

Angular Contact Ball Bearings

Table 1 Features of Single-Row Angular Contact Ball Bearings

Cage Spec.	Material	Steel	Nylon 46		L-PPS resin	Brass	
	Method	pressed	Molded		Molded	machined	
	Symbols	W	TYN	T85	T7	Omitted	MR
Features	High Load Capacity						
	High-Speed						
	High-Temperature						
	Vibration						

In addition, for bearings with the same serial number, if the type of cages are different, the number of balls may also be different. In such a case, the load rating will differ from the one listed in the bearing tables.

Angular Contact Ball Bearings with contact angles of 15° (Symbol **C**) and 25° (Symbol **A5**) are primarily for high precision or high speed applications, and molded polyamide cages (Symbol TYN) or machined brass cages or synthetic resin cages (Symbol T) are used.

The maximum operating temperature of molded polyamide cages is 150°C.

MATCHED ANGULAR CONTACT BALL BEARINGS

The types and features of matched angular contact ball bearings are shown in Table 2.

Table 2 Types and Features of Matched Angular Contact Ball Bearings

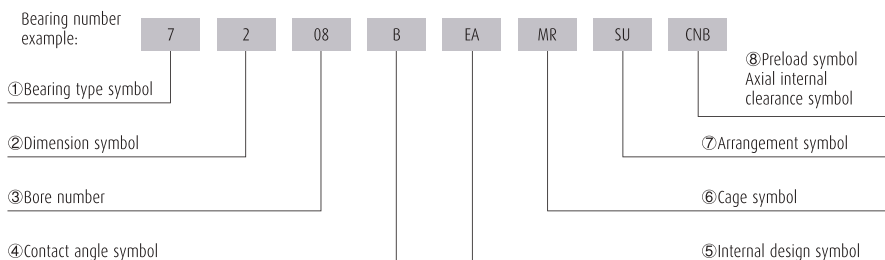
Figure	Arrangement	Features
	Back-to-back (DB) (Example) 7208 A DB	Radial loads and axial loads in both directions can be sustained. Since the distance between the effective load centers a_0 is big, this type is suitable if moments are applied.
	Face-to-face (DF) (Example) 7208 B DF	Radial loads and axial loads in both directions can be sustained. Compared with the DB Type, the distance between the effective load centers is small, so the capacity to sustain moments is inferior to the DB Type.
	Tandem (DT) (Example) 7208 A DT	Radial loads and axial loads in one direction can be sustained. Since two bearings share the axial load, this arrangement is used when the load in one direction is heavy.

ITJ ANGULAR CONTACT BALL BEARINGS

In comparison with standard angular contact ball bearings, these bearings have high capacity, high limiting speed, and highly accurate universal matching as the features. The molded polyamide cages are standard specification for the HPS type.

□ Formulation of Bearing Numbers

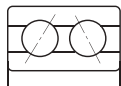
Single-Row Angular Contact Ball Bearings Matched Angular Contact Ball Bearings



① Bearing type symbol	7 : Single-Row Angular Contact Ball Bearings, Matched Angular Contact Ball Bearings
② Dimension symbol	2 : 02 Series, 3 : 03 Series, 9 : 19 Series, 0 : 10 Series
③ Bore number	Less than 03, Bearing bore 00 : 10mm, 01 : 12mm, 02 : 15mm, 03 : 17mm Over 04, Bearing bore Bore number x5 (mm)
④ Contact angle symbol	C : 15°, A5 : 25°, A : 30°, B : 40°
⑤ Internal design symbol	EA : High Load Capacity
⑥ Cage symbol	W : Pressed Steel Cage, MR : Machined Brass Cage (Ball guided), No symbol : Machined Brass Cage (Outer Ring guided), TYN : Polyamide Resin Cage, T85 : Polyamide 46 Resin Cage, T7 : L-PPS Resin Cage
⑦ Arrangement symbol	SU : Universal arrangement (Single row), DU : Universal arrangement (Double row), DB : Back-to-back arrangement, DF : Face-to-face arrangement, DT : Tandem arrangement
⑧ Preload symbol Axial internal clearance symbol	EL : Extra light preload, L : Light preload, M : Medium preload, H : Heavy preload Omitted : CN clearance, C3 : Clearance greater than CN, C4 : Clearance greater than C3, CNB : CN Clearance equivalent (Universal arrangement)

a_0

DOUBLE-ROW ANGULAR CONTACT BALL BEARINGS



This is basically a back-to-back mounting of two single-row angular contact ball bearings, but their inner and outer rings are each integrated into one. Axial loads in both directions can be sustained, and the capacity to sustain moments is good. This type is used as fixed-end bearings.

Their cages are pressed steel.

Angular Contact Ball Bearings

Formulation of Bearing Numbers

Double-Row Angular Contact Ball Bearings

Bearing number example:

LZ

3

2

01

B-

2RSR

TNG

①Pulley type symbol
LZ = Cylindrical Outerring
LB = Spherical Outerring

②Bearing type symbol

③Dimension symbol

④Bore number

⑦Cage symbol

⑥Seals

⑤Contact angle

①Pulley type symbol

②Bearing type symbol

③Dimension symbol

④Bore number

⑤Contact angle

⑥Seals

⑦Cage symbol

5 : Double-Row Angular Contact Ball Bearings

2 : 02 Series

Less than 03, Bearing bore 00 : 10mm, 01 : 12mm,
02 : 15mm, 03 : 17mm
Over 04, Bearing bore Bore number ×5 (mm)

B = 25°

2RSR = Seals; 2ZR = Shields

TNG Polyamid Cage Nylon 66

FOUR-POINT CONTACT BALL BEARINGS



The inner ring is split radially into two pieces. Their design allows one bearing to sustain significant axial loads in either direction.

The contact angle is 35°, so the axial load capacity is high. This type is suitable for carrying pure axial loads or combined loads where the axial loads are high.

The cages are made of machined brass.

Formulation of Bearing Numbers

Four-Point Contact Ball Bearings

Bearing number example:

QJ

2

16

M

C3

①Bearing type symbol

②Dimension symbol

③Bore number

⑤Internal clearance symbol

④Cage symbol

①Bearing type symbol

②Dimension symbol

③Bore number

④Cage symbol

⑤Internal clearance symbol

QJ : Four-Point Contact Ball Bearings

10 : 10 Series, 2 : 02 Series, 3 : 03 Series

Less than 03, Bearing bore 00 : 10mm, 01 : 12mm, 02 : 15mm, 03 : 17mm
Over 04, Bearing bore Bore number ×5 (mm)

M : Machined Brass Cage

C2 : Clearance less than CN, Omitted : CN clearance,
C3 : Clearance greater than CN, C4 : Clearance greater than C3

PRECAUTIONS FOR USE OF ANGULAR CONTACT BALL BEARINGS

Under severe operating conditions where the speed and temperature are close to their limits, lubrication is marginal, vibration and moment loads are heavy, they may not be suitable, particularly for certain types of cages. In such a case, please consult with ITJ beforehand.

And if the load on angular contact ball bearings becomes too small, or if the ratio of the axial and radial loads for matched bearings exceeds 'e' (e is listed in the bearings tables) during operation, slippage occurs between the balls and raceways, which may result in smearing. Especially with large bearings since the weight of the balls and cage is high. If such load conditions are expected, please consult with ITJ for selection of the bearings.



ITJ Angular Contact Ball Bearings

Axial Internal Clearance (Measured Clearance) Units : μm

Nominal Bore Diameter d (mm)		Axial Internal Clearance			
		CNB		GA	
over	incl.	min.	max.	min.	max.
12	18	17	25		
18	30	20	28	-2	6
30	50	24	32		
50	80	29	41	-3	9

LIMITING SPEEDS (Grease/Oil)

In cases of single-row and matched angular contact ball bearings, The limiting speeds (grease) and limiting speeds (oil) listed in the bearing table are for bearings with standard cage. For those with option cages, limiting speeds (grease/oil) may differ depending on cages. Please consult with ITJ. For example, limiting speeds (grease/oil) of machined cage (No symbol) is 1.25 times higher than pressed cage. The limiting speeds of bearings with contact angles of 15° (Symbol C) and 25° (Symbol A5) are for bearings with precision of P5 and better (with machined synthetic-resin cages (T) or molded polyamide cages (TYN)). The limiting speeds listed in the bearing tables should be adjusted depending on the bearing load conditions. Also, higher speeds are attainable by making changes in the lubrication method, cage design, etc.

Angular Contact Ball Bearings

TECHNICAL DATA

Free Space of Angular Contact Ball Bearings

Angular contact ball bearings are used in various components, such as spindles of machine tools, vertical pump motors, and worm gear reducers. This kind of bearing is used mostly with grease lubrication. But such grease lubrication may affect the bearing in terms of temperature rise or durability. To allow a bearing to demonstrate its full performance, it is essential to fill the bearing with the proper amount of a suitable grease. A prerequisite for this job is a knowledge of the bearing's free space.

The angular ball bearing is available in various kinds which are independent of the combinations of bearing series, contact angle, and cage type. The free space of the bearings used most frequently is described below. Table 1 shows the free space of a bearing with a pressed cage for general use and Table 2 shows that of a bearing with a high-tension brass machined cage.

The contact angle symbols A, B, and C in each table refer to the nominal contact angles of 30°, 40°, and 15° of each bearing.

**Table 1 Free Space of Angular Contact Ball Bearing (1)
(With Pressed Steel Cage)**

Units: cm³

Bearing bore No.	Bearing free space			
	Bearing series - Contact angle symbol			
	72-A	72-B	73-A	73-B
00	1.5	1.4	2.9	2.8
01	2.1	2.0	3.7	3.5
02	2.8	2.7	4.8	4.6
03	3.7	3.6	6.2	5.9
04	6.2	5.9	8.4	8.0
05	7.8	7.4	13	12
06	12	11	20	19
07	16	15	26	24
08	20	19	36	34
09	25	24	48	45
10	28	27	63	60

**Table 2 Free Space of Angular Contact Ball Bearing (2)
(With High-Tension Brass Machined Cage)**

Units: cm³

Bearing bore No.	Bearing free space				
	Bearing series - Contact angle symbol				
	70-C	72-A 72-C	72-B	73-A 73-C	73-B
00	0.9	1.0	1.0	2.2	2.1
01	0.9	1.6	1.6	2.5	2.5
02	1.2	1.9	1.9	3.4	3.3
03	1.6	2.7	2.7	4.6	4.4
04	3.0	4.7	4.2	6.1	5.9
05	3.5	6.0	5.3	9.2	9.0
06	4.3	8.5	8.1	14	13
07	6.5	12	11	18	17
08	8.3	14	14	25	24
09	10	18	17	34	33
10	11	20	20	45	44
11	16	26	25	57	55
12	17	33	31	71	69
13	18	38	37	87	83
14	24	43	42	107	103
15	24	47	45	129	123
16	34	58	57	152	146
17	37	71	70	179	172
18	44	88	85	207	201
19	44	105	105	261	244
20	47	127	127	282	278



Angular Contact Ball Bearings

Dynamic Equivalent Load of Triplex Angular Contact Ball Bearings

Three separate single-row bearings may be used side by side as shown in the figure when angular contact ball bearings are to be used to carry a large axial load. There are three patterns of combination, which are expressed by combination symbols of DBD, DFD, and DTD.

As in the case of single-row and double-row bearings, the dynamic equivalent load, which is determined from the radial and axial loads acting on a bearing, is used to calculate the fatigue life for these combined bearings.

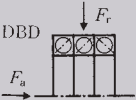
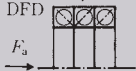
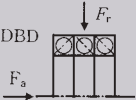
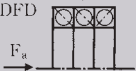
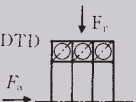
Assuming the dynamic equivalent radial load as P_r , the radial load as F_r , and axial load as F_a , the relationship between the dynamic equivalent radial load and bearing load may be approximated as follows:

$$P_r = X F_r + Y F_a \dots\dots\dots (1)$$

where, X : Radial load factor } See Table 1
Y : Axial load factor }

The axial load factor varies with the contact angle. In an angular contact ball bearing, whose contact angle is small, the contact angle varies substantially when the axial load increases.

A change in the contact angle can be expressed by the ratio between the basic static load rating C_0 , and axial load F_a . Accordingly, for the angular contact ball bearing with a contact angle of 15°, the axial load factor at a contact angle corresponding to this ratio is shown. If the angular contact ball bearings have contact angles of 25°, 30° and 40°, the effect of change in the contact angle on the axial load factor may be ignored and thus the axial load factor is assumed as constant.

Arrangement	Load direction
3 row matched stack, axial load is supported by 2 rows. (Symbol DBD or DFD)	DBD  DFD 
3 row matched stack, axial load is supported by 1 row. (Symbol DBD or DFD)	DBD  DFD 
3 row tandem matched stack (Symbol DTD)	DTD 

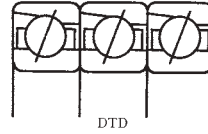
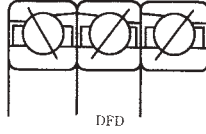
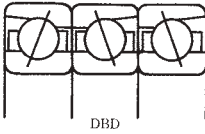
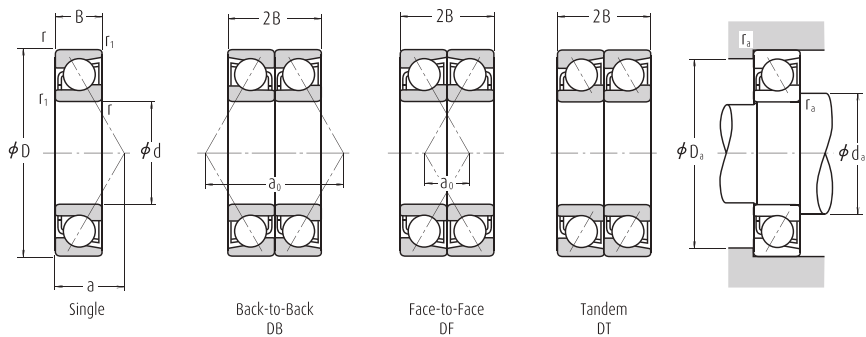


Table 1 Factors X and Y of Triplex Angular Contact Ball Bearing

Contact angle α	j	$\frac{C_{0r}}{jF_a}$	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F} > e$		e	Basic load rating of 3 row ball bearings	
			X	Y	X	Y		C_r	C_{0r}
15°	1.5	5	1	0.64	0.58	1.46	0.51	2.16 times of single bearing	3 times of single bearing
15°	1.5	10	1	0.70	0.58	1.61	0.47		
15°	1.5	15	1	0.74	0.58	1.70	0.44		
15°	1.5	20	1	0.76	0.58	1.75	0.42		
15°	1.5	25	1	0.78	0.58	1.81	0.41		
15°	1.5	30	1	0.80	0.58	1.83	0.40		
15°	1.5	50	1	0.83	0.58	1.91	0.39		
25°	—	—	1	0.48	0.54	1.16	0.68		
30°	—	—	1	0.41	0.52	1.01	0.80	2.16 times of single bearing	3 times of single bearing
40°	—	—	1	0.29	0.46	0.76	1.14		
15°	3	5	1	2.28	0.95	2.37	0.51	2.16 times of single bearing	3 times of single bearing
15°	3	10	1	2.51	0.95	2.61	0.47		
15°	3	15	1	2.64	0.95	2.76	0.44		
15°	3	20	1	2.73	0.95	2.85	0.42		
15°	3	25	1	2.80	0.95	2.93	0.41		
15°	3	30	1	2.85	0.95	2.98	0.40		
15°	3	50	1	2.98	0.95	3.11	0.39		
25°	—	—	1	1.70	0.88	1.88	0.68		
30°	—	—	1	1.45	0.84	1.64	0.80	2.16 times of single bearing	3 times of single bearing
40°	—	—	1	1.02	0.76	1.23	1.14		
15°	1	5	1	0	0.44	1.10	0.51		
15°	1	10	1	0	0.44	1.21	0.47		
15°	1	15	1	0	0.44	1.28	0.44		
15°	1	20	1	0	0.44	1.32	0.42		
15°	1	25	1	0	0.44	1.36	0.41		
15°	1	30	1	0	0.44	1.38	0.40		
15°	1	50	1	0	0.44	1.44	0.39	2.16 times of single bearing	3 times of single bearing
25°	—	—	1	0	0.41	0.87	0.68		
30°	—	—	1	0	0.39	0.76	0.80		
40°	—	—	1	0	0.35	0.57	1.14		

