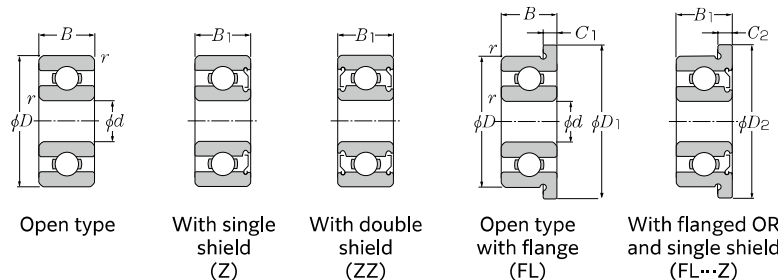


Miniature and Small Size Ball Bearings

NTN

Metric series



d 1.5 ~ 5mm

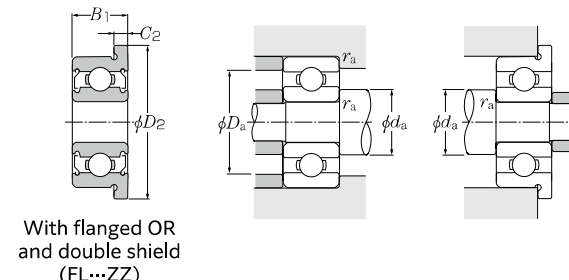
	Boundary dimensions								Basic load rating		Fatigue load limit N C _u	Factor f ₀	Allowable speed min ⁻¹		
	mm								dynamic N C _r	static N C _{0r}			Grease lubrication	Oil lubrication	
	d	D	B	B ₁	D ₁	D ₂	C ₁	C ₂							r _s min ¹⁾
1.5	4	1.2	2	5	5	0.4	0.6	0.15	113	29.0	0.775	13.6	88 000	100 000	
	5	2	2.6	6.5	6.5	0.6	0.8	0.15	189	51.0	1.35	13.3	79 000	93 000	
	6	2.5	3	7.5	7.5	0.6	0.8	0.15	305	86.0	2.28	12.3	71 000	84 000	
2	4	1.2	—	—	—	—	—	0.05	115	37.0	0.970	14.8	83 000	98 000	
	5	1.5	2.3	6.1	6.1	0.5	0.6	0.08	189	51.0	1.35	13.3	74 000	87 000	
	5	2	2.5	—	—	—	—	0.1	189	51.0	1.35	13.3	74 000	87 000	
	6	2.3	3	7.5	7.5	0.6	0.8	0.15	310	89.0	2.37	12.8	67 000	79 000	
	6	2.5	—	7.2	—	0.6	—	0.15	310	89.0	2.37	12.8	67 000	79 000	
	7	2.5	—	—	—	—	—	0.15	430	120	3.20	11.9	59 000	70 000	
	7	2.8	3.5	8.5	8.5	0.7	0.9	0.15	425	125	3.30	12.4	62 000	73 000	
2.5	5	1.5	2.3	—	—	—	—	0.08	169	59.0	1.56	15.0	70 000	82 000	
	6	1.8	2.6	7.1	7.1	0.5	0.8	0.08	231	73.0	1.92	14.2	65 000	76 000	
	7	—	3	—	8.2	—	—	0.6	0.15	315	96.0	2.53	13.7	59 000	70 000
	7	2.5	3.5	8.5	8.5	0.7	0.9	0.15	315	96.0	2.53	13.7	59 000	70 000	
