2381	1257			(1-4)		
						1080	570					
	42	12	0.6	0.3	14.9	10.9	6.6	18 000	24 000	6.350	-	12
	1.6535	0.4724	0.024	0.012	0.587	2447	1477			(1-4)		
						1110	670					
	42	12	0.6	0.3	19.0	9.4	5.6	13 000	28 000	6.350	13	12
	1.6535	0.4724	0.024	0.012	0.748	2105	1250			(1-4)		
						955	567					
	42	12	0.6	0.3	10.1	11.1	6.5	26 000	36 000	6.350	-	12
	1.6535	0.4724	0.024	0.012	0.398	2491	1466			(1-4)		
						1130	665					
	47	14	1	0.6	14.8	14.0	7.7	21 000	27 000	7.938	-	10
	1.8504	0.5512	0.039	0.024	0.583	3153	1742			(5-16)		
						1430	790					
	47	14	1	0.6	16.7	14.5	8.3	17 000	22 000	7.938	11	10
	1.8504	0.5512	0.039	0.024	0.657	3263	1863			(5-16)		
						1480	845					
	47	14	1	0.6	21.1	13.3	7.6	12 000	16 000	7.938	11	10
	1.8504	0.5512	0.039	0.024	0.831	2998	1720			(5-16)		
						1360	780					
	47	14	1	0.6	11.5	14.5	8.1	24 000	34 000	7.938	-	10
	1.8504	0.5512	0.039	0.024	0.453	3263	1819			(5-16)		
						1480	825					
	52	15	1.1	0.6	17.9	18.7	10.4	13 000	17 000	9.525	10	9
	2.0472	0.5906	0.043	0.024	0.705	4211	2337			(3-8)		
						1910	1060					
	52	15	1.1	0.6	22.6	17.4	9.7	11 000	15 000	9.525	10	9
	2.0472	0.5906	0.043	0.024	0.890	3902	2172			(3-8)		
						1770	985					
	52	15	1.1	0.6	12.3	18.5	9.6	22 000	28 000	9.525	10	9
	2.0472	0.5906	0.043	0.024	0.484	1890	980			(3-8)		

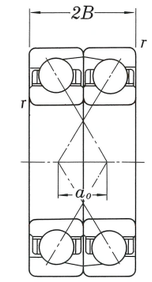
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%. The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

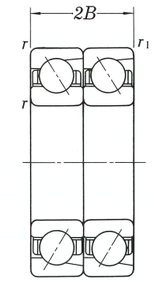
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm/inches

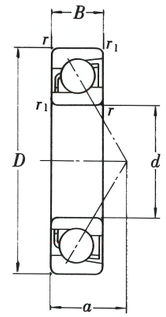
Basic Bearing Number Single	Basic Bearing Number Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN/lbs/Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7904 A5	**DB DF DT**	18	10.7	8.1	19 000	26 000	22.3	4.3
		0.7078	2403	1819			0.878	0.169
			1090	825				
7904 C	**DB DF DT**	18	11.3	8.5	22 000	32 000	16.6	1.4
		0.7078	2535	1907			0.654	0.055
			1150	865				
7004 A5	**DB DF DT**	24	17.3	12.6	17 000	24 000	26.4	2.4
		0.9449	3880	2822			1.039	0.094
			1760	1280				
7004 A	**DB DF DT**	24	17.7	13.1	15 000	20 000	29.9	5.9
		0.9449	3968	2954			1.177	0.232
			1800	1340				
7004 B	**DB DF DT**	24	15.2	11.1	10 000	14 000	38.0	14
		0.9449	3422	2491			1.496	0.551
			1552	1130				
7004 C	**DB DF DT**	24	18.0	13.0	20 000	30 000	20.3	3.7
		0.9449	4057	2932			0.799	0.146
			1840	1330				
7204 A5	**DB DF DT**	28	22.8	15.5	17 000	21 000	29.6	1.6
		1.1024	5115	3483			1.165	0.063
			2320	1580				
7204 A	**DB DF DT**	28	23.5	16.6	13 000	19 000	33.3	5.3
		1.1024	5291	3726			1.311	0.209
			2400	1690				
7204 B	**DB DF DT**	28	21.7	15.3	9 500	13 000	42.1	14.1
		1.1024	4872	3439			1.657	0.555
			2210	1560				
7204 C	**DB DF DT**	28	23.6	16.2	19 000	26 000	23.0	5.0
		1.1024	5313	3683			0.906	0.197
			2410	1650				
7304 A	**DB DF DT**	3.0	30.4	20.9	10 000	13 000	35.8	5.8
		1.1811	6834	4696			1.409	0.228
			3100	2130				
7304 B	**DB DF DT**	3.0	28.1	19.3	9 000	12 000	45.2	15.2
		1.1811	6327	4343			1.780	0.598
			2870	1970				
7304 C	**DB DF DT**	3.0	30.1	19.9	17 000	22 000	24.6	5.4
		1.1811	6764	4478			0.969	0.213
			3068	2031				

