2.2 Roller Bearing Tolerances

2.2.1 Centripetal shaft Tolerances

2.2.1.1 Symbol

d ——— Nominal bore diameter
d_s ——— Single bore diameter
d_1 ——— Nominal diameter at theoretical large end of a tapered bore
d_{mp} ——— Deviation of single mean bore diameter
Δd_{mp} ——— Deviation of the mean bore diameter from the nominal = d_{mp}-d
Δd_s ——— Deviation of a single bore diameter from the nominal
Δd_{1mp} ——— Deviation of the mean bore diameter at the theoretical large end of tapered bore from the nominal = d_{1mp}-d_1
V_{dmp} ——— Mean bore diameter variation; Difference between the largest and smallest mean bore diameters of one ring or washer = d_{mpmax}-d_{mpmin}
V_{dsp} ——— Bore diameter variation; Difference between the largest and smallest single bore diameters in one plane
a ——— Nominal half tapered angle
D ——— Nominal outside diameter
D_1 ——— Nominal flange outer ring tolerances
D_{mp} ——— Mean outside diameter
ΔD_s ——— Deviation of a single outside diameter from the nominal = D_S-D
ΔD_{mp} ——— Deviation of the mean outside diameter from the nominal = D_{mp}-D
V_{Dsp} ——— Outside diameter variation; Difference between the largest and smallest single outside diameters in one plane
V_{Dmp} ——— Mean outside diameter variation;
ΔD_{1s} ——— Outer ring flange single outer ring tolerances
B,(C) ——— Nominal width of inner ring and outer ring, respectively
B_s,(C_s) ——— Single width of inner ring and outer ring, respectively
ΔB_s,(ΔC_s) ——— Deviation of single inner ring width or single outer ring width from the nominal
V_{Bs}(V_{Cs}) ——— Ring width variation; Difference between the largest and smallest single widths of inner ring and of outer ring, respectively
T ——— Nominal width of taper roller bearing
ΔT_s ——— Deviation of effective single width of taper roller bearing from the nominal
ΔT_{1s} ——— Deviation of effective single width of cone from the nominal
ΔT_{2s} ——— Deviation of effective single width of cup from the nominal
K_{ia} ——— Radial runout of inner ring of assembled bearing
K_{ea} ——— Radial runout of outer ring of assembled bearing
S_d ——— Side face runout with reference to bore
S_D ——— Outside inclination variation; Variation in inclination of outside cylindrical surface to outer ring side face
S_{ia} ——— Axial runout of inner ring of assembled bearing
S_{ea} ——— Axial runout of outer ring of assembled bearing

2.2.1.2 Bearing tolerances for radial, except taper roller bearing

(1) Class P0 tolerances

Table 2-12 inner rings

μm

d/mm	Δd_{mp}		V_{dp} diameter series			V_{dmp}	K_{ia}	ΔB_S			V_{Bs}
			9	0、1	2、3、4			all	normal	modify①	
>-≤	h	l	max			max	max	h	l		max
0.6-2.5	0	-8	10	8	6	6	10	0	-40	-	12
2.5-10	0	-8	10	8	6	6	10	0	-120	-250	15
10-18	0	-8	10	8	6	6	10	0	-120	-250	20
18-30	0	-10	13	10	8	8	13	0	-120	-250	20
30-50	0	-12	15	12	9	9	15	0	-120	-250	20
50-80	0	-15	19	19	11	11	20	0	-150	-380	25
80-120	0	-20	25	25	15	15	25	0	-200	-380	25
120-180	0	-25	31	31	19	19	30	0	-250	-500	30
180-250	0	-30	38	38	23	23	40	0	-300	-500	30
250-315	0	-35	44	44	26	26	50	0	-350	-500	35
315-400	0	-40	50	50	30	30	60	0	-400	-630	40
400-500	0	-45	56	56	34	34	65	0	-450	-	50
500-630	0	-50	63	63	38	38	70	0	-500	-	60
630-800	0	-75	-	-	-	-	80	0	-750	-	70
800-1000	0	-100	-	-	-	-	90	0	-1000	-	80
1000-1250	0	-125	-	-	-	-	100	0	-1250	-	100
1250-1600	0	-160	-	-	-	-	120	0	-1600	-	120
1600-2000	0	-200	-	-	-	-	140	0	-2000	-	140

① One bearing inner ring for paired arrangement or multiple arrangement

Table 2-13 outer rings

μm

D/mm	ΔD_{mp}		V_{Dp}				V_{Dmp} ②	K_{ea}	ΔC_s		V_{Cs}
			Open bearing diameter series			Close ① bearing					
			9	0、1	2、3、4	2、3、4					
> – ⩽	h	l	max				max	max	h	l	max
2.5-6	0	-8	10	8	6	10	6	15			
6-18	0	-8	10	8	6	10	6	15			
18-30	0	-9	12	9	7	12	7	15			
30-50	0	-11	14	11	8	16	8	20			
50-80	0	-13	16	13	10	20	10	25			
80-120	0	-15	19	19	11	26	11	35			
120-150	0	-18	23	23	14	30	14	40			
150-180	0	-25	31	31	19	38	19	45			
180-250	0	-30	38	38	23	-	23	50			
250-315	0	-35	44	44	26	-	26	60			
315-400	0	-40	50	50	30	-	30	70			
400-500	0	-45	56	56	34	-	34	80			
500-630	0	-50	63	63	38	-	38	100			
630-800	0	-75	94	94	55	-	55	120			
800-1000	0	-100	125	125	75	-	75	140			
1000-1250	0	-125	-	-	-	-	-	160			
1250-1600	0	-160	-	-	-	-	-	190			
1600-2000	0	-200	-	-	-	-	-	220			
2000-2500	0	-250	-	-	-	-	-	250			