	8	2.5	2.8	9.2	—	0.6	—	0.15	475	152	4.05	13.2	56 000	66 000	
3	8	2.8	4	9.5	9.5	0.7	0.9	0.15	610	174	7.05	11.5	56 000	66 000	
	6	2	2.5	7.2	7.2	0.6	0.6	0.08	268	94.0	2.47	14.7	60 000	71 000	
	7	2	3	8.1	8.1	0.5	0.8	0.1	430	130	3.45	12.9	58 000	68 000	
	8	2.5	—	9.2	—	0.6	—	0.15	620	180	7.25	11.9	54 000	63 000	
	8	3	4	9.5	9.5	0.7	0.9	0.15	620	180	7.25	11.9	54 000	63 000	
	9	2.5	4	10.2	10.6	0.6	0.8	0.15	700	219	8.85	12.4	50 000	59 000	
	9	3	5	10.5	10.5	0.7	1	0.15	700	219	8.85	12.4	50 000	59 000	
4	10	4	4	11.5	11.5	1	1	0.15	710	224	9.05	12.7	50 000	58 000	
	7	2	2.5	8.2	8.2	0.6	0.6	0.08	246	88.0	2.31	15.3	54 000	63 000	
	8	2	3	9.2	9.2	0.6	0.6	0.08	440	140	5.65	13.9	52 000	61 000	
	9	2.5	4	10.3	10.3	0.6	1	0.15	710	224	9.05	12.7	49 000	57 000	
	10	3	4	11.2	11.6	0.6	0.8	0.15	720	235	9.50	13.3	46 000	55 000	
	11	4	4	12.5	12.5	1	1	0.15	790	276	11.1	13.7	45 000	52 000	
	12	4	4	13.5	13.5	1	1	0.2	1 080	360	14.4	12.8	43 000	51 000	
	13	5	5	15	15	1	1	0.2	1 450	490	19.8	12.4	42 000	49 000	
5	16	5	5	—	—	—	—	0.3	1 940	680	23.1	12.4	37 000	44 000	
	8	2	2.5	9.2	9.2	0.6	0.6	0.08	241	91.0	2.39	15.8	49 000	57 000	
	9	2.5	3	10.2	10.2	0.6	0.6	0.15	555	211	5.55	14.6	46 000	55 000	
5	10	3	4	11.2	11.6	0.6	0.8	0.15	790	276	11.1	13.7	45 000	52 000	

