2.3 Rolling Bearing Clearance

Bearing clearance is defined as the total distance through which one bearing inner ring can be moved relative to the other in the radial direction (radial clearance) or in the axial direction (axial clearance).The bearing clearance can be divided into several groups,1,2,0 (basic group),3,4,5,etc group. The clearance in group 1is minimum, and in group 5 is maximum. The group number and the value of each bearing clearance are different. Below is the clearance group and the value.

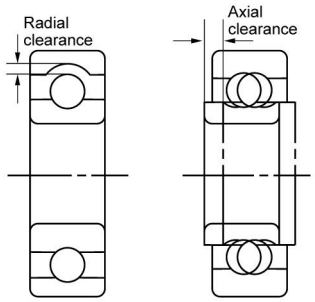

Fig 2 Bearing Clearance

2.3.1 Deep groove ball bearings radial clearance in Table2-46

Table 2-46 Deep groove ball bearings radial clearance

μm

Inner diameter d/mm		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max
2.5	6	0	7	2	13	8	23	-	-	-	-
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
16	24	0	10	5	20	13	28	26	35	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	2	35	25	85	75	140	125	195	175	265
225	250	2	40	30	95	85	160	145	225	205	300
250	280	2	45	35	105	90	170	155	245	225	340
280	315	2	55	40	115	100	190	175	270	245	370
315	355	3	60	45	125	110	210	195	300	275	410
355	400	3	70	55	145	130	240	225	340	315	460
400	450	3	80	60	170	150	270	250	380	350	510
450	500	3	90	70	190	170	300	280	420	390	570
500	560	10	100	8	210	190	330	310	470	440	630
560	630	10	110	90	230	210	360	340	520	490	690
630	710	20	130	110	260	240	400	380	570	540	760
710	800	20	140	120	290	270	450	430	630	600	840
800	900	20	160	140	320	300	500	480	700	670	940
900	1000	20	170	150	350	330	500	530	770	740	1040
1000	1120	20	180	160	380	360	600	580	850	820	1150
1120	1250	20	190	170	410	390	650	630	920	890	1260

2.3.2 Self-aligning ball bearings radial clearance in Table 2-47 to Tab2-48

Table2-47 Cylindrical bore self-aligning ball bearings radial clearance

μm

Inner diameter d/mm		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max
2.5	6	1	8	5	15	10	20	15	25	21	33
6	10	2	9	6	17	12	25	19	33	27	42
10	14	2	10	6	19	13	26	21	35	30	48
14	18	3	12	8	21	15	28	23	37	32	50
18	24	4	14	10	23	17	30	25	39	34	52
24	30	5	16	11	24	19	35	29	46	40	58
30	40	6	18	13	29	23	40	34	53	46	66
40	50	6	19	14	31	25	44	37	57	50	71
50	65	7	21	16	35	30	50	45	69	62	88
65	80	8	24	18	40	35	60	54	83	76	108
80	100	9	27	22	48	42	70	64	96	86	124
100	120	10	31	25	56	50	83	75	114	105	145
120	140	10	38	30	68	60	100	80	135	125	175
140	160	15	44	35	80	70	120	110	161	130	210

Table2-48 Tapered bore self-aligning ball bearings radial clearance

μm

Inner diameter d/mm		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max
18	24	7	17	13	26	20	33	28	42	37	55
24	30	9	20	15	28	23	39	33	50	44	62
30	40	12	24	19	35	29	46	40	59	52	72
40	50	14	27	22	39	33	52	45	65	58	79
50	65	18	32	27	47	41	61	56	80	73	99
65	80	23	39	35	57	50	75	69	98	91	123
80	100	29	47	42	68	62	90	84	116	109	144
100	120	35	56	50	81	75	108	100	139	130	170
120	140	40	68	60	98	90	130	120	165	155	205
140	160	45	74	65	110	100	150	140	191	180	240

2.3.3 Self-aligning roller bearings radial clearance in Table2-49 to Tab2-50

Table2-49 Cylindrical bore self-aligning roller bearings radial clearance

μm

Inner diameter d/mm		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max
25	18	10	20	20	35	35	45	45	60	60	75
18	24	10	20	20	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95
30	40	15	30	30	45	15	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	60	110	110	1450	145	180
80	100	35	60	60	100	100	135	135	180	180	225
100	120	40	75	75	120	120	160	160	210	210	280
120	140	50	95	95	145	145	190	190	240	240	300
140	160	60	110	110	170	170	220	220	280	280	350
160	180	65	120	120	180	180	240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	140	140	220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	556	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	500	140	260	560	410	410	550	550	720	720	900
500	560	150	280	580	440	440	600	600	780	780	1000
560	630	170	310	310	480	480	65	650	850	850	1100
630	710	190	350	350	530	530	700	700	920	920	1190
710	800	210	390	390	580	580	770	770	1010	10140	1300
800	900	230	430	430	650	650	860	860	1120	1120	1440
900	1000	260	480	480	710	710	930	930	1220	1220	1570

