TPI® BEARINGS

Technology

Precision

Innovation

TPI®

A leading Taiwanese bearing company

TPI was established in 1966 and join ventured with a Japanese bearing company to develop self-own brand. The company's headquarter is located in Taipei, Taiwan.

Until now, we have three factories, two in Taiwan and one in Shanghai, mainly producing deep groove ball bearings (DGBB) and angular contact ball bearings (ACBB).

The fourth factory in Jakarta, Indonesia is currently being built and will be in operation in 2017.

Our products

are applied in wide range of industries, including but not limited to two-wheelers, automotive, motor, machine tool segments. Beside ball bearings, we also offer fluid dynamic bearings which is used in IC industry.

Our services

TPI has cooperated with many top brands for a long time since our quality of bearings has been satisfied by all of them. Our company can offer not just high quality products but the total solution related to bearings.

We have our own bearing test center offering investigation services in order to deal with clients' application challenges. In addition to standard types of bearings, customized bearings are also available to meet clients' special requirements.

Furthermore, we are also available on request bearing accessories including cages, shields, steel balls and rivets.

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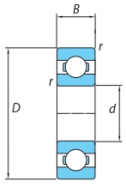
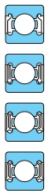
Single-row Deep Groove Ball Bearings

d 10~20mm



Open type

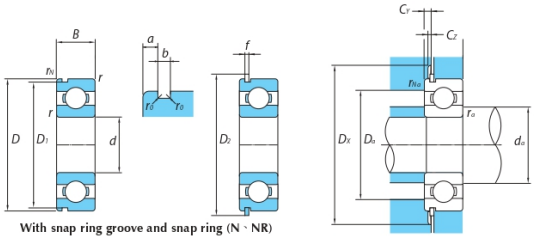


Shielded type (ZZ)

Non-contact sealed type (LLB)

Low torque sealed type (LLH)

Contact sealed type (LLU)



With snap ring groove and snap ring (N、NR)

Equivalent bearing load
dynamic
$P_r = XF_r + YF_a$

$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \le e$ X	$\frac{F_a}{F_r} \le e$ Y	$\frac{F_a}{F_r} > e$ X	$\frac{F_a}{F_r} > e$ Y
0.010	0.18	1	0	0.56	2.46
0.020	0.20				2.14
0.040	0.24				1.83
0.070	0.27				1.61
0.10	0.29				1.48
0.15	0.32				1.35
0.20	0.35				1.25
0.30	0.38				1.13
0.40	0.41				1.05
0.50	0.44				1.00

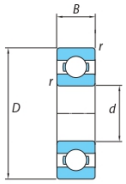
static
$P_{or} = 0.6F_r + 0.5F_a$ When $P_{or} < F_r$ use $P_{or} = F_r$

Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting speeds (rpm)				Bearing Numbers Type				Snap ring groove dimensions				Snap Ring Dimensions		Abutment and Fillet Dimensions (mm)								Weight (kg)
d	D	B	$r_{s\,min}$	Dynamic C_r	Static C_{or}	Grease Open Z, ZZ LB, LLB	Grease LLH	Grease LU, LLU	Oil Open Z, LB	Open type	Shield ZZ	Seal non-contact LLB	Low torque type LLH	Seal contact LLU	Snap ring groove	Snap ring	D_1 max	a max	b min	r_0 max	D_2 max	f max	d_a min	d_b max	D_a max	r_{as} max	D_x (Approx.)	C_Y max	C_Z max	r_{Nas} max	Open (Approx)
10	19	5	0.3	1830	925	32000	-	24000	38000	6800	ZZ	LLB	-	LLU	-	-	-	-	-	-	-	-	12	12.5	17	0.3	-	-	-	-	0.005
	22	6	0.3	2700	1270	30000	-	21000	36000	6900	ZZ	LLB	-	LLU	N	NR	20.8	1.05	0.8	0.2	24.8	0.7	12	13	20	0.3	25.5	1.5	0.7	0.3	0.009
	26	8	0.3	4550	1960	29000	25000	21000	34000	6000	ZZ	LLB	LLH	LLU	N	NR	-	-	-	-	-	-	12	13.5	24	0.3	-	-	-	-	0.019
	30	9	0.6	5100	2390	25000	21000	18000	30000	6200	ZZ	LLB	LLH	LLU	N	NR	28.17	2.06	1.35	0.4	34.7	1.12	14	16	26	0.6	35.5	2.9	1.2	0.5	0.032
	35	11	0.6	8200	3500	23000	20000	16000	27000	6300	ZZ	LLB	LLH	LLU	N	NR	33.17	2.06	1.35	0.4	39.7	1.12	14	17	31	0.6	40.5	2.9	1.2	0.5	0.053
12	21	5	0.3	1920	1040	29000	-	20000	35000	6801	ZZ	LLB	-	LLU	-	-	-	-	-	-	-	-	14	14.5	19	0.3	-	-	-	-	0.006
	24	6	0.3	2890	1460	27000	-	19000	32000	6901	ZZ	LLB	-	LLU	N	NR	22.8	1.05	0.8	0.2	26.8	0.7	14	15	22	0.3	27.5	1.5	0.7	0.3	0.011
	28	7	0.3	5100	2390	26000	-	-	30000	16001	-	-	-	-	-	-	-	-	-	-	-	-	14	-	26	0.3	-	-	-	-	0.019
	28	8	0.3	5100	2390	26000	21000	18000	30000	6001	ZZ	LLB	LLH	LLU	N	NR	-	-	-	-	-	-	14	16	26	0.3	-	-	-	-	0.021
	32	10	0.6	6100	2750	22000	20000	16000	26000	6201	ZZ	LLB	LLH	LLU	N	NR	30.5	2.06	1.35	0.4	36.7	1.12	16	17	28	0.6	37.5	2.9	1.2	0.5	0.037
	37	12	1	9700	4200	20000	19000	15000	24000	6301	ZZ	LLB	LLH	LLU	N	NR	34.77	2.06	1.35	0.4	41.3	1.12	17	18.5	32	1	42	2.9	1.2	0.5	0.060
15	24	5	0.3	2080	1260	26000	-	17000	31000	6802	ZZ	LLB	-	LLU	-	-	-	-	-	-	-	-	17	17.5	22	0.3	-	-	-	-	0.007
	28	7	0.3	3650	2000	24000	-	16000	28000	6902	ZZ	LLB	-	LLU	N	NR	26.7	1.3	0.95	0.25	30.8	0.85	17	17.5	26	0.3	31.5	1.9	0.9	0.3	0.016
	32	8	0.3	5600	2830	22000	-	-	26000	16002	-	-	-	-	-	-	-	-	-	-	-	-	17	-	30	0.3	-	-	-	-	0.025
	32	9	0.3	5600	2830	22000	18000	15000	26000	6002	ZZ	LLB	LLH	LLU	N	NR	30.15	2.06	1.35	0.4	36.7	1.12	17	19	30	0.3	37.5	2.9	1.2	0.3	0.030
	35	11	0.6	7750	3600	19000	18000	15000	23000	6202	ZZ	LLB	LLH	LLU	N	NR	33.17	2.06	1.35	0.4	39.7	1.12	19	20	31	0.6	40.5	2.9	1.2	0.5	0.045
	42	13	1	11400	5450	17000	15000	12000	21000	6302	ZZ	LLB	LLH	LLU	N	NR	39.75	2.06	1.35	0.4	46.3	1.12	20	23	37	1	47	2.9	1.2	0.5	0.082
17	26	5	0.3	2230	1460	24000	-	15000	28000	6803	ZZ	LLB	-	LLU	-	-	-	-	-	-	-	-	19	19.5	24	0.3	-	-	-	-	0.008
	30	7	0.3	4650	2580	22000	-	14000	26000	6903	ZZ	LLB	-	LLU	N	NR	28.7	1.3	0.95	0.25	32.8	0.85	19	20	28	0.3	33.5	1.9	0.9	0.3	0.018
	35	8	0.3	6800	3350	20000	-	-	24000	16003	-	-	-	-	-	-	-	-	-	-	-	-	19	-	33	0.3	-	-	-	-	0.032
	35	10	0.3	6800	3350	20000	16000	14000	24000	6003	ZZ	LLB	LLH	LLU	N	NR	33.17	2.06	1.35	0.4	39.7	1.12	19	21	33	0.3	40.5	2.9	1.2	0.3	0.039
	40	12	0.6	9600	4600	18000	15000	12000	21000	6203	ZZ	LLB	LLH	LLU	N	NR	38.1	2.06	1.35	0.4	44.6	1.12	21	23	36	0.6	45.5	2.9	1.2	0.5	0.066
	47	14	1	13500	6550	16000	14000	11000	19000	6303	ZZ	LLB	LLH	LLU	N	NR	44.6	2.46	1.35	0.4	52.7	1.12	22	25	42	1	53.5	3.3	1.2	0.5	0.115
20	32	7	0.3	4000	2470	21000	-	13000	25000	6804	ZZ	LLB	-	LLU	N	NR	30.7	1.3	0.95	0.25	34.8	0.85	22	22.5	30	0.3	35.5	1.9	0.9	0.3	0.019
	37	9	0.3	6400	3700	19000	-	12000	23000	6904	ZZ	LLB	-	LLU	N	NR	35.7	1.7	0.95	0.25	39.8	0.85	22	24	35	0.3	40.5	2.3	0.9	0.3	0.036
	42	8	0.3	7900	4500	18000	-	-	21000	16004	-	-	-	-	-	-	-	-	-	-	-	-	22	-	40	0.3	-	-	-	-	0.051
	42	12	0.6	9400	5050	18000	13000	11000	21000	6004	ZZ	LLB	LLH	LLU	N	NR	39.75	2.06	1.35	0.4	46.3	1.12	24	26	38	0.6	47	2.9	1.2	0.5	0.069
	47	14	1	12800	6650	16000	12000	10000	18000	6204	ZZ	LLB	LLH	LLU	N	NR	44.6	2.46	1.35	0.4	52.7	1.12	25	28	42	1	53.5	3.3	1.2	0.5	0.106
	52	15	1.1	15900	7900	14000	12000	10000	17000	6304	ZZ	LLB	LLH	LLU	N	NR	49.73	2.46	1.35	0.4	57.9	1.12	26.5	28.5	45.5	1	58.5	3.3	1.2	0.5	0.144

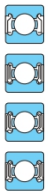
Bearings with * mark are not available and could be supplied on request.

Single-row Deep Groove Ball Bearings

d 22~35mm



Open type

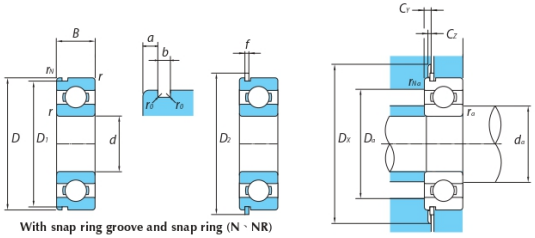


Shielded type (ZZ)

Non-contact sealed type (LLB)

Low torque sealed type (LLH)

Contact sealed type (LLU)



With snap ring groove and snap ring (N、NR)

Equivalent bearing load
dynamic
$P_r = XF_r + YF_a$

$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \le e$ X	$\frac{F_a}{F_r} \le e$ Y	$\frac{F_a}{F_r} > e$ X	$\frac{F_a}{F_r} > e$ Y
0.010	0.18	1	0	0.56	2.46
0.020	0.20				2.14
0.040	0.24				1.83
0.070	0.27				1.61
0.10	0.29				1.48
0.15	0.32				1.35
0.20	0.35				1.25
0.30	0.38				1.13
0.40	0.41				1.05
0.50	0.44				1.00

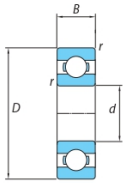
static
$P_{or} = 0.6F_r + 0.5F_a$ When $P_{or} < F_r$ use $P_{or} = F_r$

Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting speeds (rpm)				Bearing Numbers Type				Snap ring groove dimensions				Snap Ring Dimensions		Abutment and Fillet Dimensions (mm)								Weight (kg)
						Grease			Oil																			
d	D	B	$r_{s\,min}$	Dynamic C_r	Static C_{or}	Open Z, ZZ LB, LLB	LLH	LU LLU	Open Z, LB	Open type	Shield ZZ	Seal non-contact LLB	Low torque type LLH	Seal contact LLU	Snap ring groove	Snap ring	D_1 max	a max	b min	r_0 max	D_2 max	f max	d_a min	d_a max	D_a max	r_{as} max	D_x (Approx.)	C_Y max	C_Z max	r_{Nas} max	Open (Approx)
22	44	12	0.6	9400	5050	17000	13000	10000	20000	60/22	ZZ	LLB	LLH	LLU	N	NR	41.75	2.06	1.35	0.4	48.3	1.12	26	26.5	40	0.6	49	2.9	1.2	0.5	0.074
	50	14	1	12900	6800	14000	12000	9700	17000	62/22	ZZ	LLB	LLH	LLU	N	NR	47.6	2.46	1.35	0.4	55.7	1.12	27	29.5	45	1	56.5	3.3	1.2	0.5	0.117
	56	16	1.1	18400	9250	13000	11000	9200	15000	63/22	ZZ	LLB	LLH	LLU	N	NR	53.6	2.46	1.35	0.4	61.7	1.12	28.5	31	49.5	1	62.5	3.3	1.2	0.5	0.176
25	37	7	0.3	4300	2950	18000	-	10000	21000	6805	ZZ	LLB	-	LLU	N	NR	35.7	1.3	0.95	0.25	39.8	0.85	27	28	35	0.3	40.5	1.9	0.9	0.3	0.022
	42	9	0.3	7050	4550	16000	-	9800	19000	6905	ZZ	LLB	-	LLU	N	NR	40.7	1.7	0.95	0.25	44.8	0.85	27	29	40	0.3	45.5	2.3	0.9	0.3	0.042
	47	8	0.3	8350	5100	15000	-	-	18000	16005	-	-	-	-	-	-	-	-	-	-	-	-	27	-	45	0.3	-	-	-	-	0.060
	47	12	0.6	10100	5850	15000	11000	9400	18000	6005	ZZ	LLB	LLH	LLU	N	NR	44.6	2.06	1.35	0.4	52.7	1.12	29	30.5	43	0.6	53.5	2.9	1.2	0.5	0.080
	52	15	1	14000	7850	13000	11000	8900	15000	6205	ZZ	LLB	LLH	LLU	N	NR	49.73	2.46	1.35	0.4	57.9	1.12	30	32	47	1	58.5	3.3	1.2	0.5	0.128
	62	17	1.1	21200	10900	12000	9700	8100	14000	6305	ZZ	LLB	LLH	LLU	N	NR	59.61	3.28	1.9	0.6	67.7	1.7	31.5	35	55.5	1	68.5	4.6	1.7	0.5	0.232
	80	21	1.5	34500	17500	10000	-	-	12000	6405	-	-	-	-	-	-	-	-	-	-	-	-	33	-	72	1.5	-	-	-	-	0.53
28	52	12	0.6	12500	7400	14000	10000	8400	16000	60/28	ZZ	LLB	LLH	LLU	N	NR	49.7	2.06	1.35	0.4	57.9	1.12	32	34	48	0.6	58.5	2.9	1.2	0.5	0.098
	58	16	1	17900	9750	12000	9700	8100	14000	62/28	ZZ	LLB	LLH	LLU	N	NR	55.6	2.46	1.35	0.4	63.7	1.12	33	35.5	53	1	64.5	3.3	1.2	0.5	0.171
	68	18	1.1	26700	14000	11000	8900	7400	13000	63/28	ZZ	LLB	LLH	LLU	N	NR	64.82	3.28	1.9	0.6	74.6	1.7	34.5	38.5	61.5	1	76	4.6	1.7	0.5	0.284
30	42	7	0.3	4700	3650	15000	-	8800	18000	6806*	ZZ	LLB	-	LLU	N	NR	40.7	1.3	0.95	0.25	44.8	0.85	32	33	40	0.3	45.5	1.9	0.9	0.3	0.026
	47	9	0.3	7250	5000	14000	-	8400	17000	6906	ZZ	LLB	-	LLU	N	NR	45.7	1.7	0.95	0.25	49.8	0.85	32	34	45	0.3	50.5	2.3	0.9	0.3	0.048
	55	9	0.3	11200	7350	13000	-	-	15000	16006*	-	-	-	-	-	-	-	-	-	-	-	-	32	-	53	0.3	-	-	-	-	0.091
	55	13	1	13200	8300	13000	9200	7700	15000	6006	ZZ	LLB	LLH	LLU	N	NR	52.6	2.08	1.35	0.4	60.7	1.12	35	37	50	1	61.5	2.9	1.2	0.5	0.116
	62	16	1	19500	11300	11000	8800	7300	13000	6206	ZZ	LLB	LLH	LLU	N	NR	59.61	3.28	1.9	0.6	67.7	1.7	35	39	57	1	68.5	4.6	1.7	0.5	0.199
	72	19	1.1	26700	15000	10000	7900	6600	12000	6306	ZZ	LLB	LLH	LLU	N	NR	68.81	3.28	1.9	0.6	78.6	1.7	36.5	43	65.5	1	80	4.6	1.7	0.5	0.360
32	58	13	1	11800	8050	12000	8700	7200	15000	60/32	ZZ	LLB	LLH	LLU	N	NR	55.6	2.08	1.35	0.4	63.7	1.12	37	39	53	1	64.5	2.9	1.2	0.5	0.129
	65	17	1	20700	11600	11000	8400	7100	12000	62/32	ZZ	LLB	LLH	LLU	N	NR	62.6	3.28	1.9	0.6	70.7	1.7	37	40	60	1	71.5	4.6	1.7	0.5	0.226
	75	20	1.1	29800	16900	9500	7700	6500	11000	63/32*	ZZ	LLB	LLH	LLU	N	NR	71.83	3.28	1.9	0.6	81.6	1.7	38.5	43.5	68.5	1	83	4.6	1.7	0.5	0.382
35	47	7	0.3	4900	4050	13000	-	-	16000	6807*	ZZ	LLB	-	LLU	N	NR	45.7	1.3	0.95	0.25	49.8	0.85	37	38	45	0.3	50.5	1.9	0.9	0.3	0.029
	55	10	0.6	9550	6850	12000	-	7100	15000	6907	ZZ	LLB	-	LLU	N	NR	53.7	1.7	0.95	0.25	57.8	0.85	39	40	51	0.6	58.8	2.3	0.9	0.5	0.074
	62	9	0.3	11700	8200	12000	-	-	14000	16007*	-	-	-	-	-	-	-	-	-	-	-	-	37	-	60	0.3	-	-	-	-	0.110
	62	14	1	16000	10300	12000	8200	6800	14000	6007	ZZ	LLB	LLH	LLU	N	NR	59.61	2.08	1.9	0.6	67.7	1.7	40	42	57	1	68.5	3.4	1.7	0.5	0.155
	72	17	1.1	25700	15300	9800	7600	6300	11000	6207	ZZ	LLB	LLH	LLU	N	NR	68.81	3.28	1.9	0.6	78.6	1.7	41.5	45	65.5	1	80	4.6	1.7	0.5	0.288
	80	21	1.5	33500	19100	8800	7300	6000	10000	6307	ZZ	LLB	LLH	LLU	N	NR	76.81	3.28	1.9	0.6	86.6	1.7	43	47	72	1.5	88	4.6	1.7	0.5	0.457

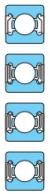
Bearings with * mark are not available and could be supplied on request.

Single-row Deep Groove Ball Bearings

d 40~70mm



Open type

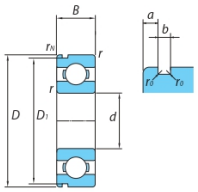


Shielded type (ZZ)

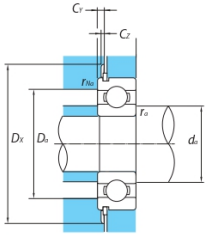
Non-contact sealed type (LLB)

Low torque sealed type (LLH)

Contact sealed type (LLU)



With snap ring groove and snap ring (N、NR)



Equivalent bearing load

dynamic

$P_r = XF_r + YF_a$

$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \le e$ X	$\frac{F_a}{F_r} \le e$ Y	$\frac{F_a}{F_r} > e$ X	$\frac{F_a}{F_r} > e$ Y
0.010	0.18	1	0	0.56	2.46
0.020	0.20				2.14
0.040	0.24				1.83
0.070	0.27				1.61
0.10	0.29				1.48
0.15	0.32				1.35
0.20	0.35				1.25
0.30	0.38				1.13
0.40	0.41				1.05
0.50	0.44				1.00

static

$P_{or} = 0.6F_r + 0.5F_a$ When $P_{or} < F_r$ use $P_{or} = F_r$

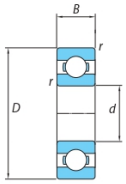
Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting speeds (rpm)				Bearing Numbers Type			
d	D	B	$r_{s\,min}$	Dynamic C_r	Static C_{or}	Grease: Open Z, ZZ LB, LLB	Grease: LLH	Grease: LU LLU	Oil: Open Z, LB	Open type	Shield ZZ	Seal non-contact LLB	Low torque type LLH
40	52	7	0.3	5100	4400	12000	-	-	14000	6808	ZZ	LLB	-
	62	12	0.6	12200	8900	11000	-	6300	13000	6908	ZZ	LLB	-
	68	9	0.3	12600	9650	10000	-	-	12000	16008*	-	-	-
	68	15	1	16800	11500	10000	7300	6100	12000	6008	ZZ	LLB	LLH
	80	18	1.1	29100	17800	8700	6700	5600	10000	6208	ZZ	LLB	LLH
	90	23	1.5	40500	24000	7800	6400	5300	9200	6308	ZZ	LLB	LLH
45	58	7	0.3	5350	4950	11000	-	5900	12000	6809*	ZZ	LLB	-
	68	12	0.6	13100	10400	9800	-	5600	12000	6909	ZZ	LLB	-
	75	10	0.6	12900	10500	9200	-	-	11000	16009*	-	-	-
	75	16	1	21000	15100	9200	6500	5400	11000	6009	ZZ	LLB	LLH
	85	19	1.1	32500	20400	7800	6200	5200	9200	6209	ZZ	LLB	LLH
	100	25	1.5	53000	32000	7000	5600	4700	8200	6309	ZZ	LLB	LLH
50	65	7	0.3	6600	6100	9600	-	5300	11000	6810	ZZ	LLB	-
	72	12	0.6	13400	11200	8900	-	5100	11000	6910*	ZZ	LLB	-
	80	10	0.6	13200	11300	8400	-	-	9800	16010	-	-	-
	80	16	1	21800	16600	8400	6000	5000	9800	6010	ZZ	LLB	LLH
	90	20	1.1	35000	23200	7100	5700	4700	8300	6210	ZZ	LLB	LLH
	110	27	2	62000	38500	6400	5000	4200	7500	6310	ZZ	LLB	LLH
55	72	9	0.3	8800	8100	8700	-	4800	10000	6811*	ZZ	LLB	-
	80	13	1	16000	13300	8200	-	4600	9600	6911*	ZZ	LLB	-
	90	11	0.6	18600	15300	7700	-	-	9000	16011*	-	-	-
	90	18	1.1	28300	21200	7700	-	4500	9000	6011	ZZ	LLB	-
	100	21	1.5	43500	29200	6400	-	4300	7600	6211*	ZZ	LLB	-
	120	29	2	71500	45000	5800	-	3900	6800	6311	ZZ	LLB	-
60	78	10	0.3	11500	10600	8000	-	4400	9400	6812*	ZZ	LLB	-
	85	13	1	16400	14300	7600	-	4300	8900	6912*	ZZ	LLB	-
	95	11	0.6	20000	17500	7000	-	-	8300	16012*	-	-	-
	95	18	1.1	29500	23200	7000	-	4100	8300	6012*	ZZ	LLB	-
	110	22	1.5	52500	36000	6000	-	3800	7000	6212	ZZ	LLB	-
	130	31	2.1	82000	52000	5400	-	3600	6300	6312	ZZ	LLB	-
65	140	33	2.1	92500	60000	4900	-	-	5800	6313	-	-	-
70	150	35	3	104000	68000	4100	-	-	4800	6314*	-	-	-

Bearings with * mark are not available and could be supplied on request.

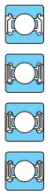
			Snap ring groove dimensions				Snap Ring Dimensions		Abutment and Fillet Dimensions (mm)								Weight (kg)
Seal contact LLU	Snap ring groove	Snap ring	D_1 max	a max	b min	r_0 max	D_2 max	f max	d_a min	d_a max	D_a max	r_{as} max	D_x (Approx.)	C_Y max	C_Z max	r_{Nas} max	Open (Approx)
LLU	N	NR	50.7	1.3	0.95	0.25	54.8	0.85	42	43	50	0.3	55.5	1.9	0.9	0.3	0.033
LLU	N	NR	60.7	1.7	0.95	0.25	64.8	0.85	44	45	58	0.6	65.5	2.3	0.9	0.5	0.110
-	-	-	-	-	-	-	-	-	42	-	66	0.3	-	-	-	-	0.125
LLU	N	NR	64.82	2.49	1.9	0.6	74.6	1.7	45	47	63	1	76	3.8	1.7	0.5	0.190
LLU	N	NR	76.81	3.28	1.9	0.6	86.6	1.7	46.5	51	73.5	1	88	4.6	1.7	0.5	0.366
LLU	N	NR	86.79	3.28	2.7	0.6	96.5	2.46	48	54	82	1.5	98	5.4	2.5	0.5	0.630
LLU	N	NR	56.7	1.3	0.95	0.25	60.8	0.85	47	48	56	0.3	61.5	1.9	0.9	0.3	0.04
LLU	N	NR	66.7	1.7	0.95	0.25	70.8	0.85	49	51	64	0.6	72	2.3	0.9	0.5	0.128
-	-	-	-	-	-	-	-	-	49	-	71	0.6	-	-	-	-	0.171
LLU	N	NR	71.83	2.49	1.9	0.6	81.6	1.7	50	52.5	70	1	83	3.8	1.7	0.5	0.237
LLU	N	NR	81.81	3.28	1.9	0.6	91.6	1.7	51.5	55.5	78.5	1	93	4.6	1.7	0.5	0.398
LLU	N	NR	96.8	3.28	2.7	0.6	106.5	2.46	53	61.5	92	1.5	108	5.4	2.5	0.5	0.814
LLU	N	NR	63.7	1.3	0.95	0.25	67.8	0.85	52	54	63	0.3	68.5	1.9	0.9	0.3	0.052
LLU	N	NR	70.7	1.7	0.95	0.25	74.8	0.85	54	55.5	68	0.6	76	2.3	0.9	0.5	0.132
-	-	-	-	-	-	-	-	-	54	-	76	0.6	-	-	-	-	0.18
LLU	N	NR	76.81	2.49	1.9	0.6	86.6	1.7	55	57.5	75	1	88	3.8	1.7	0.5	0.261
LLU	N	NR	86.79	3.28	2.7	0.6	96.5	2.46	56.5	60	83.5	1	98	5.4	2.5	0.5	0.454
LLU	N	NR	106.81	3.28	2.7	0.6	116.6	2.46	59	68.5	101	2	118	5.4	2.5	0.5	1.07
LLU	N	NR	70.7	1.7	0.95	0.25	74.8	0.85	57	59	70	0.3	76	2.3	0.9	0.3	0.083
LLU	N	NR	77.9	2.1	1.3	0.4	84.4	1.12	60	61.5	75	1	86	2.9	1.2	0.5	0.18
-	-	-	-	-	-	-	-	-	59	-	86	0.6	-	-	-	-	0.258
LLU	N	NR	86.79	2.87	2.7	0.6	96.5	2.46	61.5	64	83.5	1	98	5	2.5	0.5	0.388
LLU	N	NR	96.8	3.28	2.7	0.6	106.5	2.46	63	67	92	1.5	108	5.4	2.5	0.5	0.601
LLU	N	NR	115.21	4.06	3.1	0.6	129.7	2.82	64	74	111	2	131.5	6.5	2.9	0.5	1.37
LLU	N	NR	76.2	1.7	1.3	0.4	82.7	1.12	62	64.5	76	0.3	87	2.5	1.2	0.3	0.106
LLU	N	NR	82.9	2.1	1.3	0.4	89.4	1.12	65	66.5	80	1	91	2.9	1.2	0.5	0.193
-	-	-	-	-	-	-	-	-	64	-	91	0.6	-	-	-	-	0.283
LLU	N	NR	91.82	2.87	2.7	0.6	101.6	2.46	66.5	69	88.5	1	103	5	2.5	0.5	0.414
LLU	N	NR	106.81	3.28	2.7	0.6	116.6	2.46	68	75	102	1.5	118	5.4	2.5	0.5	0.783
LLU	N	NR	125.22	4.06	3.1	0.6	139.7	2.82	71	80.5	119	2	141.5	6.5	2.9	0.5	1.73
-	-	-	-	-	-	-	-	-	76	-	129	2	-	-	-	-	2.08
-	-	-	-	-	-	-	-	-	81	-	139	2	-	-	-	-	2.52