Angular Contact Ball Bearings

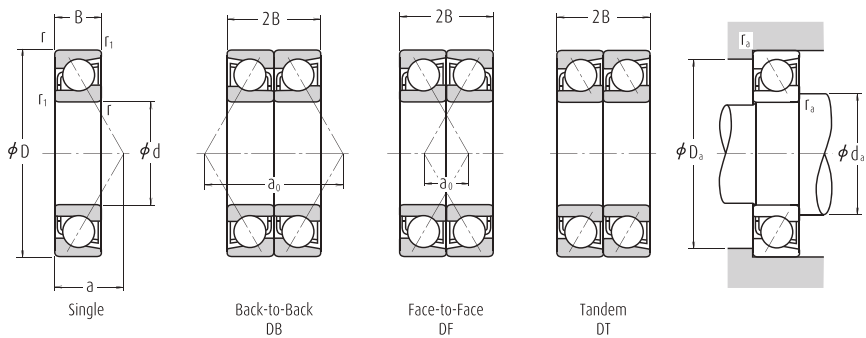
Single/matched mountings
Bore Diameter 10 – 15 mm



Boundary Dimensions	Basic Load Ratings (Single)	Factor	Limiting	Eff.Load	Abutment and Fillet	Mass
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Angular Contact Ball Bearings

Single/matched mountings
Bore Diameter 17 – 25 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (r/min)		Eff.Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r1 min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _s min.	D _s max.	r _{fs} max.	approx.
17	30	7	0.3	0.15	5 000	2 800	—	42 600	63 900	9.0	19.5	27.5	0.3	0.017
	30	7	0.3	0.15	5 250	2 940	14.8	49 000	74 500	6.6	19.5	27.5	0.3	0.017
	35	10	0.3	0.15	6 400	3 500	—	22 900	30 500	12.5	19.5	32.5	0.3	0.040
	35	10	0.3	0.15	6 950	3 800	14.5	44 300	67 400	8.5	19.5	32.5	0.3	0.044
	40	12	0.6	0.3	10 700	5 450	—	26 400	35 100	14.2	22	35	0.6	0.067
	40	12	0.6	0.3	9 950	5 500	—	14 000	19 000	18.0	22	35	0.6	0.068
18	40	12	0.6	0.3	11 600	6 100	—	16 000	22 000	18.2	22	35	0.6	0.065
	45	15	0.6	0.3	14 000	7 200	12.2	10 400	14 000	18.0	22	35	0.6	0.075
	50	18	0.6	0.3	16 000	8 000	12.2	10 400	14 000	18.0	22	35	0.6	0.075

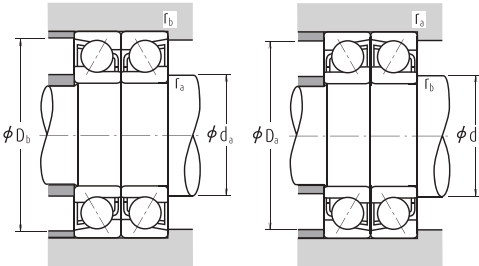
Dynamic Equivalent Load $P = X F_r + Y F_a$

Contact Angle	$H_F F_r^*$ C_{or}	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
25°	—	1.14	0	0.35	0.57	1	0.55	0.57	0.93	—
30°	—	—	—	—	—	—	—	—	—	—
40°	—	—	—	—	—	—	—	—	—	—

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C _r	C _{0r}	Grease	Oil	DB	a ₀ DF	d _b (2) min.	D _b max.	r _b (2) max.
7900 A5°	TYN	(M)	DB DF DT	4 700	2 900	32 000	43 000	13.5	1.5	—	20.8	0.15
7900 C°	TYN	(M),T	DB DF DT	4 900	3 050	38 000	53 000	10.3	1.7	—	20.8	0.15
7000 A°	W	(M), T,TYN	DB DF DT	8 750	5 200	24 000	34 000	18.4	2.4	11.2	24.8	0.15
7000 C°	TYN	W,(M),T	DB DF DT	8 650	5 000	36 000	50 000	12.8	3.2	—	24.8	0.15
7200 A°	W	(M), TYN	DB DF DT	8 800	5 400	22 000	30 000	20.5	2.5	12.5	27.5	0.3
7200 B	W	(M), T	DB DF DT	8 100	5 000	16 000	22 000	25.8	7.8	12.5	27.5	0.3
7200 C°	TYN	W,(M),T	DB DF DT	8 800	5 200	32 000	45 000	14.4	3.6	—	27.5	0.3
7300 A	W	(M), T	DB DF DT	15 100	8 600	16 000	22 000	24.0	2.0	12.5	32.5	0.3
7300 B	W	(M), T	DB DF DT	14 200	8 100	14 000	20 000	29.9	7.9	12.5	32.5	0.3
7901 A5°	TYN	(M),T	DB DF DT	5 200	3 550	30 000	43 000	14.4	2.4	—	22.8	0.15
7901 C°	TYN	(M),T	DB DF DT	5 450	3 700	36 000	50 000	10.8	1.2	—	22.8	0.15
7001 A°	W	(M), T,TYN	DB DF DT	9 400	5 950	22 000	30 000	19.5	3.5	13.2	26.8	0.15
7001 C°	TYN	W,(M),T	DB DF DT	9 400	5 800	32 000	45 000	13.4	2.6	—	26.8	0.15
7201 A°	W	(M),T,TYN	DB DF DT	13 000	8 050	20 000	28 000	22.7	2.7	14.5	29.5	0.3
7201 B	W	(M),T	DB DF DT	12 100	7 500	15 000	20 000	28.5	8.5	14.5	29.5	0.3
7201 BEA°	T85	—	— — —	—	—	16 000	24 000	28.5	8.5	14.5	29.5	0.3
7201 C°	TYN	W,(M),T	DB DF DT	12 800	7 700	30 000	40 000	15.9	4.1	—	29.5	0.3
7301 A	W	(M), T	DB DF DT	15 400	9 000	15 000	20 000	26.1	2.1	17	32	0.6
7301 B	W	(M), T	DB DF DT	14 400	8 400	13 000	18 000	32.6	8.6	17	32	0.6
7301 BEA°	T85	—	— — —	—	—	15 000	22 000	32.6	8.6	17	32	0.6
7902 A5°	TYN	(M),T	DB DF DT	7 400	5 050	26 000	34 000	17.0	3.0	—	26.8	0.15
7902 C°	TYN	(M),T	DB DF DT	7 750	5 300	30 000	43 000	12.8	1.2	—	26.8	0.15
7002 A°	W	(M), T,TYN	DB DF DT	9 950	6 850	19 000	26 000	22.6	4.6	16.2	30.8	0.15
7002 C°	TYN	W, (M),T	DB DF DT	10 100	6 750	28 000	38 000	15.3	2.7	—	30.8	0.15
7202 A°	W	(M),T,TYN	DB DF DT	14 000	9 300	18 000	24 000	25.4	3.4	17.5	32.5	0.3
7202 B	W	(M),T	DB DF DT	12 900	8 600	13 000	18 000	32.0	10.0	17.5	32.5	0.3
7202 BEA°	T85	—	— — —	—	—	14 000	20 000	32.0	10.0	17.5	32.5	0.3
7202 C°	TYN	W,(M),T	DB DF DT	14 100	9 050	26 000	36 000	17.7	4.3	—	32.5	0.3
7302 A	W	(M), T	DB DF DT	21 800	14 200	13 000	17 000	29.5	3.5	20	37	0.6
7302 B	W	(M), T	DB DF DT	20 200	13 200	11 000	15 000	36.9	10.9	20	37	0.6
7302 BEA°	T85	—	— — —	—	—	13 000	18 000	36.9	10.9	20	37	0.6

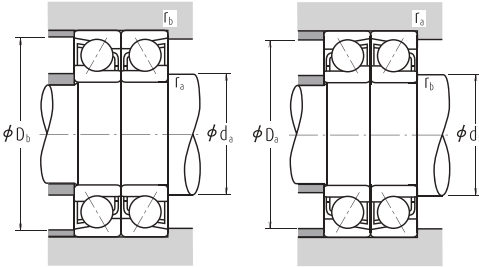
Dynamic Equivalent Load $P = X F_r + Y F_a$

Contact Angle	$H_a F_a^* / C_{or}$	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.21
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
25°	—	—	1	0	0.35	0.57	1	0.55	0.57	0.93
30°	—	—	1	0	0.35	0.57	1	0.55	0.57	0.93
40°	—	—	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

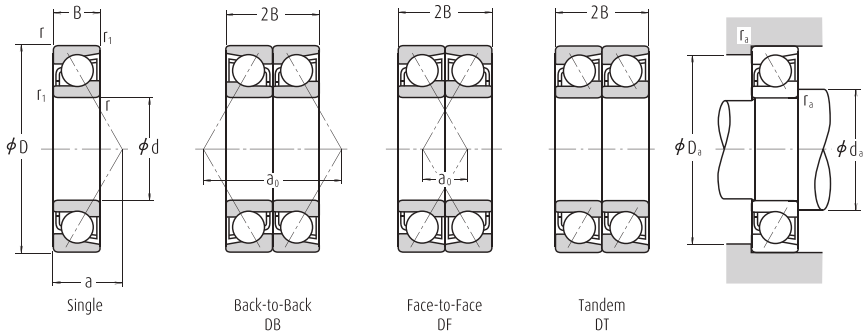
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_r F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C _r	C _{0r}	Grease	Oil	DB	a ₀ DF	d _b (3) min.	D _b max.	r _b (3) max.
7903 A5°	TYN	(M),T	DB DF DT	7 750	5 600	24 000	32 000	18.0	4.0	—	28.8	0.15
7903 C°	TYN	(M),T	DB DF DT	8 150	5 850	28 000	38 000	13.3	0.7	—	28.8	0.15
7003 A°	W	(M), T,TYN	DB DF DT	10 400	7 650	17 000	24 000	25.0	5.0	18.2	33.8	0.15
7003 C°	TYN	W, (M),T	DB DF DT	10 700	7 600	26 000	34 000	17.0	3.0	—	33.8	0.15
7203 A°	W	(M), T,TYN	DB DF DT	17 600	12 000	16 000	22 000	28.5	4.5	19.5	37.5	0.3
7203 B	W	(M),T	DB DF DT	16 100	11 000	11 000	15 000	35.9	11.9	19.5	37.5	0.3
7203 BEA°	T85	T7	— — —	—	—	13 000	18 000	36.3	12.3	19.5	37.5	0.3
7203 C°	TYN	W,(M),T	DB DF DT	17 600	11 700	22 000	32 000	19.6	4.4	—	37.5	0.3
7303 A	W	(M), T	DB DF DT	25 900	17 300	11 000	15 000	32.5	4.5	22	42	0.6
7303 B	W	(M), T	DB DF DT	24 000	16 000	10 000	14 000	40.9	12.9	22	42	0.6
7303 BEA°	T85	—	— — —	—	—	11 000	16 000	40.9	12.9	22	42	0.6
7904 A5°	TYN	(M),T	DB DF DT	10 700	8 100	19 000	26 000	22.3	4.3	—	35.8	0.15
7904 C°	TYN	(M),T	DB DF DT	11 300	8 500	22 000	32 000	16.6	1.4	—	35.8	0.15
7004 A°	W	(M), T,TYN	DB DF DT	17 600	13 200	15 000	20 000	29.9	5.9	22.5	39.5	0.3
7004 C°	TYN	W,(M),T	DB DF DT	18 000	13 100	20 000	30 000	20.3	3.7	—	39.5	0.3
7204 A°	W	(M), T,TYN	DB DF DT	23 500	16 600	13 000	19 000	33.3	5.3	25	42	0.6
7204 B	W	(M),T	DB DF DT	21 600	15 300	9 500	13 000	42.1	14.1	25	42	0.6
7204 BEA°	T85	T7	— — —	—	—	11 000	16 000	42.1	14.1	25	42	0.6
7204 C°	TYN	W,(M),T	DB DF DT	23 600	16 100	19 000	26 000	23.0	5.0	—	42	0.6
7304 A	W	(M), T	DB DF DT	30 500	20 800	10 000	13 000	35.8	5.8	25	47	0.6
7304 B	W	(M), T	DB DF DT	28 200	19 300	9 000	12 000	45.2	15.2	25	47	0.6
7304 BEA°	T85	MR, T7	— — —	—	—	10 000	14 000	45.2	15.2	25	47	0.6
7905 A5°	TYN	(M),T	DB DF DT	12 100	10 300	16 000	22 000	24.6	6.6	—	40.8	0.15
7905 C°	TYN	(M),T	DB DF DT	12 700	10 800	19 000	26 000	18.0	0.0	—	40.8	0.15
7005 A°	W	(M), T,TYN	DB DF DT	18 300	14 800	13 000	17 000	32.8	8.8	27.5	44.5	0.3
7005 C°	TYN	W,(M),T	DB DF DT	19 000	14 800	18 000	26 000	21.6	2.4	—	44.5	0.3
7205 A°	W	(M), T,TYN	DB DF DT	26 300	20 500	12 000	16 000	37.2	7.2	30	47	0.6
7205 B	W	(M),T	DB DF DT	24 000	18 800	8 500	11 000	47.3	17.3	30	47	0.6
7205 BEA°	T85	T7	— — —	—	—	9 500	14 000	47.3	17.3	30	47	0.6
7205 C°	TYN	W,(M),T	DB DF DT	27 000	20 400	17 000	24 000	25.3	4.7	—	47	0.6
7305 A	W	(M), T	DB DF DT	43 000	31 500	8 500	11 000	42.1	8.1	30	57	0.6

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 25 – 40 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
25	62	17	1.1	0.6	24 400	14 600	—	9 000	13 000	26.7	32	55	1	0.241
	62	17	1.1	0.6	27 200	14 900	—	10 000	15 000	26.8	32	55	1	0.229
	47	9	0.3	0.15	8 250	5 950	—	26 000	39 000	13.5	32.5	44.5	0.3	0.049
	47	9	0.3	0.15	8 700	6 250	15.9	29 900	45 500	9.7	32.5	44.5	0.3	0.049
30	55	13	1	0.6	14 600	9 450	—	17 700	23 600	18.8	36	49	1	0.116
	55	13	1	0.6	15 900	10 300	14.9	27 100	41 200	12.2	36	49	1	0.134
	62	16	1	0.6	22 400	13 600	—	16 400	21 800	21.3	36	56	1	0.197
	62	16	1	0.6	20 500	13 500	—	8 500	12 000	27.3	36	56	1	0.202
	62	16	1	0.6	23 700	14 300	—	10 000	14 000	27.3	36	56	1	0.194
	62	16	1	0.6	24 200	14 700	13.9	25 000	38 100	14.2	36	56	1	0.222
	72	19	1.1	0.6	33 500	20 900	—	9 000	12 000	24.2	37	65	1	0.346
	72	19	1.1	0.6	31 000	19 300	—	8 000	11 000	30.9	37	65	1	0.354
	72	19	1.1	0.6	36 500	20 600	—	9 000	13 000	30.9	37	65	1	0.336
	55	10	0.6	0.3	12 000	8 700	—	22 300	33 400	15.5	40	50	0.6	0.074
	55	10	0.6	0.3	12 700	9 150	15.7	25 600	38 900	11.0	40	50	0.6	0.074
	62	14	1	0.6	18 400	12 600	—	15 500	20 700	21.0	41	56	1	0.153
35	62	14	1	0.6	20 100	13 700	15.0	23 800	36 100	13.5	41	56	1	0.173
	72	17	1.1	0.6	29 600	18 500	—	14 100	18 700	23.9	42	65	1	0.287
	72	17	1.1	0.6	27 100	18 400	—	7 500	10 000	30.9	42	65	1	0.294
	72	17	1.1	0.6	32 500	19 600	—	8 500	12 000	30.9	42	65	1	0.271
	72	17	1.1	0.6	32 000	19 900	13.9	21 500	32 800	15.7	42	65	1	0.32
	80	21	1.5	1	40 000	26 300	—	8 000	10 000	27.1	44	71	1.5	0.469
	80	21	1.5	1	40 500	24 400	—	5 600	7 500	34.6	44	71	1.5	0.474
	80	21	1.5	1	40 500	24 400	—	8 000	11 000	34.6	44	71	1.5	0.451
	62	12	0.6	0.3	14 300	11 200	—	14 000	18 000	17.9	45	57	0.6	0.11
	62	12	0.6	0.3	15 900	11 700	15.7	22 600	34 400	12.8	45	57	0.6	0.109
	68	15	1	0.6	19 700	14 600	—	13 900	18 600	23.1	46	62	1	0.19
	68	15	1	0.6	21 600	15 900	15.4	21 300	32 500	14.7	46	62	1	0.213
40	80	18	1.1	0.6	35 500	23 300	—	12 500	16 700	26.3	47	73	1	0.375
	80	18	1.1	0.6	32 000	23 000	—	6 700	9 000	34.2	47	73	1	0.383