Table2-50 Tapered bore self-aligning roller bearings radial clearance

μm

Inner diameter d/mm		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max
18	24	15	25	25	35	35	45	45	60	60	75
24	30	20	30	30	40	40	55	55	75	75	95
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
80	100	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910
450	500	260	370	370	490	490	630	630	790	790	1000
500	560	290	410	410	540	540	660	680	870	870	1100
560	630	320	460	460	600	600	760	760	980	980	1230
630	710	350	510	540	670	670	850	850	1090	1090	1360
710	800	390	570	570	750	750	960	960	1220	1220	1500
800	900	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	490	710	710	930	930	1190	1190	1520	1520	1860

2.3.4 Cylindrical roller bearings radial clearance

The cylindrical bore cylindrical roller bearings radial clearance in table 2-51, and the cylindrical bore double row cylindrical roller bearings radial clearance in table 2-52, and the tapered bore double row cylindrical roller bearings radial clearance in table 2-53.

Table 2-51 Cylindrical bore cylindrical roller bearings radial clearance μm

Inner diameter d/mm		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max
-	10	0	25	20	45	35	60	50	75	-	-
10	24	0	25	20	45	35	60	50	75	65	90
24	30	0	25	20	45	35	60	50	75	70	95
30	40	5	30	25	50	45	70	60	85	80	105
40	50	5	35	30	60	50	80	70	100	95	125
50	65	10	40	40	70	60	90	80	110	110	140
65	80	10	45	40	75	65	100	90	125	130	165
80	100	15	50	50	85	75	110	105	140	155	190
100	120	150	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	110	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485
315	355	65	145	145	225	225	305	305	385	455	535
355	400	100	190	190	280	280	370	370	460	510	600
400	450	110	210	210	310	310	410	410	510	564	665
450	500	110	220	220	330	330	440	440	550	625	735

Table 2-52 Cylindrical bore double row cylindrical roller bearings radial clearance μm

Inner diameter d/mm		1 Group		2 Group		3 Group	
>	≤	min	max	min	max	min	max
-	-	-	15	10	20	20	30
24	30	5	15	10	25	25	35
30	40	5	15	12	25	25	40
40	50	5	18	15	30	30	45
50	65	5	20	15	35	35	50
65	80	10	25	20	40	40	60
80	100	10	30	25	45	45	70
100	120	10	30	25	50	50	80
120	140	10	35	30	60	60	90
140	160	10	35	35	65	65	100
160	180	10	40	35	75	75	110
180	200	15	45	40	80	80	120
200	225	15	50	45	90	90	135
225	250	15	50	50	100	100	150
250	280	20	55	55	110	110	165
280	315	20	60	65	120	120	180
315	355	20	65	65	135	135	200
355	400	25	75	75	150	150	225
400	450	25	85	85	170	170	255
450	500	25	95	95	190	190	285

Table2-53 Cylindrical roller bearings radial clearance μm

Inner diameter d/mm		1 Group		2 Group	
>	≤	min	max	min	max
-	24	10	20	20	30
24	30	15	25	25	35
30	40	15	25	25	40
-	-	-	-	-	-
40	50	17	30	30	45
50	65	20	35	35	50
65	80	25	40	40	60
-	-	-	-	-	-
80	100	35	55	45	70
100	120	40	60	50	80
120	140	45	70	60	90
-	-	-	-	-	-
140	160	50	75	65	100

Inner diameter d/mm		1 Group		2 Group	
>	≤	min	max	min	max
160	180	55	85	75	110
180	200	60	90	80	120
-	-	-	-	-	-
200	225	60	95	90	135
225	25	65	100	100	150
250	280	75	110	110	165
-	-	-	-	-	-
280	315	80	120	120	180
315	355	90	135	135	200
355	400	100	150	150	225
-	-	-	-	-	-
400	450	110	170	170	255
450	500	120	190	190	285

2.3.5 Needle roller bearing clearance

The Needle roller bearings with inner ring, outer ring and cage, except the pressed outer ring and heavy bearing series, can refer to the radial clearance of cylindrical roller bearings. Depends on the diameter of inner ring raceway and the inscribed circle diameter of needle roller component, heavy bearing series with inner ring and outer ring, and needle roller bearings with cage, which inner ring can be supplied as a separate accessory, can refers to the radial clearance of cylindrical roller bearings.

