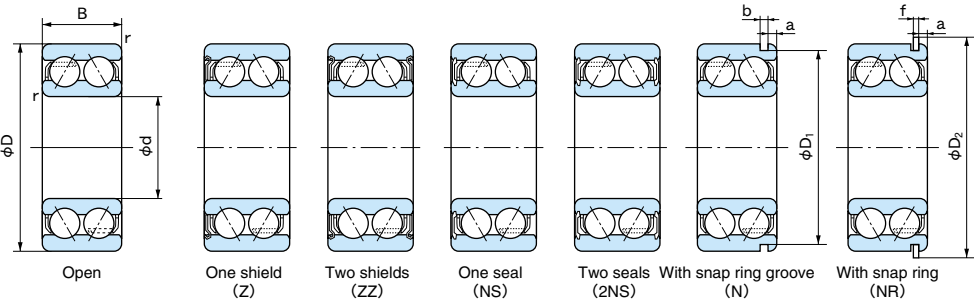
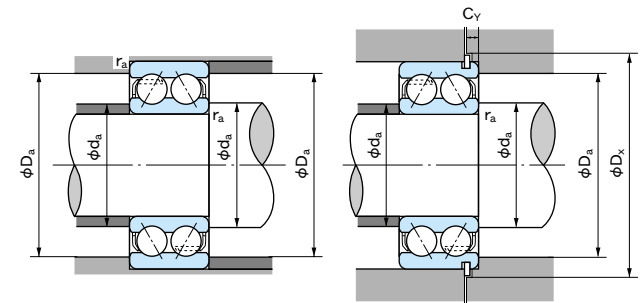


# Double-row Angular Contact Ball Bearings

Bore Diameter : 10~50mm



1N=0.102kgf



- Dynamic equivalent radial load  
 $Pr = XFr + YFa$ 

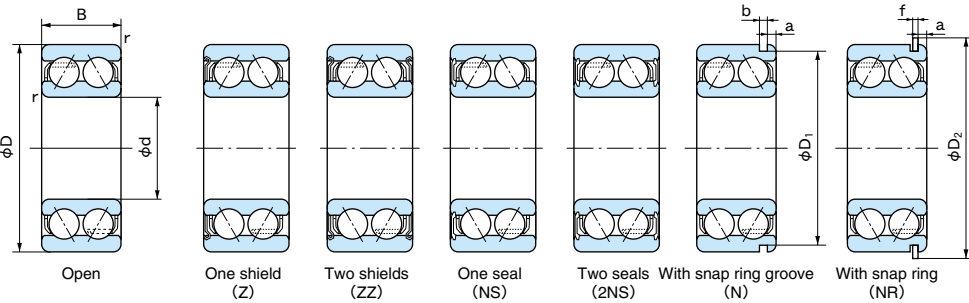
Contact angle e	$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
	X	Y	X	Y
30°	0.80	1.0	0.78	1.24
20°	0.57	1.0	1.09	0.70
- Static equivalent radial load  
 Nominal contact angle 30°  
 $Pr = Fr + 0.66Fa$   
 Nominal contact angle 20°  
 $Pr = Fr + 0.84Fa$