Single-row Deep Groove Ball Bearings

Special dimensions of bearings



Open type

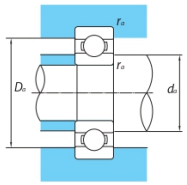


Shielded type (ZZ)

Non-contact sealed type (LLB)

Low torque sealed type (LLH)

Contact sealed type (LLU)



Equivalent bearing load

dynamic

$P_r = XF_r + YF_a$

$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.010	0.18	1	0	0.56	2.46
0.020	0.20				2.14
0.040	0.24				1.83
0.070	0.27				1.61
0.10	0.29				1.48
0.15	0.32				1.35
0.20	0.35				1.25
0.30	0.38				1.13

static

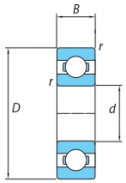
$P_{or} = 0.6F_r + 0.5F_a$ When $P_{or} < F_r$ use $P_{or} = F_r$

Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting speeds (rpm)		Bearing numbers			Abutment and fillet dimensions (mm)			Weight (kg)
d	D	B	$r_{s\,min}$	C_r	C_{or}	Grease	Oil	Open	Non Contact Seal LLB Shield ZZ	Contact Seal LLU	d_a min	D_a max	r_{as} max	Open Type (Approx.)
12	32	10	0.6	6100	2750	22000	26000	AC-6201	AC-6201ZZ	AC-6201LLU	16	28	0.6	0.037
15	35	11	0.6	7750	3600	19000	23000	AC-6202	AC-6202ZZ	AC-6202LLU	19	31	0.6	0.045
17	12	40	0.6	9600	4600	18000	21000	AC-6203	AC-6203ZZ	AC-6203LLU	21	36	0.6	0.066
20	14	47	1.0	12800	6650	16000	18000	-	AC-6204 LLB	AC-6204 LLU	25	42	1.0	0.106
25	15	52	1.0	14000	7850	13000	15000	-	AC-6205ZZ	-	30	47	1.0	0.128
30	13	55	1.0	13200	8300	13000	15000	-	AC-6006ZZ	-	35	50	1.0	0.116
8	14	23	0.3	3950	1540	22000	26000	EC1-SC8A37	-	-	10	21	0.3	0.024
8	7	22	0.3	3350	1400	32000	37000	EC-608	EC-608ZZ	-	10	20	0.3	0.012
9	8	26	0.3	4550	1960	30000	35000	EC-629	EC-629ZZ	EC-629LLU	13	22	0.3	0.020
10	8	26	0.3	4550	1960	29000	34000	EC-6000	EC-6000ZZ	EC-6000LLU	12	24	0.3	0.019
12	8	28	0.3	5100	2390	26000	30000	-	EC1-6001ZZ	-	14	26	0.3	0.021
15	9	32	0.3	5600	2830	22000	26000	EC-6002	EC-6002ZZ	EC-6002LLU	17	30	0.3	0.030
15	11	35	0.6	7750	3600	19000	23000	EC1-6202	EC1-6202LLB	-	19	31	0.6	0.045
9.525	5.557	22.225	0.41	3300	1400	31000	37000	EE3	-	-	12.5	20.2	0.4	0.009
9.525	7.142	22.225	0.41	3300	1400	31000	37000	-	R6ZZ	R6LLU	12.5	20.2	0.4	0.014
12.7	6.35	28.575	0.41	5100	2390	25000	29000	EE4	-	-	14.5	25.5	0.3	0.017
12.7	7.938	28.575	0.41	5100	2390	25000	29000	R8U	R8ZZ	R8LLU	14.5	25.5	0.3	0.022
30	16	62	1.0	24900	16300	10000	12000	BL206	-	-	36	56	1.0	0.214
35	17	72	1.1	33000	22100	8800	10000	BL207	-	-	42	65	1.0	0.318
7	6	18	0.2	2240	910	34000	40000	-	SC727ZZ	-	9	17	0.2	0.007
8	6	18	0.2	2240	910	34000	40000	-	SC8A96ZZ*	-	9	17	0.2	0.006
10	8	26	0.3	4590	1980	29000	34000	-	SC0039ZZ	-	12	24	0.3	0.018
10	8	30	0.6	5100	2390	25000	30000	SC00T50	-	-	14	26	0.6	0.029
11.087	9	30	0.6	5100	2390	18000	30000	-	-	SC0117LLU	14	26	0.6	0.029
14	7	26	0.3	3430	1795	26000	31000	-	SC02T01LLB	-	16	24	0.3	0.013
15	11.5	42	0.6	11400	5450	17000	21000	SC0284	-	-	20	37	0.6	0.074
15	8.5	35	0.6	7750	3600	19000	23000	SC02A17	-	-	19	31	0.6	0.045
15	13	35	0.6	7760	3610	19000	23000	-	-	SC02A51LLU	19	31	0.6	0.049

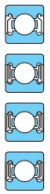
Bearings with * mark are not available and could be supplied on request.

Single-row Deep Groove Ball Bearings

Special dimensions of bearings



Open type

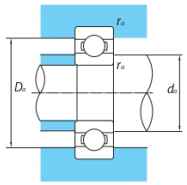


Shielded type (ZZ)

Non-contact sealed type (LLB)

Low torque sealed type (LLH)

Contact sealed type (LLU)



Equivalent bearing load

dynamic

$P_r = XF_r + YF_a$

$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.010	0.18	1	0	0.56	2.46
0.020	0.20				2.14
0.040	0.24				1.83
0.070	0.27				1.61
0.10	0.29				1.48
0.15	0.32				1.35
0.20	0.35				1.25
0.30	0.38				1.13

static

$P_{or} = 0.6F_r + 0.5F_a$ When $P_{or} < F_r$ use $P_{or} = F_r$

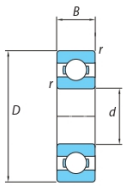
Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting speeds (rpm)	
d	D	B	$r_{s\,min}$	C_r	C_{or}	Grease	Oil
15.875	34.925	11	0.6	7750	3600	15000	23000
15.875	34.925	11.112	0.6	7750	3600	15000	23000
15.875	34.925	11	0.6	7750	3600	15000	23000
17	42	13	0.6	11400	5200	18000	21000
17	42	12	0.6	11400	5200	18000	21000
17	40	14	0.6	9600	4600	18000	21000
17	46	14	0.6	13500	6550	11000	19000
17	52	16	1.0	16000	7940	11000	19000
18	30	7	0.3	4600	2620	22000	26000
19.05	45.225	15.494	1.0	13500	6550	16000	19000
19.06	45.224	15.494	1.0	12800	6550	16000	19000
20	47	12	1.0	12800	6650	16000	18000
20	47	12	1.0	10100	5750	14000	17000
20	52	12	1.0	10100	5750	14000	17000
20	52	12	1.0	12800	6650	16000	18000
22	56	15	1.1	20700	10400	13000	15000
22	56	15	1.5	20700	10400	13000	15000
25	52	13	1.0	14000	7850	13000	15000
25	52	15	1.0	14000	7850	13000	15000
25	52	15	1.0	14000	7850	13000	15000
25	56	12	0.6	14000	7850	13000	15000
25	62	12	0.6	16700	9600	12000	14000
28	72	18	1.5	19500	11300	11000	13000
35	72	14	1.0	25700	15300	9800	11000
6	19	6.6	0.3	2340	885	34000	40000
12	32	10.8	0.6	6100	2750	22000	26000
12	32	16	0.6	6100	2750	22000	26000
15	35	11	0.6	7750	3600	19000	23000
27	47	8	0.3	10100	5850	15000	18000
15.875	34.925	11	0.6	7750	3600	15000	23000

Bearings with * mark are not available and could be supplied on request.

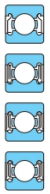
Bearing numbers			Abutment and fillet dimensions (mm)			Weight (kg)
Open	Non Contact Seal LLB Shield ZZ	Contact Seal LLU	d_a min	D_a max	r_{as} max	Open Type (Approx.)
-	SC0217ZZ	SC0217LLU	19	31	0.6	0.045
-	SC0228LLB	SC0228LLU	19	31	0.6	0.045
-	-	SC02A47LLU	19	31	0.6	0.039
SC03A39	-	-	21	36	0.6	0.080
SC0345	-	SC0345LLU	21	36	0.6	-
-	-	SC03T01LLU	21	36	0.6	0.068
-	-	SC03T52LLU	22	42	0.6	0.115
-	-	SC03T50LLU	22	47	1.0	0.166
-	-	SC03T02LLB	20	28	0.3	0.018
SC04B09	-	-	22	42	1.0	-
-	-	SC0440LLU	25	39	1.0	0.108
SC04A31	-	-	25	42	1.0	0.068
SC04A34	-	-	25	47	0.6	0.079
SC04A47	-	-	25	47	0.6	0.116
SC04A50	-	-	26	44	1.0	0.105
SC04A86	-	-	29	49	1.1	0.166
SC632201	-	-	28.5	49.5	1.5	0.166
SC05T52*	-	-	30	51	0.6	-
		SC05T03LLB*	30	51	0.6	-
SC05T51	-	-	30	51	0.6	0.128
SC05A97	-	-	30	51	0.6	0.125
SC0563*	-	-	30	55	0.6	-
SC06T02	-	-	35	57	1.0	-
SC07B37	-	-	41.5	65.5	1.0	0.241
-	SX6A54ZZ	-	8	17	0.3	0.010
SX01A36	-	-	16	28	0.6	0.037
SX01T50	-	-	16	28	0.6	0.037
-	SX02A26ZZ	-	19	31	0.6	0.041
SX05A81*	-	-	29	43	0.3	-
99502	99502HV	99502H	19	31	0.6	0.044

Miniature and Extra Small Ball Bearings

d 1.5~9mm



Open type

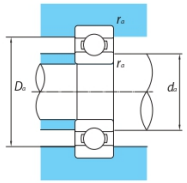


Shielded type (ZZ)

Non-contact sealed type (LLB)

Low torque sealed type (LLH)

Contact sealed type (LLU)



Equivalent bearing load

dynamic

$P_r = XF_r + YF_a$

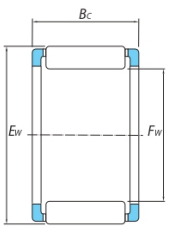
$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.010	0.18	1	0	0.56	2.46
0.020	0.20				2.14
0.040	0.24				1.83
0.070	0.27				1.61
0.10	0.29				1.48
0.15	0.32				1.35
0.20	0.35				1.25
0.30	0.38				1.13

static

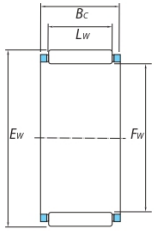
$P_{or} = 0.6F_r + 0.5F_a$ When $P_{or} < F_r$ use $P_{or} = F_r$

Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting speeds (rpm)				Bearing Numbers					Abutment and Fillet Dimensions (mm)				Weight (kg)
				Dynamic	Static		Grease		Oil										
d	D	B	$r_{s\,min}$	C_r	C_{or}	Open Z, ZZ LB, LLB	LLH	LU LLU	Open Z, LB	Open type	Shield ZZ	Seal non-contact LLB	Low torque type LLH	Seal contact LLU	d_a min	d_a max	D_a max	r_{as} max	Open (Approx)
6	19	6	0.3	2340	885	34000	36500	30000	40000	626	ZZ	LLB	LLH	LLU	8	9.5	17	0.3	0.009
7	19	6	0.3	2240	910	34000	33300	27800	40000	607	ZZ	LLB	LLH	LLU	9	10.4	17	0.3	0.008
	22	7	0.3	3350	1400	32000	-	23600	37000	627	ZZ	LLB	-	LLU	9	12.2	20	0.3	0.013
8	22	7	0.3	3350	1400	32000	28000	23000	37000	608	ZZ	LLB	LLH	LLU	10	12.2	20	0.3	0.012
	24	8	0.3	4000	1590	31000	-	-	36000	628	ZZ	-	-	-	10	12.1	22	0.3	0.017
	28	9	0.3	5100	2390	29000	-	20700	34000	638	ZZ	-	-	LLU	10	13.9	24	0.3	0.027
9	20	6	0.3	2480	1090	32000	-	-	38000	699	ZZ	LLB	-	-	11	11.6	18	0.3	0.008
	24	7	0.3	3400	1450	31000	-	22000	36000	609	ZZ	LLB	-	LLU	11	13.1	22	0.3	0.014
	26	8	0.3	4550	1960	30000	-	20700	35000	629	ZZ	LLB	-	LLU	13	13.9	22	0.3	0.020

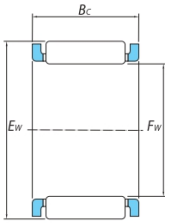
Needle Roller Bearings



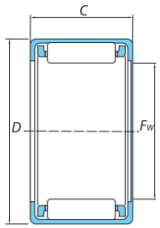
TYPE PK



TYPE KBK



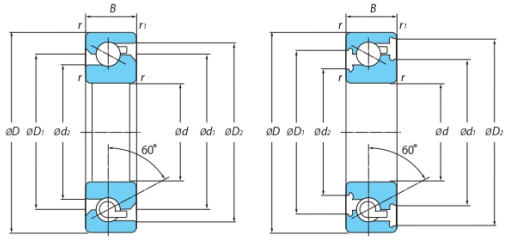
TYPE K



TYPE HKS

Boundary Dimensions (mm)				Basic Load Ratings				Bearing numbers	Weight (kg)
F_w	E_w	B_c $^{0}_{-0.2}$	L_w	C_r (N)	C_r (Kgf)	C_{or} (N)	C_{or} (Kgf)		
18	24	11.8	7.8	11300	1150	12400	1260	PK18×24×11.8	0.011
25	30	14.8	11.8	15100	1540	22800	2330	PK25×30×14.8 X	0.0147
25.1	30.1	13.8	10.8	14300	1450	20800	2120	PK25.1×30.1×13.8 X2	0.0145
26	31	13.8	10.8	14200	1450	20900	2130	PK26×31×13.8X31	0.015
28	33	13.8	10.8	15100	1540	23100	2360	PK28×33×13.8 X	0.0153
28	35	13.8	10.8	17800	1820	22800	2330	PK28×35×13.8 X1	0.023
12	17	14.2	11.8	9750	995	10400	1060	KBK12×17×14.2 X2	0.0058
28	32	17	13.8	15300	1560	27500	2810	K28×32×17	0.017
17	25	18	10.8	13400	1360	15200	1550	HKS17×25×18	0.024
20	29	18	10.3	14100	1440	15300	1560	HKS20×29×18	0.0277