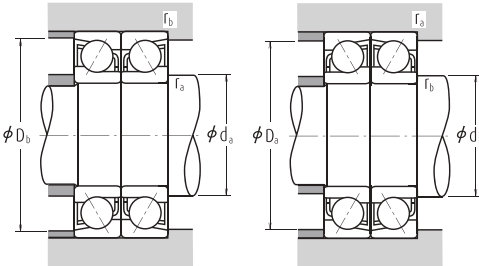
Dynamic Equivalent Load $P = X F_r + Y F_a$

Contact Angle	H_{F_r} Cor	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
25°	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
30°	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
40°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

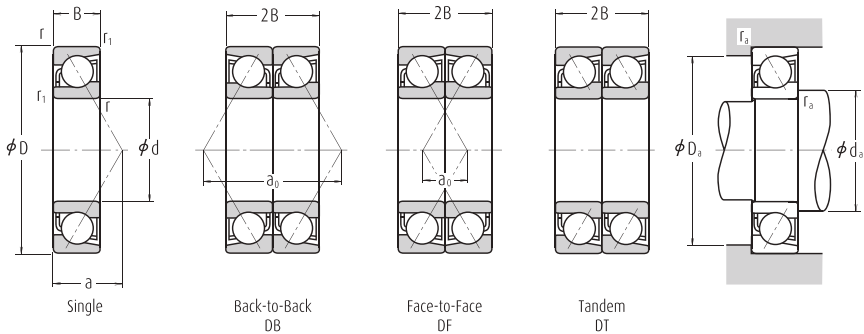
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_r F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C_r	C_{or}	Grease	Oil	DB	DF	d_b (3) min.	D_b max.	r_b (3) max.
7305 B	W	(M), T	DB DF DT	39 500	29 300	7 500	10 000	53.5	19.5	30	57	0.6
7305 BEA [®]	T8S	MR, T7	—	—	—	8 500	12 000	53.5	19.5	30	57	0.6
7906 A5 [®]	TYN	(M), T	DB DF DT	12 800	11 900	14 000	19 000	27.0	9.0	—	45.8	0.15
7906 C [®]	TYN	(M), T	DB DF DT	13 500	12 500	17 000	24 000	19.3	1.3	—	45.8	0.15
7006 A [®]	W	(M), T, TYN	DB DF DT	23 600	20 200	17 000	15 000	37.5	11.5	35	50	0.6
7006 C [®]	TYN	W, (M), T	DB DF DT	24 600	20 500	15 000	22 000	24.4	1.6	—	50	0.6
7206 A [®]	W	(M), T, TYN	DB DF DT	36 500	29 500	10 000	13 000	42.6	10.6	35	57	0.6
7206 B	W	(M), T	DB DF DT	33 500	27 000	7 100	9 500	54.6	22.6	35	57	0.6
7206 BEA [®]	T8S	MR, T7	—	—	—	8 000	11 000	54.6	22.6	35	57	0.6
7206 C [®]	TYN	W, (M), T	DB DF DT	37 500	29 300	14 000	20 000	28.3	3.7	—	57	0.6
7306 A	W	(M), T	DB DF DT	54 500	41 500	7 100	9 500	48.4	10.4	35	67	0.6
7306 B	W	(M), T	DB DF DT	50 500	38 500	6 300	8 500	61.8	23.8	35	67	0.6
7306 BEA [®]	T8S	MR, T7	—	—	—	7 100	10 000	61.8	23.8	35	67	0.6
7907 A5 [®]	TYN	(M), T	DB DF DT	18 600	17 400	12 000	17 000	31.0	11.0	—	52.5	0.3
7907 C [®]	TYN	(M), T	DB DF DT	19 600	18 300	14 000	20 000	22.1	2.1	—	52.5	0.3
7007 A [®]	W	(M), T, TYN	DB DF DT	29 700	26 800	9 500	13 000	42.0	14.0	40	57	0.6
7007 C [®]	TYN	W, (M), T	DB DF DT	31 000	27 300	13 000	19 000	27.0	1.0	—	57	0.6
7207 A [®]	W	(M), T, TYN	DB DF DT	48 500	40 000	8 500	12 000	47.9	13.9	40	67	0.6
7207 BEA	W	MR, T7	DB DF DT	65 500	49 000	4 500	6 000	69.2	27.2	41	74	1
7207 BEA [®]	T8S	MR, T7	—	—	—	6 700	9 500	61.9	27.9	40	67	0.6
7207 C [®]	(M)	W, T, TYN	DB DF DT	49 500	40 000	12 000	17 000	31.3	2.7	—	67	0.6
7307 A	W	(M), T	DB DF DT	65 000	52 500	6 300	8 500	54.2	12.2	41	74	1
7307 B	W	(M), T	DB DF DT	59 500	48 500	5 600	7 500	69.2	27.2	41	74	1
7307 BEA [®]	T8S	MR, T7	—	—	—	6 300	9 000	69.2	27.2	41	74	1
7908 A5	TYN	(M), T	DB DF DT	23 300	22 300	11 000	15 000	35.8	11.8	—	59.5	0.3
7908 C [®]	TYN	(M), T	DB DF DT	24 600	23 500	13 000	18 000	25.7	1.7	—	59.5	0.3
7008 A [®]	W	(M), T, TYN	DB DF DT	31 500	31 000	8 500	11 000	46.2	16.2	45	63	0.6
7008 C [®]	(M)	W, T, TYN	DB DF DT	33 500	32 000	12 000	17 000	29.5	0.5	—	63	0.6
7208 A [®]	W	(M), T, TYN	DB DF DT	57 500	50 500	7 500	10 000	52.6	16.6	45	75	0.6
7208 B	W	(M), T	DB DF DT	52 000	46 000	5 300	7 500	68.3	32.3	45	75	0.6

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 40 – 55 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
40	80	18	1.1	0.6	38 500	24 500	—	7 500	11 000	34.2	47	73	1	0.357
	80	18	1.1	0.6	38 000	25 200	14.1	19 200	29 200	17.0	47	73	1	0.418
	90	23	1.5	1	49 000	33 000	—	7 100	9 000	30.3	49	81	1.5	0.633
	90	23	1.5	1	53 000	33 000	—	5 000	6 700	38.8	49	81	1.5	0.644
	90	23	1.5	1	53 000	33 000	—	7 100	10 000	38.8	49	81	1.5	0.619
45	68	12	0.6	0.3	15 900	12 700	—	17 700	26 600	19.2	50	63	0.6	0.13
	68	12	0.6	0.3	16 800	13 400	16.0	20 400	31 000	13.6	50	63	0.6	0.129
	75	16	1	0.6	23 400	17 700	—	12 500	16 700	25.3	51	69	1	0.25
	75	16	1	0.6	25 600	19 300	15.4	19 200	29 200	16.0	51	69	1	0.274
	85	19	1.1	0.6	39 500	26 700	—	11 600	15 400	28.3	52	78	1	0.411
	85	19	1.1	0.6	36 000	26 200	—	6 300	8 500	36.8	52	78	1	0.421
	85	19	1.1	0.6	40 500	27 100	—	7 100	10 000	36.8	52	78	1	0.40
	85	19	1.1	0.6	43 000	28 800	14.2	17 700	27 000	18.2	52	78	1	0.468
	100	25	1.5	1	63 500	43 500	—	6 300	8 500	33.4	54	91	1.5	0.848
	100	25	1.5	1	62 500	39 500	—	4 500	6 000	42.9	54	91	1.5	0.860
50	100	25	1.5	1	62 500	39 500	—	6 300	9 000	42.9	54	91	1.5	0.823
	72	12	0.6	0.3	16 700	14 200	—	16 400	24 600	20.2	55	67	0.6	0.132
	72	12	0.6	0.3	17 700	15 000	16.2	18 900	28 700	14.2	55	67	0.6	0.13
	80	16	1	0.6	24 900	21 100	—	11 600	15 400	26.8	56	74	1	0.263
	80	16	1	0.6	27 300	21 900	15.7	17 700	27 000	16.7	56	74	1	0.293
	90	20	1.1	0.6	41 500	29 300	—	10 800	14 300	30.2	57	83	1	0.466
	90	20	1.1	0.6	37 500	28 600	—	5 600	8 000	39.4	57	83	1	0.477
	90	20	1.1	0.6	42 000	29 700	—	6 300	9 500	39.4	57	83	1	0.453
	90	20	1.1	0.6	45 000	31 500	14.5	16 500	25 000	19.4	57	83	1	0.528
	110	27	2	1	74 000	52 000	—	5 600	7 500	36.6	60	100	2	1.1
55	110	27	2	1	78 000	50 500	—	4 000	5 600	47.1	60	100	2	1.11
	110	27	2	1	78 000	50 500	—	5 600	8 000	47.1	60	100	2	1.07
	80	13	1	0.6	19 000	16 800	—	14 900	22 300	22.2	61	74	1	0.184
	80	13	1	0.6	20 100	17 700	16.3	17 100	26 000	15.5	61	74	1	0.182
	90	18	1.1	0.6	32 500	26 300	—	10 400	13 800	29.9	62	83	1	0.391

Dynamic Equivalent Load $P = X F_r + Y F_a$

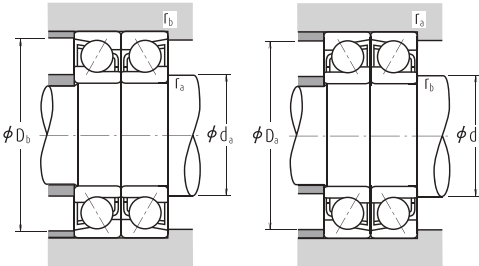
Contact Angle	H_{F_0} C_{or}	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
25°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
30°	—	—	—	—	—	—	—	—	—	—
40°	—	—	—	—	—	—	—	—	—	—

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load

$$P_0 = X_0 F_r + Y_0 F_a$$

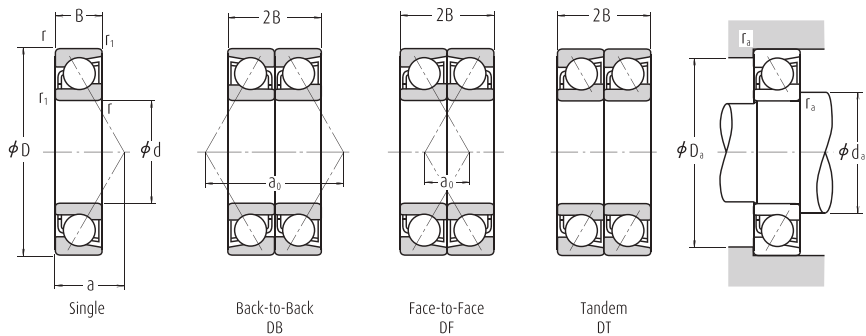
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C_r	C_{or}	Grease	Oil	DB	DF	d_b (3) min.	D_b max.	r_b (3) max.
7208 BEA ^o	T85	MR, T7	—	—	—	6 000	8 500	68.3	32.3	45	75	0.6
7208 C ^o	(M)	W, T, YN	DB DF DT	59 000	50 500	11 000	15 000	34.1	1.9	—	75	0.6
7308 A ^o	W	(M), T	DB DF DT	79 500	66 000	5 600	7 500	60.5	14.5	46	84	1
7308 BEA	W	MR, T7	DB DF DT	68 500	65 500	4 000	5 300	85.8	35.8	51	94	1
7308 BEA ^o	T85	MR, T7	—	—	—	5 600	8 000	77.5	31.5	46	84	1
7909 A5 ^o	(M)	T, YN	DB DF DT	24 600	25 400	9 500	13 000	38.4	14.4	—	65.5	0.3
7909 C ^o	(M)	T, YN	DB DF DT	26 000	26 800	12 000	16 000	27.1	3.1	—	65.5	0.3
7009 A ^o	W	(M), YN	DB DF DT	37 500	37 500	7 500	10 000	50.6	18.6	50	70	0.6
7009 C ^o	(M)	W, YN	DB DF DT	39 500	38 500	11 000	15 000	32.1	0.1	—	70	0.6
7209 A ^o	W	(M), T, YN	DB DF DT	64 500	57 500	7 100	9 500	56.5	18.5	50	80	0.6
7209 B	W	(M), T	DB DF DT	58 500	52 500	5 000	6 700	73.5	35.5	50	80	0.6
7209 BEA ^o	T85	MR, T7	—	—	—	5 600	8 000	73.5	35.5	50	80	0.6
7209 C ^o	(M)	W, T, YN	DB DF DT	66 500	57 500	10 000	14 000	36.4	1.6	—	80	0.6
7309 A	W	(M), T	DB DF DT	103 000	87 000	5 000	6 700	66.9	16.9	51	94	1
7309 BEA	W	MR, T7	DB DF DT	102 000	79 500	3 600	4 800	85.8	35.8	51	94	1
7309 BEA ^o	T85	MR, T7	—	—	—	5 000	7 100	85.8	35.8	51	94	1
7910 A5 ^o	(M)	T, YN	DB DF DT	25 900	28 400	9 000	12 000	40.5	16.5	—	69.5	0.3
7910 C ^o	(M)	T, YN	DB DF DT	27 400	30 000	11 000	15 000	28.3	4.3	—	69.5	0.3
7010 A ^o	W	(M), T, YN	DB DF DT	40 000	42 000	7 100	9 500	53.5	21.5	55	75	0.6
7010 C ^o	(M)	W, T, YN	DB DF DT	42 000	44 000	10 000	14 000	33.4	1.4	—	75	0.6
7210 A ^o	W	(M), T, YN	DB DF DT	67 000	63 000	6 300	9 000	60.4	20.4	55	85	0.6
7210 B	W	(M), T	DB DF DT	60 500	57 000	4 500	6 300	78.7	38.7	55	85	0.6
7210 BEA ^o	T85	MR, T7	—	—	—	5 000	7 500	78.7	38.7	55	85	0.6
7210 C ^o	(M)	W, T, YN	DB DF DT	69 500	63 500	9 500	13 000	38.7	1.3	—	85	0.6
7310 A	W	(M), T	DB DF DT	121 000	104 000	4 500	6 000	73.2	19.2	56	104	1
7310 BEA	W	MR, T7	DB DF DT	127 000	101 000	3 200	4 500	94.1	40.1	56	104	1
7310 BEA ^o	T85	MR, T7	—	—	—	4 500	6 700	94.1	40.1	56	104	1
7911 A5 ^o	(M)	T, YN	DB DF DT	29 300	33 500	8 000	11 000	44.5	18.5	—	75	0.6
7911 C ^o	(M)	T, YN	DB DF DT	31 000	35 500	9 500	13 000	31.1	5.1	—	75	0.6
7011 A ^o	W	(M), T, YN	DB DF DT	52 500	55 500	6 300	8 500	59.9	23.9	60	85	0.6