Boundary dimensions (mm)				Bearing No.							Basic dynamic load rating Cr(N)	Basic static load rating Cor(N)	Limiting speed (rpm)					Dimensions of snap ring groove and snap ring (mm)					Abutment and fillet dimensions (mm)					Mass (kg)	Bearing No.
d	D	B	r (min)	Open type		Shield type		Seal type		With snap ring groove			With snap ring	Grease lubrication	Oil lubrication	D <sub>1</sub> (max)	a (max)	b (min)	D <sub>2</sub> (max)	f (max)	d <sub>a</sub> (min)	D <sub>a</sub> (max)	D <sub>X</sub> (min)	r <sub>a</sub> (max)	C <sub>Y</sub> (max)				
10	30	14.3	0.6	5200	5200Z	5200ZZ	5200NS	5200-2NS	5200N	5200NR	7300	4000	18000	24000	28.17	2.06	1.35	34.7	1.12	15	25	35.5	0.6	2.9	0.050	5200			
	30	14.3	0.6	5200A	5200AZ	5200AZZ	5200ANS	5200A-2NS	5200AN	5200ANR	6950	3800	16000	22000	28.17	2.06	1.35	34.7	1.12	15	25	35.5	0.6	2.9	0.050	5200A			
12	32	15.9	0.6	5201	5201Z	5201ZZ	5201NS	5201-2NS	5201N	5201NR	10700	5950	16000	22000	30.15	2.06	1.35	36.7	1.12	17	27	37.5	0.6	2.9	0.060	5201			
	32	15.9	0.6	5201A	5201AZ	5201AZZ	5201ANS	5201A-2NS	5201AN	5201ANR	10300	5650	15000	20000	30.15	2.06	1.35	36.7	1.12	17	27	37.5	0.6	2.9	0.060	5201A			
15	35	15.9	0.6	5202	5202Z	5202ZZ	5202NS	5202-2NS	5202N	5202NR	11900	7200	14000	19000	33.17	2.06	1.35	39.7	1.12	20	30	40.5	0.6	2.9	0.070	5202			
	35	15.9	0.6	5202A	5202AZ	5202AZZ	5202ANS	5202A-2NS	5202AN	5202ANR	11400	6850	12000	17000	33.17	2.06	1.35	39.7	1.12	20	30	40.5	0.6	2.9	0.070	5202A			
17	40	17.5	0.6	5203	5203Z	5203ZZ	5203NS	5203-2NS	5203N	5203NR	15000	9250	12000	17000	38.1	2.06	1.35	44.6	1.12	22	35	45.5	0.6	2.9	0.090	5203			
	40	17.5	0.6	5203A	5203AZ	5203AZZ	5203ANS	5203A-2NS	5203AN	5203ANR	14200	8800	11000	15000	38.1	2.06	1.35	44.6	1.12	22	35	45.5	0.6	2.9	0.090	5203A			
	47	22.2	1	5303	-	-	-	-	5303N	5303NR	23100	12700	10000	14000	44.6	2.46	1.35	52.7	1.12	23	41	53.5	1	3.3	0.140	5303			
20	47	20.6	1	5204	5204Z	5204ZZ	5204NS	5204-2NS	5204N	5204NR	20000	12700	10000	14000	44.6	2.46	1.35	52.7	1.12	26	41	53.5	1	3.3	0.120	5204			
	47	20.6	1	5204A	5204AZ	5204AZZ	5204ANS	5204A-2NS	5204AN	5204ANR	19000	12100	9500	13000	44.6	2.46	1.35	52.7	1.12	26	41	53.5	1	3.3	0.120	5204A			
	52	22.2	1.1	5304	-	-	-	-	5304N	5304NR	21700	13300	9000	11000	49.73	2.46	1.35	57.9	1.12	27	45	58.5	1	3.3	0.230	5304			
25	52	20.6	1	5205	5205Z	5205ZZ	5205NS	5205-2NS	5205N	5205NR	21800	15100	9500	13000	49.73	2.46	1.35	57.9	1.12	31	46	58.5	1	3.3	0.190	5205			
	52	20.6	1	5205A	5205AZ	5205AZZ	5205ANS	5205A-2NS	5205AN	5205ANR	20600	14300	8000	11000	49.73	2.46	1.35	57.9	1.12	31	46	58.8	1	3.3	0.190	5205A			
	62	25.4	1.1	5305	-	-	-	-	5305N	5305NR	32000	21600	7300	10000	59.61	3.28	1.9	67.7	1.7	32	55	68.5	1	4.7	0.340	5305			
30	62	23.8	1	5206	-	-	-	-	5206N	5206NR	30500	21700	8000	11000	59.61	3.28	1.9	67.7	1.7	36	56	68.5	1	4.7	0.290	5206			
