भारतीय मानक

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(पांचवा पुनरीक्षण)

Rolling Bearings — Thrust Bearings — Geometrical Product Specifications (GPS) and Tolerance Values

(Fifth Revision)

ICS 21.100.20

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Bearing Sectional Committee, PGD 13

NATIONAL FOREWORD

This Indian Standard (Fifth Revision) which is identical to ISO 199 : 2023 'Rolling bearings — Thrust bearings — Geometrical product specification (GPS) and tolerance values' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Bearing Sectional Committee and approval of the Production and General Engineering Division Council.

This standard was first published in 1970 and subsequently revised in 1993, 2002, 2015 and 2019. First revision was identical to ISO 199 : 1979. Second revision was identical to ISO 199 : 1997. Third revision was identical to ISO 199 : 2005. Fourth revision of this standard was identical to ISO 199 : 2014 'Rolling bearings — Thrust bearings — Geometrical product specification (GPS) and tolerance values', issued by the International Organization for Standardization (ISO). In this revision of this standard has been undertaken to align it with the latest version of ISO 199.

The major changes incorporated in this revision are as follows:

a) Symbols have been revised and the symbol list amended; and

b) Annexes A, B, C and D have been deleted.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 1101 Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out	IS 8000 (Part 1) : 2019/ISO 1101 : 2017 Geometrical product specifications (GPS) — Geometrical tolerancing: Part 1 Tolerances of form, orientation, location and run-out (*second revision*)	Identical
ISO 5593 Rolling bearings — Vocabulary	IS 2399 : 2024/ISO 5593 : 2023 Rolling bearings — Vocabulary (*third revision*)	Identical
ISO 8015 Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules	IS 12160 : 2015/ISO 8015 : 2011 Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules (*first revision*)	Identical
ISO 14405-1 Geometrical product specifications (GPS) — Dimensional tolerancing — Part 1: Linear sizes	IS 18229 (Part 1) : 2023/ISO 14405-1 : 2016 Geometrical product specifications (GPS) — Dimensional tolerancing: Part 1 Linear sizes	Identical

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Introduction

This document is a machine element geometry standard as defined in the geometrical product specification system (GPS system) presented in matrix model of ISO 14638[6].

The fundamental rules of ISO GPS given in ISO 8015 apply to this document and the default decision rules given in ISO 14253-1[4] apply to specifications made in accordance with this document, unless otherwise indicated.

The connection between functional requirements, measuring technique, and measuring uncertainty is always intended to be considered. For measurement uncertainty, it is intended that ISO 14253-2[5] be considered.

This document uses most of the existing symbols associated with rolling bearings because they are well established in the market. In some cases, new terms are derived from the full GPS definition. The definitions of the established terms and symbols are necessarily changed according to the GPS rules. These changes of terms, definitions and symbols for geometrical product specifications (GPS) to define characteristics and tolerances of rolling bearing components and assemblies are given in ISO 22872 and incorporated in this document.

The representation of symbols, tolerance values, limits of size, deviation limits and limit values derived from GPS indications according to, for example, ISO 1101 and ISO 14405-1, including indications in tables and graphical descriptions, have been revised and implemented in accordance with the principles of ISO 22872.

Indian Standard

ROLLING BEARINGS — THRUST BEARINGS — GEOMETRICAL PRODUCT SPECIFICATIONS (GPS) AND TOLERANCE VALUES

(Fifth Revision)

1 Scope

This document specifies dimensional characteristics, deviation limits from nominal values, and tolerance values to define the interface (except chamfers) of thrust rolling bearings. Nominal boundary dimensions are defined in ISO 104[1].

This document is not applicable to certain thrust bearings (e.g. thrust needle roller bearings) or for particular fields of application (e.g. special thrust precision bearings). Tolerances for such bearings are given in the relevant International Standards.

Chamfer dimension limits are given in ISO 582[3].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1101:2017, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

ISO 14405-1:2016, *Geometrical product specifications (GPS) — Dimensional tolerancing — Part 1: Linear sizes*

ISO/TS 17863:2013, *Geometrical product specification (GPS) — Tolerancing of moveable assemblies*

ISO 22872, *Rolling bearings — Geometrical product specifications (GPS) — Vocabulary and representation of symbols*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1101, ISO 5593, ISO 14405-1, ISO/TS 17863 and ISO 22872 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Symbols

4.1 Symbols for physical quantities

Symbols in Table 1 represent physical quantities in the GPS environment and may sometimes be applied to more than one physical quantity.

In this document, the symbols for tolerance values, deviation limits and limit values are preceded by letter "*t*" in figures and tables.

EXAMPLE 1 t_{Se}, t_{Vdsp}.