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 55 – 65 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
55	90	18	1.1	0.6	36 000	28 600	15.5	15 900	24 200	18.7	62	83	1	0.43
	100	21	1.5	1	51 000	37 000	—	9 700	13 000	32.9	64	91	1.5	0.613
	100	21	1.5	1	46 500	36 000	—	5 300	7 100	43.0	64	91	1.5	0.627
	100	21	1.5	1	51 500	37 000	—	6 000	8 500	43.0	64	91	1.5	0.596
	100	21	1.5	1	55 500	40 000	14.5	14 900	22 600	20.9	64	91	1.5	0.688
	120	29	2	1	86 000	61 500	—	5 000	6 700	39.8	65	110	2	1.41
	120	29	2	1	89 000	58 500	—	3 600	5 000	51.2	65	110	2	1.42
	120	29	2	1	89 000	58 500	—	5 000	7 500	51.2	65	110	2	1.36
	85	13	1	0.6	19 200	17 700	—	13 800	20 700	23.4	66	79	1	0.197
	85	13	1	0.6	20 400	18 700	16.5	15 900	24 200	16.2	66	79	1	0.194
60	95	18	1.1	0.6	33 500	28 100	—	9 700	13 000	31.4	67	88	1	0.417
	95	18	1.1	0.6	37 000	30 500	15.7	14 900	22 600	19.4	67	88	1	0.46
	110	22	1.5	1	62 000	45 500	—	8 900	11 800	35.5	69	101	1.5	0.798
	110	22	1.5	1	56 000	44 500	—	4 800	6 300	46.7	69	101	1.5	0.815
	110	22	1.5	1	61 500	45 000	—	5 300	7 500	46.7	69	101	1.5	0.791
	110	22	1.5	1	67 500	49 000	14.4	13 600	20 600	22.4	69	101	1.5	0.889
	130	31	2.1	1.1	98 000	71 500	—	4 800	6 300	42.9	72	118	2	1.74
	130	31	2.1	1.1	102 000	68 500	—	3 400	4 500	55.4	72	118	2	1.77
	130	31	2.1	1.1	102 000	68 500	—	4 800	6 700	55.4	72	118	2	1.7
	90	13	1	0.6	20 000	19 400	—	13 000	19 400	24.6	71	84	1	0.211
65	90	13	1	0.6	21 200	20 500	16.7	14 900	22 600	16.9	71	84	1	0.208
	100	18	1.1	0.6	33 500	31 500	—	9 100	12 200	32.8	72	93	1	0.455
	100	18	1.1	0.6	39 000	34 500	15.9	14 000	21 300	20.0	72	93	1	0.493
	120	23	1.5	1	70 500	54 000	—	8 200	10 900	38.2	74	111	1.5	1.03
	120	23	1.5	1	63 500	52 500	—	4 300	6 000	50.3	74	111	1.5	1.05
	120	23	1.5	1	70 000	53 500	—	4 800	7 100	50.3	74	111	1.5	1.01
	120	23	1.5	1	77 000	58 500	14.6	12 500	19 000	23.9	74	111	1.5	1.14
	140	33	2.1	1.1	111 000	82 000	—	4 300	6 000	46.1	77	128	2	2.12
	140	33	2.1	1.1	114 000	77 000	—	3 200	4 300	59.5	77	128	2	2.17
	140	33	2.1	1.1	114 000	77 000	—	4 300	6 300	59.5	77	128	2	2.09

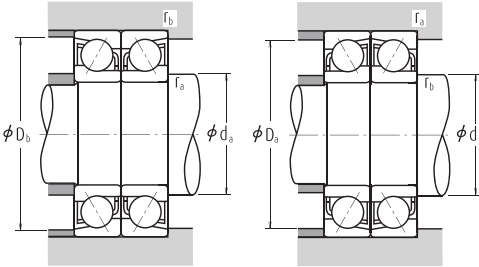
Dynamic Equivalent Load $P = X F_r + Y F_a$

Contact Angle	$H_F F_r$ C_{or}	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
25°	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
30°	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
40°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

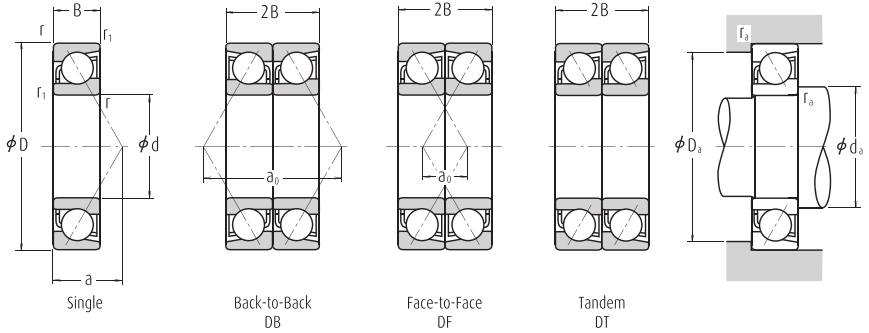
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C_r	C_{or}	Grease	Oil	DB	a ₀ DF	d _b (3) min.	D _b max.	f _b (3) max.
7011 C°	(M)	W, T, TYN	DB DF DT	55 500	57 500	9 000	12 000	37.4	1.4	—	85	0.6
7211 A°	W	(M), T, TYN	DB DF DT	83 000	79 000	6 000	8 000	65.7	23.7	61	94	1
7211 B	W	(M), T	DB DF DT	75 000	72 000	4 000	5 600	86.0	44.0	61	94	1
7211 BEA°	T85	MR, T7	—	—	—	4 500	6 700	86.0	44.0	61	94	1
7211 C°	(M)	W, T, TYN	DB DF DT	86 000	80 000	8 500	12 000	41.7	0.3	—	94	1
7311 A	W	(M), T	DB DF DT	139 000	123 000	4 000	5 600	79.5	21.5	61	114	1
7311 BEA	W	MR, T7	DB DF DT	145 000	117 000	3 000	4 000	102.4	44.4	61	114	1
7311 BEA°	T85	MR, T7	—	—	—	4 000	6 000	102.4	44.4	61	114	1
7912 A5°	(M)	T, TYN	DB DF DT	29 800	35 500	7 500	10 000	46.8	20.8	—	80	0.6
7912 C°	(M)	T, TYN	DB DF DT	31 500	37 500	9 000	12 000	32.4	6.4	—	80	0.6
7012 A°	W	(M), T, TYN	DB DF DT	53 500	59 000	6 000	8 000	62.7	26.7	65	90	0.6
7012 C°	(M)	W, T, TYN	DB DF DT	57 000	61 500	8 500	12 000	38.8	2.8	—	90	0.6
7212 A°	W	(M), T, TYN	DB DF DT	100 000	97 500	5 300	7 100	71.1	27.1	66	104	1
7212 B	W	(M), T	DB DF DT	91 000	89 000	3 800	5 300	93.3	49.3	66	104	1
7212 BEA°	T85	MR, T7	—	—	—	4 300	6 000	93.3	49.3	66	104	1
7212 C°	(M)	W, T, TYN	DB DF DT	104 000	98 500	7 500	11 000	44.8	0.8	—	104	1
7312 A	W	(M), T	DB DF DT	159 000	143 000	3 800	5 000	85.9	23.9	67	123	1
7312 BEA	W	MR, T7	DB DF DT	166 000	137 000	2 600	3 800	110.7	48.7	67	123	1
7312 BEA°	T85	MR, T7	—	—	—	3 800	5 600	110.7	48.7	67	123	1
7913 A5°	(M)	T, TYN	DB DF DT	31 000	39 000	7 100	9 500	49.1	23.1	—	85	0.6
7913 C°	(M)	T, TYN	DB DF DT	33 000	41 000	8 500	12 000	33.8	7.8	—	85	0.6
7013 A°	W	(M), T, TYN	DB DF DT	56 500	65 500	5 600	7 500	65.6	29.6	70	95	0.6
7013 C°	(M)	W, T, TYN	DB DF DT	60 500	68 500	8 000	11 000	40.1	4.1	—	95	0.6
7213 A°	W	(M), T, TYN	DB DF DT	114 000	116 000	4 800	6 700	76.4	30.4	71	114	1
7213 B	W	(M), T	DB DF DT	103 000	105 000	3 400	4 800	100.6	54.6	71	114	1
7213 BEA°	T85	MR, T7	—	—	—	3 800	5 600	100.6	54.6	71	114	1
7213 C°	(M)	W, T, TYN	DB DF DT	119 000	117 000	7 100	9 500	47.8	1.8	—	114	1
7313 A	W	(M), T	DB DF DT	180 000	164 000	3 600	4 800	92.2	26.2	72	133	1
7313 BEA	W	MR, T7	DB DF DT	184 000	154 000	2 400	3 400	119.0	53.0	72	133	1
7313 BEA°	T85	MR, T7	—	—	—	3 600	5 000	119.0	53.0	72	133	1

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 70 – 80 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
70	100	16	1	0.6	27 900	26 300	—	11 800	17 700	27.8	76	94	1	0.341
	100	16	1	0.6	29 500	27 800	16.4	13 600	20 600	19.4	76	94	1	0.338
	110	20	1.1	0.6	45 000	39 500	—	8 400	11 200	36.0	77	103	1	0.625
	110	20	1.1	0.6	49 000	43 000	15.7	12 800	19 500	22.1	77	103	1	0.698
	125	24	1.5	1	77 000	59 500	—	7 700	10 300	40.1	79	116	1.5	1.11
	125	24	1.5	1	69 000	58 000	—	4 000	5 600	52.9	79	116	1.5	1.14
	125	24	1.5	1	75 500	58 500	—	4 500	6 700	52.9	79	116	1.5	1.08
	125	24	1.5	1	83 500	64 500	14.6	11 800	18 000	25.1	79	116	1.5	1.24
	150	35	2.1	1.1	125 000	93 500	—	4 000	5 300	49.3	82	138	2	2.6
	150	35	2.1	1.1	124 000	87 500	—	2 800	4 000	63.6	82	138	2	2.62
	150	35	2.1	1.1	124 000	87 500	—	4 000	6 000	63.7	82	138	2	2.53
	150	35	2.1	1.1	124 000	87 500	—	4 000	6 000	63.7	82	138	2	2.53
75	105	16	1	0.6	28 300	27 700	—	11 200	16 700	29.0	81	99	1	0.355
	105	16	1	0.6	30 000	29 300	16.6	12 800	19 500	20.1	81	99	1	0.357
	115	20	1.1	0.6	46 000	41 500	—	7 900	10 600	37.4	82	108	1	0.661
	115	20	1.1	0.6	50 500	45 500	15.9	12 200	18 500	22.7	82	108	1	0.748
	130	25	1.5	1	80 000	64 500	—	7 400	9 800	42.1	84	121	1.5	1.19
	130	25	1.5	1	68 500	58 500	—	3 800	5 300	55.5	84	121	1.5	1.22
	130	25	1.5	1	78 500	63 500	—	4 300	6 300	55.5	84	121	1.5	1.18
	130	25	1.5	1	87 000	70 000	14.8	11 300	17 100	26.2	84	121	1.5	1.36
	160	37	2.1	1.1	136 000	106 000	—	3 800	5 000	52.4	87	148	2	3.13
	160	37	2.1	1.1	134 000	98 500	—	2 800	3 800	67.8	87	148	2	3.13
	160	37	2.1	1.1	134 000	98 500	—	3 800	5 600	—	—	—	—	—
	160	37	2.1	1.1	134 000	98 500	—	3 800	5 600	—	—	—	—	—
80	110	16	1	0.6	28 700	29 000	—	10 600	15 800	30.2	86	104	1	0.38
	110	16	1	0.6	30 500	30 500	16.7	12 200	18 500	20.7	86	104	1	0.376
	125	22	1.1	0.6	56 000	50 500	—	7 400	9 800	40.6	87	118	1	0.88
	125	22	1.1	0.6	61 500	55 500	15.7	11 300	17 100	24.7	87	118	1	0.966
	140	26	2	1	89 500	71 500	—	6 900	9 100	44.8	90	130	2	1.46
	140	26	2	1	80 500	69 500	—	3 600	5 000	59.1	90	130	2	1.49
	140	26	2	1	87 500	70 000	—	4 000	6 000	59.2	87	148	2	1.42
	140	26	2	1	97 500	77 500	14.7	10 500	16 000	27.7	90	130	2	1.63
	170	39	2.1	1.1	147 000	119 000	—	3 600	4 800	55.6	92	158	2	3.71
	170	39	2.1	1.1	144 000	110 000	—	2 600	3 400	71.9	92	158	2	3.84
	170	39	2.1	1.1	144 000	110 000	—	3 600	5 300	—	—	—	—	—
	170	39	2.1	1.1	144 000	110 000	—	3 600	5 300	—	—	—	—	—

Dynamic Equivalent Load $P = X F_r + Y F_a$

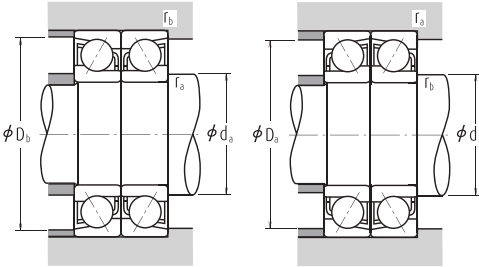
Contact Angle	$H_F F_r$ Cor	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
25°	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
30°	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
40°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load

$$P_0 = X_0 F_r + Y_0 F_a$$

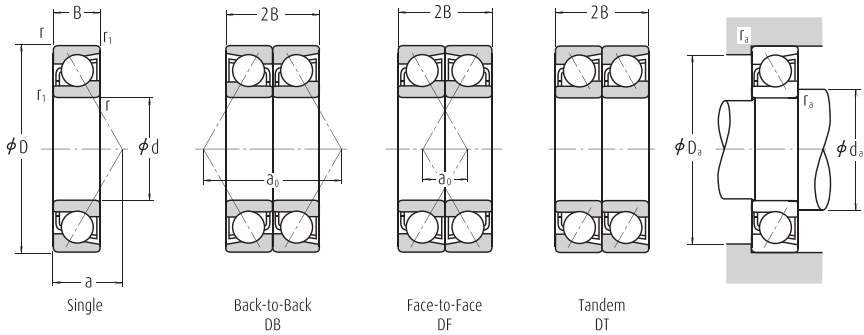
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C_r	C_{or}	Grease	Oil	DB	a_0 DF	d_b (3) min.	D_b max.	r_b (3) max.
7914 A5°	(M)	T, TYN	DB DF DT	43 000	52 500	6 300	9 000	55.6	23.6	—	95	0.6
7914 C°	(M)	T, TYN, T85	DB DF DT	45 500	55 500	7 500	11 000	38.8	6.8	—	95	0.6
7014 A°	W	(M), T, TYN	DB DF DT	71 500	82 500	5 000	6 700	72.0	32.0	75	105	0.6
7014 C°	(M)	W, T, TYN	DB DF DT	76 000	86 000	7 100	10 000	44.1	4.1	—	105	0.6
7214 A°	W	(M), T, TYN	DB DF DT	124 000	127 000	4 500	6 300	80.3	32.3	76	119	1
7214 B	W	(M), T	DB DF DT	112 000	116 000	3 200	4 500	105.8	57.8	76	119	1
7214 BEA°	T85	MR, T7	— — —	—	—	3 600	5 300	105.8	57.8	76	119	1
7214 C°	(M)	W, T, TYN, T7	DB DF DT	129 000	129 000	6 700	9 000	50.1	2.1	—	119	1
7314 A	W	(M), T	DB DF DT	203 000	187 000	3 200	4 300	98.5	28.5	77	143	1
7314 BEA	W	MR, T7	DB DF DT	201 000	175 000	2 400	3 200	127.3	57.3	77	143	1
7314 BEA°	T85	MR, T7	— — —	—	—	3 200	4 800	127.3	57.3	77	143	1
7915 A5°	(M)	TYN	DB DF DT	44 000	55 500	6 000	8 500	58.0	26.0	—	100	0.6
7915 C°	(M)	T, TYN	DB DF DT	46 500	58 500	7 100	10 000	40.1	8.1	—	100	0.6
7015 A°	W	(M), T, TYN	DB DF DT	73 000	87 500	4 800	6 700	74.8	34.8	80	110	0.6
7015 C°	(M)	W, T, TYN	DB DF DT	78 000	91 500	6 700	9 500	45.4	5.4	—	110	0.6
7215 A°	W	(M), T, TYN	DB DF DT	123 000	129 000	4 300	6 000	84.2	34.2	81	124	1
7215 B	W	(M), T	DB DF DT	112 000	117 000	3 200	4 300	111.0	61.0	81	124	1
7215 BEA°	T85	MR	— — —	—	—	3 600	5 000	111.0	61.0	81	124	1
7215 C°	(M)	W, T, TYN, T7	DB DF DT	134 000	140 000	6 300	9 000	52.4	2.4	—	124	1
7315 A	W	(M), T	DB DF DT	221 000	212 000	3 000	4 000	104.8	30.8	82	153	1
7315 BEA	W	MR, T7	DB DF DT	217 000	197 000	2 200	3 000	135.6	61.6	82	153	1
7315 BEA°	T85	MR	— — —	—	—	3 800	5 600	—	—	—	—	—
7916 A5°	(M)	T, TYN	DB DF DT	44 500	58 000	5 600	8 000	60.3	28.3	—	105	0.6
7916 C°	(M)	T, TYN	DB DF DT	47 000	61 500	6 700	9 500	41.5	9.5	—	105	0.6
7016 A°	W	(M), T, TYN	DB DF DT	89 500	106 000	4 300	6 000	81.2	37.2	85	120	0.6
7016 C°	(M)	W, T, TYN	DB DF DT	95 500	111 000	6 300	9 000	49.4	5.4	—	120	0.6
7216 A°	W	(M), T, TYN	DB DF DT	145 000	152 000	4 000	5 600	89.5	37.5	86	134	1
7216 B	W	(M), T	DB DF DT	131 000	139 000	2 800	4 000	118.3	66.3	86	134	1
7216 BEA°	T85	MR, T7	— — —	—	—	3 200	4 800	118.3	66.3	82	153	1
7216 C°	(M)	W, T, TYN	DB DF DT	151 000	155 000	6 000	8 000	55.5	3.5	—	134	1
7316 A	W	(M), T	DB DF DT	239 000	238 000	2 800	3 800	111.2	33.2	87	163	1
7316 BEA	W	MR, T7	DB DF DT	235 000	220 000	2 000	2 800	143.9	65.9	87	163	1
7316 BEA°	T85	MR, T7, W	— — —	—	—	3 600	5 300	—	—	—	—	—