	62	23.8	1	-	5206Z	5206ZZ	5206NS	5206-2NS	-	-	25900	18700	8000	-	-	-	-	-	36	56	-	1	-	-	0.290	5206Z			
	62	23.8	1	5206A	-	-	-	-	5206AN	5206ANR	28600	20500	7000	9500	59.61	3.28	1.9	67.7	1.7	36	56	68.5	1	4.7	0.290	5206A			
	62	23.8	1	-	5206AZ	5206AZZ	5206ANS	5206A-2NS	-	-	24400	17700	7000	-	-	-	-	-	36	56	-	1	-	-	0.290	5206AZ			
	72	30.2	1.1	5306	-	-	-	-	5306N	5306NR	41500	29000	7000	9500	68.81	3.28	1.9	78.6	1.7	37	65	80	1	4.7	0.510	5306			
35	72	27	1.1	5207	-	-	-	-	5207N	5207NR	40000	29500	7000	9500	68.81	3.28	1.9	78.6	1.7	42	65	80	1	4.7	0.430	5207			
	72	27	1.1	-	5207Z	5207ZZ	5207NS	5207-2NS	-	-	35000	25900	7000	-	-	-	-	-	42	65	-	1	-	-	0.430	5207Z			
	72	27	1.1	5207A	-	-	-	-	5207AN	5207ANR	38000	27700	6000	8000	68.81	3.28	1.9	78.6	1.7	42	65	80	1	4.7	0.430	5207A			
	72	27	1.1	-	5207AZ	5207AZZ	5207ANS	5207A-2NS	-	-	33000	24500	6000	-	-	-	-	-	42	65	-	1	-	-	0.430	5207AZ			
	80	34.9	1.5	5307	-	-	-	-	5307N	5307NR	52000	37000	6300	8500	76.81	3.28	1.9	86.6	1.7	44	71	88	1.5	4.7	0.790	5307			
40	80	30.2	1.1	5208	-	-	-	-	5208N	5208NR	45500	34000	6000	8000	76.81	3.28	1.9	86.6	1.7	47	73	88	1	4.7	0.570	5208			
	80	30.2	1.1	-	5208Z	5208ZZ	5208NS	5208-2NS	-	-	40000	30500	6000	-	-	-	-	-	47	73	-	1	-	-	0.570	5208Z			
	80	30.2	1.1	5208A	-	-	-	-	5208AN	5208ANR	42500	32500	5300	7200	76.81	3.28	1.9	86.6	1.7	47	73	88	1	4.7	0.570	5208A			
	80	30.2	1.1	-	5208AZ	5208AZZ	5208ANS	5208A-2NS	-	-	37500	28700	5300	-	-	-	-	-	47	73	-	1	-	-	0.570	5208AZ			
	90	36.5	1.5	5308	-	-	-	-	5308N	5308NR	63500	46500	5500	7500	86.79	3.28	2.7	96.5	2.46	49	81	98	1.5	5.4	1.05	5308			
45	85	30.2	1.1	5209	-	-	-	-	5209N	5209NR	51000	39000	5500	7500	81.81	3.28	1.9	91.6	1.7	52	78	93	1	4.7	0.620	5209			
	85	30.2	1.1	-	5209Z	5209ZZ	5209NS	5209-2NS	-	-	42500	34500	5500	-	-	-	-	-	52	78	-	1	-	-	0.620	5209Z			
	85	30.2	1.1	5209A	-	-	-	-	5209AN	5209ANR	48000	37000	5000	6700	81.81	3.28	1.9	91.6	1.7	52	78	93	1	4.7	0.620	5209A			
	85	30.2	1.1	-	5209AZ	5209AZZ	5209ANS	5209A-2NS	-	-	40000	32500	5000	-	-	-	-	-	52	78	-	1	-	-	0.620	5209AZ			
	100	39.7	1.5	5309	-	-	-	-	5309N	5309NR	76500	56500	5000	6700	96.8	3.28	2.7	106.5	2.46	54	91	108	1.5	5.4	1.42	5309			
50	90	30.2	1.1	5210	-	-	-	-	5210N	5210NR	54500	44500	5000	6700	86.79	3.28	2.7	96.5	2.46	57	83	98	1	5.4	0.670	5210			
	90	30.2	1.1	-	5210Z	5210ZZ	5210NS	5210-2NS	-	-	45000	39000	5000	-	-	-	-	-	57	83	-	1	-	-	0.670	5210Z			
	90	30.2	1.1	5210A	-	-	-	-	5210AN	5210ANR	51000	42000	4500	6000	86.79	3.28	2.7	96.5	2.46	57	83	98	1	5.4	0.670	5210A			
	90	30.2	1.1	-	5210AZ	5210AZZ	5210ANS	5210A-2NS	-	-	42000	36500	4500	-	-	-	-	-	57	83	-	1	-	-	0.670	5210AZ			
	110	44.4	2	5310	-	-	-	-	5310N	5310NR	90000	68000	4500	6000	106.81	3.28	2.7	116.6	2.46	60	100	118	2	5.4	1.93	5310			