Values are identical to those for inner ring of same bearing (ΔB_s & V_{bs})

① No requested value for bearings with diameter serial of 7,8,9,0 and 1

② Only applicable when the inner or outer snap rings are not mounted

2）class P6 tolerances

Table 2-14 inner rings

μm

d/mm	Δd_{mp}		V_{dp} diameter series			V_{dmp}	K_{ia}	ΔB_s			V_{Bs}
			9	0、1	2、3、4			all	normal	modify ①	
> – ⩽	h	l	max			max	max	h	l		max
0.6-2.5	0	-7	9	7	5	5	5	0	-40	-	12
2.5-10	0	-7	9	7	5	5	6	0	-120	-250	15
10-18	0	-7	9	7	5	5	7	0	-120	-250	20
18-30	0	-8	10	8	6	6	8	0	-120	-250	20
30-50	0	-10	13	10	8	8	10	0	-120	-250	20
50-80	0	-12	15	15	9	9	10	0	-150	-380	25
80-120	0	-15	19	19	11	11	13	0	-200	-380	25
120-180	0	-18	23	23	14	14	18	0	-250	-500	30
180-250	0	-22	28	28	17	17	20	0	-300	-500	30
250-315	0	-25	31	31	19	19	25	0	-350	-500	35
315-400	0	-30	38	38	23	23	30	0	-400	-630	40
400-500	0	-35	44	44	26	26	35	0	-450	-	45
500-630	0	-40	50	50	30	30	40	0	-500	-	50

① Applicable for single bearing inner ring when paired or grouped mounting

Table 2-15 outer rings

μm

D/mm	ΔD_{mp}		V_{Dp}				V_{Dmp}	K_{ea}	ΔC_s		V_{Cs}
			Open bearing diameter series			Close ① bearing					
			9	0、1	2、3、4	0、1、2、3、4					
> – ⩽	h	l	max				max	max	h	l	max
2.5-6	0	-7	9	7	5	9	5	8			
6-18	0	-7	9	7	5	9	5	8			
18-30	0	-8	10	8	6	10	6	9			
30-50	0	-9	11	9	7	13	7	10			
50-80	0	-11	14	11	8	16	8	13			
80-120	0	-13	16	16	10	20	10	18			
120-150	0	-15	19	19	11	25	11	20			
150-180	0	-18	23	23	14	30	14	23			
180-250	0	-20	25	25	15	-	15	25			
250-315	0	-25	31	31	19	-	19	30			
315-400	0	-28	35	35	21	-	21	35			
400-500	0	-33	41	41	25	-	25	40			
500-630	0	-38	48	48	29	-	29	50			
630-800	0	-45	56	56	34	-	34	60			
800-1000	0	-60	75	75	45	-	45	75			

Values are identical to those for inner ring of same bearing (ΔB_s & V_{bs})

① No requested value for diameter series of 7, 8 and 9

3）class P5 tolerances

Table 2-16 inner rings

μm

d/mm	Δ d_{mp}		V_{dp} diameter series		V_{dmp}	K_{ia}	S_d	S_{ia}①	Δ B_s			V_{Bs}
			9	0、1 2、3、4					all	normal	modify②	
> – ≤	h	l	max		max	max	max	max	h	l		max
0.6-2.5	0	-5	5	4	3	4	7	7	0	-40	-	5
2.5-10	0	-5	5	4	3	4	7	7	0	-40	-250	5
10-18	0	-5	5	4	3	4	7	7	0	-80	-250	5
18-30	0	-6	6	5	3	4	8	8	0	-120	-250	5
30-50	0	-8	8	6	4	5	8	8	0	-120	-250	5
50-80	0	-9	9	7	5	5	8	8	0	-150	-380	6
80-120	0	-10	10	8	5	6	9	9	0	-200	-380	7
120-180	0	-13	13	10	7	8	10	10	0	-250	-500	8
180-250	0	-15	15	12	8	10	11	13	0	-300	-500	10
250-315	0	-18	18	14	9	13	13	15	0	-350	-500	13
315-400	0	-23	23	18	12	15	15	20	0	-400	-630	15

