
International Standard



5753

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Rolling bearings — Radial internal clearance

Roulements — Jeu interne radial

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5753 was developed by Technical Committee ISO/TC 4, *Rolling bearings*, and was circulated to the member bodies in June 1980.

It has been approved by the member bodies of the following countries :

Australia	Germany, F. R.	Poland
Austria	Hungary	Romania
Brazil	India	South Africa, Rep. of
Canada	Italy	Spain
China	Japan	Sweden
Czechoslovakia	Korea, Dem. P. Rep. of	United Kingdom
Egypt, Arab Rep. of	Korea, Rep. of	USA
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The member body of the following country expressed disapproval of the document on technical grounds :

Switzerland

This International Standard cancels and replaces ISO Recommendations R 201-1961, R 465-1965, R 1038-1969 and R 1646-1970, of which it constitutes a technical revision.

Rolling bearings — Radial internal clearance

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1 Scope and field of application

This International Standard specifies values of radial internal clearance for

- radial contact groove ball bearings;
- double row self-aligning ball bearings;
- cylindrical roller bearings;
- needle roller bearings; and,
- double row self-aligning roller bearings.

Values are given for all five types of bearing with cylindrical bore, and also for the self-aligning bearings with tapered bore.

The values given apply to non-preloaded bearings and of a design such that they can take purely radial load.

Depending on bearing design and measuring method some scatter of the results of repeated measurements may be experienced. Manufacturers are expected to take such scatter into consideration by applying correspondingly reduced manufacturing tolerances.

2 References

ISO 1132, *Rolling bearings — Tolerances — Definitions.*

ISO 6979, *Needle roller bearings — Heavy series — Dimensions and tolerances.*¹⁾

3 Definitions

3.1 Radial internal clearance of bearings: (capable of taking purely radial load, non-preloaded) is defined in ISO 1132, clause 6.1.1.

1) At present at the stage of draft.

4 Radial internal clearance values

4.1 Radial contact groove ball bearings

Table 1 — Radial contact groove ball bearings with cylindrical bore

Clearance values in micrometres

Bore diameter <i>d</i> mm		Group 2		Normal group		Group 3		Group 4		Group 5	
over	incl.	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
18	24	0	10	5	20	13	28	20	36	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

NOTE — These values are to be considered as "acceptance limits". Regarding manufacturing tolerances see clause 1.

4.2 Double row self-aligning ball bearings

Table 2 – Double row self-aligning ball bearings with cylindrical bore

Clearance values in micrometres

Bore diameter d mm		Group 2		Normal group		Group 3		Group 4		Group 5	
over	incl.	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	36	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	89	124
100	120	10	31	25	56	50	83	75	114	105	145
120	140	10	38	30	68	60	100	90	135	125	175
140	160	15	44	35	80	70	120	110	161	150	210

Table 3 – Double row self-aligning ball bearings with tapered bore

Clearance values in micrometres

Bore diameter d mm		Group 2		Normal group		Group 3		Group 4		Group 5	
over	incl.	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