Angular Contact Ball Bearings BS Series | d 17~60mm



Open Type Sealed Type

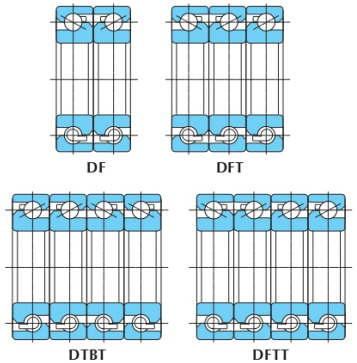


Table 1.1 Value of Factors X and Y

Normal Contact Angle	$\frac{i f_0 F_a}{C_{0r}}$	e	Single, DT				DB or DF			
			Fa/Fr ≤ e		Fa/Fr>e		Fa/Fr ≤ e		Fa/Fr>e	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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

Table 2.1 Static Equivalent Load Po=XoFr+YoFa

Contact Angle	Single, DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity	
					Dynamic C_a		Static C_{0a}			
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)
17	47	15	1.0	0.6	24.2	2470	37.5	3850	25.7	2620
20	47	15	1.0	0.6	24.2	2470	37.5	3850	25.7	2620
25	62	15	1.0	0.6	29.2	2980	59.0	6050	40.0	4100
30	62	15	1.0	0.6	29.2	2980	59.0	6050	40.0	4100
35	72	15	1.0	0.6	30.5	3150	70.0	7150	47.5	4850
40	72	15	1.0	0.6	30.5	3150	70.0	7150	47.5	4850
45	75	15	1.0	0.6	32.0	3300	77.0	7900	52.0	5350
40	90	20	1.0	0.6	58.5	6000	130	13300	88.0	9000
45	100	20	1.0	0.6	62.0	6350	153	15600	104	10600
50	100	20	1.0	0.6	62.0	6350	153	15600	104	10600
60	120	20	1.0	0.6	66.0	6750	183	18700	124	12700

Limiting Speeds n_L(min^{-1})		Reference Dimensions				Space Capacity (cm³)	Weight (kg)	Bearing Numbers Type
Grease	Oil	d_1	d_2	D_1	D_2	Open (Approx)	Open (Approx)	
10300	13700	30.6 33.4	24.2 27.1	35.9 33.7	42.5 40.2	3.3	0.129	BS1747 LLE* BS1747
10300	13700	30.6 33.4	24.2 27.1	35.9 33.7	42.5 40.2	3.3	0.118	BS2047 LLE BS2047
7200	9600	45.0 47.9	38.7 41.6	50.4 48.2	57.3 55.2	4.6	0.231	BS2562 LLE BS2562
7200	9600	45.0 47.9	38.7 41.6	50.4 48.2	57.3 55.2	4.6	0.205	BS3062 LLE BS3062
6500	8600	53.0 55.8	46.7 49.5	58.5 56.3	65.0 63.2	5.4	0.284	BS3572 LLE BS3572
6500	8600	53.0 55.8	46.7 49.5	58.5 56.3	65.0 63.2	5.4	0.250	BS4072 LLE BS4072
5500	7400	59.4 62.2	52.8 55.6	64.4 62.2	70.9 69.1	6.0	0.254	BS4575 LLE* BS4575
5100	6800	65.1 68.0	54.1 57.0	70.2 68.0	82.1 80.3	12	0.636	BS4090 LLE* BS4090
4400	6200	75.8	70.1	86.2	92.6	13	0.842	BS45100
4400	5800	75.8	70.1	86.2	92.6	13	0.778	BS50100
3700	4400	90.8	85.1	101.2	107.6	16	1.16	BS60120

Angular Contact Ball Bearings Special series | d 8~100mm

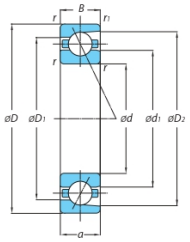
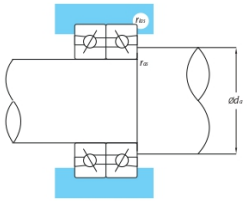


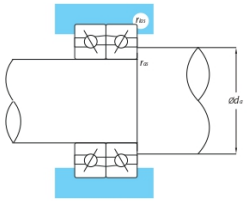
Table 1.1 Value of Factors X and Y

Normal Contact Angle	$i\frac{F_a}{C_{or}}$*	e	Single, DT				DB or DF			
			Fa/Fr≤e		Fa/Fr>e		Fa/Fr≤e		Fa/Fr>e	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load $P_0=X_0F_r+Y_0F_a$

Contact Angle	Single, DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type
					Dynamic C_r		Static C_{or}				
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)	
8	22	10.31	0.3	0.15	3.50	360	1.54	157	1.41	144	5S1-SF8AT01C
8	22	7	0.3	0.15	3.30	340	1.44	147	1.02	104	708A*
8	22	7	0.3	0.15	3.50	355	1.50	153	1.29	132	708C*
15	35	11	0.6	0.3	8.45	865	4.40	445	2.99	305	7202A
17	30	8	0.3	0.15	6.20	635	6.30	645	6.75	690	5S1-SF03T01C
17	40	14	0.6	0.3	11.1	1140	6.20	630	4.00	410	7203A
20	47	14	1	0.6	12.9	1310	7.20	730	5.75	590	7204A
25	52	15	1	0.6	14.6	1490	9.10	925	6.95	710	7205A
35	72	17	1.1	0.6	29.1	2970	19.1	1950	15.5	1580	7207AD
40	80	18	1.1	0.6	34.5	3500	24.0	2450	22.1	2260	7208AD
50	90	20	1.1	0.6	40.5	4150	30.0	3050	23.5	2400	7210AD
70	110	20	1.1	0.6	32.0	3250	33.5	3400	70.5	7200	HS014AD*
100	150	45	1.5	1.0	58.5	6000	134	13700	82.0	8400	BT020A DB
100	150	45	1.5	1.0	72.0	7300	158	16200	80.0	8200	BT020B DB

Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm³)	Weight (kg)
a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{las} max	Open (Approx)	Open (Approx)
7.2	92400	140400	12.8	-	17.5	19.2	10.5	19.5	-	0.3	-	0.8	0.015
7.8	50000	67000	12.8	-	17.5	19.1	10.5	19.5	-	0.3	-	0.8	0.012
5.5	77000	117000	12.8	-	17.5	19.1	10.5	19.5	-	0.3	-	0.8	0.012
12.7	22000	29000	21.8	-	28.9	31.3	19.5	30.5	32.5	0.6	0.3	1.5	0.045
7	38000	51000	21.1	-	25.9	28.4	19.5	27.5	28.8	0.3	0.15	1.3	0.025
14.2	19000	26000	25	-	32	35.51	21.5	35.5	37.5	0.6	0.3	2.1	0.065
16.7	17000	23000	29.2	-	38.5	41.9	25.5	41.5	42.5	1	0.6	3.1	0.10
13	14000	19000	33.9	-	43.3	46.8	30.5	46.5	47.5	1	0.6	4.1	0.12
18.5	14100	18300	46.8	-	60.2	64.57	42	65	67.5	1	0.6	8.8	0.28
20.5	12600	16300	53	-	67.1	71.7	47	73	75.5	1	0.6	11	0.35
23.3	10800	14000	63.1	-	78	82.5	57	83	85.5	1	0.6	17	0.45
30.8	13400	18900	84.3	81.1	95.3	99.3	76	104	106.2	1.1	0.6	20	0.64
74.9	5300	6600	118.2	114.2	131.6	137.9	108.5	141.5	144.5	1.5	1.0	81	2.62
58.6	4600	5700	118.7	113.8	131.3	137.3	108.5	141.5	144.5	1.5	1.0	81	2.01

Angular Contact Ball Bearings 70C Series | d 10~100mm

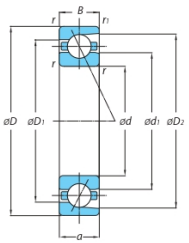
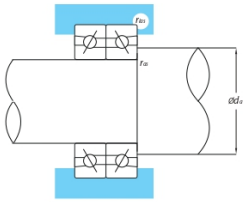


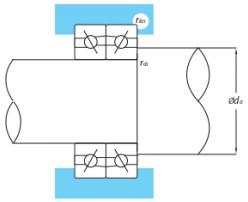
Table 1.1 Value of Factors X and Y

Normal Contact Angle	iF_a/C_{or}*	e	Single, DT				DB or DF			
			$F_a/F_r \le e$		$F_a/F_r > e$		$F_a/F_r \le e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load $P_0=X_0F_r+Y_0F_a$

Contact Angle	Single, DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type
					Dynamic C_r		Static C_{or}				
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)	
10	26	8	0.3	0.15	5.30	540	2.45	250	4.50	450	7000C
12	28	8	0.3	0.15	5.40	555	2.63	269	5.25	540	7001C
15	32	9	0.3	0.15	6.20	635	3.35	345	6.35	650	7002C
17	35	10	0.3	0.15	6.55	670	3.80	390	5.90	605	7003C
20	42	12	0.6	0.3	11.1	1130	6.55	670	10.2	1040	7004C
25	47	12	0.6	0.3	11.7	1190	7.40	755	11.2	1140	7005C
30	55	13	1.0	0.6	15.1	1540	10.3	1050	15.7	1600	7006C
35	62	14	1.0	0.6	19.1	1950	13.7	1400	20.6	2100	7007C
40	68	15	1.0	0.6	20.6	2100	15.9	1620	22.5	2300	7008C
45	75	16	1.0	0.6	24.4	2490	19.3	1970	27.9	2850	7009C
50	80	16	1.0	0.6	26.0	2650	21.9	2230	31.0	3200	7010C
55	90	18	1.1	0.6	34.0	3500	28.6	2900	40.5	4150	7011C
60	95	18	1.1	0.6	35.0	3600	30.0	3100	43.0	4400	7012C
65	100	18	1.1	0.6	37.0	3800	34.0	3500	47.5	4850	7013C
70	110	20	1.1	0.6	47.0	4800	43.0	4400	65.0	6640	7014C
75	115	20	1.1	0.6	48.0	4900	45.5	4650	65.5	6700	7015C
80	125	22	1.1	0.6	58.5	6000	55.5	5650	79.0	8100	7016C
85	130	22	1.1	0.6	60.0	6150	58.5	6000	83.0	8500	7017C
90	140	24	1.5	1.1	71.5	7300	69.0	7000	101	10300	7018C
95	145	24	1.5	1.1	73.5	7500	73.0	7450	103	10500	7019C
100	150	24	1.5	1.1	75.5	7700	77.0	7900	118	11400	7020C

Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm³)	Weight (kg)
a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{las} max	Open (Approx)	Open (Approx)
6.0	63900	97300	15.4	-	20.6	22.9	12.5	23.5	24.8	0.3	0.15	0.9	0.019
6.5	57500	87500	18.1	-	22.6	25.4	14.5	25.5	26.8	0.3	0.15	1	0.021
7.5	49000	74500	21.1	-	26.1	28.5	17.5	29.5	30.8	0.3	0.15	1.3	0.030
8.5	44300	67400	23.4	-	28.6	31.0	19.5	32.5	33.8	0.3	0.15	1.8	0.037
10.0	37100	56500	27.5	-	34.5	37.7	24.5	37.5	39.5	0.6	0.3	2.9	0.067
11.0	32000	48700	32.5	-	39.5	42.7	29.5	42.5	44.5	0.6	0.3	3.3	0.079
12.0	27100	41200	38.6	-	46.4	50.0	35.5	49.5	50.5	1.0	0.6	4.8	0.11
13.5	23800	36100	44.2	-	52.8	56.9	40.5	56.5	57.5	1.0	0.6	6.3	0.15
15.0	21300	32500	49.6	-	58.3	62.4	45.5	62.5	63.5	1.0	0.6	7.4	0.19
16.0	19200	29200	55.2	-	64.8	69.2	50.5	69.5	70.5	1.0	0.6	9.4	0.24
16.0	17700	27000	60.2	-	69.8	74.2	55.5	74.5	75.5	1.0	0.6	11	0.26
19.0	15900	24200	66.8	-	78.1	83.4	62	83	85.5	1.0	0.6	16	0.38
19.5	14900	22600	71.8	-	83.1	88.4	67	88	90.5	1.0	0.6	17	0.41
20.0	14000	21300	76.8	-	88.1	93.4	72	93	95.5	1.0	0.6	18	0.44
22.0	12800	19500	83.6	-	96.4	102.5	77	103	105.5	1.0	0.6	24	0.61
23.0	12200	18500	88.5	-	101.5	107.5	82	108	110.5	1.0	0.6	26	0.64
25.0	11300	17100	95.1	-	109.9	116.7	87	118	120.5	1.0	0.6	34	0.86
25.0	10700	16300	100.1	-	114.9	121.7	92	123	125.5	1.0	0.6	36	0.90
27.0	10000	15300	106.8	-	123.2	130.8	98.5	131.5	134.5	1.5	1.0	47	1.17
28.0	9600	14600	111.7	-	128.2	135.8	103.5	136.5	139.5	1.5	1.0	49	1.22
29.0	9200	14000	116.8	-	133.2	140.8	108.5	141.5	144.5	1.5	1.0	51	1.27

Angular Contact Ball Bearings 70AD Series | d 10~100mm

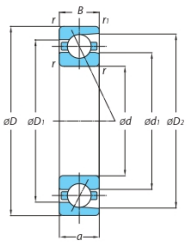
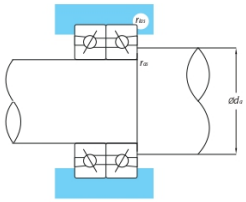


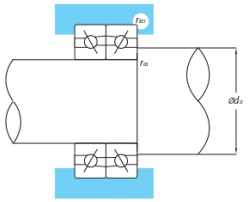
Table 1.1 Value of Factors X and Y

Normal Contact Angle	$i f_0 F_a / C_{or}$*	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	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