① Only applicable for deep groove and angular contact ball bearing

② Only applicable for assembled bearing of inner ring

Table 2-17 outer rings

μm

D/mm	Δ D_{mp}		V_{Dp}① diameter series		V_{Dmp}	K_{ea}	S_D	S_{ea}②	Δ C_s		V_{Bs}
			9	0、1 2、3、4							
> – ≤	h	l	max		max	max	max	max	h	l	max
2.5-6	0	-5	5	4	3	5	8	8			5
6-18	0	-5	5	4	3	5	8	8			5
18-30	0	-6	6	5	3	6	8	8			5
30-50	0	-7	7	5	4	7	8	8			5
50-80	0	-9	9	7	5	8	8	10	Values are identical to those for inner ring of same bearing (Δ B_s)		6
80-120	0	-10	10	8	5	10	9	11			8
120-150	0	-11	11	8	6	11	10	13			8
150-180	0	-13	13	10	7	13	10	14			8
180-250	0	-15	15	11	8	15	11	16			10
250-315	0	-18	18	14	9	18	13	18			11
315-400	0	-20	20	15	10	20	13	20			13
400-500	0	-23	23	17	12	23	15	23			15
500-630	0	-28	28	21	14	25	18	25			18
630-800	0	-35	35	26	18	30	20	30			20

① Not regulate numerical value for close bearing

② Only applicable for deep groove and angular contact ball bearing

4）class P4 tolerances

Table 2-18 inner ring

μm

d/mm	Δ d_{mp}		Δ d_s①		V_{dp} diameter series		V_{dmp}	K_{ia}	S_d	S_{ia}②	Δ B_s			V_{Bs}
					9	0、1 2、3、4					all	normal	modify③	
> – ≤	h	l	h	l	max		max	max	max	max	h	l		max
0.6-2.5	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	-250	2.5
2.5-10	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	-250	2.5
10-18	0	-4	0	-4	4	3	2	2.5	3	3	0	-80	-250	2.5
18-30	0	-5	0	-5	5	4	2.5	3	4	4	0	-120	-250	2.5
30-50	0	-6	0	-6	6	5	3	4	4	4	0	-120	-250	3
50-80	0	-7	0	-7	7	5	3.5	4	5	5	0	-150	-250	4
80-120	0	-8	0	-8	8	6	4	5	5	5	0	-200	-380	4
120-180	0	-10	0	-10	10	8	5	6	6	7	0	-250	-380	5
180-250	0	-12	0	-12	12	9	6	8	7	8	0	-300	-500	6

① Only applicable for diameter series 0, 1, 2, 3 and 4

② Only applicable for deep groove and angular contact ball bearing

③ Only applicable for assembled bearing of inner ring

Table 2-19 outer rings

μm

D/mm	Δ D_{mp}		Δ D_s①		V_{dp}② diameter series		V_{Dmp}	K_{ea}	S_D	S_{ea}③	Δ C_s		V_{cs}
					9	0、1 2、3、4							
> – ≤	h	l	h	l	max		max	max	max	max	h	l	max
2.5-6	0	-4	0	-4	4	3	2	3	4	5			2.5
6-18	0	-4	0	-4	4	3	2	3	4	5			2.5
18-30	0	-5	0	-5	5	4	2.5	4	4	5			2.5
30-50	0	-6	0	-6	6	5	3	5	4	5	Values are identical		2.5
50-80	0	-7	0	-7	7	5	3.5	5	4	5	to those for inner		3
80-120	0	-8	0	-8	8	6	4	6	5	6	ring of same bearing		4
120-150	0	-9	0	-9	9	7	5	7	5	7	(Δ B_s)		5
150-180	0	-10	0	-10	10	8	5	8	5	8			5
180-250	0	-11	0	-11	11	8	6	10	7	10			7
250-315	0	-13	0	-13	13	10	7	11	8	10			7
315-400	0	-15	0	-15	15	11	8	13	10	13			8

① Only applicable for diameter series 0, 1, 2, 3 and 4

② No numerical value for close bearings

③ Only applicable for deep groove and angular contact ball bearing

5）class P2 tolerances

Table 2-20 inner rings

μm

d/mm	Δd_{mp}		Δd_s		V_{dp}	V_{dmp}	K_{ia}	S_d	S_{ia}①	ΔB_s		V_{Bs}
> – ≤	h	l	h	l	max	max	max	max	max	h	l	max
0.6①-2.5	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-40	1.5
2.5-10	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-40	1.5
10-18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-80	1.5
18-30	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2.5	0	-120	1.5
30-50	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2.5	0	-120	1.5
50-80	0	-4	0	-4	4	2	2.5	1.5	2.5	0	-150	1.5
80-120	0	-5	0	-5	5	2.5	2.5	2.5	2.5	0	-200	2.5
120-150	0	-7	0	-7	7	3.5	2.5	2.5	2.5	0	-250	2.5
150-180	0	-7	0	-7	7	3.5	5	4	5	0	-250	4
180-250	0	-8	0	-8	8	4	5	5	5	0	-300	5

① Only applicable for deep groove and angular contact ball bearing

Table 2-21 outer rings

μm

D/mm	ΔD_{mp}		ΔD_s		V_{Dp}①	V_{Dmp}	K_{ea}	S_D	S_{ea}②	ΔC_s		V_{cs}
> – ≤	h	l	h	l	max	max	max	max	max	h	l	max
2.5-6	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5			1.5
6-18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5			1.5
18-30	0	-4	0	-4	4	2	2.5	1.5	2.5	Values are identical to those for inner ring of same bearing (ΔB_s)		1.5
30-50	0	-4	0	-4	4	2	2.5	1.5	2.5			1.5
50-80	0	-4	0	-4	4	2	4	1.5	4			1.5
80-120	0	-5	0	-5	5	2.5	5	2.5	5			2.5
120-150	0	-5	0	-5	5	2.5	5	2.5	5			2.5
150-180	0	-7	0	-7	7	3.5	5	2.5	5			2.5
180-250	0	-8	0	-8	8	4	7	4	7			4
250-315	0	-8	0	-8	8	4	7	5	7			5
315-400	0	-10	0	-10	10	5	8	7	8			7

