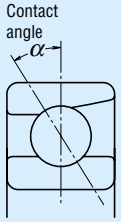
ANGULAR CONTACT BALL BEARINGS

DESIGN, TYPES, AND FEATURES

SINGLE-ROW ANGULAR CONTACT BALL BEARINGS



Since these bearings have a contact angle, they can sustain significant axial loads in one direction together with radial loads. Because of their design, when a radial load is applied, an axial force component is produced; therefore, two opposed bearings or a combination of more than two must be used.

Since the rigidity of single-row angular contact ball bearings can be increased by preloading, they are often used in the main spindles of machine tools, for which high running accuracy is required. (Refer to Chapter 10, Preload, Page A96).

Usually, the cages for angular contact ball bearings with a contact angle of 30° (Symbol **A**) or 40°(Symbol **B**) are in accordance with Table 1,but depending on the application, machined synthetic resin cages or molded polyamide resin cages are also used. The basic load ratings given in the bearing tables are based on the cage classification listed in Table 1.

Though the figures in the bearing tables (Pages B50 to B61; bearing bore diameters of 10 to 120) show bearings with single-shoulder-type inner rings, both-shoulder-type bearings are also available. Please consult NSK for more detailed information.

Table 1 Standard Cages for Angular Contact Ball Bearings

Series	Pressed Steel Cages	Machined Brass Cages
79A5, C	—	7900 – 7940
70A	7000 – 7018	7019 – 7040
70C	—	7000 – 7022
72A, B	7200 – 7222	7224 – 7240
72C	—	7200 – 7240
73A, B	7300 – 7320	7321 – 7340

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.

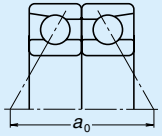
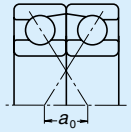
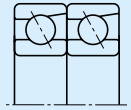
Angular Contact Ball Bearings with contact angles of 15° (Symbol **C**) and 25° (Symbol **A5**) are primarily for high precision or high speed applications, and machined brass or synthetic resin cages or molded polyamide cages are used.

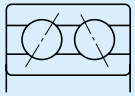
The maximum operating temperature of molded polyamide cages is 120℃.

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

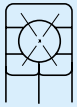
Figure	Arrangement	Features
	Back-to-back (DB) (Example) 7208 A DB	Radial loads and axial loads in both directions can be sustained. Since the distance between the effective load centers a_0 is big, this type is suitable if moments are applied.
	Face-to-face (DF) (Example) 7208 B DF	Radial loads and 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.



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.



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.

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 NSK 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 NSK for selection of the bearings.

TOLERANCES AND RUNNING ACCURACY

RECOMMENDED FITS

INTERNAL CLEARANCES

Matched angular contact ball bearings with precision better than P5 are primarily used in the main spindles of machine tools, so they are used with a preload for rigidity. For convenience of selection, internal clearances are adjusted to produce Very Light, Light, Medium, and Heavy Preloads. Their fitting is also special. Concerning these matters, please refer to Tables 10.1 and 10.2 (Pages A98 and A99).

The clearance (or preload) of matched bearings is obtained by axially tightening a pair of bearings till the side faces of their inner or outer rings are pressed against each other.

DOUBLE-ROW ANGULAR CONTACT BALL BEARINGS

For the clearance in double-row angular contact ball bearings, please consult with NSK.

LIMITING SPEEDS

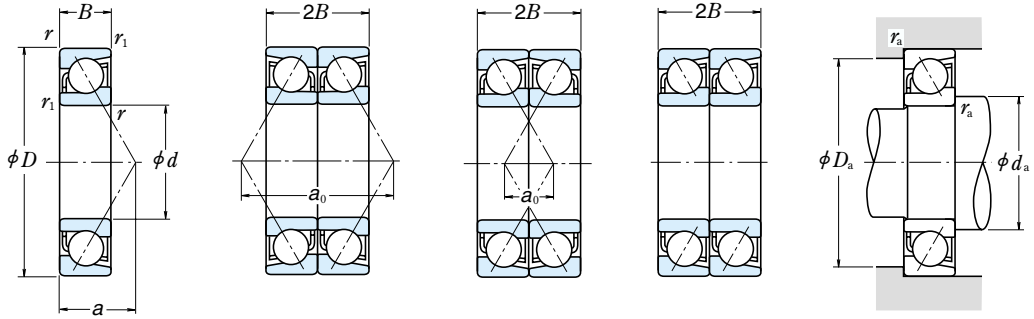
In cases of single-row and matched angular contact ball bearings, the Limiting speeds listed in the bearing table are for bearings with machined cage. For those with pressed cages, the listed speeds must be reduced by 20%.

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 or molded polyamide cages).

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. Refer to Page A37 for detailed information.

SINGLE/MATCHED MOUNTINGS

Bore Diameter 10 – 17 mm



Single | Back-to-Back DB | Face-to-Face DF | Tandem DT

Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Single, DT $F_a/F_r \leqq e$ Y	Single, DT $F_a/F_r > e$ X	Single, DT $F_a/F_r > e$ Y	DB or DF $F_a/F_r \leqq e$ X	DB or DF $F_a/F_r \leqq e$ Y	DB or DF $F_a/F_r > e$ X	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	(kgf) C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
10	22	6	0.3	0.15	2 880	1 450	294	148	—	40 000	56 000	6.7	12.5	19.5	0.3	0.009
	22	6	0.3	0.15	3 000	1 520	305	155	14.1	48 000	63 000	5.1	12.5	19.5	0.3	0.009
	26	8	0.3	0.15	5 350	2 600	550	266	—	32 000	43 000	9.2	12.5	23.5	0.3	0.019
	26	8	0.3	0.15	5 300	2 490	540	254	12.6	45 000	63 000	6.4	12.5	23.5	0.3	0.021
	30	9	0.6	0.3	5 400	2 710	555	276	—	28 000	38 000	10.3	15	25	0.6	0.032
	30	9	0.6	0.3	5 000	2 500	510	255	—	20 000	28 000	12.9	15	25	0.6	0.032
	30	9	0.6	0.3	5 400	2 610	550	266	13.2	40 000	56 000	7.2	15	25	0.6	0.036
	35	11	0.6	0.3	9 300	4 300	950	440	—	20 000	26 000	12.0	15	30	0.6	0.053
	35	11	0.6	0.3	8 750	4 050	890	410	—	18 000	24 000	14.9	15	30	0.6	0.054
12	24	6	0.3	0.15	3 200	1 770	325	181	—	38 000	53 000	7.2	14.5	21.5	0.3	0.011
	24	6	0.3	0.15	3 350	1 860	340	189	14.7	45 000	63 000	5.4	14.5	21.5	0.3	0.011
	28	8	0.3	0.15	5 800	2 980	590	305	—	28 000	38 000	9.8	14.5	25.5	0.3	0.021
	28	8	0.3	0.15	5 800	2 900	590	296	13.2	40 000	56 000	6.7	14.5	25.5	0.3	0.024
	32	10	0.6	0.3	8 000	4 050	815	410	—	26 000	34 000	11.4	17	27	0.6	0.037
	32	10	0.6	0.3	7 450	3 750	760	380	—	18 000	26 000	14.2	17	27	0.6	0.038
	32	10	0.6	0.3	7 900	3 850	805	395	12.5	36 000	50 000	7.9	17	27	0.6	0.041
	37	12	1	0.6	9 450	4 500	965	460	—	18 000	24 000	13.1	18	31	1	0.060
	37	12	1	0.6	8 850	4 200	900	425	—	16 000	22 000	16.3	18	31	1	0.062
15	28	7	0.3	0.15	4 550	2 530	465	258	—	32 000	43 000	8.5	17.5	25.5	0.3	0.015
	28	7	0.3	0.15	4 750	2 640	485	270	14.5	38 000	53 000	6.4	17.5	25.5	0.3	0.015
	32	9	0.3	0.15	6 100	3 450	625	350	—	24 000	32 000	11.3	17.5	29.5	0.3	0.030
	32	9	0.3	0.15	6 250	3 400	635	345	14.1	34 000	48 000	7.6	17.5	29.5	0.3	0.034
	35	11	0.6	0.3	8 650	4 650	880	475	—	22 000	30 000	12.7	20	30	0.6	0.045
	35	11	0.6	0.3	7 950	4 300	810	440	—	16 000	22 000	16.0	20	30	0.6	0.046
	35	11	0.6	0.3	8 650	4 550	885	460	13.2	32 000	45 000	8.8	20	30	0.6	0.052
	42	13	1	0.6	13 400	7 100	1 370	720	—	16 000	22 000	14.7	21	36	1	0.084
	42	13	1	0.6	12 500	6 600	1 270	670	—	14 000	19 000	18.5	21	36	1	0.086
17	30	7	0.3	0.15	4 750	2 800	485	286	—	30 000	40 000	9.0	19.5	27.5	0.3	0.017
	30	7	0.3	0.15	5 000	2 940	510	299	14.8	34 000	48 000	6.6	19.5	27.5	0.3	0.017
	35	10	0.3	0.15	6 400	3 800	655	390	—	22 000	30 000	12.5	19.5	32.5	0.3	0.040
	35	10	0.3	0.15	6 600	3 800	675	390	14.5	32 000	43 000	8.5	19.5	32.5	0.3	0.044
	40	12	0.6	0.3	10 800	6 000	1 100	610	—	20 000	28 000	14.2	22	35	0.6	0.067
	40	12	0.6	0.3	9 950	5 500	1 010	565	—	14 000	19 000	18.0	22	35	0.6	0.068
	40	12	0.6	0.3	10 900	5 850	1 110	595	13.3	28 000	38 000	9.8	22	35	0.6	0.075
	47	14	1	0.6	15 900	8 650	1 630	880	—	14 000	19 000	16.2	23	41	1	0.116
	47	14	1	0.6	14 800	8 000	1 510	820	—	13 000	17 000	20.4	23	41	1	0.118