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 85 – 100 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
85	120	18	1.1	0.6	38 500	38 500	—	9 800	14 700	32.9	92	113	1	0.541
	120	18	1.1	0.6	41 000	40 500	16.5	11 300	17 100	22.7	92	113	1	0.534
	130	22	1.1	0.6	57 500	53 500	—	7 000	9 400	42.0	92	123	1	0.913
	130	22	1.1	0.6	63 000	58 500	15.9	10 700	16 300	25.4	92	123	1	1.01
	150	28	2	1	104 000	83 500	—	6 400	8 600	47.9	95	140	2	1.83
	150	28	2	1	93 000	81 000	—	3 400	4 800	63.3	95	140	2	1.87
	150	28	2	1	113 000	90 500	14.7	9 800	14 900	29.7	95	140	2	2.04
	180	41	3	1.1	159 000	133 000	—	3 400	4 500	58.8	99	166	2.5	4.33
	180	41	3	1.1	146 000	122 000	—	3 000	4 000	76.1	99	166	2.5	4.42
	125	18	1.1	0.6	31 000	43 500	—	9 400	14 000	34.1	97	118	1	0.56
90	125	18	1.1	0.6	44 000	46 000	16.6	10 700	16 300	23.4	97	118	1	0.563
	140	24	1.5	1	68 500	63 500	—	6 600	8 700	45.2	99	131	1.5	1.19
	140	24	1.5	1	75 500	69 000	15.7	10 000	15 300	27.4	99	131	1.5	1.34
	160	30	2	1	118 000	96 500	—	6 000	8 000	51.1	100	150	2	2.25
	160	30	2	1	107 000	94 000	—	3 200	4 300	67.4	100	150	2	2.29
	160	30	2	1	129 000	105 000	14.6	9 200	14 000	31.7	100	150	2	2.51
	190	43	3	1.1	171 000	147 000	—	3 200	4 300	61.9	104	176	2.5	5.06
	190	43	3	1.1	156 000	135 000	—	2 800	3 800	80.2	104	176	2.5	5.17
	130	18	1.1	0.6	42 000	45 500	—	8 900	13 400	35.2	102	123	1	0.597
	130	18	1.1	0.6	44 500	48 000	16.7	10 300	15 600	24.1	102	123	1	0.591
95	145	24	1.5	1	70 000	67 000	—	6 300	8 400	46.6	104	136	1.5	1.43
	145	24	1.5	1	77 000	73 000	15.9	9 600	14 600	28.1	104	136	1.5	1.42
	170	32	2.1	1.1	128 000	103 000	—	5 700	7 600	54.2	107	158	2	2.68
	170	32	2.1	1.1	116 000	101 000	—	3 000	4 000	71.6	107	158	2	2.74
	170	32	2.1	1.1	139 000	112 000	14.6	8 700	13 300	33.7	107	158	2	3.05
	200	45	3	1.1	183 000	162 000	—	3 000	4 000	65.1	109	186	2.5	5.83
	200	45	3	1.1	167 000	149 000	—	2 600	3 600	84.3	109	186	2.5	5.98
	140	20	1.1	0.6	49 500	51 500	—	8 400	12 500	38.0	107	133	1	0.804
	140	20	1.1	0.6	52 500	54 000	16.5	9 600	14 600	26.1	107	133	1	0.794
	150	24	1.5	1	72 000	70 500	—	6 000	8 000	48.1	109	141	1.5	1.48

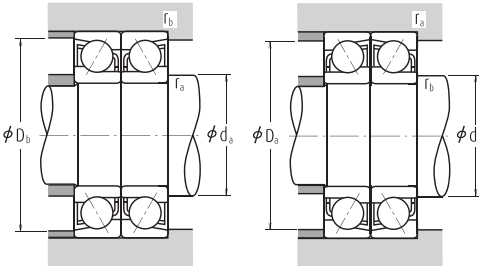
Dynamic Equivalent Load $P = X F_r + Y F_a$

Contact Angle	H_{F_r} Cor	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
25°	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
30°	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
40°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

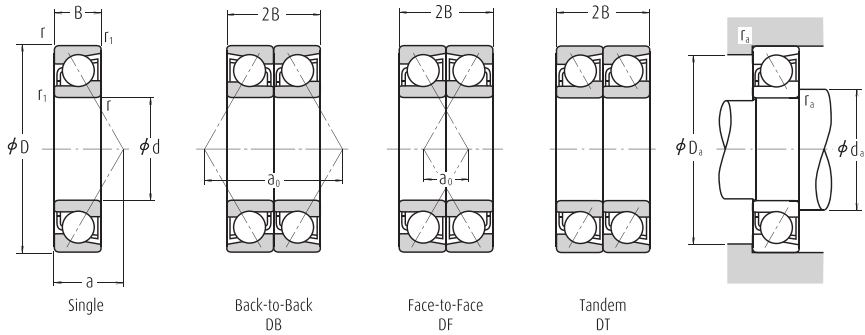
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_r F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)					Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex		C_r	C_{or}	Grease	Oil	DB	DF	d_b (3) min.	D_b max.	r_b (3) max.
7917 A5°	(M)	T, TYN	DB DF DT		59 500	77 000	5 300	7 500	65.8	29.8	—	115	0.6
7917 C°	(M)	T, TYN	DB DF DT		63 000	81 500	6 300	9 000	45.5	9.5	—	115	0.6
7017 A°	W	(M), T, TYN	DB DF DT		91 500	112 000	4 300	5 600	84.1	40.1	90	125	0.6
7017 C°	(M)	W, T, TYN	DB DF DT		98 000	117 000	6 000	8 500	50.8	6.8	—	125	0.6
7217 A°	W	(M), T, TYN	DB DF DT		167 000	178 000	3 800	5 300	95.8	39.8	91	144	1
7217 B	W	(M), T	DB DF DT		151 000	162 000	2 800	3 800	126.6	70.6	91	144	1
7217 C°	T85	—	—		174 000	181 000	5 600	7 500	59.5	3.5	—	144	1
7317 A	(M)	W, T, TYN	DB DF DT		258 000	265 000	2 600	3 600	117.5	35.5	92	173	1
7317 B	W	(M), T	DB DF DT		236 000	244 000	2 400	3 200	152.2	70.2	92	173	1
7918 A5°	W	(M), T	DB DF DT		64 000	87 000	5 000	7 100	68.1	32.1	—	120	0.6
7918 C°	T85	MR, T7	—		67 500	92 000	6 000	8 500	46.8	10.8	—	120	0.6
7018 A°	(M)	T, TYN	DB DF DT		109 000	133 000	3 800	5 300	90.4	42.4	96	134	1
7018 C°	(M)	T, TYN	DB DF DT		116 000	138 000	5 600	8 000	54.8	6.8	—	134	1
7218 A°	W	(M), T, TYN	DB DF DT		191 000	206 000	3 600	5 000	102.2	42.2	96	154	1
7218 B	(M)	W, T, TYN	DB DF DT		173 000	188 000	2 600	3 400	134.9	74.9	96	154	1
7218 C°	W	(M), T, TYN	DB DF DT		199 000	209 000	5 300	7 100	63.5	3.5	—	154	1
7318 A	W	(M), T	DB DF DT		277 000	294 000	2 600	3 400	123.8	37.8	97	183	1
7318 B	T85	MR	—		254 000	270 000	2 200	3 000	160.5	74.5	97	183	1
7919 A5°	(M)	W, T, TYN	DB DF DT		64 500	91 000	4 800	6 700	70.5	34.5	—	125	0.6
7919 C°	(M)	(M), T	DB DF DT		68 500	96 000	5 600	8 000	48.1	12.1	—	125	0.6
7019 A°	W	(M), T	DB DF DT		109 000	134 000	3 800	5 000	93.3	45.3	—	139	1
7019 C°	T85	MR	—		119 000	146 000	5 300	7 500	56.1	8.1	—	139	1
7219 A°	(M)	T, TYN	DB DF DT		208 000	221 000	3 400	4 500	108.5	44.5	102	163	1
7219 B	(M)	T, TYN	DB DF DT		188 000	202 000	2 400	3 200	143.2	79.2	102	163	1
7219 C°	(M)	T, TYN	DB DF DT		216 000	224 000	4 800	6 700	67.5	3.5	—	163	1
7319 A	(M)	T, TYN	DB DF DT		297 000	325 000	2 400	3 200	130.2	40.2	102	193	1
7319 B	W	(M), T, TYN	DB DF DT		272 000	298 000	2 200	3 000	168.7	78.7	102	193	1
7920 A5°	W	(M), T	DB DF DT		77 000	103 000	4 500	6 300	76.0	36.0	—	135	0.6
7920 C°	T85	MR, T7	—		81 500	108 000	5 300	7 500	52.2	12.2	—	135	0.6
7020 A°	(M)	W, T, TYN	DB DF DT		111 000	141 000	3 600	5 000	96.2	48.2	—	144	1

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 100 – 120 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
100	150	24	1.5	1	79 000	77 000	16.0	9 200	14 000	28.7	109	141	1.5	1.46
	180	34	2.1	1.1	144 000	117 000	—	5 400	7 200	57.4	112	168	2	3.22
	180	34	2.1	1.1	130 000	114 000	—	2 800	3 800	75.7	112	168	2	3.28
	180	34	2.1	1.1	157 000	127 000	14.5	8 300	12 500	35.7	112	168	2	3.65
	215	47	3	1.1	207 000	193 000	—	2 800	3 800	69.0	114	201	2.5	7.29
	215	47	3	1.1	190 000	178 000	—	2 400	3 400	89.6	114	201	2.5	7.43
105	145	20	1.1	0.6	50 500	54 000	—	8 000	12 000	39.2	112	138	1	0.82
	145	20	1.1	0.6	53 500	57 000	16.6	9 200	14 000	26.7	112	138	1	0.826
	160	26	2	1	84 000	81 500	—	5 700	7 600	51.2	115	150	2	1.84
	160	26	2	1	92 500	89 500	15.9	8 700	13 300	30.7	115	150	2	1.82
	190	36	2.1	1.1	157 000	132 000	—	5 100	6 800	60.6	117	178	2	3.84
	190	36	2.1	1.1	142 000	129 000	—	2 600	3 600	79.9	117	178	2	3.92
110	190	36	2.1	1.1	171 000	143 000	14.5	7 800	11 900	37.7	117	178	2	4.33
	225	49	3	1.1	208 000	56 000	—	2 600	3 600	72.1	119	211	2.5	9.34
	225	49	3	1.1	191 000	59 500	—	2 400	3 200	93.7	119	211	2.5	9.43
	150	20	1.1	0.6	51 500	95 500	—	7 700	11 600	40.3	117	143	1	0.877
	150	20	1.1	0.6	54 500	104 000	16.7	8 900	13 500	27.4	117	143	1	0.867
	170	28	2	1	101 000	148 000	—	5 400	7 200	54.4	120	160	2	2.28
120	170	28	2	1	111 000	144 000	15.6	8 300	12 500	32.7	120	160	2	2.26
	200	38	2.1	1.1	170 000	160 000	—	4 900	6 500	63.7	122	188	2	4.49
	200	38	2.1	1.1	154 000	144 000	—	2 600	3 400	84.0	122	188	2	4.58
	200	38	2.1	1.1	185 000	160 000	14.5	7 500	11 300	39.8	122	188	2	5.1
	240	50	3	1.1	220 000	215 000	—	2 600	3 400	75.5	124	226	2.5	11.1
	240	50	3	1.1	201 000	197 000	—	2 200	3 000	98.4	124	226	2.5	11.2
120	165	22	1.1	0.6	71 000	77 000	—	7 100	10 600	44.2	127	158	1	1.15
	165	22	1.1	0.6	75 500	81 000	16.5	8 100	12 300	30.1	127	158	1	1.15
	180	28	2	1	107 000	107 000	—	5 000	6 700	57.3	130	170	2	2.45
	215	40	2.1	1.1	192 000	177 000	—	4 500	6 000	68.3	132	203	2	6.22
	215	40	2.1	1.1	165 000	162 000	—	2 400	3 200	90.3	132	203	2	6.26
	260	55	3	1.1	246 000	252 000	—	2 200	3 000	82.3	134	246	2.5	14.5
	260	55	3	1.1	225 000	231 000	—	2 000	2 800	107.2	134	246	2.5	14.4