In this document, the symbols for nominal dimensions and values of upper/lower limit of size are not preceded by the letter "*t*" because those values are usually interpreted as nominal dimensions.

EXAMPLE 2 *D*.

Table 1 — Symbols for dimensions and tolerance values

Symbol	Description	Figure
D	Nominal outside diameter	1, 2, 3, 4
d	Nominal bore diameter <cylindrical bore>	1, 2
d_2	Nominal bore diameter of central shaft washer	3,4
T	Nominal assembled bearing height <single-direction thrust bearing>	1,2
T_1	Nominal assembled bearing height <double-direction thrust bearing>	3,4
t_{Se}	Tolerance value for range of housing washer raceway thickness <thrust ball bearing>	1,3
t_{Se}	Tolerance value for range of housing washer raceway thickness <thrust cylindrical roller bearing>	2,4
t_{Si}	Tolerance value for range of shaft washer raceway thickness <thrust ball bearing>	1
t_{Si}	Tolerance value for range of shaft washer raceway thickness <thrust cylindrical roller bearing>	2
t_{VDsp}	Tolerance value for range of outside diameter	1,2,3,4
t_{Vdsp}	Tolerance value for range of bore diameter	1, 2
t_{Vd2sp}	Tolerance value for range of central shaft washer bore diameter	3,4
$t_{\Delta Dmp}$	Upper and lower deviation limits of mid-range outside diameter	1,2,3,4
$t_{\Delta dmp}$	Upper and lower deviation limits of mid-range bore diameter <cylindrical bore>	1,2
$t_{\Delta d2mp}$	Upper and lower deviation limits of mid-range central shaft washer bore diameter	3,4
$t_{\Delta Tg}$	Upper and lower deviation limits of actual assembled bearing height <single-direction thrust bearing>	1,2
$t_{\Delta T1g}$	Upper and lower deviation limits of actual assembled bearing height <double-direction thrust bearing>	3,4

4.2 Additional symbols

Symbols defined in standards other than ISO 22872 and used in this document are presented in Table 2 for information.

These include symbols for specification modifiers and complementary specification modifiers.

Table 2 — Additional symbols defined in other standards

Symbol	Description	Figure	Reference
ACS	Any cross-section	1, 2,3, 4	ISO 14405-1:2016, 7.4
ALS	Any longitudinal section	1,3	ISO 14405-1:2016, 7.4
Ⓖ	Minimum circumscribed size	1,2,3,4	ISO 14405-1:2016, 3.7.1.3

Table 2 *(continued)*

Symbol	Description	Figure	Reference
(LS)	Spherical size	1,3	ISO 14405-1:2016, 3.6.4
(SD)	Mid-range size	1,2,3,4	ISO 14405-1:2016, 3.7.2.2.5
(SN)	Minimum size	1,3	ISO 14405-1:2016, 3.7.2.2.2
(SR)	Range of sizes	1,2,3,4	ISO 14405-1:2016, 3.7.2.2.6
⌯	Symmetry	1,3	ISO 1101:2017, 13.3
G	Gravity	1,2,3,4	ISO/TS 17863:2013, 6.3
⬡1	Flag	1,2,3,4	ISO/TS 17863:2013, 6.8 and 6.9

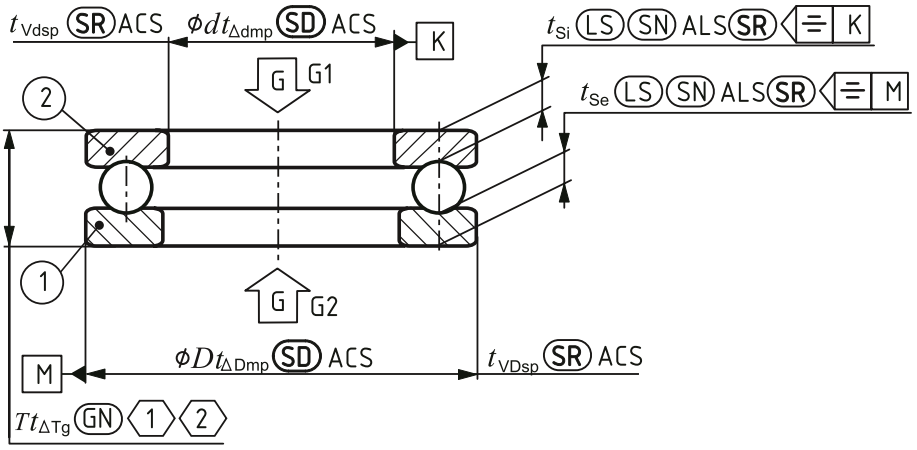
5 Graphical description

To express that the ISO GPS system in ISO 8015 is applied, the dimensional characteristics shall be included in the technical product documentation (e.g. on the drawing). The dimensional specifications associated to these characteristics are described in Figures 1 to 4.

