

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
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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

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 <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	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 <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	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				interchangeable				interchangeable				interchangeable				interchangeable			
		matched				matched				matched				matched				matched			
over	incl.	min.	min.	max.	max.	min.	min.	max.	max.	min.	min.	max.	max.	min.	min.	max.	max.	min.	min.	max.	max.
	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	155	170	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.