① Only applicable for deep groove and angular contact ball bearing

2.2.1.3 Tolerances for taper roller bearing

(1) class P0 tolerances

Table 2-22 inner ring diameter and radial run-out

μm

d/mm	Δd_{mp}		V_{dp}	V_{dmp}	K_{ia}
> – ≤	h	l	max	max	max
0-18	0	-12	12	9	15
18-30	0	-12	12	9	18
30-50	0	-12	12	9	20
50-80	0	-15	15	11	25
80-120	0	-20	20	15	30
120-180	0	-25	25	19	35
180-250	0	-30	30	23	50
250-315	0	-35	35	26	60
315-400	0	-40	40	30	70
400-500	0	-45	45	34	80
500-630	0	-60	60	40	90
630-800	0	-75	75	45	100
800-1000	0	-100	100	55	115
1000-1250	0	-125	125	65	130
1250-1600	0	-160	160	80	150
1600-2000	0	-200	200	100	170

Table 2-23 outer ring diameter and radial run-out

μm

D/mm	ΔD_{mp}		V_{Dp}	V_{Dmp}	K_{ea}
	h	l	max	max	max
18-30	0	-12	12	9	18
30-50	0	-14	14	11	20
50-80	0	-16	16	12	25
80-120	0	-18	18	14	35
120-150	0	-20	20	15	40
150-180	0	-25	25	19	45
180-250	0	-30	30	23	50
250-315	0	-35	35	26	60
315-400	0	-40	40	30	70
400-500	0	-45	45	34	80
500-630	0	-50	60	38	100
630-800	0	-75	80	55	120
800-1000	0	-100	100	75	140
1000-1250	0	-125	130	90	160
1250-1600	0	-160	170	100	180
1600-2000	0	-200	210	110	200
2000-2500	0	-250	265	120	220

Table 2-24 Width of inner or outer ring and bearing assembly

μm

d/mm	ΔB_s		ΔC_s		ΔT_s		ΔT_{1s}		ΔT_{2s}	
> – ≤	h	l	h	l	h	l	h	l	h	l
0-18	0	-120	0	-120	+200	0	+100	0	+100	0
18-30	0	-120	0	-120	+200	0	+100	0	+100	0
30-50	0	-120	0	-120	+200	0	+100	0	+100	0
50-80	0	-150	0	-150	+200	0	+100	0	+100	0
80-120	0	-200	0	-200	+200	-200	+100	-100	+100	-100
120-180	0	-250	0	-250	+350	-250	+150	-150	+200	-100
180-250	0	-300	0	-300	+350	-250	+150	-150	+200	-100
250-315	0	-350	0	-350	+350	-250	+150	-150	+200	-100
315-400	0	-400	0	-400	+400	-400	+200	-200	+200	-200
400-500	0	-450	0	-450	+450	-450	+225	-225	+225	-225
500-630	0	-500	0	-500	+500	-500	-	-	-	-
630-800	0	-750	0	-750	+600	-600	-	-	-	-
800-1000	0	-1000	0	-1000	+750	-750	-	-	-	-
1000-1250	0	-1250	0	-1250	+900	-900	-	-	-	-
1250-1600	0	-1600	0	-1600	+1050	-1050	-	-	-	-
1600-2000	0	-2000	0	-2000	+1200	-1200	-	-	-	-

(2) Class P6 tolerances. The tolerances of diameter and radial runout of inner ring and outer ring refer to Grade 0 values in table 2-22 and 2-23, and the width tolerances refer to table 2-25

Table 2-25 Width of inner or outer ring and bearing assembly

μm

d/mm	ΔBs		ΔCs		ΔTs		ΔT1s		ΔT2s	
> – ≤	h	l	h	l	h	l	h	l	h	l
0-18	0	-50	0	-100	+100	0	+50	0	+50	0
18-30	0	-50	0	-100	+100	0	+50	0	+50	0
30-50	0	-50	0	-100	+100	0	+50	0	+50	0
50-80	0	-50	0	-100	+100	0	+50	0	+50	0
80-120	0	-50	0	-100	+100	0	+50	0	+50	0
120-180	0	-50	0	-100	+150	0	+50	0	+100	0
180-250	0	-50	0	-100	+150	0	+50	0	+100	0
250-315	0	-50	0	-100	+200	0	+100	0	+100	0
315-400	0	-50	0	-100	+200	0	+100	0	+100	0
400-500	0	-50	0	-100	+200	0	+100	0	+100	0