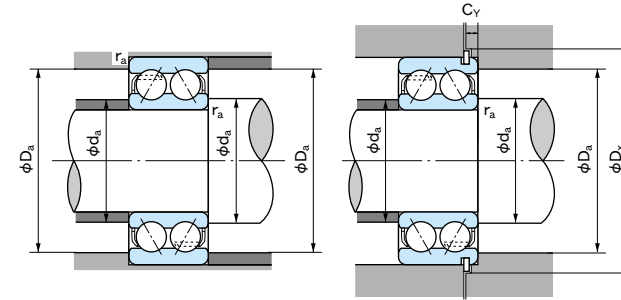
Note : Dimensions and tolerances of snap ring groove and snap ring are shown on pages 45 to 48.

# Double-row Angular Contact Ball Bearings

Bore Diameter : 55~100mm



1N=0.102kgf



• Dynamic equivalent radial load  
Pr = XFr + YFa

Contact angle e	Fa ≤ e Fr		Fa > e Fr	
	X	Y	X	Y
30°	0.80	1.0	0.78	1.24
20°	0.57	1.0	1.09	0.70

• Static equivalent radial load  
Nominal contact angle 30°  
: Pr = Fr + 0.66Fa  
Nominal contact angle 20°  
: Pr = Fr + 0.84Fa