Contact Angle	Single, DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type
					Dynamic C_r		Static C_{or}				
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)	
10	26	8	0.3	0.15	5.10	520	2.41	246	2.33	238	7000AD
12	28	8	0.3	0.15	5.20	530	2.53	258	3.10	318	7001AD
15	32	9	0.3	0.15	5.95	605	3.20	330	3.75	385	7002AD
17	35	10	0.3	0.15	6.30	640	3.60	370	3.90	400	7003AD
20	42	12	0.6	0.3	10.5	1080	6.25	640	7.55	770	7004AD
25	47	12	0.6	0.3	11.0	1130	7.05	720	8.20	840	7005AD
30	55	13	1.0	0.6	14.4	1470	9.80	1000	11.5	1180	7006AD
35	62	14	1.0	0.6	18.2	1860	13.0	1330	14.1	1440	7007AD
40	68	15	1.0	0.6	19.5	1990	15.1	1540	16.4	1680	7008AD
45	75	16	1.0	0.6	23.0	2350	18.2	1860	20.6	2100	7009AD
50	80	16	1.0	0.6	24.6	2510	20.7	2120	23.1	2360	7010AD
55	90	18	1.1	0.6	32.0	3300	27.1	2770	30.0	3100	7011AD
60	95	18	1.1	0.6	33.0	3350	29.1	2970	31.0	3200	7012AD
65	100	18	1.1	0.6	35.0	3550	32.0	3300	33.0	3400	7013AD
70	110	20	1.1	0.6	44.0	4500	40.5	4150	42.0	4300	7014AD
75	115	20	1.1	0.6	45.0	4600	43.0	4400	47.0	4800	7015AD
80	125	22	1.1	0.6	55.5	5650	52.0	5350	58.5	5950	7016AD
85	130	22	1.1	0.6	56.5	5800	55.5	5650	61.0	6200	7017AD
90	140	24	1.5	1.1	67.5	6900	65.5	6650	75.0	7650	7018AD
95	145	24	1.5	1.1	69.5	7050	69.0	7050	77.5	7900	7019AD
100	150	24	1.5	1.1	71.0	7250	73.0	7450	82.5	8450	7020AD

Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm³)	Weight (kg)
a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{las} max	Open (Approx)	Open (Approx)
8.2	55000	84700	15.4	-	20.6	22.7	12.5	23.5	24.8	0.3	0.15	0.9	0.019
8.8	49500	76100	18	-	22.9	25.2	14.5	25.5	26.8	0.3	0.15	1	0.021
10.0	42100	64800	21.1	-	25.9	28.2	17.5	29.5	30.8	0.3	0.15	1.3	0.030
11.1	38100	58600	23.4	-	29	30.7	19.5	32.5	33.8	0.3	0.15	1.8	0.037
12.2	31900	49200	27.5	-	34.5	37.3	24.5	37.5	39.5	0.6	0.3	2.9	0.067
14.4	27500	42400	32.5	-	39.5	42.3	29.5	42.5	44.5	0.6	0.3	3.3	0.079
15.9	23300	35800	38.6	-	46.4	49.5	35.5	49.5	50.5	1.0	0.6	4.8	0.11
17.8	20500	31400	44.2	-	52.8	56.3	40.5	56.5	57.5	1.0	0.6	6.3	0.15
19.6	18300	28300	49.6	-	58.3	61.8	45.5	62.5	63.5	1.0	0.6	7.4	0.19
21.5	16500	25400	55.2	-	64.8	68.6	50.5	69.5	70.5	1.0	0.6	9.4	0.24
23.2	15200	23500	60.2	-	69.8	73.6	55.5	74.5	75.5	1.0	0.6	11	0.26
25.9	13700	21100	66.8	-	78.1	82.7	62	83	85.5	1.0	0.6	16	0.38
27.1	12800	19700	71.8	-	83.1	87.6	67	88	90.5	1.0	0.6	17	0.41
28.2	12000	18500	76.8	-	881	92.6	72	93	95.5	1.0	0.6	18	0.44
31.0	11000	17000	83.6	-	96.4	101.7	77	103	105.5	1.0	0.6	24	0.61
22.1	10500	16100	88.5	-	101.5	106.7	82	108	110.5	1.0	0.6	26	0.64
34.9	9700	14900	95.1	-	109.9	115.8	87	118	120.5	1.0	0.6	34	0.86
36.1	9200	14200	100.1	-	114.9	120.8	92	123	125.5	1.0	0.6	36	0.90
38.8	8600	13300	106.8	-	123.2	129.8	98.5	131.5	134.5	1.5	1.0	47	1.17
40.0	8300	12700	111.7	-	128.2	134.8	103.5	136.5	139.5	1.5	1.0	49	1.22
41.1	7900	12200	116.8	-	132.2	139.8	108.5	141.5	144.5	1.5	1.0	51	1.27

Angular Contact Ball Bearings 70A Series | d 10~50mm

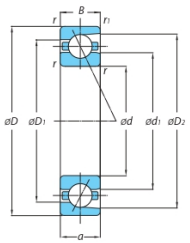
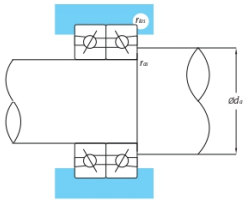


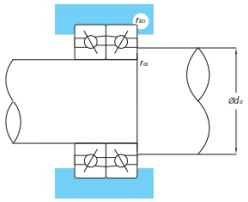
Table 1.1 Value of Factors X and Y

Normal Contact Angle	$i f_0 F_a / C_{or}$*	e	Single, DT				DB or DF			
			$F_a/F_r \le e$		$F_a/F_r > e$		$F_a/F_r \le e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load $P_0 = X_0F_r + Y_0F_a$

Contact Angle	Single, DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type
					Dynamic C_r		Static C_{or}				
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)	
10	26	8	0.3	0.15	5.00	510	2.33	238	2.00	204	7000A
12	28	8	0.3	0.15	5.05	515	2.46	251	2.38	243	7001A
15	32	9	0.3	0.15	5.75	590	3.10	320	2.90	296	7002A
17	35	10	0.3	0.15	6.05	620	3.50	360	3.40	350	7003A
20	42	12	0.6	0.3	10.3	1050	6.05	620	5.75	590	7004A
25	47	12	0.6	0.3	10.7	1100	6.15	630	6.35	650	7005A
30	55	13	1.0	0.6	13.9	1420	9.40	960	9.00	920	7006A
35	62	14	1.0	0.6	17.4	1780	12.5	1280	10.9	1120	7007A
40	68	15	1.0	0.6	18.1	1850	14.2	1450	12.7	1300	7008A
45	75	16	1.0	0.6	22.4	2290	18.6	1900	15.6	1600	7009A
50	80	16	1.0	0.6	23.6	2410	20.0	2040	17.8	1820	7010A

Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm³)	Weight (kg)
a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{las} max	Open (Approx)	Open (Approx)
9.2	46600	60300	15.4	-	20.3	22.7	12.5	23.5	24.8	0.3	0.15	0.9	0.019
10	41900	54200	18.1	-	22.9	25.4	14.5	25.5	26.8	0.3	0.15	1	0.021
11.5	35700	46100	21.1	-	25.9	28.4	17.5	29.5	30.8	0.3	0.15	1.3	0.030
16	32300	41800	23.4	-	28.6	31	19.5	32.5	33.8	0.3	0.15	1.8	0.037
14.9	27000	35000	27.5	-	34.5	37.2	24.5	37.5	39.5	0.6	0.3	2.9	0.067
16.4	23300	30200	32.5	-	39.5	42.2	29.5	42.5	44.5	0.6	0.3	3.3	0.079
18.8	19800	25500	38.6	-	46.4	49.5	35.5	49.5	50.5	1.0	0.6	4.8	0.11
21.0	17400	22400	44.2	-	52.8	56.3	40.5	56.5	57.5	1.0	0.6	6.3	0.15
23.1	15500	20100	49.6	-	58.3	61.8	45.5	62.5	63.5	1.0	0.6	7.4	0.19
25.8	14000	18100	55.2	-	64.8	68.6	50.5	69.5	70.5	1.0	0.6	9.4	0.24
28.2	12900	16700	60.2	-	69.8	73.6	55.5	74.5	75.5	1.0	0.6	11	0.26

Angular Contact Ball Bearings HS CE1 Series | d 10~100mm

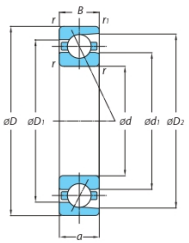
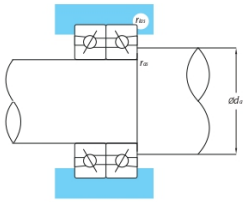


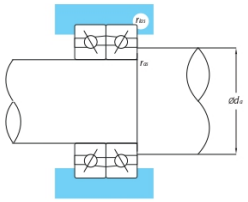
Table 1.1 Value of Factors X and Y

Normal Contact Angle	$i f_0 F_a / C_{or}$*	e	Single, DT				DB or DF			
			$F_a/F_r \le e$		$F_a/F_r > e$		$F_a/F_r \le e$		$F_a/F_r > e$	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load $P_0 = X_0 F_r + Y_0 F_a$

Contact Angle	Single, DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type	Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm^3)	Weight (kg)
					Dynamic C_r		Static C_{or}																		
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)		a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{1as} max	Open (Approx)	Open (Approx)
10	26	8	0.3	0.15	2.07	212	1.57	160	2.00	204	HS000CE1	7.0	77900	119800	16.3	13.4	19.8	22.5	14	12	12.6	0.3	0.15	0.5	0.019
12	28	8	0.3	0.15	2.06	210	1.59	163	2.06	210	HS001CE1	7.2	65900	101400	18.3	15.0	21.8	24.9	16.5	24.5	25.1	0.3	0.15	0.6	0.021
15	32	9	0.3	0.15	2.85	291	2.40	245	3.05	315	HS002CE1	8.0	53900	82900	21.6	18.5	25.6	28.5	19	29	30.5	0.3	0.15	0.9	0.028
17	35	10	0.3	0.15	2.92	298	2.60	265	3.30	340	HS003CE1	9.0	47900	73700	24.1	20.2	28.1	31.8	21	32	32.6	0.3	0.15	1.3	0.035
20	42	12	0.6	0.3	4.70	480	4.50	460	5.75	590	HS004CE1	11.0	40100	61700	28.6	24.3	33.6	37.7	25	37	38.2	0.6	0.3	2.2	0.065
25	47	12	0.6	0.3	4.80	490	4.90	500	6.25	640	HS005CE1	12.0	33500	51600	33.6	29.3	38.6	42.7	30	42	43.2	0.6	0.3	2.5	0.078
30	55	13	1.0	0.6	10.4	1070	10.0	1020	12.8	1310	HS006CE1	13.0	35900	55300	38.7	35.7	46.3	49.2	34.6	50.4	52.4	1.0	0.6	3.9	0.11
35	62	14	1.0	0.6	12.9	1320	12.7	1300	16.2	1660	HS007CE1	15.0	29900	46100	44.2	40.9	52.8	56.0	39.6	57.4	59.4	1.0	0.6	4.8	0.15
40	68	15	1.0	0.6	13.7	1400	14.5	1480	18.6	1900	HS008CE1	16.0	27000	41500	49.7	46.4	58.2	61.6	44.6	63.4	65.4	1.0	0.6	5.9	0.19
45	75	16	1.0	0.6	14.4	1470	16.2	1660	20.8	2130	HS009CE1	18.0	24600	37800	55.7	52.2	64.2	67.6	49.6	70.4	72.4	1.0	0.6	8.1	0.24
50	80	16	1.0	0.6	17.5	1790	20.1	2050	25.8	2630	HS010CE1	19.0	22800	35000	60.2	56.6	69.8	73.4	54.6	75.4	77.4	1.0	0.6	8.8	0.25
55	90	18	1.1	0.6	18.7	1910	24.4	2490	30.0	3100	HS011CE1	21.0	19200	29500	67.7	63.9	77.3	81.0	61	84	86.2	1.1	0.6	12	0.40
60	95	18	1.1	0.6	19.0	1940	24.6	2510	31.0	3200	HS012CE1	21.5	18000	27600	72.7	68.9	82.3	86.0	66	89	91.2	1.1	0.6	13	0.42
65	100	18	1.1	0.6	22.7	2320	29.4	3000	38.0	3900	HS013CE1	22.5	16800	25800	77.3	73.2	87.7	91.8	71	94	96.2	1.1	0.6	14	0.45
70	110	20	1.1	0.6	26.4	2700	35.0	3600	45.0	4600	HS014CE1	24.5	15600	24000	84.3	79.8	95.3	100.1	76	104	106.2	1.1	0.6	20	0.64
75	115	20	1.1	0.6	26.9	2750	36.5	3750	48.0	4900	HS015CE1	25.5	14400	22100	89.3	84.8	100.7	105.1	81	109	111.2	1.1	0.6	20	0.67
80	125	22	1.1	0.6	35.0	3600	47.5	4850	61.5	6300	HS016CE1	28.0	12900	19900	95.8	90.7	109.2	114.3	86	119	121.2	1.1	0.6	27	0.85
85	130	22	1.1	0.6	35.5	3650	50.0	5100	64.5	6600	HS017CE1	28.5	12600	19400	100.8	95.7	114.2	119.3	91	124	126.2	1.1	0.6	28	0.90
90	140	24	1.5	1.1	37.0	3800	53.5	5500	70.0	7150	HS018CE1	31.0	11600	17900	108.3	103.0	121.7	126.9	97	113	116	1.5	1.1	37	1.20
95	145	24	1.5	1.1	46.0	4700	65.0	6650	83.5	8550	HS019CE1	31.5	11100	17100	112.4	106.6	127.6	133.4	102	138	141	1.5	1.1	38	1.25
100	150	24	1.5	1.1	46.5	4750	68.0	6950	87.5	8950	HS020CE1	32.0	10700	16500	117.4	111.6	132.6	138.4	107	143	146	1.5	1.1	40	1.30

Angular Contact Ball Bearings 72C Series | d 10~100mm

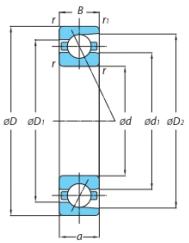
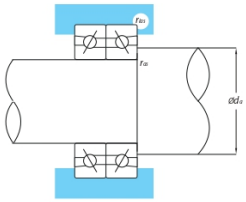