(3) Class P5 tolerances

Table 2-26 Inner ring and single bearing width

μm

d/mm	Δdmp		Vdp	Vdmp	Kia	Sd
> – ≤	h	l	max	max	max	max
0-18	0	-7	5	5	5	7
18-30	0	-8	6	5	5	8
30-50	0	-10	8	5	6	8
50-80	0	-12	9	6	7	8
80-120	0	-15	11	8	8	9
120-180	0	-18	14	9	11	10
180-250	0	-22	17	11	13	11
250-315	0	-25	19	13	13	13
315-400	0	-30	23	15	15	15
400-500	0	-35	28	17	20	17
500-630	0	-40	35	20	25	20
630-800	0	-50	45	25	30	25
800-1000	0	-60	60	30	37	30
1000-1250	0	-75	75	37	45	40
1250-1600	0	-90	90	45	55	50

Table 2-27 Outer ring

μm

D/mm	ΔDmp		VDp	VDmp	Kea	Sd
> – ≤	h	l	max	max	max	max
18-30	0	-8	6	5	6	8
30-50	0	-9	7	5	7	8
50-80	0	-11	8	6	8	8
80-120	0	-13	10	7	10	9
120-150	0	-15	11	8	11	10
150-180	0	-18	14	9	13	10
180-250	0	-20	15	10	15	11
250-315	0	-25	19	13	18	13
315-400	0	-28	22	14	20	13
400-500	0	-33	26	17	24	17
500-630	0	-38	30	20	30	20
630-800	0	-45	38	25	36	25
800-1000	0	-60	50	30	43	30
1000-1250	0	-80	65	38	52	38
1250-1600	0	-100	90	50	62	50
1600-2000	0	-125	120	65	73	65

Table 2-28 Width of inner or outer ring and bearing assembly

μm

d/mm	ΔBs		ΔCs		ΔTs		ΔT1s		ΔT2s	
> – ≤	h	l	h	l	h	l	h	l	h	l
0-10	0	-200	0	-200	+200	-200	+100	-100	+100	-100
10-18	0	-200	0	-200	+200	-200	+100	-100	+100	-100
18-30	0	-200	0	-200	+200	-200	+100	-100	+100	-100
30-50	0	-240	0	-240	+200	-200	+100	-100	+100	-100
50-80	0	-300	0	-300	+200	-200	+100	-100	+100	-100
80-120	0	-400	0	-400	+200	-200	+100	-100	+100	-100
120-180	0	-500	0	-500	+350	-250	+150	-150	+200	-100
180-250	0	-600	0	-600	+350	-250	+150	-150	+200	-100
250-315	0	-700	0	-700	+350	-250	+150	-150	+200	-100
315-400	0	-800	0	-800	+400	-400	+200	-200	+200	-200
400-500	0	-900	0	-900	+450	-450	+225	-225	+225	-225
500-630	0	-1100	0	-1100	+500	-500	-	-	-	-
630-800	0	-1600	0	-1600	+600	-600	-	-	-	-
800-1000	0	-2000	0	-2000	+750	-750	-	-	-	-
1000-1250	0	-2000	0	-2000	+750	-750	-	-	-	-
1250-1600	0	-2000	0	-2000	+900	-900	-	-	-	-

4）Class P4 tolerances

Table 2-29 Width of Inner ring and single bearing

μm

d/mm > – ≤	V_{dmp}		Δd_s		V_{dp}	Δd_{mp}	K_{ia}	S_d	S_{ia}
	h	l	h	l	max	max	max	max	max
0-18	0	-5	0	-5	4	4	3	3	3
18-30	0	-6	0	-6	5	4	3	4	4
30-50	0	-8	0	-8	6	5	4	4	4
50-80	0	-9	0	-9	7	5	4	5	4
80-120	0	-10	0	-10	8	5	5	5	5
120-180	0	-13	0	-13	10	7	6	6	7
180-250	0	-15	0	-15	11	8	8	7	8
250-315	0	-18	0	-18	12	9	9	8	9

Table 2-30 Width of outer ring and single bearing

μm

D/mm > – ≤	ΔD_{mp}		ΔD_s		V_{Dp}	V_{Dmp}	K_{ea}	S_D	S_{ea}
	h	l	h	l	max	max	max	max	max
0-30	0	-6	0	-6	5	4	4	4	5
30-50	0	-7	0	-7	5	5	5	4	5
50-80	0	-9	0	-9	7	5	5	4	5
80-120	0	-10	0	-10	8	5	6	5	6
120-150	0	-11	0	-11	8	6	7	5	7
150-180	0	-13	0	-13	10	7	8	5	8
180-250	0	-15	0	-15	11	8	10	7	10
250-315	0	-18	0	-18	14	9	11	8	10
315-400	0	-20	0	-20	15	10	13	10	13

Table 2-31 Width of inner or outer ring and bearing assembly

μm

d/mm > – ≤	ΔB_s		ΔC_s		ΔT_s		ΔT_{1S}		ΔT_{2S}	
	h	l	h	l	h	l	h	l	h	l
--10	0	-200	0	-200	+200	-200	+100	-100	+100	-100
10-18	0	-200	0	-200	+200	-200	+100	-100	+100	-100
18-30	0	-200	0	-200	+200	-200	+100	-100	+100	-100
30-50	0	-240	0	-240	+200	-200	+100	-100	+100	-100
50-80	0	-300	0	-300	+200	-200	+100	-100	+100	-100
80-120	0	-400	0	-400	+200	-200	+100	-100	+100	-100
120-180	0	-500	0	-500	+350	-250	+150	-150	+200	-100
180-250	0	-600	0	-600	+350	-250	+150	-150	+200	-100
250-315	0	-700	0	-700	+350	-250	+150	-150	+200	-100