4.3 Cylindrical roller bearings

Table 4 – Cylindrical roller bearings with cylindrical bore

Clearance values in micrometres

Bore diameter <i>d</i> mm		Group 2				Normal group				Group 3				Group 4				Group 5			
		interchangeable		matched		interchangeable		matched		interchangeable		matched		interchangeable		matched		interchangeable		matched	
		over	incl.	min.	min.	max.	max.	min.	min.	max.	max.	min.	min.	max.	max.	min.	min.	max.	max.	min.	min.
	10	0	10	20	30	10	20	30	40	25	35	45	55	35	45	55	65	—	—	—	—
10	18	0	10	20	30	10	20	30	40	25	35	45	55	35	45	55	65	55	65	75	85
18	24	0	10	20	30	10	20	30	40	25	35	45	55	35	45	55	65	55	65	75	85
24	30	0	10	25	30	10	25	35	45	30	40	50	65	40	50	60	70	60	70	80	90
30	40	0	12	25	35	15	25	40	50	35	45	55	70	45	55	70	80	70	80	95	105
40	50	5	15	30	40	20	30	45	55	40	50	65	75	55	65	80	90	85	95	110	120
50	65	5	15	35	45	20	35	50	65	45	55	75	90	65	75	90	105	100	110	130	140
65	80	5	20	40	55	25	40	60	75	55	70	90	105	75	90	110	125	115	130	150	165
80	100	10	25	45	60	30	45	70	80	65	80	105	115	90	105	125	140	145	155	180	195
100	120	10	25	50	65	35	50	80	90	80	95	120	135	105	120	145	160	165	180	205	220
120	140	10	30	60	75	40	60	90	105	90	105	135	155	115	135	160	180	185	200	230	250
140	160	15	35	65	80	50	65	100	115	100	115	150	165	130	150	180	195	210	225	260	275
160	180	20	35	75	85	60	75	110	125	110	125	165	175	150	165	200	215	235	250	285	300
180	200	25	40	80	95	65	80	120	135	125	140	180	195	165	180	220	235	260	275	315	330
200	225	30	45	90	105	75	90	135	150	140	155	200	215	180	200	240	255	290	305	350	365
225	250	40	50	100	115	90	100	150	165	150	165	215	230	205	215	265	280	320	330	380	395
250	280	45	55	110	125	100	110	165	180	175	185	240	255	230	240	295	310	355	370	420	435
280	315	50	60	120	135	110	120	180	195	195	205	265	280	255	265	325	340	400	410	470	485
315	355	55	65	135	145	125	135	200	215	215	225	295	305	280	295	360	370	440	455	520	530
355	400	65	75	150	160	140	150	225	235	245	255	330	340	320	330	405	415	500	510	585	595
400	450	70	85	170	190	155	170	255	275	270	285	370	390	355	370	455	465	555	565	650	675
450	500	85	95	190	205	180	190	285	300	300	315	410	420	395	410	505	515	620	625	720	740

NOTES

- 1 Unless indicated by the manufacturer that rings need to remain together as supplied, the values given in the columns headed "interchangeable" apply even after intermixing of rings.
- 2 When indicated by the manufacturer that bearings are delivered as matched assemblies, the values given in the columns headed "matched" apply, providing the rings remain together as supplied.

4.4 Needle roller bearings

For complete needle roller bearings, except drawn cup bearings and heavy series bearings given in ISO 6979, the same radial internal clearance values apply as given for cylindrical roller bearings in table 4.

For complete bearings of the heavy series (see ISO 6979), and for needle roller bearings comprising an inner ring delivered as a separate item, the radial clearance is given by the inner ring raceway and the needle roller complement bore diameters. Tolerances for these diameters are given in the International Standards covering needle roller bearing inner rings and needle roller bearings without inner ring.

4.5 Double row self-aligning roller bearings

Table 5 — Double row self-aligning roller bearings with cylindrical bore

Clearance values in micrometres

Bore diameter <i>d</i> mm		Group 2		Normal group		Group 3		Group 4		Group 5	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
14	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	45	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	80	110	110	145	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	260
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	550	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	260	410	410	550	550	720	720	900
500	560	150	280	280	440	440	600	600	780	780	1 000
560	630	170	310	310	480	480	650	650	850	850	1 100
630	710	190	350	350	530	530	700	700	920	920	1 190
710	800	210	390	390	580	580	770	770	1 010	1 010	1 300
800	900	230	430	430	650	650	860	860	1 120	1 120	1 440
900	1 000	260	480	480	710	710	930	930	1 220	1 220	1 570

Table 6 – Double row self-aligning roller bearings with tapered bore

Clearance values in micrometres

Bore diameter <i>d</i> mm		Group 2		Normal group		Group 3		Group 4		Group 5	
over	incl.	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	1 000
500	560	290	410	410	540	540	680	680	870	870	1 100
560	630	320	460	460	600	600	760	760	980	980	1 230
630	710	350	510	510	670	670	850	850	1 090	1 090	1 360
710	800	390	570	570	750	750	960	960	1 220	1 220	1 500
800	900	440	640	640	840	840	1 070	1 070	1 370	1 370	1 690
900	1 000	490	710	710	930	930	1 190	1 190	1 520	1 520	1 860

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