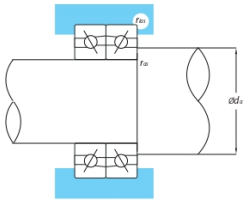
Table 1.1 Value of Factors X and Y

Normal Contact Angle	$i\frac{F_a}{C_{or}}$*	e	Single DT				DB or DF			
			Fa/Fr≤e		Fa/Fr>e		Fa/Fr≤e		Fa/Fr>e	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load $P_0=X_0F_r+Y_0F_a$

Contact Angle	Single DT		DB or DF	
	X_0	Y_0	X_0	Y_0
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type
					Dynamic C_r		Static C_{or}				
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)	
10	30	9	0.6	0.3	5.40	555	2.63	269	1.01	103	7200C
12	32	10	0.6	0.3	7.05	720	3.45	355	1.58	162	7201C
15	35	11	0.6	0.3	8.95	915	4.50	460	1.89	193	7202C
17	40	12	0.6	0.3	11.1	1140	5.75	590	2.66	272	7203C
20	47	14	1.0	0.6	14.6	1490	8.15	835	3.65	375	7204C
25	52	15	1.0	0.6	16.5	1690	10.3	1050	3.75	385	7205C
30	62	16	1.0	0.6	23.0	2350	14.7	1500	7.10	725	7206C
35	72	17	1.1	0.6	30.0	3100	19.9	2030	10.6	1090	7207C
40	80	18	1.1	0.6	36.0	3700	25.2	2570	14.4	1470	7208C
45	85	19	1.1	0.6	40.5	4150	28.8	2940	14.8	1510	7209C
50	90	20	1.1	0.6	42.5	4350	31.5	3250	15.3	1560	7210C
55	100	21	1.5	1.0	52.5	5400	40.0	4100	21.5	2200	7211C
60	110	22	1.5	1.0	64.0	6550	49.5	5050	26.0	2660	7212C
65	120	23	1.5	1.0	69.5	7100	54.5	5600	28.5	2910	7213C
70	125	24	1.5	1.0	76.0	7750	60.0	6150	30.5	3150	7214C
75	130	25	1.5	1.0	79.0	8100	65.5	6700	33.0	3400	7215C
80	140	26	2.0	1.0	92.5	9450	77.0	7900	34.5	3550	7216C
85	150	28	2.0	1.0	103	10600	90.0	9200	46.5	4750	7217C
90	160	30	2.0	1.0	122	12500	104	10700	53.0	5450	7218C
95	170	32	2.1	1.1	139	14200	119	12200	62.0	6350	7219C
100	180	34	2.1	1.1	149	15200	126	12900	66.5	6800	7220C

Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm³)	Weight (kg)
a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{las} max	Open (Approx)	Open (Approx)
7.0	42900	55600	17.4	-	23.0	26.2	14.5	25.5	27.5	0.6	0.3	0.9	0.029
8.0	40000	51800	18.7	-	25.7	28.2	16.5	27.5	29.5	0.6	0.3	1.3	0.036
9.0	35200	45600	21.7	-	28.7	31.3	19.5	30.5	32.5	0.6	0.3	1.5	0.045
10.0	30500	39600	24.8	-	32.7	35.7	21.5	35.5	37.5	0.6	0.3	2.1	0.062
11.5	25500	33000	29.2	-	38.5	41.9	25.5	41.5	42.5	1.0	0.6	3.1	0.10
13.0	22600	29200	34.2	-	43.5	47.0	30.5	46.5	47.5	1.0	0.6	4.1	0.12
14.0	18900	24500	40.8	-	52.0	56.0	35.5	56.5	57.5	1.0	0.6	6.6	0.19
16.0	16400	21300	47.4	-	60.5	65.2	42	65	67.5	1.0	0.6	8.8	0.27
17.0	14700	19000	53.5	-	67.5	72.4	47	73	75.5	1.0	0.6	11	0.35
18.0	13500	17500	58.1	-	73.0	78.4	52	78	80.5	1.0	0.6	14	0.40
19.0	12600	16300	63.1	-	78.0	82.5	57	83	85.5	1.0	0.6	17	0.45
21.0	11400	14700	69.7	-	86.5	91.5	63.5	91.5	94.5	1.5	1.0	21	0.59
22.0	10200	13200	76.3	-	95.0	100.5	68.5	101.5	104.5	1.5	1.0	28	0.76
24.0	9500	12300	83.4	-	103.0	109.5	73.5	111.5	114.5	1.5	1.0	34	0.95
25.0	9000	11700	87.9	-	108.5	114.5	78.5	116.5	119.5	1.5	1.0	40	1.04
26.0	8500	11000	92.9	-	113.5	119.6	83.5	121.5	124.5	1.5	1.0	43	1.14
28.0	8000	10400	99.6	-	121.9	128.6	90	130	134.5	2.0	1.0	54	1.39
30.0	7500	9700	106.2	-	130.5	137.7	95	140	144.5	2.0	1.0	63	1.73
32.0	7000	9100	112.9	-	138.9	146.7	100	150	154.5	2.0	1.0	80	2.13
34.0	6600	8600	119.5	-	147.4	155.8	107	158	163	2.0	1.0	96	2.58
36.0	6300	8100	126.2	-	155.9	164.8	112	168	173	2.0	1.0	119	3.21

Angular Contact Ball Bearings 72A Series | d 10~50mm

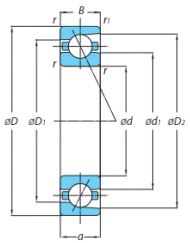
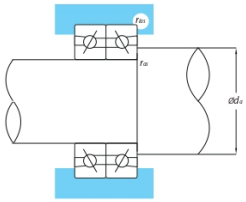


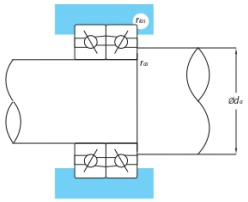
Table 1.1 Value of Factors X and Y

Normal Contact Angle	$i\frac{f_0F_a}{C_{or}}$*	e	Single, DT				DB or DF			
			Fa/Fr≤e		Fa/Fr>e		Fa/Fr≤e		Fa/Fr>e	
			X	Y	X	Y	X	Y	X	Y
15	0.178	0.38	1	0	0.14	1.47	1	1.65	0.72	2.39
	0.357	0.4				1.4		1.57		2.28
	0.714	0.43				1.3		1.46		2.11
	1.07	0.46				1.23		1.38		2
	1.43	0.47				1.19		0.34		1.93
	2.14	0.5				1.12		0.26		1.82
	3.57	0.55				1.02		1.14		1.66
	5.35	0.56				1		1.12		1.63
18		0.57	1	0	0.43	1	1	1.09	0.7	1.63
25		0.68	1	0	0.41	0.87	1	0.92	1.67	1.41
30		0.8	1	0	0.39	0.76	1	0.78	1.63	1.24
40		1.14	1	0	0.35	0.57	1	0.55	0.57	0.93
50		1.49			0.73	1	1.37	0.57	0.73	
55		1.79			0.81	1	1.6	0.56	0.81	
60		2.17			0.92	1	1.9	0.55	0.92	

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



Back-to-back
(DB)



Face-to-face
(DF)

Table 2.1 Static Equivalent Load Po=XoFr+YoFa

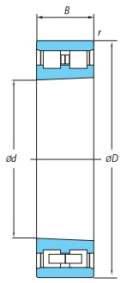
Contact Angle	Single, DT		DB or DF	
	X_o	Y_o	X_o	Y_o
15	0.5	0.46	1	0.92
18	0.5	0.42	1	0.84
25	0.5	0.38	1	0.76
30	0.5	0.33	1	0.66
40	0.5	0.26	1	0.52

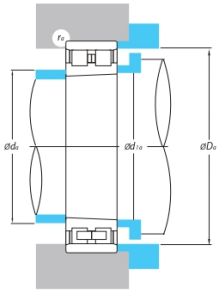
Boundary Dimensions (mm)					Basic Load Ratings				Static Axial Load Capacity		Bearing Numbers Type
					Dynamic C_r		Static C_{or}				
d	D	B	$r_{s\,min}$	$r_{1s\,min}$	(KN)	(Kgf)	(KN)	(Kgf)	(KN)	(Kgf)	
10	30	9	0.6	0.3	5.05	515	2.45	250	1.92	196	7200A
12	32	10	0.6	0.3	6.67	680	3.24	330	2.73	278	7201A
15	35	11	0.6	0.3	8.44	860	4.27	432	3.04	310	7202A
17	40	12	0.6	0.3	10.5	1070	5.40	550	4.07	415	7203A
20	47	14	1.0	0.6	13.6	1390	7.55	770	5.79	590	7204A
25	52	15	1.0	0.6	15.4	1570	9.47	965	6.97	710	7205A
30	62	16	1.0	0.6	21.3	2170	13.6	1390	9.22	940	7206A
35	72	17	1.1	0.6	28.2	2870	18.5	1890	12.8	1300	7207A
40	80	18	1.1	0.6	33.8	3450	20.7	2110	15.9	1620	7208A
45	85	19	1.1	0.6	37.8	3850	26.8	2730	18.1	1840	7209A
50	90	20	1.1	0.6	39.7	4050	29.3	2990	19.4	1980	7210A

Load Center (mm)	Limiting Speeds n_L(min^{-1})		Reference Dimensions				Abutment and Dimensions (mm)					Space Capacity (cm³)	Weight (kg)
a	Grease	Oil	d_1	d_2	D_1	D_2	d_a min	D_a max	D_b max	r_{as} max	r_{las} max	Open (Approx)	Open (Approx)
10.3	27700	36000	17.4	-	23.0	26.2	14.5	25.5	27.5	0.6	0.3	0.9	0.029
11.4	25800	33500	18.7	-	25.7	28.2	16.5	27.5	29.5	0.6	0.3	1.3	0.036
12.7	22700	29400	21.7	-	28.7	31.3	19.5	30.5	32.5	0.6	0.3	1.5	0.045
14.2	19700	25500	24.8	-	32.7	35.7	21.5	35.5	37.5	0.6	0.3	2.1	0.062
16.7	16400	21300	29.2	-	38.5	41.9	25.5	41.5	42.5	1.0	0.6	3.1	0.10
18.6	14600	18800	34.2	-	43.5	47.0	30.5	46.5	47.5	1.0	0.6	4.1	0.12
21.3	12200	15800	40.8	-	52.0	56.0	35.5	56.5	57.5	1.0	0.6	6.6	0.19
23.9	10600	13700	47.4	-	60.5	65.2	42.0	65.0	67.5	1.0	0.6	8.8	0.27
26.3	9480	12300	53.5	-	67.5	72.4	47.0	73.0	75.5	1.0	0.6	11	0.35
28.4	8700	11300	58.1	-	73.0	78.4	52.0	78.0	80.5	1.0	0.6	14	0.40
30.2	8120	10500	63.1	-	78.0	82.5	57.0	83.0	85.5	1.0	0.6	17	0.45

Cylindrical Roller Bearings

d 80~130mm





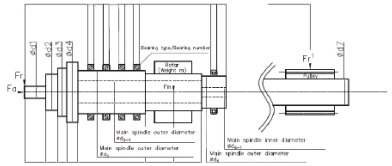
Boundary Dimensions (mm)				Basic Load Ratings				Circumscribed circle diameter of roller (mm)	Bearing Numbers Type
				Dynamic C_r		Static C_{or}			
d	D	B	r	(KN)	(Kgf)	(KN)	(Kgf)		
80	125	34	1.1	118	12000	182	18600	113	NN3016K
90	140	37	1.5	146	14900	232	23600	127	NN3018K
100	150	37	1.5	156	15900	261	26600	137	NN3020K
110	170	45	2	234	23900	382	38900	155	NN3022K
120	180	46	2	238	24300	400	40800	165	NN3024K
130	200	52	2	291	29700	486	49500	182	NN3026K

Limiting Speeds n_L(min^{-1})		Abutment and Dimensions (mm)					Space Capacity (cm^3)	Weight (kg)
Grease	Oil	d_a min	D_{1a} min	D_a max	D_a min	r_a max	Open (Approx)	Open (Approx)
6800	8300	86.5	87	118.5	115	1.0	45	1.47
6000	7300	98	99	132	129	1.5	64.1	2.01
5600	6700	108	109	142	139	1.5	67.5	2.19
5000	6000	119	121	161	157	2.0	115	3.56
4600	5600	129	131	171	167	2.0	130	3.83
4200	5100	139	141	191	185	2.0	182	5.71

Appendix I Required Information for Ball Screw Support Bearings Selection

(1) Ball Screw Support Type	☐ Two-ends support ☐ One-end support ☐ Pretension
(2) Ball Screw Support Bearing	Installation type: ☐ Fixed-Support ☐ Fixed-Free ☐ Fixed-Fixed Fixed-end bearing: ☐ ACBB Support-end bearing: ☐ ACBB ☐ DGBB ☐ NRB Fixed-end arrangement: ☐ DB/DF ☐ DBT/DFT ☐ DTBT/DTFT Support-end arrangement: ☐ Single ☐ DB/DF ☐ Others
(3) Lubrication method	☐ Grease ☐ Air-oil
(4) Load conditions (machining conditions)	Max. speed: _____ Min-1 Radial load Fr: _____ N Axial load Fa: _____ N Moment: _____ N-mm Tightening force: _____ N
(5) Shaft and Housing	Shaft material: _____ Shaft tolerance: _____ mm Housing material: _____ Housing tolerance: _____ mm Housing outer diameter: _____ mm Hollow shaft bore diameter: _____ mm Fits on shaft : _____ mm Fits on housing : _____ mm Spacer length: _____ mm Ambient temperature: _____°C
(6) Requirement Value	Rigidity: _____ N/um Preload: _____ N Starting Torque: _____ N-mm Life: _____ hours
(7) Specific Requests	