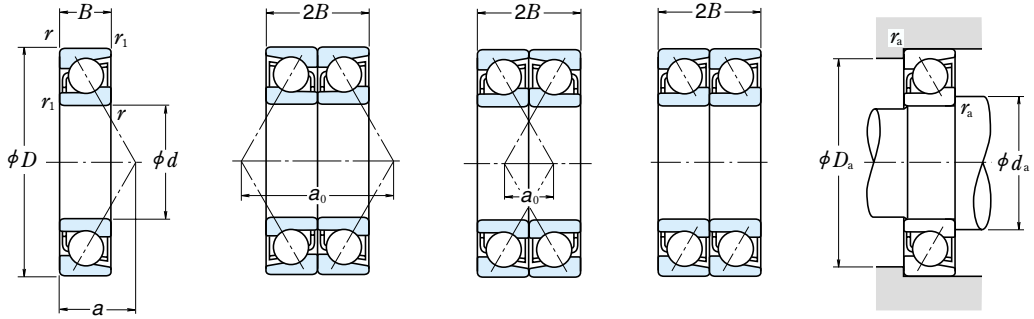
Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	(kgf) C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7900 A5	**DB DF DT**	4 700	2 900	475	296	32 000	43 000	13.5	1.5	—	20.8	0.15
7900 C	**DB DF DT**	4 900	3 050	500	310	38 000	53 000	10.3	1.7	—	20.8	0.15
7000 A	**DB DF DT**	8 750	5 200	890	530	24 000	34 000	18.4	2.4	11.2	24.8	0.15
7000 C	**DB DF DT**	8 650	5 000	880	510	36 000	50 000	12.8	3.2	—	24.8	0.15
7200 A	**DB DF DT**	8 800	5 400	900	555	22 000	30 000	20.5	2.5	12.5	27.5	0.3
7200 B	**DB DF DT**	8 100	5 000	825	510	16 000	22 000	25.8	7.8	12.5	27.5	0.3
7200 C	**DB DF DT**	8 800	5 200	895	530	32 000	45 000	14.4	3.6	—	27.5	0.3
7300 A	**DB DF DT**	15 100	8 600	1 540	880	16 000	22 000	24.0	2.0	12.5	32.5	0.3
7300 B	**DB DF DT**	14 200	8 100	1 450	825	14 000	20 000	29.9	7.9	12.5	32.5	0.3
7901 A5	**DB DF DT**	5 200	3 550	530	360	30 000	43 000	14.4	2.4	—	22.8	0.15
7901 C	**DB DF DT**	5 450	3 700	555	380	36 000	50 000	10.8	1.2	—	22.8	0.15
7001 A	**DB DF DT**	9 400	5 950	955	610	22 000	30 000	19.5	3.5	13.2	26.8	0.15
7001 C	**DB DF DT**	9 400	5 800	960	590	32 000	45 000	13.4	2.6	—	26.8	0.15
7201 A	**DB DF DT**	13 000	8 050	1 330	820	20 000	28 000	22.7	2.7	14.5	29.5	0.3
7201 B	**DB DF DT**	12 100	7 500	1 230	765	15 000	20 000	28.5	8.5	14.5	29.5	0.3
7201 C	**DB DF DT**	12 800	7 700	1 310	785	30 000	40 000	15.9	4.1	—	29.5	0.3
7301 A	**DB DF DT**	15 400	9 000	1 570	915	15 000	20 000	26.1	2.1	17	32	0.6
7301 B	**DB DF DT**	14 400	8 400	1 460	855	13 000	18 000	32.6	8.6	17	32	0.6
7902 A5	**DB DF DT**	7 400	5 050	755	515	26 000	34 000	17.0	3.0	—	26.8	0.15
7902 C	**DB DF DT**	7 750	5 300	790	540	30 000	43 000	12.8	1.2	—	26.8	0.15
7002 A	**DB DF DT**	9 950	6 850	1 010	700	19 000	26 000	22.6	4.6	16.2	30.8	0.15
7002 C	**DB DF DT**	10 100	6 750	1 030	690	28 000	38 000	15.3	2.7	—	30.8	0.15
7202 A	**DB DF DT**	14 000	9 300	1 430	950	18 000	24 000	25.4	3.4	17.5	32.5	0.3
7202 B	**DB DF DT**	12 900	8 600	1 310	875	13 000	18 000	32.0	10.0	17.5	32.5	0.3
7202 C	**DB DF DT**	14 100	9 050	1 440	925	26 000	36 000	17.7	4.3	—	32.5	0.3
7302 A	**DB DF DT**	21 800	14 200	2 220	1 440	13 000	17 000	29.5	3.5	20	37	0.6
7302 B	**DB DF DT**	20 200	13 200	2 060	1 340	11 000	15 000	36.9	10.9	20	37	0.6
7903 A5	**DB DF DT**	7 750	5 600	790	570	24 000	32 000	18.0	4.0	—	28.8	0.15
7903 C	**DB DF DT**	8 150	5 850	830	600	28 000	38 000	13.3	0.7	—	28.8	0.15
7003 A	**DB DF DT**	10 400	7 650	1 060	780	17 000	24 000	25.0	5.0	18.2	33.8	0.15
7003 C	**DB DF DT**	10 700	7 600	1 100	775	26 000	34 000	17.0	3.0	—	33.8	0.15
7203 A	**DB DF DT**	17 600	12 000	1 790	1 220	16 000	22 000	28.5	4.5	19.5	37.5	0.3
7203 B	**DB DF DT**	16 100	11 000	1 650	1 130	11 000	15 000	35.9	11.9	19.5	37.5	0.3
7203 C	**DB DF DT**	17 600	11 700	1 800	1 190	22 000	32 000	19.6	4.4	—	37.5	0.3
7303 A	**DB DF DT**	25 900	17 300	2 640	1 760	11 000	15 000	32.5	4.5	22	42	0.6
7303 B	**DB DF DT**	24 000	16 000	2 450	1 640	10 000	14 000	40.9	12.9	22	42	0.6

Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

Bore Diameter 20 – 35 mm



Single | Back-to-Back DB | Face-to-Face DF | Tandem DT

Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Y	Single, DT $F_a/F_r > e$ X	Y	DB or DF $F_a/F_r \leqq e$ X	Y	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
20	37	9	0.3	0.15	6 600	4 050	675	410	—	24 000	32 000	11.1	22.5	34.5	0.3	0.036
	37	9	0.3	0.15	6 950	4 250	710	430	14.9	28 000	38 000	8.3	22.5	34.5	0.3	0.036
	42	12	0.6	0.3	10 800	6 600	1 110	670	—	18 000	24 000	14.9	25	37	0.6	0.068
	42	12	0.6	0.3	11 100	6 550	1 130	665	14.0	26 000	36 000	10.1	25	37	0.6	0.076
	47	14	1	0.6	14 500	8 300	1 480	845	—	17 000	22 000	16.7	26	41	1	0.106
	47	14	1	0.6	13 300	7 650	1 360	780	—	12 000	16 000	21.1	26	41	1	0.109
	47	14	1	0.6	14 600	8 050	1 480	825	13.3	24 000	34 000	11.5	26	41	1	0.118
	52	15	1.1	0.6	18 700	10 400	1 910	1 060	—	13 000	17 000	17.9	27	45	1	0.146
	52	15	1.1	0.6	17 300	9 650	1 770	985	—	11 000	15 000	22.6	27	45	1	0.15
25	42	9	0.3	0.15	7 450	5 150	760	525	—	20 000	28 000	12.3	27.5	39.5	0.3	0.043
	42	9	0.3	0.15	7 850	5 400	800	555	15.5	24 000	34 000	9.0	27.5	39.5	0.3	0.042
	47	12	0.6	0.3	11 300	7 400	1 150	750	—	16 000	22 000	16.4	30	42	0.6	0.079
	47	12	0.6	0.3	11 700	7 400	1 190	755	14.7	22 000	30 000	10.8	30	42	0.6	0.089
	52	15	1	0.6	16 200	10 300	1 650	1 050	—	15 000	20 000	18.6	31	46	1	0.13
	52	15	1	0.6	14 800	9 400	1 510	960	—	10 000	14 000	23.7	31	46	1	0.133
	52	15	1	0.6	16 600	10 200	1 690	1 040	14.0	22 000	28 000	12.7	31	46	1	0.143
	62	17	1.1	0.6	26 400	15 800	2 690	1 610	—	10 000	14 000	21.1	32	55	1	0.235
	62	17	1.1	0.6	24 400	14 600	2 490	1 490	—	9 000	13 000	26.7	32	55	1	0.241
30	47	9	0.3	0.15	7 850	5 950	800	605	—	18 000	24 000	13.5	32.5	44.5	0.3	0.049
	47	9	0.3	0.15	8 300	6 250	845	640	15.9	22 000	28 000	9.7	32.5	44.5	0.3	0.049
	55	13	1	0.6	14 500	10 100	1 480	1 030	—	13 000	18 000	18.8	36	49	1	0.116
	55	13	1	0.6	15 100	10 300	1 540	1 050	14.9	19 000	26 000	12.2	36	49	1	0.134
	62	16	1	0.6	22 500	14 800	2 300	1 510	—	12 000	17 000	21.3	36	56	1	0.197
	62	16	1	0.6	20 500	13 500	2 090	1 380	—	8 500	12 000	27.3	36	56	1	0.202
	62	16	1	0.6	23 000	14 700	2 350	1 500	13.9	18 000	24 000	14.2	36	56	1	0.222
	72	19	1.1	0.6	33 500	20 900	3 450	2 130	—	9 000	12 000	24.2	37	65	1	0.346
	72	19	1.1	0.6	31 000	19 300	3 150	1 960	—	8 000	11 000	30.9	37	65	1	0.354
35	55	10	0.6	0.3	11 400	8 700	1 170	885	—	15 000	20 000	15.5	40	50	0.6	0.074
	55	10	0.6	0.3	12 100	9 150	1 230	930	15.7	18 000	24 000	11.0	40	50	0.6	0.074
	62	14	1	0.6	18 300	13 400	1 870	1 370	—	12 000	16 000	21.0	41	56	1	0.153
	62	14	1	0.6	19 100	13 700	1 950	1 390	15.0	17 000	22 000	13.5	41	56	1	0.173
	72	17	1.1	0.6	29 700	20 100	3 050	2 050	—	10 000	14 000	23.9	42	65	1	0.287
	72	17	1.1	0.6	27 100	18 400	2 760	1 870	—	7 500	10 000	30.9	42	65	1	0.294
	72	17	1.1	0.6	30 500	19 900	3 100	2 030	13.9	15 000	20 000	15.7	42	65	1	0.32
	80	21	1.5	1	40 000	26 300	4 050	2 680	—	8 000	10 000	27.1	44	71	1.5	0.464
	80	21	1.5	1	36 500	24 200	3 750	2 460	—	7 100	9 500	34.6	44	71	1.5	0.474