SINGLE ROW

Bore Diameter 25mm/0.9843inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

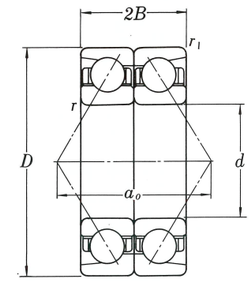
Dimensions mm / inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor (KN / lbs / Kgf)	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Size Da	Ball complement No. W (Cage Type)	Ball complement No. T (Cage Type)
25	42	9	0.3	0.15	12.3	7.5	5.1	20 000	28 000	4.762	-	16
0.9843	1.6535	0.3543	0.012	0.006	0.484	1676	1157			(3-16)		
						760	525					
	42	9	0.3	0.15	9.0	7.8	5.4	24 000	34 000	4.762	-	16
	1.6535	0.3543	0.012	0.006	0.354	1764	1224			(3-16)		
						800	555					
	47	12	0.6	0.3	14.4	11.2	7.1	19 000	25 000	6.350	-	13
	1.8504	0.4724	0.024	0.012	0.567	2513	1598			(1-4)		
						1140	725					
	47	12	0.6	0.3	16.4	11.3	7.4	16 000	22 000	6.350	14	13
	1.8504	0.4724	0.024	0.012	0.646	2535	1653			(1-4)		
						1150	750					
	47	12	0.6	0.3	21.1	9.7	6.2	11 000	16 000	6.350	14	13
	1.8504	0.4724	0.024	0.012	0.831	2185	1400			(1-4)		
						991	635					
	47	12	0.6	0.3	10.8	11.7	7.4	22 000	30 000	6.350	-	13
	1.8504	0.4724	0.024	0.012	0.425	2624	1664			(1-4)		
						1190	755					
	52	15	1	0.6	16.5	15.9	9.8	18 000	23 000	7.938	-	12
	2.0472	0.5906	0.039	0.024	0.650	3571	2194			(5-16)		
						1620	995					
	52	15	1	0.6	18.6	16.2	10.3	15 000	20 000	7.938	13	12
	2.0472	0.5906	0.039	0.024	0.732	3638	2315			(5-16)		
						1650	1050					
	52	15	1	0.6	23.7	14.8	9.4	10 000	14 000	7.938	13	12
	2.0472	0.5906	0.039	0.024	0.933	3229	2116			(5-16)		
						1510	960					
	52	15	1	0.6	12.7	16.6	10.2	22 000	28 000	7.938	-	12
	2.0475	0.5906	0.039	0.024	0.500	3726	2293			(5-16)		
						1690	1040					
	62	17	1.1	0.6	21.1	26.4	15.8	10 000	14 000	11.112	11	10
	2.4409	0.6693	0.043	0.024	0.831	5930	3549			(7-16)		
						2690	1610					
	62	17	1.1	0.6	26.7	24.4	14.6	9 000	13 000	11.112	11	10
	2.4409	0.6693	0.043	0.024	1.051	5490	3285			(7-16)		
						2490	1490					
	62	17	1.1	0.6	14.3	26.4	15.3	18 000	23 000	11.112	11	10
	2.4409	0.6693	0.043	0.024	0.563	5930	3448			(7-16)		
						2690	1564					

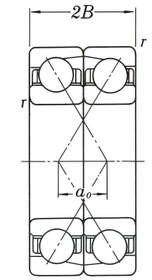
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%. The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

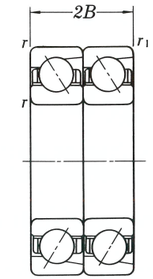
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm / inches

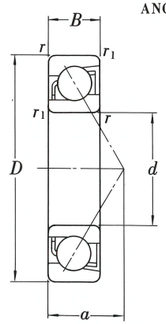
Basic Bearing Number Single	Basic Bearing Number Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor (KN / lbs / Kgf)	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7905 A5	DB DF DT	18	12.1	10.3	16 000	22 000	24.6	6.6
		0.7087	2712	2315			0.969	0.260
			1230	1050				
7905 C	DB DF DT	18	12.7	10.8	19 000	26 000	18.0	0
		0.7087	2866	2447			0.709	0.000
			1300	1110				
7005 A5	DB DF DT	24	11.2	7.1	15 000	20 000	28.8	4.8
		0.9449	2513	1598			1.134	0.189
			1140	725				
7005 A	DB DF DT	24	18.3	14.8	13 000	17 000	32.8	8.8
		0.9449	4123	3329			1.291	0.346
			1870	1510				
7005 B	DB DF DT	24	15.8	12.4	8,800	13 000	42.2	18.2
		0.9449	3549	2798			1.661	0.717
			1610	1269				
7005 C	DB DF DT	24	19.0	14.8	18 000	26 000	21.6	2.4
		0.9449	4277	3329			0.850	0.094
			1940	1510				
7205 A5	DB DF DT	30	25.8	17.5	14 000	18 000	32.9	2.9
		1.1811	5798	3924			1.295	0.114
			2630	1780				
7205 A	DB DF DT	30	26.4	20.5	12 000	16 000	37.2	7.2
		1.1811	5930	3329			1.465	0.283
			2690	4608				
7205 B	DB DF DT	30	24.0	18.8	8 500	11 000	47.3	17.3
		1.1811	5401	4223			1.862	0.681
			2450	1920				
7205 C	DB DF DT	30	27.0	20.4	17 000	24 000	25.3	4.7
		1.1811	6063	4586			0.996	0.185
			2750	2080				
7305 A	DB DF DT	34	43.1	31.9	8 500	11 000	42.1	8.1
		1.3386	9700	7165			1.657	0.319
			4400	3250				
7305 B	DB DF DT	34	39.7	29.2	7 500	11 000	53.3	19.5
		1.3386	8929	6570			2.098	0.768
			4050	2980				
7305 C	DB DF DT	34	42.8	30.7	14 000	18 000	28.6	5.4
		1.3386	9632	6896			1.126	0.213
			4369	3128				