5）Class P5 tolerances

Table 2-32 inner rings

μm

d/mm > – ≤	Δ_{dmp} Δ_{ds}		V_{dsp}	V_{dmp}	K_{ia}	S_d	S_{ia}
	h	l	max	max	max	max	max
--10	0	-4	2.5	1.5	2	1.5	2
10-18	0	-4	2.5	1.5	2	1.5	2
18-30	0	-4	2.5	1.5	2.5	1.5	2.5
30-50	0	-5	3	2	2.5	2	2.5
50-80	0	-5	4	2	3	2	3
80-120	0	-6	5	2.5	3	2.5	3
120-180	0	-7	7	3.5	4	3.5	4
180-250	0	-8	7	4	5	5	5
250-315	0	-8	8	5	6	5.5	6

Table 2-33 outer rings

μm

D/mm > – ≤	Δ_{Dmp} Δ_{Ds}		V_{dsp}	V_{dmp}	K_{ea}	S_D [a] S_{D1}	S_{ea} [a]	S_{ea1}
	h	l	max	max	max	max	max	max
--18	0	-5	4	2.5	2.5	1.5	2.5	4
18-30	0	-5	4	2.5	2.5	1.5	2.5	4
30-50	0	-5	4	2.5	2.5	2	2.5	4
50-80	0	-6	4	2.5	4	2.5	4	6
80-120	0	-6	5	3	5	3	5	7
120-150	0	-7	5	3.5	5	3.5	5	7
150-180	0	-7	7	4	5	4	5	7
180-250	0	-8	8	5	7	5	7	10
250-315	0	-9	8	5	7	6	7	10
315-400	0	-10	10	6	8	7	8	11

[a] not applicable for bearings with flanged outer ring

Table 2-34 Width of inner or outer ring, single row bearing and its assembly

μm

d/mm > – ≤	ΔB_s		ΔC_s		ΔT_s		ΔT_{1S}		ΔT_{2S}	
	h	l	h	l	h	l	h	l	h	l
--10	0	-200	0	-200	+200	-200	+100	-100	+100	-100
10-18	0	-200	0	-200	+200	-200	+100	-100	+100	-100
18-30	0	-200	0	-200	+200	-200	+100	-100	+100	-100
30-50	0	-240	0	-240	+200	-200	+100	-100	+100	-100
50-80	0	-300	0	-300	+200	-200	+100	-100	+100	-100
80-120	0	-400	0	-400	+200	-200	+100	-100	+100	-100
120-180	0	-500	0	-500	+200	-250	+100	-100	+100	-150
180-250	0	-600	0	-600	+200	-300	+100	-150	+100	-150
250-315	0	-700	0	-700	+200	-300	+100	-150	+100	-150

2.2.1.4 Outer ring flange of radial bearing

(1) Flanged outer ring tolerances of radial bearing and taper roller bearing

Table 2-35 Flanged outer ring tolerances μm

d/mm > – ≤	Δ_{D1S}			
	Orientation flange		Not orientation flange	
	h	l	h	l
--6	0	-36	+220	-36
6-10	0	-36	+220	-36
10-18	0	-43	+270	-43
18-30	0	-52	+330	-52
30-50	0	-62	+390	-62
50-80	0	-74	+460	-74
80-120	0	-87	+540	-87
120-180	0	-100	+630	-100
180-250	0	-115	+720	-115
250-315	0	-130	+810	-130
315-400	0	-140	+890	-140
400-500	0	-155	+970	-155
500-630	0	-175	+1100	-175
630-800	0	-200	+1250	-200
800-1000	0	-230	+1400	-230
1000-1250	0	-260	+1650	-260
1250-1600	0	-310	+1950	-310
1600-2000	0	-370	+2300	-370
2000-2500	0	-440	+2800	-440

2.2.1.5 Class P0 tolerances of tapered bore

Table 2-36 tapered bore (1:12) μm

d/mm > – ≤	Δ_{dmp}		Δ_{d1mp}- Δ_{dmp}		V_{dsp} [a.b]
	h	l	h	l	max
--10	+22	0	+15	0	9
10-18	+27	0	+18	0	11
18-30	+33	0	+21	0	13
30-50	+39	0	+25	0	16
50-80	+46	0	+30	0	19
80-120	+54	0	+35	0	22
120-180	+63	0	+40	0	40
180-250	+72	0	+46	0	46
250-315	+81	0	+52	0	52
315-400	+89	0	+57	0	57
400-500	+97	0	+63	0	63
500-630	+110	0	+70	0	70
630-800	+125	0	+80	0	-
800-1000	+140	0	+90	0	-
1000-1250	+165	0	+105	0	-
1250-1600	+195	0	+125	0	-

[a] Applies inner ring of single outside diameters in one plane; [b] not applies diameter series 7 and 8