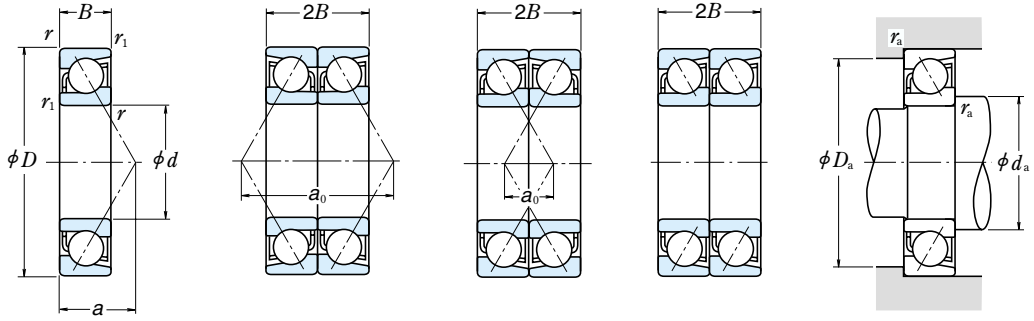
Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7904 A5	**DB DF DT**	10 700	8 100	1 090	825	19 000	26 000	22.3	4.3	—	35.8	0.15
7904 C	**DB DF DT**	11 300	8 500	1 150	865	22 000	32 000	16.6	1.4	—	35.8	0.15
7004 A	**DB DF DT**	17 600	13 200	1 800	1 340	15 000	20 000	29.9	5.9	22.5	39.5	0.3
7004 C	**DB DF DT**	18 000	13 100	1 840	1 330	20 000	30 000	20.3	3.7	—	39.5	0.3
7204 A	**DB DF DT**	23 500	16 600	2 400	1 690	13 000	19 000	33.3	5.3	25	42	0.6
7204 B	**DB DF DT**	21 600	15 300	2 210	1 560	9 500	13 000	42.1	14.1	25	42	0.6
7204 C	**DB DF DT**	23 600	16 100	2 410	1 650	19 000	26 000	23.0	5.0	—	42	0.6
7304 A	**DB DF DT**	30 500	20 800	3 100	2 130	10 000	13 000	35.8	5.8	25	47	0.6
7304 B	**DB DF DT**	28 200	19 300	2 870	1 970	9 000	12 000	45.2	15.2	25	47	0.6
7905 A5	**DB DF DT**	12 100	10 300	1 230	1 050	16 000	22 000	24.6	6.6	—	40.8	0.15
7905 C	**DB DF DT**	12 700	10 800	1 300	1 110	19 000	26 000	18.0	0.0	—	40.8	0.15
7005 A	**DB DF DT**	18 300	14 800	1 870	1 510	13 000	17 000	32.8	8.8	27.5	44.5	0.3
7005 C	**DB DF DT**	19 000	14 800	1 940	1 510	18 000	26 000	21.6	2.4	—	44.5	0.3
7205 A	**DB DF DT**	26 300	20 500	2 690	2 090	12 000	16 000	37.2	7.2	30	47	0.6
7205 B	**DB DF DT**	24 000	18 800	2 450	1 920	8 500	11 000	47.3	17.3	30	47	0.6
7205 C	**DB DF DT**	27 000	20 400	2 750	2 080	17 000	24 000	25.3	4.7	—	47	0.6
7305 A	**DB DF DT**	43 000	31 500	4 400	3 250	8 500	11 000	42.1	8.1	30	57	0.6
7305 B	**DB DF DT**	39 500	29 300	4 050	2 980	7 500	10 000	53.5	19.5	30	57	0.6
7906 A5	**DB DF DT**	12 800	11 900	1 300	1 210	14 000	19 000	27.0	9.0	—	45.8	0.15
7906 C	**DB DF DT**	13 500	12 500	1 380	1 280	17 000	24 000	19.3	1.3	—	45.8	0.15
7006 A	**DB DF DT**	23 600	20 200	2 410	2 060	11 000	15 000	37.5	11.5	35	50	0.6
7006 C	**DB DF DT**	24 600	20 500	2 510	2 090	15 000	22 000	24.4	1.6	—	50	0.6
7206 A	**DB DF DT**	36 500	29 500	3 750	3 000	10 000	13 000	42.6	10.6	35	57	0.6
7206 B	**DB DF DT**	33 500	27 000	3 400	2 760	7 100	9 500	54.6	22.6	35	57	0.6
7206 C	**DB DF DT**	37 500	29 300	3 800	2 990	14 000	20 000	28.3	3.7	—	57	0.6
7306 A	**DB DF DT**	54 500	41 500	5 600	4 250	7 100	9 500	48.4	10.4	35	67	0.6
7306 B	**DB DF DT**	50 500	38 500	5 150	3 950	6 300	8 500	61.8	23.8	35	67	0.6
7907 A5	**DB DF DT**	18 600	17 400	1 890	1 770	12 000	17 000	31.0	11.0	—	52.5	0.3
7907 C	**DB DF DT**	19 600	18 300	2 000	1 860	14 000	20 000	22.1	2.1	—	52.5	0.3
7007 A	**DB DF DT**	29 700	26 800	3 050	2 740	9 500	13 000	42.0	14.0	40	57	0.6
7007 C	**DB DF DT**	31 000	27 300	3 150	2 790	13 000	19 000	27.0	1.0	—	57	0.6
7207 A	**DB DF DT**	48 500	40 000	4 900	4 100	8 500	12 000	47.9	13.9	40	67	0.6
7207 B	**DB DF DT**	44 000	36 500	4 500	3 750	6 000	8 000	61.9	27.9	40	67	0.6
7207 C	**DB DF DT**	49 500	40 000	5 050	4 050	12 000	17 000	31.3	2.7	—	67	0.6
7307 A	**DB DF DT**	65 000	52 500	6 600	5 350	6 300	8 500	54.2	12.2	41	74	1
7307 B	**DB DF DT**	59 500	48 500	6 100	4 950	5 600	7 500	69.2	27.2	41	74	1

Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

Bore Diameter 40 – 55 mm



Single | Back-to-Back DB | Face-to-Face DF | Tandem DT

Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Single, DT $F_a/F_r \leqq e$ Y	Single, DT $F_a/F_r > e$ X	Single, DT $F_a/F_r > e$ Y	DB or DF $F_a/F_r \leqq e$ X	DB or DF $F_a/F_r \leqq e$ Y	DB or DF $F_a/F_r > e$ X	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
40	62	12	0.6	0.3	14 300	11 200	1 460	1 140	—	14 000	18 000	17.9	45	57	0.6	0.11
	62	12	0.6	0.3	15 100	11 700	1 540	1 200	15.7	16 000	22 000	12.8	45	57	0.6	0.109
	68	15	1	0.6	19 500	15 400	1 990	1 570	—	10 000	14 000	23.1	46	62	1	0.19
	68	15	1	0.6	20 600	15 900	2 100	1 620	15.4	15 000	20 000	14.7	46	62	1	0.213
	80	18	1.1	0.6	35 500	25 100	3 600	2 560	—	9 500	13 000	26.3	47	73	1	0.375
	80	18	1.1	0.6	32 000	23 000	3 250	2 340	—	6 700	9 000	34.2	47	73	1	0.383
	80	18	1.1	0.6	36 500	25 200	3 700	2 570	14.1	14 000	19 000	17.0	47	73	1	0.418
	90	23	1.5	1	49 000	33 000	5 000	3 350	—	7 100	9 000	30.3	49	81	1.5	0.633
	90	23	1.5	1	45 000	30 500	4 550	3 100	—	6 300	8 500	38.8	49	81	1.5	0.648
45	68	12	0.6	0.3	15 100	12 700	1 540	1 290	—	12 000	17 000	19.2	50	63	0.6	0.13
	68	12	0.6	0.3	16 000	13 400	1 630	1 360	16.0	14 000	20 000	13.6	50	63	0.6	0.129
	75	16	1	0.6	23 100	18 700	2 360	1 910	—	9 500	13 000	25.3	51	69	1	0.25
	75	16	1	0.6	24 400	19 300	2 490	1 960	15.4	14 000	19 000	16.0	51	69	1	0.274
	85	19	1.1	0.6	39 500	28 700	4 050	2 930	—	8 500	12 000	28.3	52	78	1	0.411
	85	19	1.1	0.6	36 000	26 200	3 650	2 680	—	6 300	8 500	36.8	52	78	1	0.421
	85	19	1.1	0.6	41 000	28 800	4 150	2 940	14.2	12 000	17 000	18.2	52	78	1	0.468
	100	25	1.5	1	63 500	43 500	6 450	4 450	—	6 300	8 500	33.4	54	91	1.5	0.848
	100	25	1.5	1	58 500	40 000	5 950	4 100	—	5 600	7 500	42.9	54	91	1.5	0.869
50	72	12	0.6	0.3	15 900	14 200	1 630	1 450	—	11 000	15 000	20.2	55	67	0.6	0.132
	72	12	0.6	0.3	16 900	15 000	1 720	1 530	16.2	13 000	18 000	14.2	55	67	0.6	0.13
	80	16	1	0.6	24 500	21 100	2 500	2 150	—	8 500	12 000	26.8	56	74	1	0.263
	80	16	1	0.6	26 000	21 900	2 650	2 230	15.7	12 000	17 000	16.7	56	74	1	0.293
	90	20	1.1	0.6	41 500	31 500	4 200	3 200	—	8 000	11 000	30.2	57	83	1	0.466
	90	20	1.1	0.6	37 500	28 600	3 800	2 920	—	5 600	8 000	39.4	57	83	1	0.477
	90	20	1.1	0.6	43 000	31 500	4 350	3 250	14.5	12 000	16 000	19.4	57	83	1	0.528
	110	27	2	1	74 000	52 000	7 550	5 300	—	5 600	7 500	36.6	60	100	2	1.1
	110	27	2	1	68 000	48 000	6 950	4 900	—	5 000	6 700	47.1	60	100	2	1.12
55	80	13	1	0.6	18 100	16 800	1 840	1 710	—	10 000	14 000	22.2	61	74	1	0.184
	80	13	1	0.6	19 100	17 700	1 950	1 810	16.3	12 000	16 000	15.5	61	74	1	0.182
	90	18	1.1	0.6	32 500	27 700	3 300	2 830	—	7 500	11 000	29.9	62	83	1	0.391
	90	18	1.1	0.6	34 000	28 600	3 500	2 920	15.5	11 000	15 000	18.7	62	83	1	0.43
	100	21	1.5	1	51 000	39 500	5 200	4 050	—	7 100	10 000	32.9	64	91	1.5	0.613
	100	21	1.5	1	46 500	36 000	4 700	3 700	—	5 300	7 100	43.0	64	91	1.5	0.627
	100	21	1.5	1	53 000	40 000	5 400	4 100	14.5	10 000	14 000	20.9	64	91	1.5	0.688
	120	29	2	1	86 000	61 500	8 750	6 250	—	5 000	6 700	39.8	65	110	2	1.41
	120	29	2	1	79 000	56 500	8 050	5 750	—	4 500	6 300	51.2	65	110	2	1.45