SINGLE ROW

Bore Diameter 30mm/1.1811inch

Suffix A5 = Contact Angle 25°
Suffix A = Contact Angle 30°
Suffix B = Contact Angle 40°
Suffix C = Contact Angle 15°

Suffix W = One-piece Pressed Steel cage
Suffix T = One-piece Machined Reinforced Phenolic cage
Omitted = One-piece Machined Bronze cage



Suffix A
Contact Angle 30°

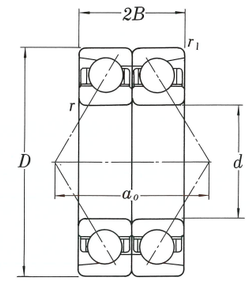
Dimensions mm / inches

Bore d	O.D D	Width B	Chamfer r min	Chamfer r1 min	Efective Load Center a	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Size Da	Ball complement No. W (Cage Type)	Ball complement No. T (Cage Type)
30	47	9	0.3	0.15	13.5	7.8	5.9	18 000	24 000	4.762	-	18
1.1811	1.8504	0.3543	0.012	0.006	0.531	1764	1334			(3-16)		
						800	605					
	47	9	0.3	0.15	9.7	8.3	6.3	22 000	28 000	4.762	-	18
	1.8504	0.3543	0.012	0.006	0.382	1863	1411			(3-16)		
						845	640					
	55	13	1	0.6	16.4	14.4	9.8	16 000	21 000	7.144	-	14
	2.1654	0.5118	0.039	0.024	0.646	3241	2194			(9-32)		
						1470	995					
	55	13	1	0.6	18.8	14.5	10.1	13 000	18 000	7.144	15	14
	2.1654	0.5118	0.039	0.024	0.740	3263	2271			(9-32)		
						1480	1030					
	55	13	1	0.6	24.3	12.5	8.6	9 000	13 000	7.144	15	14
	2.1654	0.5118	0.039	0.024	0.957	2818	1925			(9-32)		
						1278	873					
	55	13	1	0.6	12.2	15.1	10.3	19 000	26 000	7.144	-	14
	2.1654	0.5118	0.039	0.024	0.480	3395	2315			(9-32)		
						1540	1050					
	62	16	1	0.6	18.7	22.1	14.0	15 000	20 000	9.525	-	12
	2.4409	0.6299	0.039	0.024	0.736	4960	3153			(3-8)		
						2250	1430					
	62	16	1	0.6	21.3	22.6	14.8	12 000	17 000	9.525	13	12
	2.4409	0.6299	0.039	0.024	0.839	5071	3329			(3-8)		
						2300	1510					
	62	16	1	0.6	27.3	20.5	13.5	8 500	12 000	9.525	13	12
	2.4409	0.6299	0.039	0.024	1.075	4608	3042			(3-8)		
						2090	1380					
	62	16	1	0.6	14.2	23.0	14.7	18 000	24 000	9.525	-	12
	2.4409	0.6299	0.039	0.024	0.559	5181	3307			(3-8)		
						2350	1500					
	72	19	1.1	0.6	24.2	33.8	20.9	9 000	12 000	12,700	11	10
	2.8346	0.7480	0.043	0.024	0.953	7606	4696			(1-2)		
						3450	2130					
	72	19	1.1	0.6	30.9	30.9	19.2	8 000	11 000	12,700	11	10
	2.8346	0.7480	0.043	0.024	1.217	6945	4321			(1-2)		
						3150	1960					
	72	19	1.1	0.6	16.3	34.4	21.2	15 000	20 000	12,700	11	10
	2.8346	0.7480	0.043	0.024	0.642	7729	4760			(1-2)		
						3506	2159					

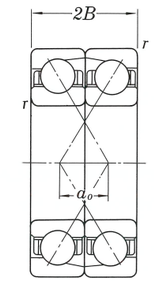
1) The basic load ratings listed above apply to bearings with machined cages.

2) The limiting speed above apply to bearings with machined cages. For bearings with pressed cages, the above limiting speeds must be reduced by 20%. The limiting speeds of bearings with a contact angle of apply to bearings with high precision (p5 or better) and cages made of synthetic resin.