Table 2-37 tapered bore (1:30) μm

d/mm > – ≤	Δ_{dmp}		Δ_{d1mp}- Δ_{dmp}		V_{dsp} [a.b]
	h	l	h	l	max
--50	+15	0	+30	0	19
50-80	+15	0	+30	0	19
80-120	+20	0	+35	0	22
120-180	+25	0	+40	0	40
180-250	+30	0	+46	0	46
250-315	+35	0	+52	0	52
315-400	+40	0	+57	0	57
400-500	+45	0	+63	0	63
500-630	+50	0	+70	0	70

[a] Applies inner ring of single outside diameters in one plane;
[b] not applies diameter series 7 and 8

2.2.2 Thrust ball bearing tolerances

2.2.2.1 Symbol

d —— Nominal bore diameter
d_s —— Single bore diameter
d —— Nominal bore diameter of single direction bearing
d_2 —— Nominal bore diameter of double direction bearing
Δd_{mp} —— Deviation of single direction bearing the mean of bore diameter
Δd_{2mp} —— Deviation of the mean double direction bearing bore diameter from the nominal
D —— Nominal outside diameter of bearing housing
ΔD_{mp} —— Deviation of the mean bearing housing outside diameter from the nominal
S_e —— variation of bearing housing raceways for fundus ply
Note —— Only applicable for thrust ball bearing (90°) and thrust cylindrical roller bearing
S_i —— variation of shaft ring raceways for fundus ply
Note —— Only applicable for thrust ball bearing(90°) and thrust cylindrical roller bearing
T —— the height of single direction bearing
T_1 —— the height of double direction bearing
ΔT_s —— Deviation of effective height of single direction bearing
ΔT_{1s} —— Deviation of effective height of double direction bearing
V_{dp} —— diameter variation of single direction shaft ring in one radial plane
V_{d2p} —— diameter variation of double direction shaft ring in one radial plane
V_{Dp} —— outer diameter variation of bearing housing in one radial plane

2.2.2.2 Single and double directional thrust bearing tolerances

(1) class P0 tolerances

Table 2-38 shaft rings and bearing height

μm

d 和 d_2/mm > − ≤	Δd_{mp} Δd_{2mp}		V_{dp} V_{d2p}	S_i	ΔT_s		ΔT_{1s}	
	h	l	max	max	h	l	h	l
--18	0	-8	6	10	+20	-250	+150	-400
18-30	0	-10	8	10	+20	-250	+150	-400
30-50	0	-12	9	10	+20	-250	+150	-400
50-80	0	-15	11	10	+20	-300	+150	-500
80-120	0	-20	15	15	+25	-300	+200	-500
120-180	0	-25	19	15	+25	-400	+200	-600
180-250	0	-30	23	20	+30	-400	+250	-600
250-315	0	-35	26	25	+40	-400	-	-
315-400	0	-40	30	30	+40	-500	-	-
400-500	0	-45	34	30	+50	-500	-	-
500-630	0	-50	38	35	+60	-600	-	-
630-800	0	-75	55	40	+70	-750	-	-
800-1000	0	-100	75	45	+80	-1000	-	-
1000-1250	0	-125	95	50	+100	-1400	-	-
1250-1600	0	-160	120	60	+120	-1600	-	-
1600-2000	0	-200	150	75	+140	-1900	-	-
2000-2500	0	-250	190	90	+160	-2300	-	-

Note: Only applicable for d_2 ≤190mm for double direction bearing

Table 2-39 bearing housing

μm

D/mm > − ≤	ΔD_{mp}		V_{dp}	S_e
	h	l	max	max
10-18	0	-11	8	Values are identical to those for shaft ring of same bearing(S_i)
18-30	0	-13	10	
30-50	0	-16	12	
50-80	0	-19	14	
80-120	0	-22	17	
120-180	0	-25	19	
180-250	0	-30	23	
250-315	0	-35	26	
315-400	0	-40	30	
400-500	0	-45	34	
500-630	0	-50	38	
630-800	0	-75	55	
800-1000	0	-100	75	
1000-1250	0	-125	95	
1250-1600	0	-160	120	
1600-2000	0	-200	150	
2000-2500	0	-250	190	
2500-2850	0	-300	225	

Note: Only applicable for D ≤ 360mm for double direction bearing

(2) class P6 tolerance

Table 2-40 shaft ring and bearing height

μm

d 和 d_2/mm > − ≤	Δd_{mp} Δd_{2mp}		V_{dp} V_{d2p}	S_i	ΔT_s		ΔT_{1s}	
	h	l	max	max	h	l	h	l
--18	0	-8	6	5	+20	-250	+150	-400
18-30	0	-10	8	5	+20	-250	+150	-400
30-50	0	-12	9	6	+20	-250	+150	-400
50-80	0	-15	11	7	+20	-300	+150	-500
80-120	0	-20	15	8	+25	-300	+200	-500
120-180	0	-25	19	9	+25	-400	+200	-600
180-250	0	-30	23	10	+30	-400	+250	-600
250-315	0	-35	26	13	+40	-400	-	-
315-400	0	-40	30	15	+40	-500	-	-
400-500	0	-45	34	18	+50	-500	-	-
500-630	0	-50	38	21	+60	-600	-	-
630-800	0	-75	55	25	+70	-750	-	-
800-1000	0	-100	75	30	+80	-1000	-	-
1000-1250	0	-125	95	35	+100	-1400	-	-
1250-1600	0	-160	120	40	+120	-1600	-	-
1600-2000	0	-200	150	45	+140	-1900	-	-
2000-2500	0	-250	190	50	+160	-2300	-	-