Boundary dimensions (mm)				Bearing No.					Basic dynamic load rating Cr(N)	Basic static load rating Cor(N)	Limiting speed (rpm)		Dimensions of snap ring groove and snap ring (mm)					Abutment and fillet dimensions (mm)					Mass (kg)	Bearing No.
d	D	B	r (min)	Open type	Shield type	Seal type	With snap ring groove	With snap ring			Grease lubrication	Oil lubrication	D1 (max)	a (max)	b (min)	D2 (max)	f (max)	da (min)	Da (max)	Dx (min)	ra (max)	Cy (max)		
55	100	33.3	1.5	5211	—	—	—	—	4500	6300	96.8	3.28	2.7	106.5	2.46	64	91	108	1.5	5.4	0.960	5211		
	100	33.3	1.5	—	5211Z	5211ZZ	—	—	4500	5500	96.8	3.28	2.7	106.5	2.46	64	91	108	1.5	5.4	0.960	5211Z		
	100	33.3	1.5	5211A	—	—	—	—	4000	5500	96.8	3.28	2.7	106.5	2.46	64	91	108	1.5	5.4	0.960	5211A		
	100	33.3	1.5	—	5211AZ	5211AZZ	—	—	4000	4750	96.8	3.28	2.7	106.5	2.46	64	91	108	1.5	5.4	0.960	5211AZ		
	120	49.2	2	5311	—	—	—	—	4000	5500	115.21	4.06	3.1	129.7	2.82	65	110	131.5	2	6.5	2.30	5311		
60	110	36.5	1.5	5212	—	—	—	—	4300	5600	106.81	3.28	2.7	116.6	2.46	69	101	118	1.5	5.4	1.36	5212		
	110	36.5	1.5	—	5212Z	5212ZZ	—	—	4300	—	106.81	3.28	2.7	116.6	2.46	69	101	—	1.5	—	1.36	5212Z		
	110	36.5	1.5	5212A	—	—	—	—	3800	5000	106.81	3.28	2.7	116.6	2.46	69	101	118	1.5	5.4	1.36	5212A		
	110	36.5	1.5	—	5212AZ	5212AZZ	—	—	3800	—	106.81	3.28	2.7	116.6	2.46	69	101	—	1.5	—	1.36	5212AZ		
	130	54	2.1	5312	—	—	—	—	3800	5000	125.22	4.06	3.1	139.7	2.82	72	118	141.5	2	6.5	3.16	5312		
65	120	38.1	1.5	5213	—	—	—	—	3900	5300	115.21	4.06	3.1	129.7	2.82	74	111	131.5	1.5	6.5	1.66	5213		
	120	38.1	1.5	—	5213Z	5213ZZ	—	—	3900	—	115.21	4.06	3.1	129.7	2.82	74	111	—	1.5	—	1.66	5213Z		
	120	38.1	1.5	5213A	—	—	—	—	3400	4600	115.21	4.06	3.1	129.7	2.82	74	111	131.5	1.5	6.5	1.66	5213A		
	120	38.1	1.5	—	5213AZ	5213AZZ	—	—	3400	—	115.21	4.06	3.1	129.7	2.82	74	111	—	1.5	—	1.66	5213AZ		
	140	58.7	2.1	5313	—	—	—	—	3600	4700	135.23	4.9	3.1	149.7	2.82	77	128	152	2	7.4	3.86	5313		
70	125	39.7	1.5	5214	—	—	—	—	3800	5000	120.22	4.06	3.1	134.7	2.82	79	116	136.5	1.5	6.5	1.82	5214		
	125	39.7	1.5	—	5214Z	5214ZZ	—	—	3800	—	120.22	4.06	3.1	134.7	2.82	79	116	—	1.5	—	1.82	5214Z		
	125	39.7	1.5	5214A	—	—	—	—	3200	4500	120.22	4.06	3.1	134.7	2.82	79	116	136.5	1.5	6.5	1.82	5214A		
	125	39.7	1.5	—	5214AZ	5214AZZ	—	—	3200	—	120.22	4.06	3.1	134.7	2.82	79	116	—	1.5	—	1.82	5214AZ		
	150	63.5	2.1	5314	—	—	—	—	3200	4300	145.24	4.9	3.1	159.7	2.82	82	138	162	2	7.4	4.88	5314		
75	130	41.3	1.5	5215	—	—	—	—	3400	4700	125.22	4.06	3.1	139.7	2.82	84	121	141.5	1.5	6.5	1.91	5215		
	130	41.3	1.5	—	5215Z	5215ZZ	—	—	3400	—	125.22	4.06	3.1	139.7	2.82	84	121	—	1.5	—	1.91	5215Z		
	130	41.3	1.5	5215A	—	—	—	—	3200	4300	125.22	4.06	3.1	139.7	2.82	84	121	141.5	1.5	6.5	1.91	5215A		
	130	41.3	1.5	—	5215AZ	5215AZZ	—	—	3200	—	125.22	4.06	3.1	139.7	2.82	84	121	—	1.5	—	1.91	5215AZ		
	160	68.3	2.1	5315	—	—	—	—	3000	4000	155.22	4.9	3.1	169.7	2.82	87	148	172	2	7.4	5.51	5315		
80	140	44.2	2	5216	—	—	—	—	3500	4600	135.23	4.9	3.1	149.7	2.82	90	130	152	2	7.4	2.48	5216		
	140	44.2	2	5216A	—	—	—	—	2800	4000	135.23	4.9	3.1	149.7	2.82	90	130	152	2	7.4	2.48	5216A		
	170	68.3	2.1	5316	—	—	—	—	2800	4000	163.65	5.69	3.5	182.9	3.1	92	158	185	2	8.4	6.81	5316		
85	150	49.2	2	5217	—	—	—	—	3000	4000	145.24	4.9	3.1	159.7	2.82	95	140	162	2	7.4	3.40	5217		
	150	49.2	2	5217A	—	—	—	—	2600	3800	145.24	4.9	3.1	159.7	2.82	95	140	162	2	7.4	3.40	5217A		
90	160	52.4	2	5218	—	—	—	—	2700	3900	155.22	4.9	3.1	169.7	2.82	100	150	172	2	7.4	4.28	5218		
	160	52.4	2	5218A	—	—	—	—	2500	3500	155.22	4.9	3.1	169.7	2.82	100	150	172	2	7.4	4.28	5218A		
95	170	55.6	2.1	5219	—	—	—	—	2600	3700	163.65	5.69	3.5	182.9	3.1	107	158	185	2	8.4	5.02	5219		
	170	55.6	2.1	5219A	—	—	—	—	2400	3200	163.65	5.69	3.5	182.9	3.1	107	158	185	2	8.4	5.02	5219A		
100	180	60.3	2.1	5220	—	—	—	—	2400	3200	173.66	5.69	3.5	192.9	3.1	112	168	195	2	8.4	5.78	5220		
	180	60.3	2.1	5220A	—	—	—	—	2200	3000	173.66	5.69	3.5	192.9	3.1	112	168	195	2	8.4	5.78	5220A		

Note : Dimensions and tolerances of snap ring groove and snap ring are shown on pages 45 to 48.