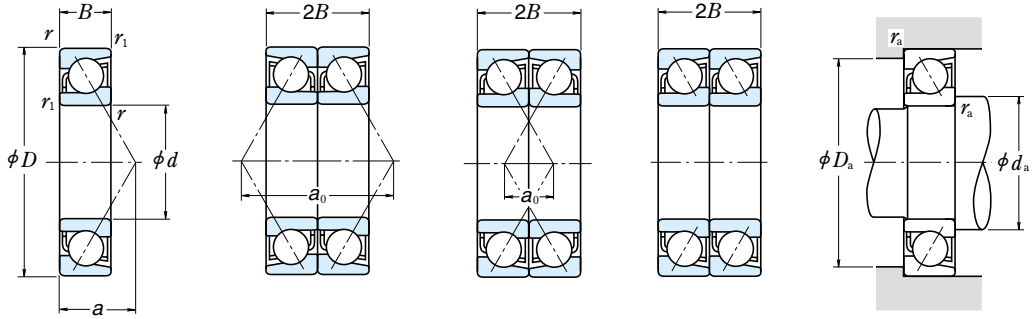
Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7908 A5	**DB DF DT**	23 300	22 300	2 370	2 270	11 000	15 000	35.8	11.8	—	59.5	0.3
7908 C	**DB DF DT**	24 600	23 500	2 510	2 390	13 000	18 000	25.7	1.7	—	59.5	0.3
7008 A	**DB DF DT**	31 500	31 000	3 250	3 150	8 500	11 000	46.2	16.2	45	63	0.6
7008 C	**DB DF DT**	33 500	32 000	3 400	3 250	12 000	17 000	29.5	0.5	—	63	0.6
7208 A	**DB DF DT**	57 500	50 500	5 850	5 150	7 500	10 000	52.6	16.6	45	75	0.6
7208 B	**DB DF DT**	52 000	46 000	5 300	4 700	5 300	7 500	68.3	32.3	45	75	0.6
7208 C	**DB DF DT**	59 000	50 500	6 000	5 150	11 000	15 000	34.1	1.9	—	75	0.6
7308 A	**DB DF DT**	79 500	66 000	8 100	6 700	5 600	7 500	60.5	14.5	46	84	1
7308 B	**DB DF DT**	73 000	60 500	7 400	6 200	5 000	6 700	77.5	31.5	46	84	1
7909 A5	**DB DF DT**	24 600	25 400	2 510	2 590	9 500	13 000	38.4	14.4	—	65.5	0.3
7909 C	**DB DF DT**	26 000	26 800	2 660	2 730	12 000	16 000	27.1	3.1	—	65.5	0.3
7009 A	**DB DF DT**	37 500	37 500	3 850	3 800	7 500	10 000	50.6	18.6	50	70	0.6
7009 C	**DB DF DT**	39 500	38 500	4 050	3 950	11 000	15 000	32.1	0.1	—	70	0.6
7209 A	**DB DF DT**	64 500	57 500	6 550	5 850	7 100	9 500	56.5	18.5	50	80	0.6
7209 B	**DB DF DT**	58 500	52 500	5 950	5 350	5 000	6 700	73.5	35.5	50	80	0.6
7209 C	**DB DF DT**	66 500	57 500	6 750	5 850	10 000	14 000	36.4	1.6	—	80	0.6
7309 A	**DB DF DT**	103 000	87 000	10 500	8 900	5 000	6 700	66.9	16.9	51	94	1
7309 B	**DB DF DT**	95 000	80 500	9 650	8 200	4 500	6 000	85.8	35.8	51	94	1
7910 A5	**DB DF DT**	25 900	28 400	2 640	2 900	9 000	12 000	40.5	16.5	—	69.5	0.3
7910 C	**DB DF DT**	27 400	30 000	2 800	3 050	11 000	15 000	28.3	4.3	—	69.5	0.3
7010 A	**DB DF DT**	40 000	42 000	4 050	4 300	7 100	9 500	53.5	21.5	55	75	0.6
7010 C	**DB DF DT**	42 000	44 000	4 300	4 450	10 000	14 000	33.4	1.4	—	75	0.6
7210 A	**DB DF DT**	67 000	63 000	6 850	6 400	6 300	9 000	60.4	20.4	55	85	0.6
7210 B	**DB DF DT**	60 500	57 000	6 200	5 850	4 500	6 300	78.7	38.7	55	85	0.6
7210 C	**DB DF DT**	69 500	63 500	7 100	6 450	9 500	13 000	38.7	1.3	—	85	0.6
7310 A	**DB DF DT**	121 000	104 000	12 300	10 600	4 500	6 000	73.2	19.2	56	104	1
7310 B	**DB DF DT**	111 000	96 000	11 300	9 800	4 000	5 600	94.1	40.1	56	104	1
7911 A5	**DB DF DT**	29 300	33 500	2 990	3 400	8 000	11 000	44.5	18.5	—	75	0.6
7911 C	**DB DF DT**	31 000	35 500	3 150	3 600	9 500	13 000	31.1	5.1	—	75	0.6
7011 A	**DB DF DT**	52 500	55 500	5 350	5 650	6 300	8 500	59.9	23.9	60	85	0.6
7011 C	**DB DF DT**	55 500	57 500	5 650	5 850	9 000	12 000	37.4	1.4	—	85	0.6
7211 A	**DB DF DT**	83 000	79 000	8 450	8 050	6 000	8 000	65.7	23.7	61	94	1
7211 B	**DB DF DT**	75 000	72 000	7 650	7 350	4 000	5 600	86.0	44.0	61	94	1
7211 C	**DB DF DT**	86 000	80 000	8 800	8 150	8 500	12 000	41.7	0.3	—	94	1
7311 A	**DB DF DT**	139 000	123 000	14 200	12 500	4 000	5 600	79.5	21.5	61	114	1
7311 B	**DB DF DT**	128 000	113 000	13 100	11 500	3 600	5 000	102.4	44.4	61	114	1

Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

Bore Diameter 60 – 75 mm



Single | Back-to-Back DB | Face-to-Face DF | Tandem DT

Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Single, DT $F_a/F_r \leqq e$ Y	Single, DT $F_a/F_r > e$ X	Single, DT $F_a/F_r > e$ Y	DB or DF $F_a/F_r \leqq e$ X	DB or DF $F_a/F_r \leqq e$ Y	DB or DF $F_a/F_r > e$ X	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
60	85	13	1	0.6	18 300	17 700	1 870	1 810	—	9 500	13 000	23.4	66	79	1	0.197
	85	13	1	0.6	19 400	18 700	1 980	1 910	16.5	11 000	15 000	16.2	66	79	1	0.194
	95	18	1.1	0.6	33 000	29 500	3 350	3 000	—	7 100	10 000	31.4	67	88	1	0.417
	95	18	1.1	0.6	35 000	30 500	3 600	3 150	15.7	10 000	14 000	19.4	67	88	1	0.46
	110	22	1.5	1	62 000	48 500	6 300	4 950	—	6 700	9 000	35.5	69	101	1.5	0.798
	110	22	1.5	1	56 000	44 500	5 700	4 550	—	4 800	6 300	46.7	69	101	1.5	0.815
	110	22	1.5	1	64 000	49 000	6 550	5 000	14.4	9 500	13 000	22.4	69	101	1.5	0.889
	130	31	2.1	1.1	98 000	71 500	10 000	7 250	—	4 800	6 300	42.9	72	118	2	1.74
	130	31	2.1	1.1	90 000	65 500	9 200	6 700	—	4 300	5 600	55.4	72	118	2	1.78
65	90	13	1	0.6	19 100	19 400	1 940	1 980	—	9 000	12 000	24.6	71	84	1	0.211
	90	13	1	0.6	20 200	20 500	2 060	2 090	16.7	10 000	14 000	16.9	71	84	1	0.208
	100	18	1.1	0.6	35 000	33 000	3 550	3 350	—	6 700	9 500	32.8	72	93	1	0.455
	100	18	1.1	0.6	37 000	34 500	3 800	3 500	15.9	10 000	13 000	20.0	72	93	1	0.493
	120	23	1.5	1	70 500	58 000	7 150	5 900	—	6 000	8 500	38.2	74	111	1.5	1.03
	120	23	1.5	1	63 500	52 500	6 500	5 350	—	4 300	6 000	50.3	74	111	1.5	1.05
	120	23	1.5	1	73 000	58 500	7 450	6 000	14.6	9 000	12 000	23.9	74	111	1.5	1.14
	140	33	2.1	1.1	111 000	82 000	11 300	8 350	—	4 300	6 000	46.1	77	128	2	2.12
	140	33	2.1	1.1	102 000	75 500	10 400	7 700	—	3 800	5 300	59.5	77	128	2	2.17
70	100	16	1	0.6	26 500	26 300	2 710	2 680	—	8 000	11 000	27.8	76	94	1	0.341
	100	16	1	0.6	28 100	27 800	2 870	2 830	16.4	9 500	13 000	19.4	76	94	1	0.338
	110	20	1.1	0.6	44 000	41 500	4 500	4 200	—	6 300	8 500	36.0	77	103	1	0.625
	110	20	1.1	0.6	47 000	43 000	4 800	4 400	15.7	9 000	12 000	22.1	77	103	1	0.698
	125	24	1.5	1	76 500	63 500	7 800	6 500	—	5 600	8 000	40.1	79	116	1.5	1.11
	125	24	1.5	1	69 000	58 000	7 050	5 900	—	4 000	5 600	52.9	79	116	1.5	1.14
	125	24	1.5	1	79 500	64 500	8 100	6 600	14.6	8 500	11 000	25.1	79	116	1.5	1.24
	150	35	2.1	1.1	125 000	93 500	12 700	9 550	—	4 000	5 300	49.3	82	138	2	2.6
	150	35	2.1	1.1	114 000	86 000	11 700	8 750	—	3 600	5 000	63.6	82	138	2	2.65
75	105	16	1	0.6	26 900	27 700	2 750	2 820	—	7 500	10 000	29.0	81	99	1	0.355
	105	16	1	0.6	28 600	29 300	2 910	2 980	16.6	9 000	12 000	20.1	81	99	1	0.357
	115	20	1.1	0.6	45 000	43 500	4 600	4 450	—	6 000	8 000	37.4	82	108	1	0.661
	115	20	1.1	0.6	48 000	45 500	4 900	4 650	15.9	8 500	12 000	22.7	82	108	1	0.748
	130	25	1.5	1	76 000	64 500	7 750	6 550	—	5 600	7 500	42.1	84	121	1.5	1.19
	130	25	1.5	1	68 500	58 500	7 000	5 950	—	3 800	5 300	55.5	84	121	1.5	1.22
	130	25	1.5	1	83 000	70 000	8 450	7 100	14.8	8 000	11 000	26.2	84	121	1.5	1.36
	160	37	2.1	1.1	136 000	106 000	13 800	10 800	—	3 800	5 000	52.4	87	148	2	3.13
	160	37	2.1	1.1	125 000	97 500	12 700	9 900	—	3 400	4 800	67.8	87	148	2	3.19