Note: Only applicable for d_2 ≤190mm for double direction bearing

Table 2-41 bearing housing

μm

D/mm > − ≤	ΔD_{mp}		V_{dp}	S_e
	h	l	max	max
10-18	0	-11	8	Values are identical to those for shaft ring of same bearing(S_i)
18-30	0	-13	10	
30-50	0	-16	12	
50-80	0	-19	14	
80-120	0	-22	17	
120-180	0	-25	19	
180-250	0	-30	23	
250-315	0	-35	26	
315-400	0	-40	30	
400-500	0	-45	34	
500-630	0	-50	38	
630-800	0	-75	55	
800-1000	0	-100	75	
1000-1250	0	-125	95	
1250-1600	0	-160	120	
1600-2000	0	-200	150	
2000-2500	0	-250	190	
2500-2850	0	-300	225	

Note: Only applicable for D ≤ 360mm for double direction bearing

3）Class P5 tolerances

Table 2-42 shaft ring and bearing height

μm

d 和 d_2/mm > − ≤	Δd_{mp} Δd_{2mp}		V_{dp} V_{d2p}	S_i	ΔT_s		ΔT_{1s}	
	h	l	max	max	h	l	h	l
--18	0	-8	6	3	+20	-250	+150	-400
18-30	0	-10	8	3	+20	-250	+150	-400
30-50	0	-12	9	3	+20	-250	+150	-400
50-80	0	-15	11	4	+20	-300	+150	-500
80-120	0	-20	15	4	+25	-300	+200	-500
120-180	0	-25	19	5	+25	-400	+200	-600
180-250	0	-30	23	5	+30	-400	+250	-600
250-315	0	-35	26	7	+40	-400	-	-
315-400	0	-40	30	7	+40	-500	-	-
400-500	0	-45	34	9	+50	-500	-	-
500-630	0	-50	38	11	+60	-600	-	-
630-800	0	-75	55	13	+70	-750	-	-
800-1000	0	-100	75	15	+80	-1000	-	-
1000-1250	0	-125	95	18	+100	-1400	-	-
1250-1600	0	-160	120	25	+120	-1600	-	-
1600-2000	0	-200	150	30	+140	-1900	-	-
2000-2500	0	-250	190	40	+160	-2300	-	-

Note: Only applicable for d_2≤190mm for double direction bearing

Table 2-43 bearing housing

μm

D/mm > − ≤	ΔD_{mp}		V_{dp}	S_e
	h	l	max	max
10-18	0	-11	8	Values are identical to those for shaft ring of same bearing(S_i)
18-30	0	-13	10	
30-50	0	-16	12	
50-80	0	-19	14	
80-120	0	-22	17	
120-180	0	-25	19	
180-250	0	-30	23	
250-315	0	-35	26	
315-400	0	-40	30	
400-500	0	-45	34	
500-630	0	-50	38	
630-800	0	-75	55	
800-1000	0	-100	75	
1000-1250	0	-125	95	
1250-1600	0	-160	120	
1600-2000	0	-200	150	
2000-2500	0	-250	190	
2500-2850	0	-300	225	

Note: Only applicable for D ≤ 360mm for double direction bearing

4）Class P4 tolerances

Table 2-44 shaft rings and bearing height

μm

d 和 d_2/mm > − ≤	Δd_{mp} Δd_{2mp}		V_{dp} V_{d2p}	S_i	ΔT_s		ΔT_{1s}	
	h	l	max	max	h	l	h	l
--18	0	-7	5	2	+20	-250	+150	-400
18-30	0	-8	6	2	+20	-250	+150	-400
30-50	0	-10	8	2	+20	-250	+150	-400
50-80	0	-12	9	3	+20	-300	+150	-500
80-120	0	-15	11	3	+25	-300	+200	-500
120-180	0	-18	14	4	+25	-400	+200	-600
180-250	0	-22	17	4	+30	-400	+250	-600
250-315	0	-25	19	5	+40	-400	-	-
315-400	0	-30	23	5	+40	-500	-	-
400-500	0	-35	26	6	+50	-500	-	-
500-630	0	-40	30	7	+60	-600	-	-
630-800	0	-50	40	8	+70	-750	-	-

Note: Only applicable for d_2≤190mm for double direction bearing

Table 2-45 bearing housing

μm

D/mm > − ≤	ΔD_{mp}		V_{dp}	S_e
	h	l	max	max
10-18	0	-7	5	Values are identical to those for shaft ring of same bearing(S_i)
18-30	0	-8	6	
30-50	0	-9	7	
50-80	0	-11	8	
80-120	0	-13	10	
120-180	0	-15	11	
180-250	0	-20	15	
250-315	0	-25	19	
315-400	0	-28	21	
400-500	0	-33	25	
500-630	0	-38	29	
630-800	0	-45	34	
800-1000	0	-60	45	

Note: Only applicable for D ≤ 360mm for double direction bearing