Dynamic Equivalent Load $P = X F_r + Y F_a$

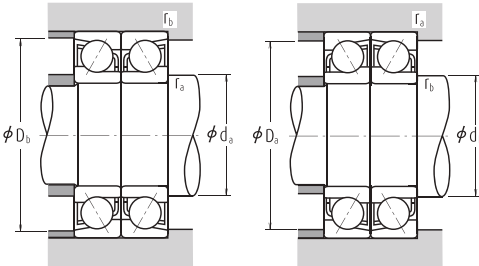
Contact Angle	$H_a F_{a0}^*$ Cor	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
25°	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
30°	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
40°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load

$$P_0 = X_0 F_r + Y_0 F_a$$

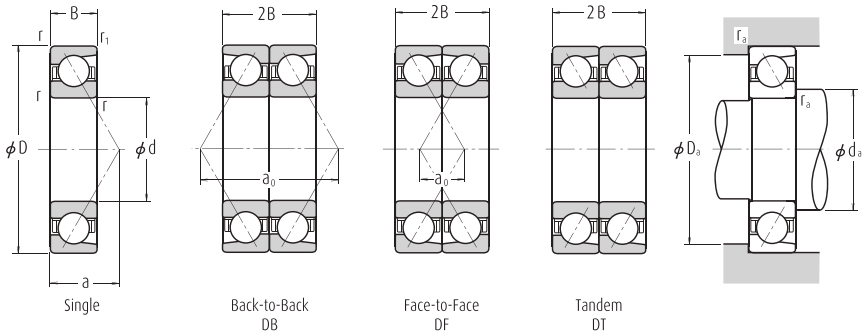
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C _r	C _{or}	Grease	Oil	DB	a ₀ DF	d _b (2) min.	D _b max.	r _b (2) max.
7020 C ^o	(M)	T, TYN	DB DF DT	122 000	154 000	5 300	7 100	57.5	9.5	—	144	1
7220 A ^o	W	(M), T, TYN	DB DF DT	233 000	251 000	3 200	4 300	114.8	46.8	107	173	1
7220 B	W	(M), T	DB DF DT	212 000	229 000	2 200	3 000	151.5	83.5	107	173	1
7220 C ^o	T85	MR	— — —	242 000	254 000	4 500	6 300	71.5	3.5	—	173	1
7320 A	(M)	W, T, TYN	DB DF DT	335 000	385 000	2 200	3 000	137.9	43.9	107	208	1
7320 B	W	(M), T	DB DF DT	310 000	355 000	2 000	2 800	179.2	85.2	107	208	1
7921 A5 ^o	W	(M), T	DB DF DT	78 500	108 000	4 300	6 000	78.3	38.3	—	140	0.6
7921 C ^o	T85	MR, T7	— — —	83 000	114 000	5 300	7 100	53.5	13.5	—	140	0.6
7021 A ^o	(M)	T, TYN	DB DF DT	130 000	163 000	3 400	4 500	102.5	50.5	—	154	1
7021 C ^o	(M)	T, TYN	DB DF DT	143 000	179 000	4 800	6 700	61.5	9.5	—	154	1
7221 A ^o	(M)	T, TYN	DB DF DT	254 000	283 000	3 000	4 000	121.2	49.2	112	183	1
7221 B	(M)	T, TYN	DB DF DT	231 000	258 000	2 200	3 000	159.8	87.8	112	183	1
7221 C ^o	W	(M), T	DB DF DT	264 000	286 000	4 300	6 000	75.5	3.5	—	183	1
7321 A	W	(M), T	DB DF DT	335 000	385 000	2 200	2 800	144.3	46.3	—	218	1
7321 B	T85	—	— — —	310 000	355 000	1 900	2 600	187.4	89.4	—	218	1
7922 A5 ^o	(M)	W, T, TYN	DB DF DT	79 500	112 000	4 300	5 600	80.6	40.6	—	145	0.6
7922 C ^o	(M)	T	DB DF DT	84 500	119 000	5 000	6 700	54.8	14.8	—	145	0.6
7022 A ^o	(M)	T	DB DF DT	157 000	191 000	3 200	4 300	108.8	52.8	—	164	1
7022 C ^o	T85	T7	— — —	172 000	208 000	4 500	6 300	65.5	9.5	—	164	1
7222 A ^o	(M)	T, TYN	DB DF DT	276 000	315 000	2 800	4 000	127.5	51.5	117	193	1
7222 B	(M)	T, TYN	DB DF DT	250 000	289 000	2 000	2 800	168.1	92.1	117	193	1
7222 C ^o	(M)	T, TYN	DB DF DT	286 000	320 000	4 000	5 600	79.5	3.5	—	193	1
7322 A	(M)	T, TYN	DB DF DT	360 000	430 000	2 000	2 600	151.0	51.0	—	233	1
7322 B	W	(M), T, TYN	DB DF DT	325 000	395 000	1 800	2 400	196.8	96.8	—	233	1
7924 A5 ^o	W	(M), T	DB DF DT	110 000	154 000	3 800	5 300	88.5	44.5	—	160	0.6
7924 C ^o	T85	MR	— — —	117 000	162 000	4 500	6 300	60.2	16.2	—	160	0.6
7024 A ^o	(M)	W, T, TYN	DB DF DT	166 000	213 000	3 000	4 000	114.6	58.6	—	174	1
7224 A ^o	(M)	W, T	DB DF DT	297 000	355 000	2 600	3 600	136.7	56.7	—	208	1
7224 B	(M)	W, T	DB DF DT	269 000	325 000	1 900	2 600	180.5	100.5	—	208	1
7324 A	T85	MR	— — —	400 000	505 000	1 800	2 400	164.7	54.7	—	253	1
7324 B	(M)	T, TYN	DB DF DT	365 000	460 000	1 600	2 200	214.4	104.4	—	253	1

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 130 – 170 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
130	180	24	1.5	1	78 000	86 000	—	6 500	9 700	48.1	139	171	1.5	1.54
	180	24	1.5	1	82 500	91 000	16.5	7 500	11 300	32.8	139	171	1.5	1.5
	200	33	2	1	123 000	125 000	—	4 600	6 100	64.1	140	190	2	3.68
	230	40	3	1.1	199 000	193 000	—	4 200	5 600	72.0	144	216	2.5	7.06
	230	40	3	1.1	171 000	175 000	—	2 200	3 000	95.5	144	216	2.5	7.1
	280	58	4	1.5	273 000	293 000	—	2 200	2 800	88.2	148	262	3	17.5
	280	58	4	1.5	250 000	268 000	—	1 900	2 600	115.0	148	262	3	17.6
	190	24	1.5	1	78 500	90 000	—	6 100	9 100	50.5	149	181	1.5	1.63
140	190	24	1.5	1	83 500	95 500	16.7	7 000	10 700	34.1	149	181	1.5	1.63
	210	33	2	1	126 000	133 000	—	4 300	5 800	67.0	150	200	2	3.9
	250	42	3	1.1	229 000	234 000	—	3 900	5 200	77.3	154	236	2.5	8.92
	250	42	3	1.1	197 000	213 000	—	2 000	2 800	102.8	154	236	2.5	8.94
	300	62	4	1.5	300 000	335 000	—	2 000	2 600	94.5	158	282	3	21.4
	300	62	4	1.5	275 000	310 000	—	1 700	2 400	123.3	158	282	3	21.6
	210	28	2	1	101 000	115 000	—	5 600	8 400	56.0	160	200	2	2.97
	210	28	2	1	107 000	122 000	16.6	6 400	9 800	38.1	160	200	2	2.96
150	225	35	2.1	1.1	144 000	154 000	—	4 000	5 400	71.6	162	213	2	4.75
	270	45	3	1.1	261 000	280 000	—	3 600	4 800	83.1	164	256	2.5	11.2
	270	45	3	1.1	225 000	254 000	—	1 800	2 600	110.6	164	256	2.5	11.2
	320	65	4	1.5	315 000	370 000	—	1 800	2 400	100.3	168	302	3	26
	320	65	4	1.5	289 000	340 000	—	1 600	2 200	131.1	168	302	3	25.9
	220	28	2	1	112 000	133 000	16.7	3 600	4 800	39.4	170	210	2	3.1
	240	38	2.1	1.1	163 000	176 000	—	3 300	4 500	76.7	172	228	2	5.77
	290	48	3	1.1	263 000	305 000	—	1 900	2 600	89.0	174	276	2.5	14.1
160	290	48	3	1.1	238 000	279 000	—	1 700	2 400	118.4	174	276	2.5	14.2
	340	68	4	1.5	345 000	420 000	—	1 700	2 200	106.2	178	322	3	30.7
	340	68	4	1.5	315 000	385 000	—	1 500	2 000	138.9	178	322	3	30.8
	230	28	2	1	118 000	148 000	16.8	5 300	8 300	40.8	180	220	2	3.36
	260	42	2.1	1.1	195 000	214 000	—	3 100	4 200	83.1	182	248	2	7.9
	310	52	4	1.5	295 000	360 000	—	1 800	2 400	95.3	188	292	3	17.3
	310	52	4	1.5	266 000	325 000	—	1 600	2 200	126.7	188	292	3	17.6
	360	72	4	1.5	390 000	485 000	—	1 600	2 200	112.5	188	342	3	35.8
170	360	72	4	1.5	355 000	445 000	—	1 400	2 000	147.2	188	342	3	35.6

Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

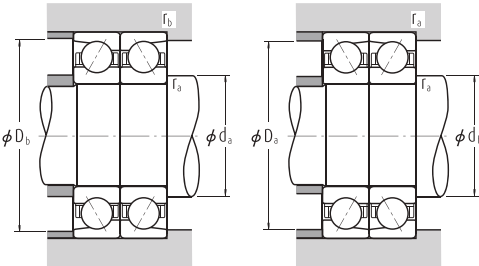
Contact Angle	H_{F_r} C_{or}	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
25°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
30°	—	—	—	—	—	—	—	—	—	—
40°	—	—	—	—	—	—	—	—	—	—

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load

$$P_0 = X_0 F_r + Y_0 F_a$$

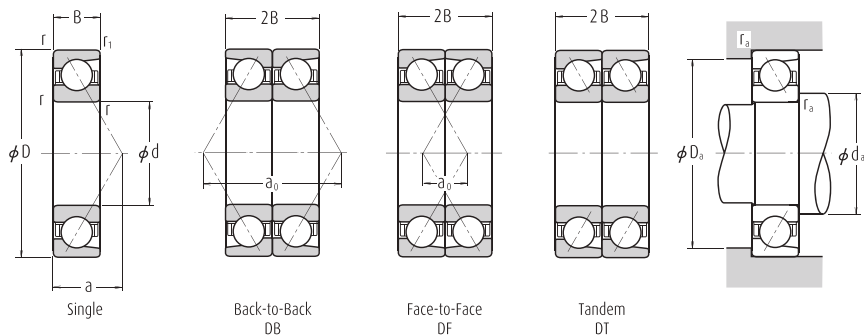
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



Bearing Numbers (2) Cage Symbol (4)				Basic Load Ratings (Matched) (N)		Limiting Speeds (1) (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C _r	C _{0r}	Grease	Oil	a ₀ DB	DF	d _b (3) min.	D _b max.	r _b (3) max.
7926 A5°	(M)	T, TYN	DB DF DT	120 000	172 000	3 400	4 800	96.3	48.3	—	174	1
7926 C°	(M)	T, TYN	DB DF DT	128 000	182 000	4 000	5 600	65.5	17.5	—	174	1
7026 A°	(M)	T, TYN	DB DF DT	191 000	251 000	2 600	3 600	128.3	62.3	—	194	1
7226 A°	(M)	T	DB DF DT	310 000	385 000	1 900	2 600	143.9	63.9	—	223	1
7226 B	(M)	T	DB DF DT	278 000	350 000	1 700	2 400	191.0	111.0	—	223	1
7326 A	(M)	T	DB DF DT	445 000	585 000	1 700	2 200	176.3	60.3	—	271	1.5
7326 B	(M)	T	DB DF DT	405 000	535 000	1 500	2 000	230.0	114.0	—	271	1.5
7928 A5°	(M)	T, TYN	DB DF DT	122 000	180 000	3 200	4 500	100.9	52.9	—	184	1
7928 C°	(M)	T, TYN	DB DF DT	129 000	191 000	3 800	5 300	68.2	20.2	—	184	1
7028 A°	(M)	T	DB DF DT	194 000	265 000	2 600	3 400	134.0	68.0	—	204	1
7228 A°	(M)	T	DB DF DT	355 000	470 000	1 800	2 400	154.6	70.6	—	243	1
7228 B	(M)	T	DB DF DT	320 000	425 000	1 600	2 200	205.6	121.6	—	243	1
7328 A	(M)	T	DB DF DT	490 000	670 000	1 600	2 000	189.0	65.0	—	291	1.5
7328 B	(M)	T	DB DF DT	445 000	615 000	1 400	1 900	246.6	122.6	—	291	1.5
7930 A5°	(M)	—	DB DF DT	157 000	231 000	3 000	4 000	112.0	56.0	—	204	1
7930 C°	(M)	—	DB DF DT	166 000	244 000	3 600	4 800	76.2	20.2	—	204	1
7030 A°	(M)	T	DB DF DT	222 000	305 000	1 900	2 400	143.3	73.3	—	218	1
7230 A°	(M)	—	DB DF DT	405 000	560 000	1 600	2 200	166.3	76.3	—	263	1
7230 B	(M)	T	DB DF DT	365 000	510 000	1 500	2 000	221.2	131.2	—	263	1
7330 A	(M)	—	DB DF DT	515 000	745 000	1 500	1 900	200.7	70.7	—	311	1.5
7330 B	(M)	T	DB DF DT	470 000	680 000	1 300	1 800	262.2	132.2	—	311	1.5
7932 C°	(M)	TYN	DB DF DT	173 000	265 000	3 000	4 000	78.9	22.9	—	214	1
7032 A°	(M)	T	DB DF DT	252 000	355 000	1 700	2 400	153.5	77.5	—	233	1
7232 A	(M)	T	DB DF DT	425 000	615 000	1 500	2 000	177.9	81.9	—	283	1
7232 B	(M)	—	DB DF DT	385 000	555 000	1 400	1 900	236.8	140.8	—	283	1
7332 A	(M)	T	DB DF DT	565 000	845 000	1 400	1 800	212.3	76.3	—	331	1.5
7332 B	(M)	T	DB DF DT	515 000	770 000	1 200	1 700	277.8	141.8	—	331	1.5
7934 C°	(M)	—	DB DF DT	183 000	297 000	2 800	3 800	81.6	25.6	—	224	1
7034 A°	(M)	—	DB DF DT	300 000	430 000	1 600	2 200	166.1	82.1	—	253	1
7234 A	(M)	—	DB DF DT	480 000	715 000	1 400	1 900	190.6	86.6	—	301	1.5
7234 B	(M)	—	DB DF DT	435 000	650 000	1 300	1 700	253.4	149.4	—	301	1.5
7334 A	(M)	—	DB DF DT	630 000	970 000	1 300	1 700	225.0	81.0	—	351	1.5
7334 B	(M)	T	DB DF DT	575 000	890 000	1 100	1 600	294.3	150.3	—	351	1.5

Angular Contact Ball Bearings

Single/matched mountings Bore Diameter 180 – 200 mm



Boundary Dimensions (mm)					Basic Load Ratings (Single) (N)		Factor	Limiting Speeds (1) (min ⁻¹)		Eff. Load Centers (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg)
d	D	B	r min.	r ₁ min.	C _r	C _{0r}	f ₀	Grease	Oil	a	d _a min.	D _a max.	r _a max.	approx.
180	250	33	2	1	152 000	184 000	16.6	4 900	7 700	45.3	190	240	2	4.9
	280	46	2.1	1.1	218 000	252 000	—	2 900	4 000	89.4	192	268	2	10.5
	320	52	4	1.5	305 000	385 000	—	1 700	2 200	98.2	198	302	3	18.1
	320	52	4	1.5	276 000	350 000	—	1 500	2 000	130.9	198	302	3	18.4
	380	75	4	1.5	410 000	535 000	—	1 500	2 000	118.3	198	362	3	42.1
190	380	75	4	1.5	375 000	490 000	—	1 300	1 800	155.0	198	362	3	42.6
	260	33	2	1	155 000	192 000	16.7	4 700	7 400	46.6	200	250	2	4.98
	290	46	2.1	1.1	235 000	280 000	—	2 800	3 800	92.3	202	278	2	11.3
	340	55	4	1.5	315 000	410 000	—	1 600	2 200	104.0	208	322	3	22.4
	340	55	4	1.5	284 000	375 000	—	1 400	2 000	138.7	208	322	3	22.5
200	400	78	5	2	450 000	600 000	—	1 400	1 900	124.2	212	378	4	47.5
	400	78	5	2	410 000	550 000	—	1 300	1 700	162.8	212	378	4	47.2
	280	38	2.1	1.1	199 000	244 000	16.5	4 400	6 900	51.2	212	268	2	6.85
	310	51	2.1	1.1	252 000	310 000	—	2 600	3 600	99.1	212	298	2	13.7
	360	58	4	1.5	335 000	450 000	—	1 500	2 000	109.8	218	342	3	26.5
	360	58	4	1.5	305 000	410 000	—	1 300	1 800	146.5	218	342	3	26.6
	420	80	5	2	475 000	660 000	—	1 300	1 800	129.5	222	398	4	54.4
	420	80	5	2	430 000	600 000	—	1 200	1 600	170.1	222	398	4	55.3

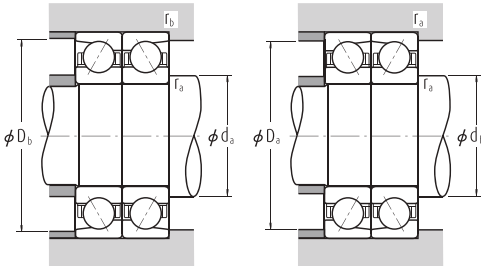
Dynamic Equivalent Load $P = X F_r + Y F_a$