Appendix II Required Information for Spindle Bearings Selection

(1) Machine Type	☐ NC Lathe ☐ Machine center ☐ Grinding Machine ☐ Others _____
(2) Main spindle orientation	☐ Vertical ☐ Horizontal ☐ Variable-direction ☐ Inclined ☐ Others _____
(3) Diameter of main spindle	☐ #30 ☐ #40 ☐ #50 ☐ Others _____
(4) Shape and mounting-related dimension of main spindle	
(5) Intended bearing type, dimension and preload method	Front: ☐ Cylindrical roller type ☐ Angular contact type [**☐ sealing] Rear: ☐ Cylindrical roller type ☐ Angular contact type [**☐ sealing] Preloading system: ☐ Fixed-position ☐ Fixed-pressure
(6) Slide system free side	☐ Cylindrical roller bearing ☐ Ball bushing (availability of cooling)
(7) Lubrication method	☐ Grease ☐ Air-oil ☐ Oil mist
(8) Drive system	☐ built-in motor ☐ Belt drive ☐ Coupling
(9) Presence/absence of jacket cooling arrangement on bearings area	☐ YES ☐ NO
(10) Load conditions (machining conditions)	Max. speed: _____ Min-1 Radial load Fr: _____ N Axial load Fa: _____ N Moment: _____ N-mm Tightening force: _____ N
(11) Shaft and Housing	Shaft material: _____ Shaft tolerance: _____ mm Housing material: _____ Housing tolerance: _____ mm Housing outer diameter: _____ mm Hollow shaft bore diameter: _____ mm Fits on shaft : _____ mm Fits on housing : _____ mm Spacer length: _____ mm Ambient temperature: _____°C
(12) Requirement Value	Rigidity: _____ N/um Preload: _____ N Life: _____ hours
(13) Specific Request	

Appendix III Dimensional tolerance for housing bore and shaft

Dimensional tolerance for shaft | Unit: μm

Diameter division d(mm)		f5		f6		g5		g6		h4		h5		h6	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	-10	-15	-10	-18	-4	-9	-4	-12	0	-4	0	-5	0	-8
6	10	-13	-19	-13	-22	-5	-11	-5	-14	0	-4	0	-6	0	-9
10	18	-16	-24	-16	-27	-6	-14	-6	-17	0	-5	0	-8	0	-11
18	30	-20	-29	-20	-33	-7	-16	-7	-20	0	-6	0	-9	0	-13
30	40	-25	-36	-25	-41	-9	-20	-9	-25	0	-7	0	-11	0	-16
40	50														
50	65	-30	-43	-30	-49	-10	-23	-10	-29	0	-8	0	-13	0	-19

d(mm)		h7		h8		js4		j5		js5		j6		js6	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	0	-12	0	-18	+2	-2	+3	-2	+2.5	-2.5	+6	-2	+4	-4
6	10	0	-15	0	-22	+2	-2	+4	-2	+3	-3	+7	-2	+4.5	-4.5
10	18	0	-18	0	-27	+2.5	-2.5	+5	-3	+4	-4	+8	-3	+5.5	-5.5
18	30	0	-21	0	-33	+3	-3	+5	-4	+4.5	-4.5	+9	-4	+6.5	-6.5
30	40	0	-25	0	-39	+3.5	-3.5	+6	-5	+5.5	-5.5	+11	-5	+8	-8
40	50														
50	65	0	-30	0	-46	+4	-4	+6	-7	+6.5	-6.5	+12	-7	+9.5	-9.5

d(mm)		j7		k4		k5		k6		m5		m6		n5	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	+8	-4	+5	+1	+6	+1	+9	+1	+9	+4	+12	+4	+13	+8
6	10	+10	-5	+5	+1	+7	+1	+10	+1	+12	+6	+15	+6	+16	+10
10	18	+12	-6	+6	+1	+9	+1	+12	+1	+15	+7	+18	+7	+20	+12
18	30	+13	-8	+8	+2	+11	+2	+15	+2	+17	+8	+21	+8	+24	+15
30	40	+15	-10	+9	+2	+13	+2	+18	+2	+20	+9	+25	+9	+28	+17
40	50														
50	65	+18	-12	+10	+2	+15	+2	+21	+2	+24	+11	+30	+11	+33	+20

d(mm)		n6		p5		p6		r6		r7		IT torance			
over	incl.	low	high	low	high	low	high	low	high	low	high	IT2	IT3	IT5	IT7
3	6	+16	+8	+17	+12	+20	+12	+23	+15	+27	+15	1.5	2.5	5	12
6	10	+19	+10	+21	+15	+24	+15	+28	+19	+34	+19	1.5	2.5	6	15
10	18	+23	+12	+26	+18	+29	+18	+34	+23	+41	+23	2	3	8	18
18	30	+28	+15	+31	+22	+35	+22	+41	+28	+49	+28	2.5	4	9	21
30	40	+33	+17	+37	+26	+42	+26	+50	+34	+59	+34	2.5	4	11	25
40	50														
50	65	+39	+20	+45	+32	+51	+32	+60	+41	+71	+41	3	5	13	30

Dimensional tolerance for housing bore | Unit: μm

Diameter division D(mm)		E7		E10		E11		E12		F6		F7		F8	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	+32	+20	+68	+20	+95	+20	+140	+20	+18	+10	+22	+10	+28	+10
6	10	+40	+25	+83	+25	+115	+25	+175	+25	+22	+13	+28	+13	+35	+13
10	18	+50	+32	+102	+32	+142	+32	+212	+32	+27	+16	+34	+16	+43	+16
18	30	+61	+40	+124	+40	+170	+40	+250	+40	+33	+20	+41	+20	+53	+20
30	40	+75	+50	+150	50	+210	+50	+300	+50	+41	+25	+50	+25	+64	+25
40	50														
50	65	+90	+60	+180	+60	+250	+60	+360	+60	+49	+30	+60	+30	+76	+30
65	80														
80	100	+107	+72	+212	+72	+292	+72	+422	+72	+58	+36	+71	+36	+90	+36
100	120														
120	140	+125	+85	+245	+85	+335	+85	+485	+85	+68	+43	+83	+43	+106	+43

D(mm)		G6		G7		H6		H7		H8		H9		H10	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	+12	+4	+16	+4	+8	0	+12	0	+18	0	+30	0	+48	0
6	10	+14	+5	+20	+5	+9	0	+15	0	+22	0	+36	0	+58	0
10	18	+17	+6	+24	+6	+11	0	+18	0	+27	0	+43	0	+70	0
18	30	+20	+7	+28	+7	+13	0	+21	0	+33	0	+52	0	+84	0
30	40	+25	+9	+34	+9	+16	0	+25	0	+39	0	+62	0	+100	0
40	50														
50	65	+29	+10	+40	+10	+19	0	+30	0	+46	0	+74	0	+120	0
65	80														
80	100	+34	+12	+47	+12	+22	0	+35	0	+54	0	+87	0	+140	0
100	120														
120	140	+39	+14	+54	+14	+25	0	+40	0	+63	0	+100	0	+160	0

D(mm)		H11		H13		J6		Js6		J7		Js7		K5	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	+75	0	+180	0	+5	-3	+4	-4	+6	-6	+6	-6	0	-5
6	10	+90	0	+220	0	+5	-4	+4.5	-4.5	+8	-7	+7.5	-7.5	+1	-5
10	18	+110	0	+270	0	+6	-5	+5.5	-5.5	+10	-8	+9	-9	+2	-6
18	30	+130	0	+330	0	+8	-5	+6.5	-6.5	+12	-9	+10.5	-10.5	+1	-8
30	40	+160	0	+390	0	+10	-6	+8	-8	+14	-11	+12.5	-12.5	+2	-9
40	50														
50	65	+190	0	+460	0	+13	-6	+9.5	-9.5	+18	-12	+15	-15	+3	-10
65	80														
80	100	+220	0	+540	0	+16	-6	+11	-11	+22	-13	+17.5	-17.5	+2	-13
100	120														
120	140	+250	0	+630	0	+18	-7	+12.5	-12.5	+26	-14	+20	-20	+3	-15

D(mm)		K6		K7		M6		M7		N6		N7		P6		P7	
over	incl.	low	high	low	high	low	high	low	high	low	high	low	high	low	high	low	high
3	6	+2	-6	+3	-9	-1	-13	0	-12	-5	0	-4	-16	-9	-17	-8	-20
6	10	+2	-7	+5	-10	-3	-16	0	-15	-7	0	-4	-19	-12	-21	-9	-24
10	18	+2	-9	+6	-12	-4	-20	0	-18	-9	0	-5	-23	-15	-26	-11	-29
18	30	+2	-11	+6	-15	-4	-24	0	-21	-11	0	-7	-28	-18	-31	-14	-35
30	40	+3	-13	+7	-18	-4	-28	0	-25	-12	0	-8	-33	-21	-37	-17	-42
40	50																
50	65	+4	-15	+9	-21	-5	-33	0	-30	-14	0	-9	-39	-26	-45	-21	-51
65	80																
80	100	+4	-18	+10	-25	-6	-38	0	-35	-16	0	-10	-45	-30	-52	-24	-59
100	120																
120	140	+4	-21	+12	-28	-8	-45	0	-40	-20	0	-12	-52	-36	-61	-28	-68

Appendix IV Tolerance for bearings | Single-row Deep Groove Ball Bearings

<1> Inner rings | Unit: μm

Nominal bore diameter d(mm)		Single plane mean bore diameter deviation Δ_{dmp}								Mean single plane bore diameter variation V_{dmp}			
		class 0		class 6		class 5		class 4[1]		class 0	class 6	class 5	class 4
over	incl.	high	low	high	low	high	low	high	low	max			
0.6[4]	2.5	0	-8	0	-7	0	-5	0	-4	6	5	3	2
2.5	10	0	-8	0	-7	0	-5	0	-4	6	5	3	2
10	18	0	-8	0	-7	0	-5	0	-4	6	5	3	2
18	30	0	-10	0	-8	0	-6	0	-5	8	6	3	2.5
30	50	0	-12	0	-10	0	-8	0	-6	9	8	4	3
50	80	0	-15	0	-12	0	-9	0	-7	11	9	5	3.5

d(mm)		Single radial plane bore diameter deviation V_{dp}											
		diameter series 7, 8, 9				diameter series 0, 1				diameter series 2, 3, 4			
		class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4
over	incl.	max				max				max			
0.6[4]	2.5	10	9	5	4	8	7	4	3	6	5	4	3
2.5	10	10	9	5	4	8	7	4	3	6	5	4	3
10	18	10	9	5	4	8	7	4	3	6	5	4	3
18	30	13	10	6	5	10	8	5	4	8	6	5	4
30	50	15	13	8	6	12	10	6	5	9	8	6	5
50	80	19	15	9	7	19	15	7	5	11	9	7	5

d(mm)		Inner ring radial runout K_{ia}				Inner ring width deviation Δ_{Bs}							
						normal				modified[3]			
		class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4
over	incl.	max				high	low	high	low	high	low	high	low
0.6[4]	2.5	10	5	4	2.5	0	-40	0	-40	-	-	0	-250
2.5	10	10	6	4	2.5	0	-120	0	-40	0	-250	0	-250
10	18	10	7	4	2.5	0	-120	0	-80	0	-250	0	-250
18	30	13	8	4	3	0	-120	0	-120	0	-250	0	-250
30	50	15	10	5	4	0	-120	0	-120	0	-250	0	-250
50	80	20	10	5	4	0	-150	0	-150	0	-380	0	-250

d(mm)		Face runout with bore S_d		Inner ring axial runout[2] S_{ia}		Inner ring width variation V_{Bs}				
		class 5	class 4	class 5	class 4	class 0	class 6	class 5	class 4	class 2
over	incl.	max		max				max		
0.6[4]	2.5	7	3	7	3	12	12	5	2.5	1.5
2.5	10	7	3	7	3	15	15	5	2.5	1.5
10	18	7	3	7	3	20	20	5	2.5	1.5
18	30	8	4	8	4	20	20	5	2.5	1.5
30	50	8	4	8	4	20	20	5	3	1.5
50	80	8	5	8	5	25	25	6	4	1.5

1) The dimensional difference Δ_{ds} of bore diameter to applied for class 4 and 2 is the same as the tolerance of dimentional difference Δ_{dmp} of average bore diameter. However, the dimensional difference is applied to diameter series 0, 1, 2, 3 and 4 against Class 4, and to all the diameter series against Class 2.
2) To be applied for deep groove ball bearing and angular contact ball bearings.
3) To be applied for individual raceway rings manufactured for combined bearing use.
4) Nominal bore diameter of bearings of 0.6 mm is included in this dimensional division.

<2> Outer rings | Unit: μm

Nominal outside diameter D(mm)		Single plane mean outside diameter deviation Δ_{Dmp}								Single radial plane outside diameter variation V_{Dp}[6]	
										capped bearings diameter series 2, 3, 4	
		class 0		class 6		class 5		class 4[5]		class 0	class 6
over	incl.	high	low	high	low	high	low	high	low	max	
2.5[8]	6	0	-8	0	-7	0	-5	0	-4	10	9
6	18	0	-8	0	-7	0	-5	0	-4	10	9
18	30	0	-9	0	-8	0	-6	0	-5	12	10
30	50	0	-11	0	-9	0	-7	0	-6	16	13
50	80	0	-13	0	-11	0	-9	0	-7	20	16
80	120	0	-15	0	-13	0	-10	0	-8	26	20
120	150	0	-18	0	-15	0	-11	0	-9	30	25

D(mm)		Single radial plane outside diameter variation V_{Dp}											
		diameter series 7, 8, 9				diameter series 0, 1				diameter series 2, 3, 4			
		class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4
over	incl.	max				max				max			
2.5[8]	6	10	9	5	4	8	7	4	3	6	5	4	3
6	18	10	9	5	4	8	7	4	3	6	5	4	3
18	30	12	10	6	5	9	8	5	4	7	6	5	4
30	50	14	11	7	6	11	9	5	5	8	7	5	5
50	80	16	14	9	7	13	11	7	5	10	8	7	5
80	120	19	16	10	8	19	16	8	6	11	10	8	6
120	150	23	19	11	9	23	19	8	7	14	11	8	7

D(mm)		Mean single plane outside diameter variation V_{Dmp}				Outer ring radial runout K_{ea}				Outside surface inclination S_D	
		class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4	class 5	class 4
over	incl.	max				max				max	
2.5[8]	6	6	5	3	2	15	8	5	3	8	4
6	18	6	5	3	2	15	8	5	3	8	4
18	30	7	6	3	2.5	15	9	6	4	8	4
30	50	8	7	4	3	20	10	7	5	8	4
50	80	10	8	5	3.5	25	13	8	5	8	4
80	120	11	10	5	4	35	18	10	6	9	5
120	150	14	11	6	5	40	20	11	7	10	5

D(mm)		Outside ring axial runout S_{ea}[7]		Outer ring width deviation Δ_{Cs}	Outer ring width variation V_{Cs}		
		class 5	class 4	all types	class 0	class 6	class 5	class 4
over	incl.	max			max			
2.5[8]	6	8	5	Identical to Δ_{Bs} of inner ring of same bearing	Identical to Δ_{Bs} and V_{Bs} of inner ring of same bearing		5	2.5
6	18	8	5				5	2.5
18	30	8	5				5	2.5
30	50	8	5				5	2.5
50	80	10	5				6	3
80	120	11	6				8	4
120	150	13	7				8	5

5) The dimensional difference Δ_{Ds} of outer diameter to be applied for classes 4 and 2 is the same as the tolerance of dimensional difference Δ_{Dmp} of average outer diameter. However, the dimensional difference is applied to diameter series 0, 1, 2, 3 and 4 against Class 4, and also to all the diameter series against Class 2.
6) To be applied in case snap rings are not installed on the bearings.
7) To be applied for deep groove ball bearings and angular contact ball bearings.
8) Nominal outer diameter of bearings of 2.5 mm is included in this dimensional division.