1) Smallest allowable dimension for chamfer dimension r.

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Miniature and Small Size Ball Bearings

NTN



Dynamic equivalent radial load
 $P_r = X F_r + Y F_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19	1	0	0.56	2.30
0.345	0.22				1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30				1.45
2.07	0.34				1.31
3.45	0.38	1	0	0.56	1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load

$$P_{0r} = 0.6 F_r + 0.5 F_a$$

When $P_{0r} < F_r$ use $P_{0r} = F_r$.

Open type	Bearing numbers						Installation-related dimensions mm				Mass (approx.) g	
	With single shield	With double shield	Open type with flange	With flanged OR and single shield	With flanged OR and double shield		d _a Min.	d _a Max. ²⁾	D _a Max.	r _{as} Max.	Open type	Open type with flange
1.5	68/1.5	W68/1.5SA	SSA	FL68/1.5	FLW68/1.5SA	SSA	2.3	2.4	3.2	0.05	0.07	0.09
	69/1.5A	W69/1.5ASA	SSA	FL69/1.5A	FLW69/1.5ASA	SSA	2.7	2.9	3.8	0.15	0.18	0.24
	60/1.5	W60/1.5ZA	ZZA	FL60/1.5	FLW60/1.5ZA	ZZA	2.7	3	4.8	0.15	0.35	0.42
	672	—	—	—	—	—	2.5	2.6	3.5	0.05	0.06	—
2	682	W682SA	SSA	FL682	FLW682SA	SSA	2.8	2.9	4.2	0.08	0.13	0.17
	BC2-5	WBC2-5SA	SSA	—	—	—	2.8	2.9	4.2	0.1	0.16	—
	692	W692SA	SSA	FL692	FLW692SA	SSA	3.2	3.3	4.8	0.15	0.31	0.38
	BC2-6	—	—	FLBC2-6	—	—	3.2	3.3	4.8	0.15	0.32	0.38
	BC2-7A	—	—	—	—	—	3.2	3.6	5.8	0.15	0.44	—
	602	W602ZA	ZZA	FL602	FLW602ZA	ZZA	3.2	3.7	5.8	0.15	0.54	0.64
	67/2.5	W67/2.5ZA	ZZA	—	—	—	3.1	3.3	4.4	0.08	0.11	—
2.5	68/2.5	W68/2.5ZA	ZZA	FL68/2.5	FLW68/2.5ZA	ZZA	3.1	3.6	4.8	0.08	0.22	0.26
	—	WBC2.5-7ZA	ZZA	—	FLWBC2.5-7ZA	ZZA	3.7	4	5.8	0.15	0.6 ³⁾	0.67 ³⁾
	69/2.5	W69/2.5SA	SSA	FL69/2.5	FLW69/2.5SA	SSA	3.7	4	5.8	0.15	0.43	0.53
	BC2.5-8	WBC2.5-8ZA	ZZA	FLBC2.5-8	—	—	3.7	4.3	6.8	0.15	0.57	0.65
	60/2.5	W60/2.5ZA	ZZA	FL60/2.5	FLW60/2.5ZA	ZZA	3.7	4.1	6.8	0.15	0.72	0.83
	673	WA673SA	SSA	FL673	FLWA673SA	SSA	3.6	4.1	5.4	0.08	0.2	0.26
3	683	W683Z	ZZ	FL683	FLW683Z	ZZ	3.9	4.1	5.8	0.1	0.33	0.38
	BC3-8	—	—	FLBC3-8	—	—	4.2	4.4	6.8	0.15	0.52	0.6
	693	W693Z	ZZ	FL693	FLW693Z	ZZ	4.2	4.4	6.8	0.15	0.61	0.72
	BC3-9	WBC3-9ZA	ZZA	FLBC3-9	FLAWBC3-9ZA	ZZA	4.2	5	7.8	0.15	0.71	0.79
	603	W603Z	ZZ	FL603	FLW603Z	ZZ	4.2	5	7.8	0.15	0.92	1
	623	623Z	ZZ	FL623	FL623Z	ZZ	4.2	5.2	8.8	0.15	1.6	1.8
	674A	WA674ASA	SSA	FL674A	FLWA674ASA	SSA	4.6	5	6.4	0.08	0.28	0.35
4	BC4-8	WBC4-8Z	ZZ	FLBC4-8	FLWBC4-8Z	ZZ	4.8	5	6.8	0.08	0.38	0.46
	684AX50	W684AX50Z	ZZ	FL684AX50	FLW684AX50Z	ZZ	5	5.2	7.8	0.1	0.67	0.76
	BC4-10	WBC4-10Z	ZZ	FLBC4-10	FLAWBC4-10Z	ZZ	5.2	6	8.8	0.15	1	1.1
	694	694Z	ZZ	FL694	FL694Z	ZZ	5.2	6.4	9.8	0.15	1.8	2
	604	604Z	ZZ	FL604	FL604Z	ZZ	5.6	6.6	10.4	0.2	2.1	2.3
	624	624Z	ZZ	FL624	FL624Z	ZZ	5.6	6.2	11.4	0.2	3.2	3.5
	634	634Z	ZZ	—	—	—	6	7.6	14	0.3	5.1	—
5	675	WA675Z	ZZ	FL675	FLWA675Z	ZZ	5.6	6	7.4	0.08	0.32	0.4
	BC5-9	WBC5-9Z	ZZ	FLBC5-9	FLWBC5-9Z	ZZ	5.2	6.1	7.8	0.15	0.55	0.63
	BC5-10	WBC5-10Z	ZZ	FLBC5-10	FLAWBC5-10Z	ZZ	6.2	6.4	8.8	0.15	0.88	0.97

2) This dimension applies to sealed and shielded bearings. 3) Values for double shielded bearings are shown.

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