Contact Angle	$H_a F_a^* / C_{or}$	e	Single, DT				DB or DF			
			$F_a/F_r \leq e$		$F_a/F_r > e$		$F_a/F_r \leq e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	1	1.65	0.72	2.39
	0.357	0.40	1	0	0.44	1.40	1	1.57	0.72	2.28
	0.714	0.43	1	0	0.44	1.30	1	1.46	0.72	2.11
	1.07	0.46	1	0	0.44	1.23	1	1.38	0.72	2.00
	1.43	0.47	1	0	0.44	1.19	1	1.34	0.72	1.93
	2.14	0.50	1	0	0.44	1.12	1	1.26	0.72	1.82
	3.57	0.55	1	0	0.44	1.02	1	1.14	0.72	1.66
	5.35	0.56	1	0	0.44	1.00	1	1.12	0.72	1.63
25°	—	0.68	1	0	0.41	0.87	1	0.92	0.67	1.41
30°	—	0.80	1	0	0.39	0.76	1	0.78	0.63	1.24
40°	—	1.14	1	0	0.35	0.57	1	0.55	0.57	0.93

*For i, use 2 for DB, DF and 1 for DT

Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

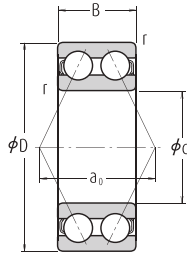
Contact Angle	Single, DT		DB or DF		Single or DT mounting When $F_r > 0.5 F_r + Y_0 F_a$ use $P_0 = F_r$
	X_0	Y_0	X_0	Y_0	
15°	0.5	0.46	1	0.92	
25°	0.5	0.38	1	0.76	
30°	0.5	0.33	1	0.66	
40°	0.5	0.26	1	0.52	



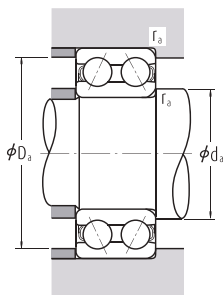
Bearing Numbers ⁽²⁾ Cage Symbol ⁽⁴⁾				Basic Load Ratings (Matched) (N)		Limiting Speeds ⁽¹⁾ (Matched) (min ⁻¹)		Load Center Spacings (mm)		Abutment and Fillet Dimensions (mm)		
Single	Standard	Option	Duplex	C_r	C_{or}	Grease	Oil	DB	DF	d_b ⁽³⁾ min.	D_b max.	r_b ⁽³⁾ max.
7936 C [®]	(M)	—	DB DF DT	236 000	370 000	2 600	3 600	90.6	24.6	—	244	1
7036 A [®]	(M)	—	DB DF DT	335 000	505 000	1 500	2 000	178.8	86.8	—	273	1
7236 A	(M)	—	DB DF DT	495 000	770 000	1 400	1 800	196.3	92.3	—	311	1.5
7236 B	(M)	—	DB DF DT	450 000	700 000	1 200	1 700	261.8	157.8	—	311	1.5
7336 A	(M)	—	DB DF DT	665 000	1 070 000	1 200	1 600	236.6	86.6	—	371	1.5
7336 B	(M)	—	DB DF DT	605 000	975 000	1 100	1 500	309.9	159.9	—	371	1.5
7938 C [®]	(M)	TYN	DB DF DT	239 000	385 000	2 400	3 400	93.3	27.3	—	254	1
7038 A [®]	(M)	—	DB DF DT	365 000	560 000	1 400	1 900	184.6	92.6	—	283	1
7238 A	(M)	—	DB DF DT	510 000	825 000	1 300	1 700	208.0	98.0	—	331	1.5
7238 B	(M)	—	DB DF DT	460 000	750 000	1 100	1 600	277.3	167.3	—	331	1.5
7338 A	(M)	T	DB DF DT	730 000	1 200 000	1 100	1 500	248.3	92.3	—	390	2
7338 B	(M)	—	DB DF DT	670 000	1 100 000	1 000	1 400	325.5	169.5	—	390	2
7940 C [®]	(M)	—	DB DF DT	305 000	490 000	2 200	3 200	102.3	26.3	—	273	1
7040 A [®]	(M)	T	DB DF DT	390 000	620 000	1 300	1 800	198.2	96.2	—	303	1
7240 A	(M)	—	DB DF DT	550 000	900 000	1 200	1 600	219.6	103.6	—	351	1.5
7240 B	(M)	—	DB DF DT	495 000	815 000	1 100	1 500	292.9	176.9	—	351	1.5
7340 A	(M)	T	DB DF DT	770 000	1 320 000	1 100	1 400	259.0	99.0	—	410	2
7340 B	(M)	—	DB DF DT	700 000	1 200 000	950	1 300	340.1	180.1	—	410	2

Double-Row Angular Contact Ball Bearings

Bore Diameter 10 – 85 mm



Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min ⁻¹)		
d	D	B	r min.	C _r	C _{0r}	Grease		Oil
						Open ZZ	DDU	Open
10	30	14,3	0,6	7 150	3 900	17 000	—	22 000
	30	14,3	0,6	7 150	3 900	17 000	15 000	—
12	32	15,9	0,6	10 500	5 800	15 000	—	20 000
	32	15,9	0,6	8 500	5 300	15 000	12 000	—
15	35	15,9	0,6	11 700	7 050	13 000	—	17 000
	35	15,9	0,6	8 500	5 300	13 000	12 000	—
	42	19	1	17 600	10 200	11 000	—	15 000
	42	19	1	14 700	9 100	11 000	10 000	—
17	40	17,5	0,6	14 600	9 050	11 000	—	15 000
	40	17,5	0,6	12 700	8 300	11 000	10 000	—
	47	22,2	1	21 000	12 600	10 000	—	13 000
	47	22,2	1	19 600	12 400	10 000	9 500	—
20	47	20,6	1	19 600	12 400	10 000	—	13 000
	47	20,6	1	15 900	10 700	10 000	9 000	—
	52	22,2	1,1	24 600	15 000	9 000	—	12 000
	52	22,2	1,1	19 700	12 800	9 000	8 500	—
25	52	20,6	1	21 300	14 700	8 500	—	11 000
	52	20,6	1	16 900	12 300	8 500	7 500	—
	62	25,4	1,1	32 500	20 700	7 500	—	10 000
	62	25,4	1,1	25 200	18 200	7 500	6 300	—
30	62	23,8	1	29 600	21 100	7 100	—	9 500
	62	23,8	1	25 200	18 200	7 100	6 300	—
	72	30,2	1,1	40 500	28 100	6 300	—	8 500
	72	30,2	1,1	39 000	28 700	6 300	5 300	—
35	72	27	1,1	39 000	28 700	6 300	—	8 000
	72	27	1,1	34 000	25 300	6 300	5 300	—
	80	34,9	1,5	51 000	36 000	5 600	—	7 500
	80	34,9	1,5	44 000	33 500	5 600	4 800	—
40	80	30,2	1,1	44 000	33 500	5 600	—	7 100
	80	30,2	1,1	36 500	29 000	5 600	4 800	—
	90	36,5	1,5	56 500	41 000	5 300	—	6 700
	90	36,5	1,5	49 500	38 000	5 300	4 500	—
45	85	30,2	1,1	49 500	38 000	5 000	—	6 700
	85	30,2	1,1	41 500	33 500	5 000	4 300	—
	100	39,7	1,5	68 500	51 000	4 500	—	6 000
50	90	30,2	1,1	53 000	43 500	4 800	—	6 000
	90	30,2	1,1	40 500	36 000	4 800	4 000	—
	110	44,4	2	81 500	61 500	4 300	—	5 600
55	100	33,3	1,5	56 000	49 000	4 300	—	5 600
	100	33,3	1,5	49 500	43 500	4 300	3 600	—
	120	49,2	2	95 000	73 000	3 800	—	5 000
60	110	36,5	1,5	62 000	62 000	3 800	—	5 000
	130	54	2,1	125 000	98 500	3 400	—	4 500
65	120	38,1	1,5	76 500	69 000	3 600	—	4 500
	140	58,7	2,1	142 000	113 000	3 200	—	4 300
70	125	39,7	1,5	94 000	82 000	3 400	—	4 500
	150	63,5	2,1	159 000	128 000	3 000	—	3 800
75	130	41,3	1,5	93 500	83 000	3 200	—	4 300
80	140	44,4	2	99 000	93 000	3 000	—	3 800
85	150	49,2	2	116 000	110 000	2 800	—	3 600



Dynamic Equivalent Load $P = X F_r + Y F_a$

$F_a/F_r \leq e$		$F_a/F_r > e$		e
X	Y	X	Y	
1	0.92	0.67	1.41	0.68

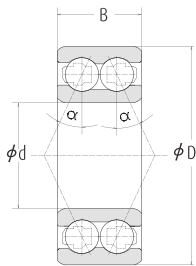
Static Equivalent Load $P_0 = F_r + 0.76 F_a$



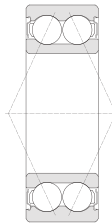
Bearing Designations			Load Center Spacings (mm)	Abutment and Fillet Dimensions (mm)			Mass (kg) approx.
Open	Shielded	Sealed	a_0	d_a min.	D_a max.	r_a max.	
5200	—	—	14,5	15	25	0,6	0,050
—	5200ZZ	5200DDU	14,5	14	26	0,6	0,050
5201	—	—	16,7	17	27	0,6	0,060
—	5201BZZ	5201BDDU	16,3	16	28	0,6	0,060
5202	—	—	18,3	20	30	0,6	0,070
—	5202BZZ	5202BDDU	16,3	19	31	0,6	0,070
5302	—	—	22	21	36	1	0,13
—	5302AZZ	5302ADDU	21	21	36	1	0,13
5203	—	—	20,8	22	35	0,6	0,10
—	5203AZZ	5203ADDU	20,1	21	36	0,6	0,10
5303	—	—	25	23	41	1	0,18
—	5303AZZ	5303ADDU	24,3	23	41	1	0,18
5204	—	—	24,3	26	41	1	0,16
—	5204AZZ	5204ADDU	23	26	41	1	0,16
5304	—	—	26,7	27	45	1	0,22
—	5304AZZ	5304ADDU	25,4	27	45	1	0,22
5205	—	—	26,8	31	46	1	0,18
—	5205BZZ	5205BDDU	25,4	31	46	1	0,18
5305	—	—	31,8	32	55	1	0,35
—	5305AZZ	5305ADDU	30,9	32	55	1	0,36
5206	—	—	31,6	36	56	1	0,30
—	5206BZZ	5206BDDU	30,9	36	56	1	0,30
5306	—	—	36,5	37	65	1	0,57
—	5306AZZ	5306ADDU	36,6	37	65	1	0,57
5207	—	—	36,6	42	65	1	0,46
—	5207AZZ	5207ADDU	36,3	42	65	1	0,46
5307	—	—	41,6	44	71	1,5	0,76
—	5307AZZ	5307ADDU	41,5	44	71	1,5	0,79
5208	—	—	41,5	47	73	1	0,62
—	5208AZZ	5208ADDU	39,4	47	73	1	0,63
5308	—	—	45,5	49	81	1,5	1,03
—	5308AZZ	5308ADDU	43,8	49	81	1,5	1,05
5209	—	—	43,4	52	78	1	0,67
—	5209A1ZZ	5209A1DDU	42,5	52	78	1	0,67
5309	—	—	50,6	54	91	1,5	1,37
5210	—	—	45,9	57	83	1	0,72
—	5210AZZ	5210ADDU	44	57	83	1	0,73
5310	—	—	55,6	60	100	2	1,84
5211	—	—	50,1	64	91	1,5	1,01
—	5211AZZ	5211ADDU	49,2	64	91	1,5	1,01
5311	—	—	60,6	65	110	2	2,40
5212	—	—	56,5	69	101	1,5	1,33
5312	—	—	69,2	72	118	2	2,92
5213	—	—	59,7	74	111	1,5	1,71
5313	—	—	72,8	77	128	2	3,67
5214	—	—	63,8	79	116	1,5	1,75
5314	—	—	78,3	82	138	2	4,55
5215	—	—	66,1	84	121	1,5	1,88
5216	—	—	69,6	90	130	2	2,51
5217	—	—	75,3	95	140	2	3,16

Angular Contact Ball Bearings

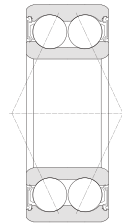
Double Row | Bore 10–90 mm



Open

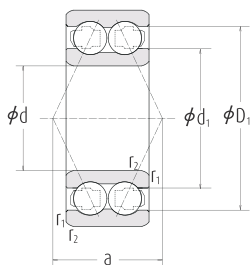


2ZR

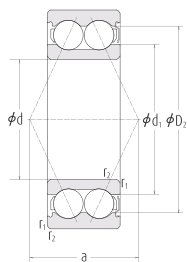


2RSR

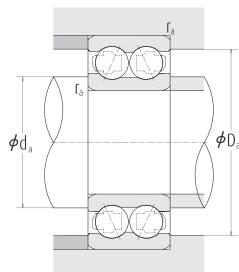
Dimensions				Abbreviation			Load ratings	
d	D	B	r _{1,2} min	Open	with shields	with seals	dyn. C	stat. C ₀
mm					2ZR	2RSR	kN	
10	30	14.0	0.6	3200BTNG	..B2ZRTNG	..B2RSRTNG	7.80	4.55
12	32	15.9	0.6	3201BTNG	..B2ZRTNG	..B2RSRTNG	10.60	5.85
	37	19.0	1.0	3301BTNG	..B2ZRTNG	..B2RSRTNG	14.50	8.20
15	35	15.9	0.6	3202BTNG	..B2ZRTNG	..B2RSRTNG	11.80	7.10
	42	19.0	1.0	3302BTNG	..B2ZRTNG	..B2RSRTNG	16.30	10.00
17	40	17.5	0.6	3203BTNG	..B2ZRTNG	..B2RSRTNG	14.60	9.00
	47	22.2	1.0	3303BTNG	..B2ZRTNG	..B2RSRTNG	20.80	12.50
20	47	20.6	1.0	3204BTNG	..B2ZRTNG	..B2RSRTNG	19.60	12.50
	52	22.2	1.1	3304BTNG	..B2ZRTNG	..B2RSRTNG	23.20	15.00
25	52	20.6	1.0	3205BTNG	..B2ZRTNG	..B2RSRTNG	21.20	14.60
	62	25.4	1.1	3305BTNG	..B2ZRTNG	..B2RSRTNG	30.00	20.00
30	62	23.8	1.0	3206BTNG	..B2ZRTNG	..B2RSRTNG	30.00	21.20
	72	30.2	1.1	3306BTNG	..B2ZRTNG	..B2RSRTNG	41.50	28.50
35	72	27.0	1.1	3207BTNG	..B2ZRTNG	..B2RSRTNG	39.00	28.50
	80	34.9	1.5	3307BTNG	..B2ZRTNG	..B2RSRTNG	51.00	34.50
40	80	30.2	1.1	3208BTNG	..B2ZRTNG	..B2RSRTNG	48.00	36.50
	90	36.5	1.5	3308BTNG	..B2ZRTNG	..B2RSRTNG	62.00	45.00
45	85	30.2	1.1	3209BTNG	..B2ZRTNG	..B2RSRTNG	48.00	37.50
	100	39.7	1.5	3309BTNG	..B2ZRTNG	..B2RSRTNG	68.00	51.00
50	90	30.2	1.1	3210BTNG	..B2ZRTNG	..B2RSRTNG	51.00	42.50
	110	44.4	2.0	3310BTNG	..B2ZRTNG	..B2RSRTNG	81.00	62.00
55	100	33.3	1.5	3211BTNG	..B2ZRTNG	..B2RSRTNG	58.50	49.00
	120	49.2	2.0	3311BTNG	..B2ZRTNG	..B2RSRTNG	102.00	78.00
60	110	36.5	1.5	3212BTNG	..B2ZRTNG	..B2RSRTNG	72.00	61.00
	130	54.0	2.1	3312BTNG	..B2ZRTNG	..B2RSRTNG	125.00	98.00
65	120	38.1	1.5	3213BTNG	..B2ZRTNG	..B2RSRTNG	80.00	73.50
	140	58.7	2.1	3313BTNG	..B2ZRTNG	..B2RSRTNG	150.00	118.00
70	125	39.7	1.5	3214BTNG	..B2ZRTNG	..B2RSRTNG	83.00	76.50
	150	63.5	2.1	3314BTNG	..B2ZRTNG	..B2RSRTNG	171.50	138.20
75	130	41.3	1.5	3215BTNG	..B2ZRTNG	..B2RSRTNG	91.50	85.00
	160	68.3	2.1	3315BTNG	..B2ZRTNG	..B2RSRTNG	173.40	145.30
80	140	44.4	2.0	3216BTNG	..B2ZRTNG	..B2RSRTNG	98.00	93.00
85	150	49.2	2.0	3217BTNG	..B2ZRTNG	..B2RSRTNG	116.00	110.00
90	160	52.4	2.0	3218BTNG	..B2ZRTNG	..B2RSRTNG	124.60	120.30