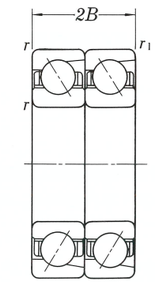
IN DUPLEX MOUNTING



DB mounting
(Back-to-Back)



DF mounting
(Face-to-Face)



DT mounting
(Tandem)

Dimensions mm / inches

Basic Bearing Number Single	Matching	Width 2 B	Basic Load Ratings 1) Dynamic Cr (KN / lbs / Kgf)	Basic Load Ratings 1) static Cor	Limiting Speeds 2) Grease (rpm)	Limiting Speeds 2) Oil (rpm)	Load Center Spacings ao	
7906 A5	**DB DF DT**	18	12.7	11.9	14 000	19 000	27.0	9.0
		0.7087	2866	2668			1.063	0.354
			1300	1210				
7906 C	**DB DF DT**	18	13.5	12.6	17 000	24 000	19.3	1.3
		0.7087	3042	2822			0.760	0.051
			1380	1280				
7006 A5	**DB DF DT**	26	23.4	19.6	13 000	17 000	32.8	6.8
		1.0236	5256	4405			1.291	0.268
			2384	1998				
7006 A	**DB DF DT**	26	23.6	20.2	11 000	15 000	37.5	11.5
		1.0236	5313	4542			1.476	0.453
			2410	2060				
7006 B	**DB DF DT**	26	20.4	17.1	7 000	10 000	48.6	22.6
		1.026	4577	3849			1.913	0.890
			2076	1746				
7006 C	**DB DF DT**	26	24.6	20.5	15 000	22 000	21.6	1.6
		1.236	5534	4608			0.850	0.063
			2510	2090				
7206 A5	**DB DF DT**	32	35.8	25.2	12 000	16 000	37.4	5.4
		1.2598	8047	5666			1.472	0.213
			3650	2570				
7206 A	**DB DF DT**	32	36.8	29.4	10 000	13 000	42.6	10.6
		1.2598	8267	6614			1.677	0.417
			3750	3000				
7206 B	**DB DF DT**	32	33.3	27.1	7 100	9 500	54.6	22.6
		1.2598	7496	6085			2.150	0.890
			3400	2760				
7206 C	**DB DF DT**	32	37.5	29.3	14 000	20 000	28.3	3.7
		1.2598	8378	6592			1.114	0.146
			3800	2990				
7306 A	**DB DF DT**	38	54.5	41.7	7 100	9 500	48.4	10.4
		1.4961	12346	9370			1.906	0.409
			5600	4250				
7306 B	**DB DF DT**	38	50.5	38.7	6 300	8 500	61.8	23.8
		1.4961	11354	8708			2.433	0.937
			5150	3950				
7306 C	**DB DF DT**	38	54.7	40.5	12 000	16 000	32.6	5.4
		1.4961	12304	9098			1.283	0.213
			5581	4127				

ENGINEERING SECTION

Material

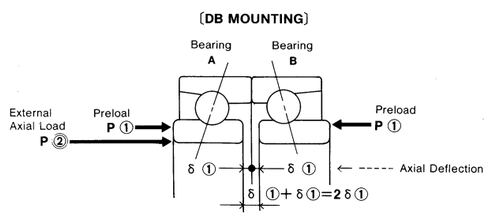
As regard the material of bearings, JIS G4805 High Carbon Chromium Bearing Steel Class 2 (SUJ2) is in general use, but where corrosion resistance is required, JIS G4303 Stainless Steel Bar Class 440 (SUS 440C) which belongs to martensite type stainless steel used.

Composition of bearingmaterial

Kind of steel	Symbol	Chemical composition							Similar steel
		C	Si	Mn	P	S	Cr	Mo	
High Carbon Chromium Bearing Steel Class 2	SUJ 2	0.95~ 1.10	0.15~ 0.35	Max. 0.50	Max. 0.025	Max. 0.025	1.30~ 1.60	—	AISI 52100
Stainless Steel Bar Class 440	SUS 440C	0.95~ 1.20	Max. 1.00	Max. 1.00	Max. 0.040	Max. 0.030	16.00~ 18.00	Max. 0.75	AISI 440C

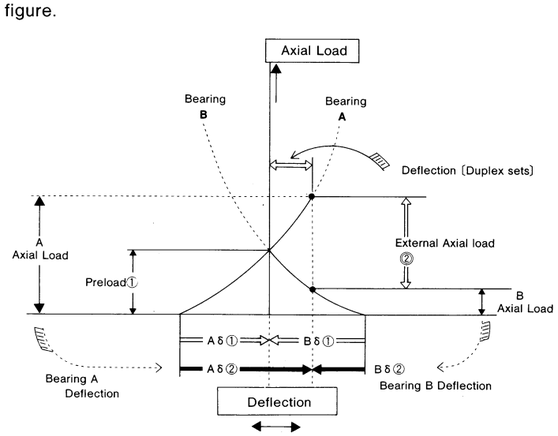
Preload

It is necessary to determine the preload value, taking use conditions, preload purpose, etc. into consideration, because excessively increasing the preload value can result in increased heating, friction moments, decreased life etc.



Preloading

When the duplex sets are tightened in the axial direction, the bearing-A and bearing-B are displaced by δ①, resulting in the clearance 2δ① of the inner ring possibly being lost. The desired preload P① must be assured under such conditions. The relationsip between the rigidity of the bearing or load deflection when the axial load P② is applied to the preloaded bearing is shown in the following figure.



Axial Deflection

The Axial Deflection δx is the elastic deformation under the action of an axially applied Load Fa.