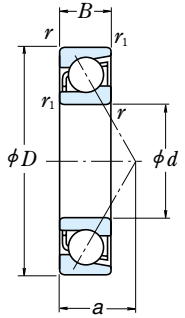
Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7912 A5	**DB DF DT**	29 800	35 500	3 050	3 600	7 500	10 000	46.8	20.8	—	80	0.6
7912 C	**DB DF DT**	31 500	37 500	3 200	3 800	9 000	12 000	32.4	6.4	—	80	0.6
7012 A	**DB DF DT**	53 500	59 000	5 450	6 000	6 000	8 000	62.7	26.7	65	90	0.6
7012 C	**DB DF DT**	57 000	61 500	5 800	6 250	8 500	12 000	38.8	2.8	—	90	0.6
7212 A	**DB DF DT**	100 000	97 500	10 200	9 950	5 300	7 100	71.1	27.1	66	104	1
7212 B	**DB DF DT**	91 000	89 000	9 300	9 050	3 800	5 300	93.3	49.3	66	104	1
7212 C	**DB DF DT**	104 000	98 500	10 600	10 000	7 500	11 000	44.8	0.8	—	104	1
7312 A	**DB DF DT**	159 000	143 000	16 200	14 500	3 800	5 000	85.9	23.9	67	123	1
7312 B	**DB DF DT**	146 000	131 000	14 900	13 400	3 400	4 500	110.7	48.7	67	123	1
7913 A5	**DB DF DT**	31 000	39 000	3 150	3 950	7 100	9 500	49.1	23.1	—	85	0.6
7913 C	**DB DF DT**	33 000	41 000	3 350	4 200	8 500	12 000	33.8	7.8	—	85	0.6
7013 A	**DB DF DT**	56 500	65 500	5 750	6 700	5 600	7 500	65.6	29.6	70	95	0.6
7013 C	**DB DF DT**	60 500	68 500	6 150	7 000	8 000	11 000	40.1	4.1	—	95	0.6
7213 A	**DB DF DT**	114 000	116 000	11 600	11 800	4 800	6 700	76.4	30.4	71	114	1
7213 B	**DB DF DT**	103 000	105 000	10 500	10 700	3 400	4 800	100.6	54.6	71	114	1
7213 C	**DB DF DT**	119 000	117 000	12 100	12 000	7 100	9 500	47.8	1.8	—	114	1
7313 A	**DB DF DT**	180 000	164 000	18 400	16 700	3 600	4 800	92.2	26.2	72	133	1
7313 B	**DB DF DT**	166 000	151 000	16 900	15 400	3 200	4 300	119.0	53.0	72	133	1
7914 A5	**DB DF DT**	43 000	52 500	4 400	5 350	6 300	9 000	55.6	23.6	—	95	0.6
7914 C	**DB DF DT**	45 500	55 500	4 650	5 650	7 500	11 000	38.8	6.8	—	95	0.6
7014 A	**DB DF DT**	71 500	82 500	7 300	8 450	5 000	6 700	72.0	32.0	75	105	0.6
7014 C	**DB DF DT**	76 000	86 000	7 750	8 750	7 100	10 000	44.1	4.1	—	105	0.6
7214 A	**DB DF DT**	124 000	127 000	12 600	13 000	4 500	6 300	80.3	32.3	76	119	1
7214 B	**DB DF DT**	112 000	116 000	11 500	11 800	3 200	4 500	105.8	57.8	76	119	1
7214 C	**DB DF DT**	129 000	129 000	13 200	13 200	6 700	9 000	50.1	2.1	—	119	1
7314 A	**DB DF DT**	203 000	187 000	20 700	19 100	3 200	4 300	98.5	28.5	77	143	1
7314 B	**DB DF DT**	186 000	172 000	19 000	17 500	2 800	4 000	127.3	57.3	77	143	1
7915 A5	**DB DF DT**	44 000	55 500	4 450	5 650	6 000	8 500	58.0	26.0	—	100	0.6
7915 C	**DB DF DT**	46 500	58 500	4 750	5 950	7 100	10 000	40.1	8.1	—	100	0.6
7015 A	**DB DF DT**	73 000	87 500	7 450	8 900	4 800	6 700	74.8	34.8	80	110	0.6
7015 C	**DB DF DT**	78 000	91 500	7 950	9 300	6 700	9 500	45.4	5.4	—	110	0.6
7215 A	**DB DF DT**	123 000	129 000	12 600	13 100	4 300	6 000	84.2	34.2	81	124	1
7215 B	**DB DF DT**	112 000	117 000	11 400	11 900	3 200	4 300	111.0	61.0	81	124	1
7215 C	**DB DF DT**	134 000	140 000	13 700	14 200	6 300	9 000	52.4	2.4	—	124	1
7315 A	**DB DF DT**	221 000	212 000	22 500	21 600	3 000	4 000	104.8	30.8	82	153	1
7315 B	**DB DF DT**	202 000	195 000	20 600	19 800	2 800	3 800	135.6	61.6	82	153	1

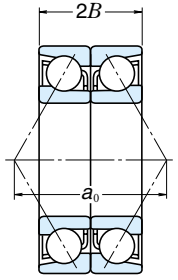
Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

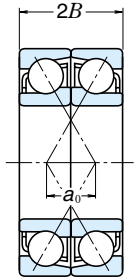
Bore Diameter 80 – 95 mm



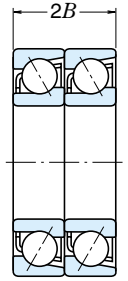
Single



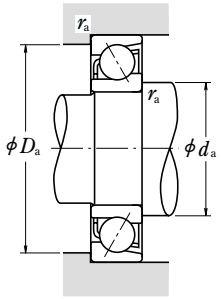
Back-to-Back
DB

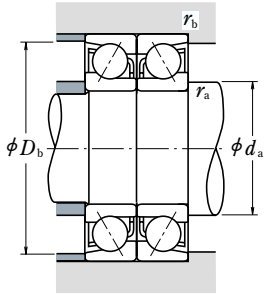


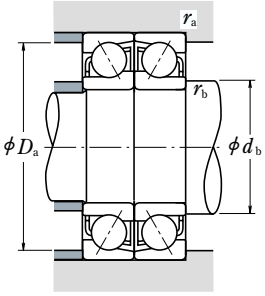
Face-to-Face
DF



Tandem
DT







Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Single, DT $F_a/F_r \leqq e$ Y	Single, DT $F_a/F_r > e$ X	Single, DT $F_a/F_r > e$ Y	DB or DF $F_a/F_r \leqq e$ X	DB or DF $F_a/F_r \leqq e$ Y	DB or DF $F_a/F_r > e$ X	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
80	110	16	1	0.6	27 300	29 000	2 790	2 960	—	7 100	10 000	30.2	86	104	1	0.38
	110	16	1	0.6	29 000	30 500	2 960	3 150	16.7	8 500	12 000	20.7	86	104	1	0.376
	125	22	1.1	0.6	55 000	53 000	5 650	5 400	—	5 600	7 500	40.6	87	118	1	0.88
	125	22	1.1	0.6	58 500	55 500	6 000	5 650	15.7	8 000	11 000	24.7	87	118	1	0.966
	140	26	2	1	89 000	76 000	9 100	7 750	—	5 000	7 100	44.8	90	130	2	1.46
	140	26	2	1	80 500	69 500	8 200	7 050	—	3 600	5 000	59.1	90	130	2	1.49
	140	26	2	1	93 000	77 500	9 450	7 900	14.7	7 500	10 000	27.7	90	130	2	1.63
	170	39	2.1	1.1	147 000	119 000	15 000	12 100	—	3 600	4 800	55.6	92	158	2	3.71
	170	39	2.1	1.1	135 000	109 000	13 800	11 100	—	3 200	4 300	71.9	92	158	2	3.79
85	120	18	1.1	0.6	36 500	38 500	3 750	3 900	—	6 700	9 000	32.9	92	113	1	0.541
	120	18	1.1	0.6	39 000	40 500	3 950	4 150	16.5	8 000	11 000	22.7	92	113	1	0.534
	130	22	1.1	0.6	56 500	56 000	5 750	5 700	—	5 300	7 100	42.0	92	123	1	0.913
	130	22	1.1	0.6	60 000	58 500	6 150	6 000	15.9	7 500	10 000	25.4	92	123	1	1.01
	150	28	2	1	103 000	89 000	10 500	9 100	—	4 800	6 700	47.9	95	140	2	1.83
	150	28	2	1	93 000	81 000	9 500	8 250	—	3 400	4 800	63.3	95	140	2	1.87
	150	28	2	1	107 000	90 500	10 900	9 250	14.7	6 700	9 500	29.7	95	140	2	2.04
	180	41	3	1.1	159 000	133 000	16 200	13 500	—	3 400	4 500	58.8	99	166	2.5	4.33
	180	41	3	1.1	146 000	122 000	14 800	12 400	—	3 000	4 000	76.1	99	166	2.5	4.42
90	125	18	1.1	0.6	39 500	43 500	4 000	4 450	—	6 300	8 500	34.1	97	118	1	0.56
	125	18	1.1	0.6	41 500	46 000	4 250	4 700	16.6	7 500	10 000	23.4	97	118	1	0.563
	140	24	1.5	1	67 500	66 500	6 850	6 750	—	4 800	6 700	45.2	99	131	1.5	1.19
	140	24	1.5	1	71 500	69 000	7 300	7 050	15.7	7 100	9 500	27.4	99	131	1.5	1.34
	160	30	2	1	118 000	103 000	12 000	10 500	—	4 500	6 000	51.1	100	150	2	2.25
	160	30	2	1	107 000	94 000	10 900	9 550	—	3 200	4 300	67.4	100	150	2	2.29
	160	30	2	1	123 000	105 000	12 500	10 700	14.6	6 300	9 000	31.7	100	150	2	2.51
	190	43	3	1.1	171 000	147 000	17 400	15 000	—	3 200	4 300	61.9	104	176	2.5	5.06
	190	43	3	1.1	156 000	135 000	15 900	13 800	—	2 800	3 800	80.2	104	176	2.5	5.17
95	130	18	1.1	0.6	40 000	45 500	4 050	4 650	—	6 000	8 500	35.2	102	123	1	0.597
	130	18	1.1	0.6	42 500	48 000	4 300	4 900	16.7	7 100	10 000	24.1	102	123	1	0.591
	145	24	1.5	1	67 000	67 000	6 800	6 800	—	4 500	6 300	46.6	104	136	1.5	1.43
	145	24	1.5	1	73 500	73 000	7 500	7 450	15.9	6 700	9 000	28.1	104	136	1.5	1.42
	170	32	2.1	1.1	128 000	111 000	13 000	11 300	—	4 300	5 600	54.2	107	158	2	2.68
	170	32	2.1	1.1	116 000	101 000	11 800	10 300	—	3 000	4 000	71.6	107	158	2	2.74
	170	32	2.1	1.1	133 000	112 000	13 500	11 400	14.6	6 000	8 500	33.7	107	158	2	3.05
	200	45	3	1.1	183 000	162 000	18 600	16 600	—	3 000	4 000	65.1	109	186	2.5	5.83
	200	45	3	1.1	167 000	149 000	17 100	15 200	—	2 600	3 600	84.3	109	186	2.5	5.98