Open



ZR, RSR



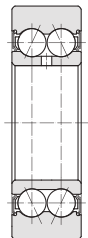
Speed limits		Dimensions (mm)			Abutment dimensions (mm)			Weight
Grease	Oil	d_1	D_1, D_2	a min	d_s max	D_s max	r_s max	kg
min^{-1}								
16,000	22,000	17.9	23.9	15.1	15	25.0	0.6	0.043
15,000	20,000	18.3	25.7	16.6	17	27.0	0.6	0.051
10,500	11,500	21.1	30.4	19.4	19	32.0	1.0	0.090
14,000	19,000	21.0	29.3	18.0	20	30.0	0.6	0.058
11,000	16,000	25.6	34.2	21.2	21	36.0	1.0	0.112
12,000	17,000	24.0	33.1	20.5	22	35.0	0.6	0.085
10,000	15,000	26.2	37.7	24.0	23	41.0	1.0	0.161
10,000	15,000	28.9	38.7	24.2	26	41.0	1.0	0.139
9,000	13,000	31.2	42.6	26.4	27	45.0	1.0	0.197
8,500	12,000	33.9	43.7	26.5	31	46.0	1.0	0.159
7,500	10,000	37.1	50.0	30.7	32	55.0	1.0	0.316
7,000	9,500	40.0	52.7	31.4	36	56.0	1.0	0.265
6,300	8500	44.0	59.0	36.2	37	65.0	1.0	0.496
6,300	8,500	47.2	60.4	36.6	42	65.0	1.0	0.412
5,600	7,500	49.2	65.4	41.5	44	71.0	1.5	0.664
5,600	7,500	52.9	67.9	40.9	47	73.0	1.0	0.550
5,000	6700	55.4	74.3	46.1	49	81.0	1.5	0.905
5,000	6,700	57.1	72.6	43.2	52	78.0	1.0	0.583
4,500	6,000	62.2	81.6	50.0	54	91.0	1.5	1.210
4,800	6,300	61.9	78.1	45.5	57	83.0	1.0	0.632
4,000	5,300	68.2	89.6	54.9	60	100.0	2.0	1.600
4,300	5,600	68.6	85.3	49.9	64	91.0	1.5	0.876
3,800	5,000	75.2	98.4	61.2	65	110.0	2.0	2.110
3,800	5,000	75.7	94.3	55.1	69	101.0	1.5	1.180
3,400	4,500	81.2	108.7	67.3	72	118.0	2.0	2.700
3,400	4,500	84.5	103.5	59.8	74	111.0	1.5	1.520
3,200	4,300	88.2	118.0	73.3	77	128.0	2.0	3.390
3,400	4,500	86.7	106.2	61.6	79	116.0	1.5	1.640
3,000	4,000	94.7	125.0	80.8	84	135.0	2.1	4.900
3,200	4,300	92.4	112.6	65.0	89	116.6	1.5	1.910
2,800	3,800	101.4	133.0	83.8	90	143.0	2.1	5.700
3,000	4,000	98.5	120.3	69.0	91	129.0	2.0	2.450
2,800	3,800	106.4	128.5	74.6	100	135.0	2.0	3.300
2,600	3,600	113.2	136.6	78.9	109	141.0	2.1	4.170

Pulleys

Bore 10–35 mm

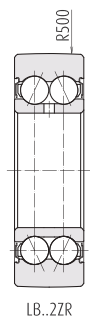


LZ...ZZR



LZ...ZRSR

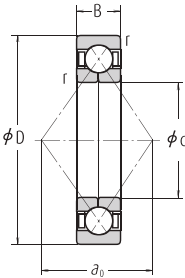
Dimensions				Abbreviation for	
d	D"	B	r, min	Shields	Seals
mm					
10	32	14.0	0.6	LZ3200BZZRSTNG	LZ3200BZRSRSTNG
	32	14.0	0.6	LB3200BZZRSTNG	LB3200BZRSRSTNG
12	35	15.9	0.6	LZ3201BZZRSTNG	LZ3201BZRSRSTNG
	35	15.9	0.6	LB3201BZZRSTNG	LB3201BZRSRSTNG
15	40	15.9	0.6	LZ3202BZZRSTNG	LZ3202BZRSRSTNG
	40	15.9	0.6	LB3202BZZRSTNG	LB3202BZRSRSTNG
17	47	17.5	0.6	LZ3203BZZRSTNG	LZ3203BZRSRSTNG
	47	17.5	0.6	LB3203BZZRSTNG	LB3203BZRSRSTNG
20	52	20.6	1.0	LZ3204BZZRSTNG	LZ3204BZRSRSTNG
	52	20.6	1.0	LB3204BZZRSTNG	LB3204BZRSRSTNG
25	62	20.6	1.0	LZ3205BZZRSTNG	LZ3205BZRSRSTNG
	62	20.6	1.0	LB3205BZZRSTNG	LB3205BZRSRSTNG
30	72	23.8	1.0	LZ3206BZZRSTNG	LZ3206BZRSRSTNG
	72	23.8	1.0	LB3206BZZRSTNG	LB3206BZRSRSTNG
35	80	27.0	1.0	LZ3207BZZRSTNG	LZ3207BZRSRSTNG
	80	27.0	1.0	LB3207BZZRSTNG	LB3207BZRSRSTNG



Load ratings [kN]				Speed limits	Weight
Bearing		Pulley			
dyn. C	stat. C ₀	dyn. C	stat. C ₀	min ⁻¹	kg
7.8	4.55	7.45	4.15	16 000	0.061
7.8	4.55	7.45	4.15	16 000	0.061
10.6	5.85	9.95	5.20	15 000	0.079
10.6	5.85	9.95	5.20	15 000	0.079
11.8	7.10	11.00	6.45	13 000	0.100
11.8	7.10	11.00	6.45	13 000	0.100
14.6	9.00	13.80	8.30	10 000	0.165
14.6	9.00	13.80	8.30	10 000	0.165
19.6	12.50	18.30	11.00	9 000	0.210
19.6	12.50	18.30	11.00	9 000	0.210
21.2	14.60	19.90	13.40	8 000	0.330
21.2	14.60	19.90	13.40	8 000	0.330
30.0	21.20	27.90	18.60	7 100	0.500
30.0	21.20	27.90	18.60	7 100	0.500
39.0	28.50	36.20	25.0	6 300	0.660
39.0	28.50	36.20	25.0	6 300	0.660

Four-Point Contact Ball Bearings

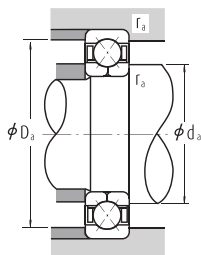
Bore Diameter 30 – 95 mm



Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min ⁻¹)	
d	D	B	r min.	C _a	C _{0a}	Grease	Oil
30	62	16	1	31 000	45 000	8 500	12 000
	72	19	1.1	46 000	63 000	8 000	11 000
35	72	17	1.1	41 000	61 500	7 500	10 000
	80	21	1.5	55 000	80 000	7 100	9 500
40	80	18	1.1	49 000	77 500	6 700	9 000
	90	23	1.5	67 000	100 000	6 300	8 500
45	85	19	1.1	55 000	88 500	6 300	8 500
	100	25	1.5	87 500	133 000	5 600	7 500
50	90	20	1.1	57 000	97 000	5 600	8 000
	110	27	2	102 000	159 000	5 000	6 700
55	100	21	1.5	71 000	122 000	5 300	7 100
	120	29	2	118 000	187 000	4 500	6 300
60	110	22	1.5	85 500	150 000	4 800	6 300
	130	31	2.1	135 000	217 000	4 300	5 600
65	120	23	1.5	97 500	179 000	4 300	6 000
	140	33	2.1	153 000	250 000	3 800	5 300
70	125	24	1.5	106 000	197 000	4 000	5 600
	150	35	2.1	172 000	285 000	3 600	5 000
75	130	25	1.5	110 000	212 000	3 800	5 300
	160	37	2.1	187 000	320 000	3 400	4 800
80	125	22	1.1	77 000	167 000	3 800	5 300
	140	26	2	124 000	236 000	3 600	5 000
85	170	39	2.1	202 000	360 000	3 200	4 300
	130	22	1.1	79 000	176 000	3 800	5 000
90	150	28	2	143 000	276 000	3 400	4 800
	180	41	3	218 000	405 000	3 000	4 000
95	140	24	1.5	94 000	208 000	3 400	4 800
	160	30	2	164 000	320 000	3 200	4 300
95	190	43	3	235 000	450 000	2 800	3 800
	145	24	1.5	96 500	220 000	3 400	4 500
95	170	32	2.1	177 000	340 000	3 000	4 000
	200	45	3	251 000	495 000	2 600	3 600

Dynamic Equivalent Load $P_a = F_a$

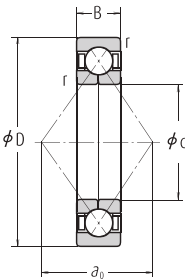
Static Equivalent Load $P_{0a} = F_a$



Bearing Numbers	Load Center Spacings (mm) a_0	Abutment and Fillet Dimensions (mm)			Mass (kg) approx.
		d_a min.	D_a max.	r_a max.	
QJ 206	32.2	36	56	1	0.24
QJ 306	35.7	37	65	1	0.42
QJ 207	37.5	42	65	1	0.35
QJ 307	40.3	44	71	1.5	0.57
QJ 208	42.0	47	73	1	0.45
QJ 308	45.5	49	81	1.5	0.78
QJ 209	45.5	52	78	1	0.52
QJ 309	50.8	54	91	1.5	1.05
QJ 210	49.0	57	83	1	0.59
QJ 310	56.0	60	100	2	1.35
QJ 211	54.3	64	91	1.5	0.77
QJ 311	61.3	65	110	2	1.75
QJ 212	59.5	69	101	1.5	0.98
QJ 312	66.5	72	118	2	2.15
QJ 213	64.8	74	111	1.5	1.2
QJ 313	71.8	77	128	2	2.7
QJ 214	68.3	79	116	1.5	1.3
QJ 314	77.0	82	138	2	3.18
QJ 215	71.8	84	121	1.5	1.5
QJ 315	82.3	87	148	2	3.9
QJ 1016	71.8	87	118	1	1.05
QJ 216	77.0	90	130	2	1.85
QJ 316	87.5	92	158	2	4.6
QJ 1017	75.3	92	123	1	1.1
QJ 217	82.3	95	140	2	2.2
QJ 317	92.8	99	166	2.5	5.34
QJ 1018	80.5	99	131	1.5	1.45
QJ 218	87.5	100	150	2	2.75
QJ 318	98.0	104	176	2.5	6.4
QJ 1019	84.0	104	136	1.5	1.5
QJ 219	92.8	107	158	2	3.35
QJ 319	103.3	109	186	2.5	7.4

Four-Point Contact Ball Bearings

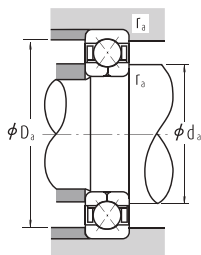
Bore Diameter 100 – 200 mm



Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min ⁻¹)	
d	D	B	r min.	C _a	C _{0a}	Grease	Oil
100	150	24	1.5	98 500	232 000	3 200	4 300
	180	34	2.1	199 000	390 000	2 800	3 800
	215	47	3	300 000	640 000	2 400	3 400
105	160	26	2	115 000	269 000	3 000	4 000
	190	36	2.1	217 000	435 000	2 600	3 600
	225	49	3	305 000	640 000	2 400	3 200
110	170	28	2	139 000	315 000	2 800	3 800
	200	38	2.1	235 000	490 000	2 600	3 400
	240	50	3	320 000	710 000	2 200	3 000
120	180	28	2	147 000	350 000	2 600	3 600
	215	40	2.1	265 000	585 000	2 400	3 200
	260	55	3	360 000	835 000	2 000	2 800
130	200	33	2	169 000	415 000	2 400	3 200
	230	40	3	274 000	635 000	2 200	3 000
	280	58	4	400 000	970 000	1 900	2 600
140	210	33	2	172 000	435 000	2 200	3 000
	250	42	3	239 000	710 000	2 000	2 800
	300	62	4	440 000	1 110 000	1 700	2 400
150	225	35	2.1	197 000	505 000	2 000	2 800
	270	45	3	315 000	785 000	1 800	2 600
	320	65	4	460 000	1 230 000	1 600	2 200
160	240	38	2.1	224 000	580 000	1 900	2 600
	290	48	3	380 000	1 010 000	1 700	2 400
	340	68	4	505 000	1 400 000	1 500	2 000
170	260	42	2.1	268 000	705 000	1 800	2 400
	310	52	4	425 000	1 180 000	1 600	2 200
	360	72	4	565 000	1 610 000	1 400	2 000
180	280	46	2.1	299 000	830 000	1 700	2 200
	320	52	4	440 000	1 270 000	1 500	2 000
	380	75	4	595 000	1 770 000	1 300	1 800
190	290	46	2.1	325 000	925 000	1 600	2 200
	340	55	4	440 000	1 290 000	1 400	2 000
	400	78	5	655 000	1 980 000	1 300	1 700
200	310	51	2.1	345 000	1 020 000	1 500	2 000
	360	58	4	490 000	1 480 000	1 300	1 800
	420	80	5	690 000	2 180 000	1 200	1 600

Dynamic Equivalent Load $P_a = F_a$

Static Equivalent Load $P_{0a} = F_a$



Bearing Numbers	Load Center Spacings (mm) a_0	Abutment and Fillet Dimensions (mm)			Mass (kg) approx.
		d_a min.	D_a max.	r_a max.	
QJ 1020	87.5	109	141	1.5	1.6
QJ 220	98.0	112	168	2	4.0
QJ 320	110.3	114	201	2.5	9.3
QJ 1021	92.8	115	150	2	2.0
QJ 221	103.3	117	178	2	4.7
QJ 321	115.5	119	211	2.5	10.5
QJ 1022	98.0	120	160	2	2.5
QJ 222	108.5	122	188	2	5.6
QJ 322	122.5	124	226	2.5	12.5
QJ 1024	105.0	130	170	2	2.65
QJ 224	117.3	132	203	2	6.9
QJ 324	133.0	134	246	2.5	15.4
QJ 1026	115.5	140	190	2	4.0
QJ 226	126.0	144	216	2.5	7.7
QJ 326	143.5	148	262	3	19
QJ 1028	122.5	150	200	2	4.3
QJ 228	136.5	154	236	2.5	9.8
QJ 328	154.0	158	282	3	24
QJ 1030	131.3	162	213	2	5.2
QJ 230	147.0	164	256	2.5	12
QJ 330	164.5	168	302	3	29
QJ 1032	140.0	172	228	2	6.4
QJ 232	157.5	174	276	2.5	15
QJ 332	175.1	178	322	3	31
QJ 1034	150.5	182	248	2	8.6
QJ 234	168.0	188	292	3	19.5
QJ 334	185.6	188	342	3	41
QJ 1036	161.0	192	268	2	11
QJ 236	175.1	198	302	3	20.5
QJ 336	196.1	198	362	3	48
QJ 1038	168.0	202	278	2	11.5
QJ 238	185.6	208	322	3	23
QJ 338	206.6	212	378	4	54.5
QJ 1040	178.6	212	298	2	15
QJ 240	196.1	218	342	3	27
QJ 340	217.1	222	398	4	61.5