The effect of Fa is to dispose one ring relative to the other by an amount δa.

$$\delta a = \frac{0.002}{\sin\alpha}\left(\frac{Q^2}{Da}\right)^{1/3} \quad \text{〔mm〕}$$

Symbols:

δa = Axial Deflection 〔mm〕

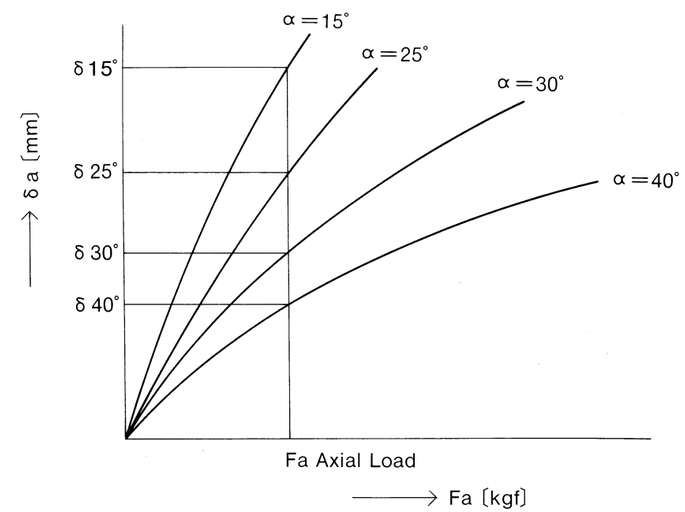
Fa = Axial Load 〔kgf〕

Z = No. of Balls

Da = Dia. of Balls 〔mm〕

α = Contact Angle 〔degree〕

$$Q = \frac{Fa}{Z\sin\alpha}$$



Preload Values of Duplex Sets

The following shows the average preload for high-precision duplex sets (Contact Angle 15°) of P5 or over, often used for machine tool spindles, etc.

79 Series Mounting (DB, DF) Preload Values Contact Angle=15°

Bearing Number	C2 Slight Preload N	lbs	(Kgf)	C7 Light Preload N	lbs	(Kgf)	C8 Medium Preload N	lbs	(Kgf)	C9 Heavy Preload N	lbs	(Kgf)
7900C	2.55	0.57	(0.26)	16.7	3.75	(1.7)	29.4	6.61	(3.0)	63.7	13.23	(6.5)
7601C	5.40	1.21	(0.55)	19.6	4.41	(2.0)	41.0	9.26	(4.2)	78.5	17.64	(8.0)
7902C	5.40	1.21	(0.55)	24.5	5.51	(2.5)	54.0	12.13	(5.5)	118	26.46	(12)
7903C	5.40	1.21	(0.55)	29.4	6.61	(3.0)	54.0	12.13	(5.5)	127	28.66	(13)
7904C	7.35	1.65	(0.75)	42.0	9.48	(4.3)	88.5	19.84	(9.0)	177	39.68	(18)
7905C	8.85	1.98	(0.90)	44.0	9.92	(4.5)	98.0	22.05	(10)	216	48.50	(22)
7906C	8.85	1.98	(0.90)	54.0	12.13	(5.5)	118	26.46	(12)	235	52.91	(24)

70 Series Mounting (DB, DF) Preload Values Contact Angle=15°

Bearing Number	C2 Slight Preload N	lbs	(Kgf)	C7 Light Preload N	lbs	(Kgf)	C8 Medium Preload N	lbs	(Kgf)	C9 Heavy Preload N	lbs	(Kgf)
7000C	5.40	1.21	(0.55)	28.4	6.39	(2.9)	58.8	13.23	(6.0)	127	28.66	(13)
7001C	5.90	1.32	(0.60)	31.4	7.05	(3.2)	63.7	14.33	(6.5)	137	30.86	(14)
7002C	6.35	1.43	(0.65)	34.3	7.72	(3.5)	73.5	16.53	(7.5)	156	35.27	(16)
7003C	6.85	1.54	(0.70)	37.3	8.38	(3.8)	78.5	17.64	(8.0)	166	37.48	(17)
7004C	12.7	2.87	(1.3)	68.6	15.43	(7.0)	137	30.86	(14)	294	66.14	(30)
7005C	13.7	3.09	(1.4)	73.5	16.53	(7.5)	147	33.07	(15)	323	72.75	(33)
7006C	18.6	4.19	(1.9)	98	22.05	(10)	206	46.30	(21)	431	97.00	(44)

72 Series Mounting (DB, DF) Preload Values Contact Angle=15°

Bearing Number	C2 Slight Preload N	lbs	(Kgf)	C7 Sight Preload N	lbs	(Kgf)	C8 Medium Preload N	lbs	(Kgf)	C9 Heavy Preload N	lbs	(Kgf)
7200C	5.40	1.21	(0.55)	28.4	6.39	(2.9)	59.0	13.23	(6.0)	127	28.66	(13)
7201C	8.35	1.87	(0.85)	44.0	9.92	(4.5)	93.0	20.94	(9.5)	196	44.09	(20)
7202C	9.30	2.09	(0.95)	49.0	11.02	(5.0)	98.0	22.05	(10)	216	48.50	(22)
7203C	11.8	2.65	(1.2)	63.5	14.33	(6.5)	127	28.66	(13)	275	61.73	(28)
7204C	16.7	3.75	(1.7)	88.5	19.84	(9.0)	177	39.68	(18)	380	85.98	(39)
7205C	19.6	4.41	(2.0)	108	24.25	(11)	216	48.50	(22)	460	103.62	(47)
7206C	29.4	6.61	(3.0)	147	33.07	(15)	315	70.55	(32)	685	154.32	(70)