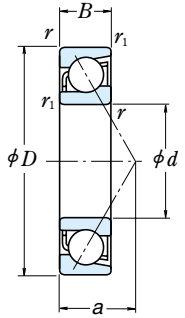
Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7916 A5	**DB DF DT**	44 500	58 000	4 550	5 900	5 600	8 000	60.3	28.3	—	105	0.6
7916 C	**DB DF DT**	47 000	61 500	4 800	6 250	6 700	9 500	41.5	9.5	—	105	0.6
7016 A	**DB DF DT**	89 500	106 000	9 150	10 800	4 300	6 000	81.2	37.2	85	120	0.6
7016 C	**DB DF DT**	95 500	111 000	9 700	11 300	6 300	9 000	49.4	5.4	—	120	0.6
7216 A	**DB DF DT**	145 000	152 000	14 700	15 600	4 000	5 600	89.5	37.5	86	134	1
7216 B	**DB DF DT**	131 000	139 000	13 300	14 100	2 800	4 000	118.3	66.3	86	134	1
7216 C	**DB DF DT**	151 000	155 000	15 400	15 800	6 000	8 000	55.5	3.5	—	134	1
7316 A	**DB DF DT**	239 000	238 000	24 400	24 200	2 800	3 800	111.2	33.2	87	163	1
7316 B	**DB DF DT**	219 000	218 000	22 400	22 300	2 600	3 400	143.9	65.9	87	163	1
7917 A5	**DB DF DT**	59 500	77 000	6 100	7 850	5 300	7 500	65.8	29.8	—	115	0.6
7917 C	**DB DF DT**	63 000	81 500	6 450	8 300	6 300	9 000	45.5	9.5	—	115	0.6
7017 A	**DB DF DT**	91 500	112 000	9 350	11 400	4 300	5 600	84.1	40.1	90	125	0.6
7017 C	**DB DF DT**	98 000	117 000	9 950	12 000	6 000	8 500	50.8	6.8	—	125	0.6
7217 A	**DB DF DT**	167 000	178 000	17 100	18 200	3 800	5 300	95.8	39.8	91	144	1
7217 B	**DB DF DT**	151 000	162 000	15 400	16 500	2 800	3 800	126.6	70.6	91	144	1
7217 C	**DB DF DT**	174 000	181 000	17 800	18 500	5 600	7 500	59.5	3.5	—	144	1
7317 A	**DB DF DT**	258 000	265 000	26 300	27 000	2 600	3 600	117.5	35.5	92	173	1
7317 B	**DB DF DT**	236 000	244 000	24 100	24 800	2 400	3 200	152.2	70.2	92	173	1
7918 A5	**DB DF DT**	64 000	87 000	6 500	8 900	5 000	7 100	68.1	32.1	—	120	0.6
7918 C	**DB DF DT**	67 500	92 000	6 900	9 400	6 000	8 500	46.8	10.8	—	120	0.6
7018 A	**DB DF DT**	109 000	133 000	11 200	13 500	3 800	5 300	90.4	42.4	96	134	1
7018 C	**DB DF DT**	116 000	138 000	11 900	14 100	5 600	8 000	54.8	6.8	—	134	1
7218 A	**DB DF DT**	191 000	206 000	19 500	21 000	3 600	5 000	102.2	42.2	96	154	1
7218 B	**DB DF DT**	173 000	188 000	17 700	19 100	2 600	3 400	134.9	74.9	96	154	1
7218 C	**DB DF DT**	199 000	209 000	20 300	21 400	5 300	7 100	63.5	3.5	—	154	1
7318 A	**DB DF DT**	277 000	294 000	28 300	30 000	2 600	3 400	123.8	37.8	97	183	1
7318 B	**DB DF DT**	254 000	270 000	25 900	27 600	2 200	3 000	160.5	74.5	97	183	1
7919 A5	**DB DF DT**	64 500	91 000	6 600	9 250	4 800	6 700	70.5	34.5	—	125	0.6
7919 C	**DB DF DT**	68 500	96 000	7 000	9 800	5 600	8 000	48.1	12.1	—	125	0.6
7019 A	**DB DF DT**	109 000	134 000	11 100	13 600	3 800	5 000	93.3	45.3	—	139	1
7019 C	**DB DF DT**	119 000	146 000	12 200	14 900	5 300	7 500	56.1	8.1	—	139	1
7219 A	**DB DF DT**	208 000	221 000	21 200	22 600	3 400	4 500	108.5	44.5	102	163	1
7219 B	**DB DF DT**	188 000	202 000	19 200	20 500	2 400	3 200	143.2	79.2	102	163	1
7219 C	**DB DF DT**	216 000	224 000	22 000	22 800	4 800	6 700	67.5	3.5	—	163	1
7319 A	**DB DF DT**	297 000	325 000	30 500	33 000	2 400	3 200	130.2	40.2	102	193	1
7319 B	**DB DF DT**	272 000	298 000	27 700	30 500	2 200	3 000	168.7	78.7	102	193	1

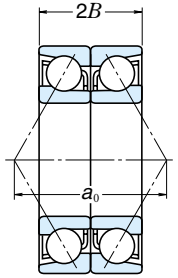
Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

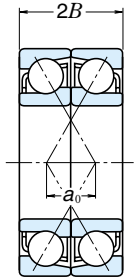
Bore Diameter 100 – 120 mm



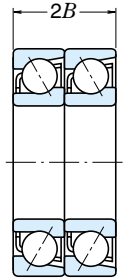
Single



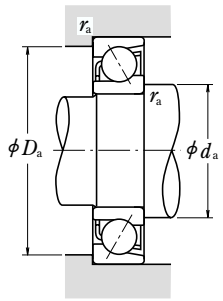
Back-to-Back
DB

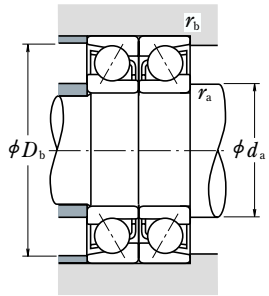


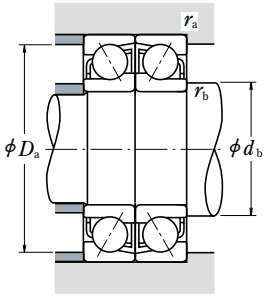
Face-to-Face
DF



Tandem
DT







Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Single, DT $F_a/F_r \leqq e$ Y	Single, DT $F_a/F_r > e$ X	Single, DT $F_a/F_r > e$ Y	DB or DF $F_a/F_r \leqq e$ X	DB or DF $F_a/F_r \leqq e$ Y	DB or DF $F_a/F_r > e$ X	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
100	140	20	1.1	0.6	47 500	51 500	4 850	5 250	—	5 600	8 000	38.0	107	133	1	0.804
	140	20	1.1	0.6	50 000	54 000	5 100	5 550	16.5	6 700	9 000	26.1	107	133	1	0.794
	150	24	1.5	1	68 500	70 500	6 950	7 200	—	4 500	6 000	48.1	109	141	1.5	1.48
	150	24	1.5	1	75 500	77 000	7 700	7 900	16.0	6 300	9 000	28.7	109	141	1.5	1.46
	180	34	2.1	1.1	144 000	126 000	14 700	12 800	—	4 000	5 300	57.4	112	168	2	3.22
	180	34	2.1	1.1	130 000	114 000	13 300	11 700	—	2 800	3 800	75.7	112	168	2	3.28
	180	34	2.1	1.1	149 000	127 000	15 200	12 900	14.5	5 600	8 000	35.7	112	168	2	3.65
	215	47	3	1.1	207 000	193 000	21 100	19 700	—	2 800	3 800	69.0	114	201	2.5	7.29
	215	47	3	1.1	190 000	178 000	19 400	18 100	—	2 400	3 400	89.6	114	201	2.5	7.43
105	145	20	1.1	0.6	48 000	54 000	4 900	5 500	—	5 600	7 500	39.2	112	138	1	0.82
	145	20	1.1	0.6	51 000	57 000	5 200	5 800	16.6	6 300	9 000	26.7	112	138	1	0.826
	160	26	2	1	80 000	81 500	8 150	8 350	—	4 300	5 600	51.2	115	150	2	1.84
	160	26	2	1	88 000	89 500	9 000	9 100	15.9	6 000	8 500	30.7	115	150	2	1.82
	190	36	2.1	1.1	157 000	142 000	16 000	14 400	—	3 800	5 000	60.6	117	178	2	3.84
	190	36	2.1	1.1	142 000	129 000	14 500	13 100	—	2 600	3 600	79.9	117	178	2	3.92
	190	36	2.1	1.1	162 000	143 000	16 600	14 600	14.5	5 300	7 500	37.7	117	178	2	4.33
	225	49	3	1.1	208 000	193 000	21 200	19 700	—	2 600	3 600	72.1	119	211	2.5	9.34
	225	49	3	1.1	191 000	177 000	19 400	18 100	—	2 400	3 200	93.7	119	211	2.5	9.43
110	150	20	1.1	0.6	49 000	56 000	5 000	5 750	—	5 300	7 100	40.3	117	143	1	0.877
	150	20	1.1	0.6	52 000	59 500	5 300	6 050	16.7	6 300	8 500	27.4	117	143	1	0.867
	170	28	2	1	96 500	95 500	9 850	9 700	—	4 000	5 300	54.4	120	160	2	2.28
	170	28	2	1	106 000	104 000	10 800	10 600	15.6	5 600	8 000	32.7	120	160	2	2.26
	200	38	2.1	1.1	170 000	158 000	17 300	16 100	—	3 600	4 800	63.7	122	188	2	4.49
	200	38	2.1	1.1	154 000	144 000	15 700	14 700	—	2 600	3 400	84.0	122	188	2	4.58
	200	38	2.1	1.1	176 000	160 000	17 900	16 300	14.5	5 000	7 100	39.8	122	188	2	5.1
	240	50	3	1.1	220 000	215 000	22 500	21 900	—	2 600	3 400	75.5	124	226	2.5	11.1
	240	50	3	1.1	201 000	197 000	20 500	20 100	—	2 200	3 000	98.4	124	226	2.5	11.2
120	165	22	1.1	0.6	67 500	77 000	6 900	7 850	—	4 800	6 300	44.2	127	158	1	1.15
	165	22	1.1	0.6	72 000	81 000	7 300	8 300	16.5	5 600	7 500	30.1	127	158	1	1.15
	180	28	2	1	102 000	107 000	10 400	10 900	—	3 600	5 000	57.3	130	170	2	2.45
	215	40	2.1	1.1	183 000	177 000	18 600	18 100	—	3 200	4 500	68.3	132	203	2	6.22
	215	40	2.1	1.1	165 000	162 000	16 900	16 500	—	2 400	3 200	90.3	132	203	2	6.26
	260	55	3	1.1	246 000	252 000	25 100	25 700	—	2 200	3 000	82.3	134	246	2.5	14.5
	260	55	3	1.1	225 000	231 000	23 000	23 600	—	2 000	2 800	107.2	134	246	2.5	14.4