Appendix IV Tolerance for bearings | Angular Contact Ball Bearings

<1> Inner rings | Unit: μm

Nominal bore diameter d(mm)		Single plane mean bore diameter deviation Δ_{dmp}						Mean bore diameter variation V_{dmp}		
		class 5		class 4		class 2		class 5	class 4	class 2
over	incl.	high	low	high	low	high	low		max	
2.5	10	0	-5	0	-4	0	-2.5	3	2	1.5
10	18	0	-5	0	-4	0	-2.5	3	2	1.5
18	30	0	-6	0	-5	0	-2.5	3	2.5	1.5
30	50	0	-8	0	-6	0	-2.5	4	3	1.5
50	80	0	-9	0	-7	0	-4	5	3.5	2
80	120	0	-10	0	-8	0	-5	5	4	2.5
120	150	0	-13	0	-10	0	-7	7	5	3.5
150	180	0	-13	0	-10	0	-7	7	5	3.5
180	250	0	-15	0	-12	0	-8	8	6	4

d(mm)		Single radial plane bore diameter variation V_{dp}						Inner ring radial runout K_{ia}			Face runout with bore S_d		
		Diameter series 9			Diameter series 0.2								
		class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2
over	incl.		max			max			max			max	
2.5	10	5	4	2.5	4	3	2.5	4	2.5	1.5	7	3	1.5
10	18	5	4	2.5	4	3	2.5	4	2.5	1.5	7	3	1.5
18	30	6	5	2.5	5	4	2.5	4	3	2.5	8	4	1.5
30	50	8	6	2.5	6	5	2.5	5	4	2.5	8	4	1.5
50	80	9	7	4	7	5	4	5	4	2.5	8	5	1.5
80	120	10	8	5	8	6	5	6	5	2.5	9	5	2.5
120	150	13	10	7	10	8	7	8	6	2.5	10	6	2.5
150	180	13	10	7	10	8	7	8	6	5	10	6	4
180	250	15	12	8	12	9	8	10	8	5	11	7	5

d(mm)		Axial runout S_{ia}			Width deviation Δ_{Bs}						Width variation V_{Bs}		
					Single bearing				Duplex bearing				
		class 5	class 4	class 2	class 5	class 4	class 2		class 5	class 4	class 5	class 4	class 2
over	incl.		max		high	low	high	low	high	low		max	
2.5	10	7	3	1.5	0	-40	0	-40	0	-250	5	2.5	1.5
10	18	7	3	1.5	0	-80	0	-80	0	-250	5	2.5	1.5
18	30	8	4	2.5	0	-120	0	-120	0	-250	5	2.5	1.5
30	50	8	4	2.5	0	-120	0	-120	0	-250	5	3	1.5
50	80	8	5	2.5	0	-150	0	-150	0	-250	6	4	1.5
80	120	9	5	2.5	0	-200	0	-200	0	-380	7	4	2.5
120	150	10	7	2.5	0	-250	0	-250	0	-380	8	5	2.5
150	180	10	7	5	0	-250	0	-250	0	-380	8	5	4
180	250	13	8	5	0	-300	0	-300	0	-500	10	6	5

<2> Outer rings | Unit: μm

Nominal outside diameter D(mm)		Single plane mean outside diameter deviation Δ_{Dmp}						Mean single plane outside diameter variation V_{Dmp}		
		class 5		class 4		class 2		class 5	class 4	class 2
over	incl.	high	low	high	low	high	low		max	
18	30	0	-6	0	-5	0	-4	3	2.5	2
30	50	0	-7	0	-6	0	-4	4	3	2
50	80	0	-9	0	-7	0	-4	5	3.5	2
80	120	0	-10	0	-8	0	-5	5	4	2.5
120	150	0	-11	0	-9	0	-5	6	5	2.5
150	180	0	-13	0	-10	0	-7	7	5	3.5
180	250	0	-15	0	-11	0	-8	8	6	4
250	315	0	-18	0	-13	0	-8	9	7	4

D(mm)		Single radial plane outside diameter variation V_{Dp}						Outer ring radial runout K_{ea}		
		Diameter series 9			Diameter series 0.2					
		class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2
over	incl.		max			max			max	
18	30	6	5	4	5	4	4	6	4	2.5
30	50	7	6	4	5	5	4	7	5	2.5
50	80	9	7	4	7	5	4	8	5	4
80	120	10	8	5	8	6	5	10	6	5
120	150	11	9	5	8	7	5	11	7	5
150	180	13	10	7	10	8	7	13	8	5
180	250	15	11	8	11	8	8	15	10	7
250	315	18	13	8	14	10	8	18	11	7

D(mm)		Outside surface inclination S_D			Axial runout S_{ea}			Width deviation Δ_{Cs}	Width variation V_{Cs}		
		class 5	class 4	class 2	class 5	class 4	class 2	All types	class 5	class 4	class 2
over	incl.		max			max				max	
18	30	8	4	1.5	8	5	2.5	Identical to of Δ_{Bs} relative to d of the same bearing	5	2.5	1.5
30	50	8	4	1.5	8	5	2.5		5	2.5	1.5
50	80	8	4	1.5	10	5	4		6	3	1.5
80	120	9	5	2.5	11	6	5		8	4	2.5
120	150	10	5	2.5	13	7	5		8	5	2.5
150	180	10	5	2.5	14	8	5		8	5	2.5
180	250	11	7	4	15	10	7		10	7	4
250	315	13	8	5	18	10	7		11	7	5

Appendix IV Tolerance for bearings | Cylindrical Roller Bearings

<1> Inner rings | Unit: μm

Nominal bore diameter d(mm)		Single plane mean bore diameter deviation Δ_{dmp}						Mean bore diameter variation V_{dmp}		
		class 5		class 4		class 2		class 5	class 4	class 2
over	incl.	high	low	high	low	high	low		max	
18	30	0	-6	0	-5	0	-2.5	3	2.5	1.5
30	50	0	-8	0	-6	0	-2.5	4	3	1.5
50	80	0	-9	0	-7	0	-4	5	3.5	2
80	120	0	-10	0	-8	0	-5	5	4	2.5
120	150	0	-13	0	-10	0	-7	7	5	3.5
150	180	0	-13	0	-10	0	-7	7	5	3.5
180	250	0	-15	0	-12	0	-8	8	6	4
250	315	0	-18	-	-	-	-	9	-	-
315	400	0	-23	-	-	-	-	12	-	-
400	500	-	-	-	-	-	-	-	-	-

d(mm)		Single radial plane bore diameter variation V_{dp}						Inner ring radial runout K_{ia}		
		Diameter series 9			Diameter series 0					
		class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2
over	incl.		max			max			max	
18	30	6	5	2.5	5	4	2.5	4	3	2.5
30	50	8	6	2.5	6	5	2.5	5	4	2.5
50	80	9	7	4	7	5	4	5	4	2.5
80	120	10	8	5	8	6	5	6	5	2.5
120	150	13	10	7	10	8	7	8	6	2.5
150	180	13	10	7	10	8	7	8	6	5
180	250	15	12	8	12	9	8	10	8	5
250	315	18	-	-	14	-	-	13	-	-
315	400	23	-	-	18	-	-	15	-	-
400	500	-	-	-	-	-	-	-	-	-

d(mm)		Face runout with bore S_d			Width deviation Δ_{Bs}				Width variation V_{Bs}		
					Single bearing						
		class 5	class 4	class 2	class 5	class 4	class 2		class 5	class 4	class 2
over	incl.		max		high	low	high	low		max	
18	30	8	4	1.5	0	-120	0	-120	5	2.5	1.5
30	50	8	4	1.5	0	-120	0	-120	5	3	1.5
50	80	8	5	1.5	0	-150	0	-150	6	4	1.5
80	120	9	5	1.5	0	-200	0	-200	7	4	2.5
120	150	10	6	2.5	0	-250	0	-250	8	5	2.5
150	180	10	6	4	0	-250	0	-300	8	5	4
180	250	10	7	5	0	-300	0	-350	10	6	5
250	315	13	-	-	0	-350	-	-	13	-	-
315	400	15	-	-	0	-400	-	-	15	-	-
400	500	-	-	-	0	-	-	-	-	-	-

<2> Outer rings | Unit: μm

Nominal outside diameter D(mm)		Single plane mean outside diameter deviation Δ_{Dmp}						Mean single plane outside diameter variation V_{Dmp}		
		class 5		class 4		class 2		class 5	class 4	class 2
over	incl.	high	low	high	low	high	low		max	
30	50	0	-7	0	-6	0	-4	4	3	2
50	80	0	-9	0	-7	0	-4	5	3.5	2
80	120	0	-10	0	-8	0	-5	5	4	2.5
120	150	0	-11	0	-9	0	-5	6	5	2.5
150	180	0	-13	0	-10	0	-7	7	5	3.5
180	250	0	-15	0	-11	0	-8	8	6	4
250	315	0	-18	0	-13	0	-8	9	7	4
315	400	0	-20	0	-15	0	-10	10	8	5
400	500	0	-23	-	-	-	-	12	-	-
500	630	0	-28	-	-	-	-	14	-	-
630	800	0	-35	-	-	-	-	18	-	-

D(mm)		Single radial plane outside diameter variation V_{Dp}						Outer ring radial runout K_{ea}		
		Diameter series 9			Diameter series 0					
		class 5	class 4	class 2	class 5	class 4	class 2	class 5	class 4	class 2
over	incl.		max			max			max	
30	50	7	6	4	5	5	4	7	5	2.5
50	80	9	7	4	7	5	4	8	5	4
80	120	10	8	5	8	6	5	10	6	5
120	150	11	9	5	8	7	5	11	7	5
150	180	13	10	7	10	8	7	13	8	5
180	250	15	11	8	11	8	8	15	10	7
250	315	18	13	8	14	10	8	18	11	7
315	400	20	15	10	15	11	10	20	13	8
400	500	23	-	-	17	-	-	23	-	-
500	630	28	-	-	21	-	-	25	-	-
630	800	35	-	-	26	-	-	30	-	-

D(mm)		Outer ring radial runout K_{ea}			Outside surface inclination S_D			Width deviation Δ_{Cs}	Width variation V_{Cs}		
		class 5	class 4	class 2	class 5	class 4	class 2	All Classes	class 5	class 4	class 2
over	incl.		max			max				max	
30	50	7	5	2.5	8	4	1.5	Identical to Δ_{Bs} relative to d of the same bearing	5	2.5	1.5
50	80	8	5	4	8	4	1.5		6	3	1.5
80	120	10	6	5	9	5	2.5		8	4	2.5
120	150	11	7	5	10	5	2.5		8	4	2.5
150	180	13	8	5	10	5	2.5		8	5	2.5
180	250	15	10	7	11	7	4		10	7	4
250	315	18	11	7	13	8	5		11	7	5
315	400	20	13	8	13	10	7		13	8	7
400	500	23	-	-	15	-	-		15	-	-
500	630	25	-	-	18	-	-		18	-	-
630	800	30	-	-	20	-	-		20	-	-

Appendix IV Tolerance for bearings | Ball Screw Support Bearings

Inner rings | Unit: μm

Nominal bore diameter d(mm)		Single plane mean bore diameter deviation Δ_{dmp}						Width variation V_{Bs}			Radial runout K_{ia}		
		class 5		class 4		class UP		class 5	class 4	class UP	class 5	class 4	class UP
over	incl.	high	low	high	low	high	low		max			max	
10	18	0	-5	0	-4	0	-3.5	5	2.5	2	3.5	3	2
18	30	0	-6	0	-5	0	-3.5	5	2.5	2	4	3	2
30	50	0	-8	0	-6	0	-5	5	3	2	5	4	2
50	80	0	-9	0	-7	0	-5	5	4	3	5	4	3

d(mm)		Face runout with bore S_d			Axial runout S_{ia}			Width deviation Δ_{Bs}					
		class 5	class 4	class UP	class 5	class 4	class UP	class 5		class 4		class UP	
over	incl.		max			max		high	low	high	low	high	low
10	18	7	3	2	5	3	2	0	-120	0	-120	0	-100
18	30	8	4	3	5	3	2	0	-120	0	-120	0	-100
30	50	8	4	3	6	3	2	0	-120	0	-120	0	-100
50	80	8	5	4	7	4	3	0	-150	0	-150	0	-150

Outer rings | Unit: μm

Nominal outside diameter D(mm)		Single plane mean outside diameter deviation Δ_{Dmp}						Width variation V_{Cs}			Radial runout K_{ea}		
		class 5		class 4		class UP		class 5	class 4	class UP	class 5	class 4	class UP
over	incl.	high	low	high	low	high	low		max			max	
30	50	0	-7	0	-6	0	-5	5	2.5	2	7	5	4
50	80	0	-9	0	-7	0	-5	6	3	2	8	5	4
80	120	0	-10	0	-8	0	-7	8	4	3	10	6	4

D(mm)		Outside surface inclination S_D			Axial runout S_{ea}	Width deviation Δ_{Cs}
		class 5	class 4	class UP	All classes	All classes
over	incl.		max			
30	50	8	4	3	Identical to S_{ia} relative to d of the same bearing	Identical to Δ_{Bs} relative to d of the same bearing
50	80	8	4	3		
8	120	9	5	4		

History of TPI®

- 1966 Established.
- 1967 Joint-ventured with NTN Japan.
- 1983 Created TPI brand.
- 1991 Technical agreement signed with AKS Japan.
- 1999 Established Shanghai Tungpei.
- 2011 TOP 100 Taiwan brand awarded.
- 2013 Taiwan Mittelstand awarded.
- 2015 Taiwan Excellence awarded.

Industry Applications