Bearing Life Calculation

The theoretical life is obtained using the fomulas:

$$L_{10} = \left(\frac{Cr}{Pr}\right)^3 \quad \text{[milions of revolution]}$$

$$Lh = \frac{L \times 10^6}{60 \times n} \quad \text{[hours]}$$

Symbols:

- L_{10} = Theoretical life inmillions of revolution
- Lh = Theoretical life in hours
- Cr = Basic Dynamic Load Rating at 33 1/3 R.P.M.
- Cor = Basic Static Load Rating
- Pr = Equivalent Radial Load on Bearing
- Pa = Equivalent Axial Load on Bearing
- n = Operating Speed
- i = Number of Bearings
- Fr = Applied Radial Load on Bearing
- Fa = Applied Axial Load on Bearing
- X = Radial Load Facter
- Y = Axial Load Facter

In case of Duplex or Tandem multiplex sets, with commom angles of contact, the Dynamic capacity of set is equal to:

Cr×K

Where K is a correction facter:-

i	1	2	3	4	5
k	1.00	1.62	2.16	2.64	3.09

i = Number of Capacity Ajacently Mounted Bearings
k = Dynamic Capacity Ajustment Factor for number of ajacently mounted bearings

The Static Capacity of the Set is:-

Cor×i

Calculation of Equivalent Dynamic Load

The Equivalent Dynamic Load is calclation as follows:-
Pr=XFr+YFa

(1) For Preloaded Bearing sets subject only to a Radial Load:-

Fa = Preload

(2) If an external Axial Load Fa is applied to a preloaded set the value of Fa use for calculation Pr Should be modifed as follows:-

(a) Fa ≦ 3Pr use Fa=Pr+ (2/3)×F
(b) Fa > 3Pr use Fa=Fa [External Preload]

Values of X & Y for Calculation

Single or DT Mounting (Tandem)

Contact Angle	Fa/iCor	Fa/izDW²	Fa/Fr ≦ e X	Fa/Fr ≦ e Y	Fa/Fr > e X	Fa/Fr > e Y	e
15°	0.015	0.172	1	0	0.44	1.47	0.38
	0.029	0.345				1.40	0.40
	0.058	0.689				1.30	0.43
	0.087	1.03				1.23	0.46
	0.17	1.38				1.19	0.47
	0.12	2.07				1.12	0.50
	0.29	3.45				1.02	0.55
	0.44	5.17				1.00	0.56
	0.58	6.89				1.00	0.56
25°	-	-	1	0	0.41	0.87	0.68
30°	-	-			0.39	0.76	0.80
40°	-	-			0.35	0.57	1.14

DB, DF Mounting (Duplex Sets)

Contact Angle	Fa/iCor	Fa/iZDW²	Fa/Fr ≦ e X	Fa/Fr ≦ e Y	Fa/Fr > e X	Fa/Fr > e Y	e
15°	0.015	0.172	1	1.65	0.72	2.39	0.38
	0.029	0.345		1.57		2.28	0.40
	0.058	0.689		1.46		2.11	0.43
	0.087	1.03		1.38		2.00	0.46
	0.12	1.38		1.34		1.93	0.47
	0.17	2.07		1.26		1.82	0.50
	0.29	3.45		1.14		1.66	0.55
	0.44	5.17		1.12		1.63	0.56
	0.58	6.89		1.12		1.63	0.56
25°	-	-	1	0.92	0.67	1.41	0.68
30°	-	-		0.78	0.63	1.24	0.80
40°	-	-		0.55	0.57	0.93	1.14

Tolerance JIS=ISO

Δdmp; (dmax.+dmin.)/2
Δds; dmax. or dmin.

Tolerance Limits in 0.001 mm

INNER RING	NOMINAL BORE DIAMETER d(mm)			Over	2.5	10	18	30
				Incl.	10	18	30	50
TOLERANCE P0	BORE	Δdmp	High		0	0	0	0
			Low		−8	−8	−10	−12
		Δds	High		+2	+3	+3	+3
			Low		−10	−11	−13	−15
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−120	−120	−120	−120
	Variation	VBs	Max.		15	20	20	20
	RADIAL RUNOUT	Kia	Max.		10	10	13	15
TOLERANCE P6	BORE	Δdmp	High		0	0	0	0
			Low		−7	−7	−8	−10
		Δds	High		+1	+1	+1	+1
			Low		−8	−8	−9	−11
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−120	−120	−120	−120
	Variation	VBs	Max.		15	20	20	20
	RADIAL RUNOUT	Kia	Max.		6	7	8	10
TOLERANCE P5	BORE	Δdmp	High		0	0	0	0
			Low		−5	−5	−6	−8
		Δds	High		0	0	0	0
			Low		−5	−5	−6	−8
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−40	−80	−120	−120
	Variation	VBs	Max.		5	5	5	5
	RADIAL RUNOUT	Kia	Max.		6	7	8	10
	Reference Side Runout With Bore	Sd	Max.		7	7	8	8
	Groove Runout with Referance Side	Sia	Max.		7	7	8	8
TOLERANCE P4	BORE	Δdmp	High		0	0	0	0
			Low		−4	−4	−5	−6
		Δds	High		0	0	0	0
			Low		−4	−4	−5	−6
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−40	−80	−120	−120
	Variation	VBs	Max.		2.5	2.5	2.5	3
	RADIAL RUNOUT	Kia	Max.		2.5	2.5	3	4
	Reference Side Runout With Bore	Sd	Max.		3	3	4	4
	Groove Runout with Referance Side	Sia	Max.		3	3	4	4
TOLERANCE P2	BORE	Δdmp	High		0	0	0	0
			Low		−2.5	−2.5	−2.5	−2.5
		Δds	High		0	0	0	0
			Low		−4	−4	−5	−5
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−40	−80	−120	−120
	Variation	VBs	Max.		1.5	1.5	1.5	1.5
	RADIAL RUNOUT	Kia	Max.		2.5	4	5	5
	Reference Side Runout With Bore	Sd	Max.		2	2	2.5	2.5
	Groove Runout with Referance Side	Sia	Max.		2.5	4	5	5