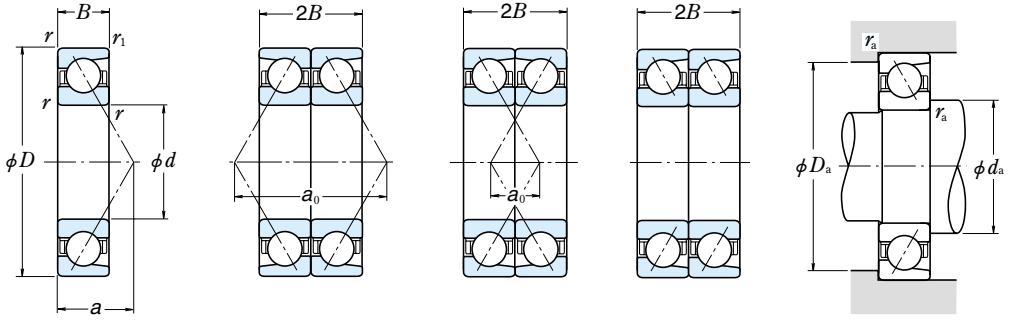
Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7920 A5	**DB DF DT**	77 000	103 000	7 850	10 500	4 500	6 300	76.0	36.0	—	135	0.6
7920 C	**DB DF DT**	81 500	108 000	8 300	11 100	5 300	7 500	52.2	12.2	—	135	0.6
7020 A	**DB DF DT**	111 000	141 000	11 300	14 400	3 600	5 000	96.2	48.2	—	144	1
7020 C	**DB DF DT**	122 000	154 000	12 500	15 800	5 300	7 100	57.5	9.5	—	144	1
7220 A	**DB DF DT**	233 000	251 000	23 800	25 600	3 200	4 300	114.8	46.8	107	173	1
7220 B	**DB DF DT**	212 000	229 000	21 600	23 300	2 200	3 000	151.5	83.5	107	173	1
7220 C	**DB DF DT**	242 000	254 000	24 700	25 900	4 500	6 300	71.5	3.5	—	173	1
7320 A	**DB DF DT**	335 000	385 000	34 500	39 500	2 200	3 000	137.9	43.9	107	208	1
7320 B	**DB DF DT**	310 000	355 000	31 500	36 000	2 000	2 800	179.2	85.2	107	208	1
7921 A5	**DB DF DT**	78 500	108 000	8 000	11 000	4 300	6 000	78.3	38.3	—	140	0.6
7921 C	**DB DF DT**	83 000	114 000	8 450	11 600	5 300	7 100	53.5	13.5	—	140	0.6
7021 A	**DB DF DT**	130 000	163 000	13 300	16 700	3 400	4 500	102.5	50.5	—	154	1
7021 C	**DB DF DT**	143 000	179 000	14 600	18 200	4 800	6 700	61.5	9.5	—	154	1
7221 A	**DB DF DT**	254 000	283 000	25 900	28 900	3 000	4 000	121.2	49.2	112	183	1
7221 B	**DB DF DT**	231 000	258 000	23 500	26 300	2 200	3 000	159.8	87.8	112	183	1
7221 C	**DB DF DT**	264 000	286 000	26 900	29 100	4 300	6 000	75.5	3.5	—	183	1
7321 A	**DB DF DT**	335 000	385 000	34 500	39 500	2 200	2 800	144.3	46.3	—	218	1
7321 B	**DB DF DT**	310 000	355 000	31 500	36 000	1 900	2 600	187.4	89.4	—	218	1
7922 A5	**DB DF DT**	79 500	112 000	8 100	11 500	4 300	5 600	80.6	40.6	—	145	0.6
7922 C	**DB DF DT**	84 500	119 000	8 600	12 100	5 000	6 700	54.8	14.8	—	145	0.6
7022 A	**DB DF DT**	157 000	191 000	16 000	19 400	3 200	4 300	108.8	52.8	—	164	1
7022 C	**DB DF DT**	172 000	208 000	17 600	21 200	4 500	6 300	65.5	9.5	—	164	1
7222 A	**DB DF DT**	276 000	315 000	28 100	32 500	2 800	4 000	127.5	51.5	117	193	1
7222 B	**DB DF DT**	250 000	289 000	25 500	29 400	2 000	2 800	168.1	92.1	117	193	1
7222 C	**DB DF DT**	286 000	320 000	29 200	32 500	4 000	5 600	79.5	3.5	—	193	1
7322 A	**DB DF DT**	360 000	430 000	36 500	44 000	2 000	2 600	151.0	51.0	—	233	1
7322 B	**DB DF DT**	325 000	395 000	33 500	40 000	1 800	2 400	196.8	96.8	—	233	1
7924 A5	**DB DF DT**	110 000	154 000	11 200	15 700	3 800	5 300	88.5	44.5	—	160	0.6
7924 C	**DB DF DT**	117 000	162 000	11 900	16 600	4 500	6 300	60.2	16.2	—	160	0.6
7024 A	**DB DF DT**	166 000	213 000	16 900	21 700	3 000	4 000	114.6	58.6	—	174	1
7224 A	**DB DF DT**	297 000	355 000	30 500	36 000	2 600	3 600	136.7	56.7	—	208	1
7224 B	**DB DF DT**	269 000	325 000	27 400	33 000	1 900	2 600	180.5	100.5	—	208	1
7324 A	**DB DF DT**	400 000	505 000	41 000	51 500	1 800	2 400	164.7	54.7	—	253	1
7324 B	**DB DF DT**	365 000	460 000	37 500	47 000	1 600	2 200	214.4	104.4	—	253	1

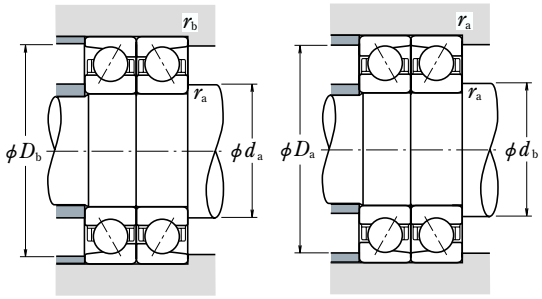
Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

Bore Diameter 130 – 170 mm



Single | Back-to-Back DB | Face-to-Face DF | Tandem DT



Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Y	Single, DT $F_a/F_r > e$ X	Y	DB or DF $F_a/F_r \leqq e$ X	Y	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
130	180	24	1.5	1	74 000	86 000	7 550	8 750	—	4 300	6 000	48.1	139	171	1.5	1.54
	180	24	1.5	1	78 500	91 000	8 000	9 250	16.5	5 000	7 100	32.8	139	171	1.5	1.5
	200	33	2	1	117 000	125 000	12 000	12 800	—	3 400	4 500	64.1	140	190	2	3.68
	230	40	3	1.1	189 000	193 000	19 300	19 600	—	2 400	3 200	72.0	144	216	2.5	7.06
	230	40	3	1.1	171 000	175 000	17 400	17 800	—	2 200	3 000	95.5	144	216	2.5	7.1
	280	58	4	1.5	273 000	293 000	27 900	29 800	—	2 200	2 800	88.2	148	262	3	17.5
	280	58	4	1.5	250 000	268 000	25 500	27 400	—	1 900	2 600	115.0	148	262	3	17.6
140	190	24	1.5	1	75 000	90 000	7 650	9 200	—	4 000	5 600	50.5	149	181	1.5	1.63
	190	24	1.5	1	79 500	95 500	8 100	9 700	16.7	4 800	6 700	34.1	149	181	1.5	1.63
	210	33	2	1	120 000	133 000	12 200	13 500	—	3 200	4 300	67.0	150	200	2	3.9
	250	42	3	1.1	218 000	234 000	22 300	23 900	—	2 200	3 000	77.3	154	236	2.5	8.92
	250	42	3	1.1	197 000	213 000	20 100	21 700	—	2 000	2 800	102.8	154	236	2.5	8.94
	300	62	4	1.5	300 000	335 000	30 500	34 500	—	2 000	2 600	94.5	158	282	3	21.4
	300	62	4	1.5	275 000	310 000	28 100	31 500	—	1 700	2 400	123.3	158	282	3	21.6
150	210	28	2	1	96 500	115 000	9 850	11 800	—	3 800	5 000	56.0	160	200	2	2.97
	210	28	2	1	102 000	122 000	10 400	12 400	16.6	4 300	6 000	38.1	160	200	2	2.96
	225	35	2.1	1.1	137 000	154 000	14 000	15 700	—	2 400	3 000	71.6	162	213	2	4.75
	270	45	3	1.1	248 000	280 000	25 300	28 500	—	2 000	2 800	83.1	164	256	2.5	11.2
	270	45	3	1.1	225 000	254 000	22 900	25 900	—	1 800	2 600	110.6	164	256	2.5	11.2
	320	65	4	1.5	315 000	370 000	32 500	38 000	—	1 800	2 400	100.3	168	302	3	26
	320	65	4	1.5	289 000	340 000	29 400	34 500	—	1 600	2 200	131.1	168	302	3	25.9
160	220	28	2	1	106 000	133 000	10 800	13 500	16.7	3 800	5 000	39.4	170	210	2	3.1
	240	38	2.1	1.1	155 000	176 000	15 800	18 000	—	2 200	2 800	76.7	172	228	2	5.77
	290	48	3	1.1	263 000	305 000	26 800	31 500	—	1 900	2 600	89.0	174	276	2.5	14.1
	290	48	3	1.1	238 000	279 000	24 200	28 400	—	1 700	2 400	118.4	174	276	2.5	14.2
	340	68	4	1.5	345 000	420 000	35 500	43 000	—	1 700	2 200	106.2	178	322	3	30.7
	340	68	4	1.5	315 000	385 000	32 000	39 500	—	1 500	2 000	138.9	178	322	3	30.8
170	230	28	2	1	113 000	148 000	11 500	15 100	16.8	3 600	4 800	40.8	180	220	2	3.36
	260	42	2.1	1.1	186 000	214 000	19 000	21 900	—	2 000	2 600	83.1	182	248	2	7.9
	310	52	4	1.5	295 000	360 000	30 000	36 500	—	1 800	2 400	95.3	188	292	3	17.3
	310	52	4	1.5	266 000	325 000	27 200	33 000	—	1 600	2 200	126.7	188	292	3	17.6
	360	72	4	1.5	390 000	485 000	39 500	49 500	—	1 600	2 200	112.5	188	342	3	35.8
	360	72	4	1.5	355 000	445 000	36 000	45 500	—	1 400	2 000	147.2	188	342	3	35.6

