International Standard 199

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Rolling bearings — Thrust ball bearings — Tolerances

Roulements — Butées à billes — Tolérances

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

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 199 was developed by Technical Committee ISO/TC 4, *Rolling bearings*, and was circulated to the member bodies in September 1978.

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

Australia	Hungary	Romania
Austria	India	South Africa, Rep. of
Belgium	Italy	Sweden
Canada	Japan	Switzerland
Chile	Korea, Rep. of	United Kingdom
China	Libyan Arab Jamahiriya	USA
Czechoslovakia	Mexico	USSR
France	Netherlands	Yugoslavia
Germany, F. R.	Poland	

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendations R 199-1961 and R 199/2-1968, of which it constitutes a technical revision.

Rolling bearings — Thrust ball bearings — Tolerances

1 Scope and field of application

This International Standard specifies the tolerances on bore diameter of shaft washers, outside diameter of housing washers and running accuracy of metric series thrust ball bearings. The thickness variation tolerances apply only to washers with flat back face.

The general conditions under which the tolerances apply are defined in ISO 1132. Chamfer dimension limits are specified in ISO 582.

2 References

ISO 104, *Rolling bearings — Thrust bearings with flat back faces — Boundary dimensions.* [1]

ISO 582, *Rolling bearings — Metric series — Chamfer dimension limits.* [1]

ISO 1132, *Rolling bearings — Tolerances — Definitions.* [1]

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 1132 apply.

4 Symbols

d = bore diameter of shaft washer of single direction bearing, nominal

d_2 = bore diameter of shaft washer of double direction bearing, nominal

Δ_{dmp} = single plane mean bore diameter deviation of shaft washer of single direction bearing

Δ_{d2mp} = single plane mean bore diameter deviation of shaft washer of double direction bearing

V_{dp} = bore diameter variation, in a single radial plane, of shaft washer of single direction bearing

V_{d2p} = bore diameter variation, in a single radial plane, of shaft washer of double direction bearing

D = outside diameter of housing washer, nominal

Δ_{Dmp} = mean outside diameter deviation, in a single plane, of housing washer

V_{Dp} = outside diameter variation, in a single radial plane, of housing washer

S_i = raceway to back face thickness variation of shaft washer

S_e = raceway to back face thickness variation of housing washer

1) At present at the stage of draft. (Revisions of ISO Recommendations.)

5 Tolerances

Table 1 — Shaft washer bore diameter tolerances

Tolerance values in micrometres

Bore diameter d and d_2 mm		Tolerance classes normal, 6 and 5			Tolerance class 4		
		Δ_{dmp} and Δ_{d2mp}		V_{dp} and V_{d2p}	Δ_{dmp} and Δ_{d2mp}		V_{dp} and V_{d2p}
>	⩽	high	low	max.	high	low	max.
–	18	0	– 8	6	0	– 7	5
18	30	0	– 10	8	0	– 8	6
30	50	0	– 12	9	0	– 10	8
50	80	0	– 15	11	0	– 12	9
80	120	0	– 20	15	0	– 15	11
120	180	0	– 25	19	0	– 18	14
180	250	0	– 30	23	0	– 22	17
250	315	0	– 35	26	0	– 25	19
315	400	0	– 40	30	0	– 30	23
400	500	0	– 45	34	0	– 35	26
500	630	0	– 50	38	0	– 40	30
630	800	0	– 75	–	0	– 50	–
800	1 000	0	– 100	–			
1 000	1 250	0	– 125	–			

Table 2 — Housing washer outside diameter tolerances

Tolerance values in micrometres

Outside diameter D mm		Tolerance classes normal, 6 and 5			Tolerance class 4		
		Δ_{Dmp}		V_{Dp}	Δ_{Dmp}		V_{Dp}
>	⩽	high	low	max.	high	low	max.
10	18	0	– 11	8	0	– 7	5
18	30	0	– 13	10	0	– 8	6
30	50	0	– 16	12	0	– 9	7
50	80	0	– 19	14	0	– 11	8
80	120	0	– 22	17	0	– 13	10
120	180	0	– 25	19	0	– 15	11
180	250	0	– 30	23	0	– 20	15
250	315	0	– 35	26	0	– 25	19
315	400	0	– 40	30	0	– 28	21
400	500	0	– 45	34	0	– 33	25
500	630	0	– 50	38	0	– 38	29
630	800	0	– 75	55	0	– 45	34
800	1 000	0	– 100	75	–	–	–
1 000	1 250	0	– 125	–	–	–	–
1 250	1 600	0	– 160	–	–	–	–

Table 3 — Shaft and housing washer thickness variation

Tolerance values in micrometres

Bore diameter d^* mm		S_i				S_e
		Normal class	Class 6	Class 5	Class 4	Tolerance classes normal, 6, 5 and 4
>	⩽	max.	max.	max.	max.	max.
–	18	10	5	3	2	
18	30	10	5	3	2	
30	50	10	6	3	2	
50	80	10	7	4	3	
80	120	15	8	4	3	
120	180	15	9	5	4	
180	250	20	10	5	4	Identical to S_i for shaft washer of same bearing
250	315	25	13	7	5	
315	400	30	15	7	5	
400	500	30	18	9	6	
500	630	35	21	11	7	
630	800	40	25	13	8	
800	1 000	45	30	15	–	
1 000	1 250	50	35	18	–	

* For a double direction bearing the permissible thickness variations, S_i and S_e are equal to those for a corresponding (same outside diameter) single direction bearing. The relevant bore diameters, d, are specified in ISO 104, tables 7, 8 and 9.