* apply to Single Bearing

ΔDmp; (Dmax.+Dmin.)/2
ΔDs; Dmax. or Dmin.

Tolerance Limits in 0.001 mm

OUTER RING	NOMINAL OUTSIDE DIAMETER D(mm)			Over	5	18	30	50	80
				Incl.	18	30	50	80	120
TOLERANCE P0	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−8	−9	−11	−13	−15
		ΔDs	High		+2	+2	+3	+4	+5
			Low		−10	−11	−14	−17	−20
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−120	−120	−120	−120	−150
	Variation	VBs	Max.		15	20	20	20	25
	RADIAL RUNOUT	Kea	Max.		15	15	20	25	35
TOLERANCE P6	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−7	−8	−9	−11	−13
		ΔDs	High		+1	+1	+2	+2	+2
			Low		−8	−9	−11	−13	−15
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−120	−120	−120	−120	−150
	Variation	VBs	Max.		15	20	20	20	25
	RADIAL RUNOUT	Kea	Max.		8	9	10	13	18
TOLERANCE P5	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−5	−6	−7	−9	−10
		ΔDs	High		0	0	0	0	0
			Low		−5	−6	−7	−9	−10
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−40	−80	−120	−120	−150
	Variation	VBs	Max.		5	5	5	6	8
	RADIAL RUNOUT	Kea	Max.		5	6	7	8	10
	Reference Side Runout With Bore	SD	Max.		8	8	8	8	9
	Groove Runout with Referance Side	Sea	Max.		8	8	8	10	11
TOLERANCE P4	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−4	−5	−6	−7	−8
		ΔDs	High		0	0	0	0	0
			Low		−4	−5	−6	−7	−8
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−40	−80	−120	−120	−150
	Variation	VBs	Max.		2.5	2.5	2.5	3	4
	RADIAL RUNOUT	Kea	Max.		3	4	5	5	6
	Reference Side Runout With Bore	SD	Max.		4	4	4	4	5
	Groove Runout with Referance Side	Sea	Max.		5	5	5	5	6
TOLERANCE P2	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−2.5	−4	−4	−5	−5
		ΔDs	High		0	0	0	0	0
			Low		−2.5	−4	−4	−4	−5
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−40	−80	−120	−120	−150
	Variation	VBs	Max.		1.5	1.5	1.5	1.5	2.5
	RADIAL RUNOUT	Kea	Max.		1.5	2.5	2.5	4	5
	Reference Side Runout With Bore	SD	Max.		1.5	1.5	1.5	1.5	2.5
	Groove Runout with Referance Side	Sea	Max.		1.5	1.0	2.5	4	5

* apply to Single Bearing

Δdmp; (dmax.+dmin.)/2
Δds; dmax. or dmin.