2.3.6 Angular contact ball bearings axial clearance

The clearance of single row angular contact ball bearing depends on the requirement of contact angular, and guaranteed by the manufacture.The double row angular contact ball bearings axial clearance in table 2-54.

Table2-54 Double row angular contact ball bearings axial clearance μm

Inner diameter d/mm		2 Group		0 Group		3 Group	
>	≤	min	max	min	max	min	max
-	10	1	11	5	21	12	28
10	18	1	12	6	23	13	31
18	24	2	14	7	25	16	34
24	30	2	15	8	27	18	37
30	40	2	16	9	29	21	40
40	50	2	18	11	33	23	44
50	65	3	22	13	36	26	48
65	80	3	24	15	40	30	54
80	100	3	26	18	46	35	63
100	100	4	30	22	53	42	73

2.3.7 Tapered roller bearings clearance

The clearance of single row tapered roller bearing depends on the application requirement. and can be adjusted during mounting. Double row and four row tapered roller bearings radial clearance in table2-55.

Table2-55 Double row and four row tapered roller bearings radial clearance

μm

Inner diameter d/mm		1 Group		2 Group		0 Group		3 Group		4 Group		5 Group	
>	≤	min	max	min	max	min	max	min	max	min	max	min	max
-	30	0	10	10	20	20	30	30	50	50	60	60	60
30	40	0	12	12	25	25	40	40	60	60	75	75	95
40	50	0	15	15	30	30	45	45	65	65	80	80	110
50	65	0	15	15	30	30	50	50	70	70	90	90	120
65	80	0	20	20	40	40	60	60	80	80	110	110	150
60	100	0	20	20	45	45	70	70	100	100	130	130	170
100	120	0	25	25	50	50	80	80	110	110	150	150	200
120	140	0	30	30	60	60	90	90	120	120	170	170	230
140	160	0	30	30	65	65	100	100	140	140	190	190	260
160	180	0	35	35	70	70	110	110	150	150	210	210	280
18	200	0	40	40	80	80	120	120	170	170	230	230	310
200	225	0	40	40	90	90	140	140	190	190	266	266	340
225	250	0	50	50	100	100	150	150	210	210	290	290	380
250	280	0	50	50	110	110	170	170	230	230	320	320	420
280	315	0	60	60	120	120	180	180	250	250	350	350	460
315	355	0	70	70	140	140	210	210	280	280	390	390	510
355	400	0	70	70	150	150	230	230	310	310	440	440	580
400	450	0	80	80	170	170	260	260	350	350	490	490	650
450	500	0	90	90	190	190	290	290	390	390	540	540	720
500	560	0	100	100	210	210	320	320	430	430	590	590	790
560	630	0	110	110	230	230	350	350	480	480	660	660	580
630	710	0	130	130	260	260	400	400	540	540	740	740	910
710	800	0	140	140	290	290	450	450	610	610	830	830	1100
800	900	0	160	160	330	330	500	500	670	670	920	920	1240
90	1000	0	180	180	360	360	540	540	720	720	980	980	1300
1000	1120	0	200	200	400	400	600	600	820				
1120	1250	0	220	220	450	450	670	670	900				
1250	1400	0	250	250	500	500	750	750	980				

2.3.8 Spherical ball bearings radial clearance in table2-56 to table 2-57

Table 2-56 Cylindrical bore spherical bearings radial clearance

μm

Inner diameter d/mm		2,3 Series					
		2 Group		0 Group		3 Group	
>	≤	min	min	min	min	min	min
10	18	3	18	10	25	18	33
18	24	5	20	12	28	20	35
24	30	5	20	12	28	23	41
30	40	6	20	13	33	28	46
40	50	6	23	14	36	30	51
50	65	8	28	18	43	38	61
65	80	10	30	20	51	46	71
80	100	12	35	24	58	53	84
100	120	15	41	28	66	61	97
120	140	18	48	33	81	71	114

Table 2-57 Tapered bore spherical bearings radial clearance

μm

Inner diameter d/mm		2,3 Series					
		2 Group		0 Group		3 Group	
>	≤	min	min	min	min	min	min
10	18	10	25	18	33	25	45
18	24	12	28	20	35	28	48
24	30	12	28	23	41	30	53
30	40	13	33	28	46	40	64
40	50	14	35	30	51	45	73
50	65	18	43	38	61	55	90
65	80	20	51	46	71	65	105
80	100	24	58	53	84	75	120
100	120	28	66	61	97	90	140
120	140	33	81	71	114	105	160