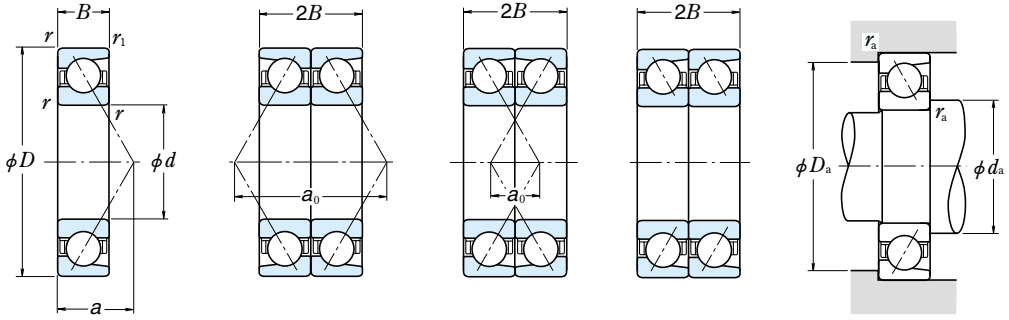
Bearing Numbers (2) Single	Duplex	Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7926 A5	**DB DF DT**	120 000	172 000	12 300	17 500	3 400	4 800	96.3	48.3	—	174	1
7926 C	**DB DF DT**	128 000	182 000	13 000	18 500	4 000	5 600	65.5	17.5	—	174	1
7026 A	**DB DF DT**	191 000	251 000	19 400	25 600	2 600	3 600	128.3	62.3	—	194	1
7226 A	**DB DF DT**	310 000	385 000	31 500	39 500	1 900	2 600	143.9	63.9	—	223	1
7226 B	**DB DF DT**	278 000	350 000	28 300	35 500	1 700	2 400	191.0	111.0	—	223	1
7326 A	**DB DF DT**	445 000	585 000	45 500	59 500	1 700	2 200	176.3	60.3	—	271	1.5
7326 B	**DB DF DT**	405 000	535 000	41 500	54 500	1 500	2 000	230.0	114.0	—	271	1.5
7928 A5	**DB DF DT**	122 000	180 000	12 400	18 400	3 200	4 500	100.9	52.9	—	184	1
7928 C	**DB DF DT**	129 000	191 000	13 200	19 400	3 800	5 300	68.2	20.2	—	184	1
7028 A	**DB DF DT**	194 000	265 000	19 800	27 000	2 600	3 400	134.0	68.0	—	204	1
7228 A	**DB DF DT**	355 000	470 000	36 000	48 000	1 800	2 400	154.6	70.6	—	243	1
7228 B	**DB DF DT**	320 000	425 000	32 500	43 500	1 600	2 200	205.6	121.6	—	243	1
7328 A	**DB DF DT**	490 000	670 000	50 000	68 500	1 600	2 000	189.0	65.0	—	291	1.5
7328 B	**DB DF DT**	445 000	615 000	45 500	63 000	1 400	1 900	246.6	122.6	—	291	1.5
7930 A5	**DB DF DT**	157 000	231 000	16 000	23 500	3 000	4 000	112.0	56.0	—	204	1
7930 C	**DB DF DT**	166 000	244 000	16 900	24 900	3 600	4 800	76.2	20.2	—	204	1
7030 A	**DB DF DT**	222 000	305 000	22 700	31 500	1 900	2 400	143.3	73.3	—	218	1
7230 A	**DB DF DT**	405 000	560 000	41 000	57 000	1 600	2 200	166.3	76.3	—	263	1
7230 B	**DB DF DT**	365 000	510 000	37 000	52 000	1 500	2 000	221.2	131.2	—	263	1
7330 A	**DB DF DT**	515 000	745 000	52 500	75 500	1 500	1 900	200.7	70.7	—	311	1.5
7330 B	**DB DF DT**	470 000	680 000	48 000	69 500	1 300	1 800	262.2	132.2	—	311	1.5
7932 C	**DB DF DT**	173 000	265 000	17 600	27 000	3 000	4 000	78.9	22.9	—	214	1
7032 A	**DB DF DT**	252 000	355 000	25 700	36 000	1 700	2 400	153.5	77.5	—	233	1
7232 A	**DB DF DT**	425 000	615 000	43 500	62 500	1 500	2 000	177.9	81.9	—	283	1
7232 B	**DB DF DT**	385 000	555 000	39 500	57 000	1 400	1 900	236.8	140.8	—	283	1
7332 A	**DB DF DT**	565 000	845 000	57 500	86 000	1 400	1 800	212.3	76.3	—	331	1.5
7332 B	**DB DF DT**	515 000	770 000	52 500	78 500	1 200	1 700	277.8	141.8	—	331	1.5
7934 C	**DB DF DT**	183 000	297 000	18 700	30 000	2 800	3 800	81.6	25.6	—	224	1
7034 A	**DB DF DT**	300 000	430 000	31 000	43 500	1 600	2 200	166.1	82.1	—	253	1
7234 A	**DB DF DT**	480 000	715 000	49 000	73 000	1 400	1 900	190.6	86.6	—	301	1.5
7234 B	**DB DF DT**	435 000	650 000	44 000	66 500	1 300	1 700	253.4	149.4	—	301	1.5
7334 A	**DB DF DT**	630 000	970 000	64 500	99 000	1 300	1 700	225.0	81.0	—	351	1.5
7334 B	**DB DF DT**	575 000	890 000	59 000	90 500	1 100	1 600	294.3	150.3	—	351	1.5

Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

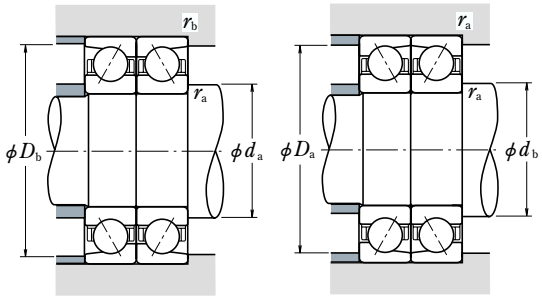
Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.

SINGLE/MATCHED MOUNTINGS

Bore Diameter 180 – 200 mm



Single | Back-to-Back DB | Face-to-Face DF | Tandem DT



Dynamic Equivalent Load $P = XF_r + YF_a$

Contact Angle	$if_0F_a^*/C_{0r}$	e	Single, DT $F_a/F_r \leqq e$ X	Y	Single, DT $F_a/F_r > e$ X	Y	DB or DF $F_a/F_r \leqq e$ X	Y	DB or DF $F_a/F_r > e$ 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 $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT X_0	Single, DT Y_0	DB or DF X_0	DB or DF 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

Single or DT mounting
When $F_r > 0.5F_r + Y_0F_a$ use $P_0 = F_r$

Boundary Dimensions (mm) d	D	B	r min	r_1 min	Basic Load Ratings (Single) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Factor f_0	Limiting Speeds (1) (min^{-1}) Grease	Oil	Eff.Load Centers (mm) a	Abutment and Fillet Dimensions (mm) d_a min	D_a max	r_a max	Mass (kg) approx
180	250	33	2	1	145 000	184 000	14 800	18 800	16.6	3 200	4 500	45.3	190	240	2	4.9
	280	46	2.1	1.1	207 000	252 000	21 100	25 700	—	1 900	2 400	89.4	192	268	2	10.5
	320	52	4	1.5	305 000	385 000	31 000	39 000	—	1 700	2 200	98.2	198	302	3	18.1
	320	52	4	1.5	276 000	350 000	28 100	35 500	—	1 500	2 000	130.9	198	302	3	18.4
	380	75	4	1.5	410 000	535 000	41 500	54 500	—	1 500	2 000	118.3	198	362	3	42.1
	380	75	4	1.5	375 000	490 000	38 000	50 000	—	1 300	1 800	155.0	198	362	3	42.6
190	260	33	2	1	147 000	192 000	15 000	19 600	16.7	3 000	4 300	46.6	200	250	2	4.98
	290	46	2.1	1.1	224 000	280 000	22 800	28 600	—	1 800	2 400	92.3	202	278	2	11.3
	340	55	4	1.5	315 000	410 000	32 000	42 000	—	1 600	2 200	104.0	208	322	3	22.4
	340	55	4	1.5	284 000	375 000	28 900	38 000	—	1 400	2 000	138.7	208	322	3	22.5
	400	78	5	2	450 000	600 000	46 000	61 000	—	1 400	1 900	124.2	212	378	4	47.5
	400	78	5	2	410 000	550 000	42 000	56 000	—	1 300	1 700	162.8	212	378	4	47.2
200	280	38	2.1	1.1	189 000	244 000	19 300	24 900	16.5	2 800	4 000	51.2	212	268	2	6.85
	310	51	2.1	1.1	240 000	310 000	24 500	31 500	—	1 700	2 200	99.1	212	298	2	13.7
	360	58	4	1.5	335 000	450 000	34 500	46 000	—	1 500	2 000	109.8	218	342	3	26.5
	360	58	4	1.5	305 000	410 000	31 000	41 500	—	1 300	1 800	146.5	218	342	3	26.6
	420	80	5	2	475 000	660 000	48 500	67 000	—	1 300	1 800	129.5	222	398	4	54.4
	420	80	5	2	430 000	600 000	44 000	61 500	—	1 200	1 600	170.1	222	398	4	55.3

Bearing Numbers (2) Single	Duplex			Basic Load Ratings (Matched) (N) C_r	C_{0r}	{kgf} C_r	C_{0r}	Limiting Speeds (1) (Matched) (min^{-1}) Grease	Oil	Load Center Spacings (mm) a_0 DB	DF	Abutment and Fillet Dimensions (mm) d_b (3) min	D_b max	r_b (3) max
7936 C	**DB**	**DF**	**DT**	236 000	370 000	24 000	37 500	2 600	3 600	90.6	24.6	—	244	1
7036 A	**DB**	**DF**	**DT**	335 000	505 000	34 500	51 500	1 500	2 000	178.8	86.8	—	273	1
7236 A	**DB**	**DF**	**DT**	495 000	770 000	50 500	78 500	1 400	1 800	196.3	92.3	—	311	1.5
7236 B	**DB**	**DF**	**DT**	450 000	700 000	45 500	71 000	1 200	1 700	261.8	157.8	—	311	1.5
7336 A	**DB**	**DF**	**DT**	665 000	1 070 000	68 000	109 000	1 200	1 600	236.6	86.6	—	371	1.5
7336 B	**DB**	**DF**	**DT**	605 000	975 000	62 000	99 500	1 100	1 500	309.9	159.9	—	371	1.5
7938 C	**DB**	**DF**	**DT**	239 000	385 000	24 400	39 000	2 400	3 400	93.3	27.3	—	254	1
7038 A	**DB**	**DF**	**DT**	365 000	560 000	37 000	57 000	1 400	1 900	184.6	92.6	—	283	1
7238 A	**DB**	**DF**	**DT**	510 000	825 000	52 000	84 000	1 300	1 700	208.0	98.0	—	331	1.5
7238 B	**DB**	**DF**	**DT**	460 000	750 000	47 000	76 000	1 100	1 600	277.3	167.3	—	331	1.5
7338 A	**DB**	**DF**	**DT**	730 000	1 200 000	74 500	122 000	1 100	1 500	248.3	92.3	—	390	2
7338 B	**DB**	**DF**	**DT**	670 000	1 100 000	68 000	112 000	1 000	1 400	325.5	169.5	—	390	2
7940 C	**DB**	**DF**	**DT**	305 000	490 000	31 500	50 000	2 200	3 200	102.3	26.3	—	273	1
7040 A	**DB**	**DF**	**DT**	390 000	620 000	40 000	63 500	1 300	1 800	198.2	96.2	—	303	1
7240 A	**DB**	**DF**	**DT**	550 000	900 000	56 000	92 000	1 200	1 600	219.6	103.6	—	351	1.5
7240 B	**DB**	**DF**	**DT**	495 000	815 000	50 500	83 000	1 100	1 500	292.9	176.9	—	351	1.5
7340 A	**DB**	**DF**	**DT**	770 000	1 320 000	78 500	134 000	1 100	1 400	259.0	99.0	—	410	2
7340 B	**DB**	**DF**	**DT**	700 000	1 200 000	71 500	123 000	950	1 300	340.1	180.1	—	410	2

Notes (1) For applications operating near the limiting speed, refer to Page **B49**.
(2) The suffixes A, A5, B, and C represent contact angles of 30°, 25°, 40°, and 15° respectively.

Note (3) For bearings marked — in the column for d_b, d_b and r_b for shafts are d_a (min) and r_a (max) respectively.