Tolerance Limits in 0.0001inch

INNER RING	NOMINAL BORE DIAMETER d(in.)			Over	0.0984	0.3937	0.7087	1.1811
				Incl.	0.3937	0.7087	1.1811	1.9685
TOLERANCE P0	BORE	Δdmp	High		0	0	0	0
			Low		−3.1	−3.1	−3.9	−4.7
		Δds	High		+0.8	+0.8	+0.8	+0.8
			Low		−3.9	−4.3	−5.1	−5.9
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−47.2	−47.2	−47.2	−47.2
	Variation	VBs	Max.		5.9	7.9	7.9	7.9
	RADIAL RUNOUT	Kia	Max.		3.9	3.9	5.1	5.9
TOLERANCE P6	BORE	Δdmp	High		0	0	0	0
			Low		−2.8	−2.8	−3.1	−3.9
		Δds	High		+0.4	+0.4	+0.4	+0.4
			Low		−3.1	−3.1	−3.5	−4.3
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−47.2	−47.2	−47.2	−47.2
	Variation	VBs	Max.		5.9	7.9	7.9	7.9
	RADIAL RUNOUT	Kia	Max.		2.4	2.8	3.1	3.9
TOLERANCE P5	BORE	Δdmp	High		0	0	0	0
			Low		−2.0	−2.0	−2.4	−3.1
		Δds	High		0	0	0	0
			Low		−2.0	−2.0	−2.4	−3.1
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−15.7	−31.5	−47.2	−47.2
	Variation	VBs	Max.		2.0	2.0	2.0	2.0
	RADIAL RUNOUT	Kia	Max.		2.4	2.8	3.1	3.9
	Reference Side Runout With Bore	Sd	Max.		2.8	2.8	3.1	3.1
	Groove Runout with Referance Side	Sia	Max.		2.8	2.8	3.1	3.1
TOLERANCE P4	BORE	Δdmp	High		0	0	0	0
			Low		−1.6	−1.6	−2.0	−2.4
		Δds	High		0	0	0	0
			Low		−1.6	−1.6	−2.0	−2.4
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−15.7	−31.5	−47.2	−47.2
	Variation	VBs	Max.		1.0	1.0	1.0	1.2
	RADIAL RUNOUT	Kia	Max.		1.0	1.0	1.2	1.6
	Reference Side Runout With Bore	Sd	Max.		1.2	1.2	1.6	1.6
	Groove Runout with Referance Side	Sia	Max.		1.2	1.2	1.6	1.6
TOLERANCE P2	BORE	Δdmp	High		0	0	0	0
			Low		−1.0	−1.0	−1.0	−1.0
		Δds	High		0	0	0	0
			Low		−1.6	−1.6	−2.0	−2.0
	WIDTH*	ΔBs	High		0	0	0	0
			Low		−15.7	−31.5	−47.2	−47.2
	Variation	VBs	Max.		0.6	0.6	0.6	0.6
	RADIAL RUNOUT	Kia	Max.		1.0	1.6	2.0	2.0
	Reference Side Runout With Bore	Sd	Max.		0.8	0.8	1.0	1.0
	Groove Runout with Referance Side	Sia	Max.		1.0	1.6	2.0	2.0

* apply to Single Bearing

ΔDmp; (Dmax.+Dmin.)/2
ΔDs; Dmax. or Dmin.

Tolerance Limits in 0.0001inch

OUTER RING	NOMINAL OUTSIDE DIAMETER D(in.)			Over	0.1969	0.7087	1.1811	1.9685	3.1496
				Incl.	0.7087	1.1811	1.9685	3.1496	4.7244
TOLERANCE P0	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−3.1	−3.5	−4.3	−5.1	−5.9
		ΔDs	High		+0.8	+0.8	+1.2	+1.6	+2.0
			Low		−3.9	−4.3	−5.5	−6.7	−7.9
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−47.2	−47.2	−47.2	−47.2	−59.1
	Variation	VBs	Max.		5.9	7.9	7.9	7.9	9.8
	RADIAL RUNOUT	Kea	Max.		5.9	5.9	7.9	9.8	13.8
TOLERANCE P6	OUTSIDE DIAMETER	ΔDmp	High						
			Low		−2.8	−3.1	−3.5	−4.3	−5.1
		ΔDs	High		+0.4	+0.4	+0.8	+0.8	+0.8
			Low		−3.1	−3.5	−4.3	−5.1	−5.9
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−47.2	−47.2	−47.2	−47.2	−59.1
	Variation	VBs	Max.		5.9	7.9	7.9	7.9	9.8
	RADIAL RUNOUT	Kea	Max.		3.1	3.5	3.9	5.1	7.1
TOLERANCE P5	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−2.0	−2.4	−2.8	−3.5	−3.9
		ΔDs	High		0	0	0	0	0
			Low		−2.0	−2.4	−2.8	−3.5	−3.9
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−15.7	−31.5	−47.2	−47.2	−59.1
	Variation	VBs	Max.		2.0	2.0	2.0	2.4	3.1
	RADIAL RUNOUT	Kea	Max.		2.0	2.4	2.8	3.1	3.9
	Reference Side Runout With Bore	SD	Max.		3.1	3.1	3.1	3.1	3.5
	Groove Runout with Referance Side	Sea	Max.		3.1	3.1	3.1	3.9	4.3
TOLERANCE P4	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−1.6	−2.0	−2.4	−2.8	−3.1
		ΔDs	High		0	0	0	0	0
			Low		−1.6	−2.0	−2.4	−2.8	−3.1
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−15.7	−31.5	−47.2	−47.2	−59.1
	Variation	VBs	Max.		1.0	1.0	1.0	1.2	1.6
	RADIAL RUNOUT	Kea	Max.		1.2	1.6	2.0	2.0	2.4
	Reference Side Runout With Bore	SD	Max.		1.6	1.6	1.6	1.6	2.0
	Groove Runout with Referance Side	Sea	Max.		2.0	2.0	2.0	2.0	2.4
TOLERANCE P2	OUTSIDE DIAMETER	ΔDmp	High		0	0	0	0	0
			Low		−1.0	−1.6	−1.6	−1.6	−2.0
		ΔDs	High		0	0	0	0	0
			Low		−1.6	−1.6	−1.6	−2.0	−2.0
	WIDTH*	ΔBs	High		0	0	0	0	0
			Low		−15.7	−31.5	−47.2	−47.2	−59.1
	Variation	VBs	Max.		0.6	0.6	0.6	0.6	1.0
	RADIAL RUNOUT	Kea	Max.		0.6	1.0	1.0	1.6	2.0
	Reference Side Runout With Bore	SD	Max.		0.6	0.6	0.6	0.6	1.0
	Groove Runout with Referance Side	Sea	Max.		0.6	1.0	1.0	1.6	2.0

* apply to Single Bearing