According to ISO 8015, specifications shall be completed with specification operators, e.g. filtration. These may be agreed between manufacturer and customer case by case.

The indications in Figures 1 to 4 illustrate the correlation of interface dimensions and corresponding dimensional tolerance symbols.

NOTE Figures 1 to 4 are drawn schematically and do not necessarily show all design details.



Key

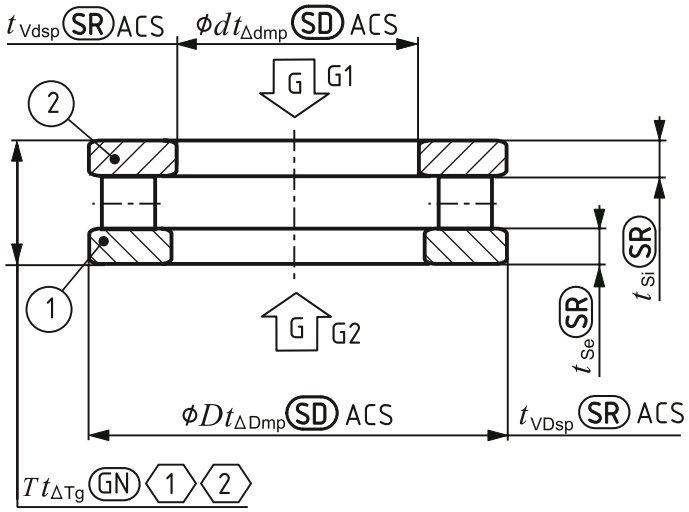
⬡1 = G1 or G2

⬡2 = the rolling elements shall be in correct functional contact with both shaft and housing washer raceways

1 housing washer

2 shaft washer

Figure 1 — Size specification for single-direction thrust bearing — Thrust ball bearing



Key

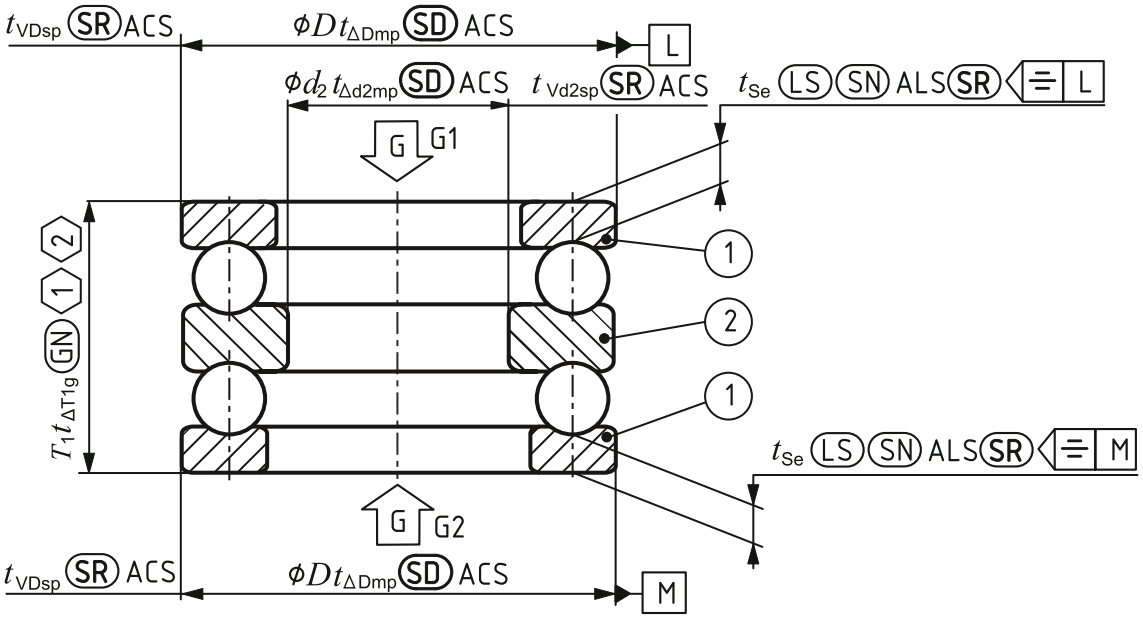
〈1〉 = G1 or G2

〈2〉 = the rolling elements shall be in correct functional contact with both shaft and housing washer raceways

1 housing washer

2 shaft washer

Figure 2 — Size specification for single-direction thrust bearing — Thrust cylindrical roller bearing



Key

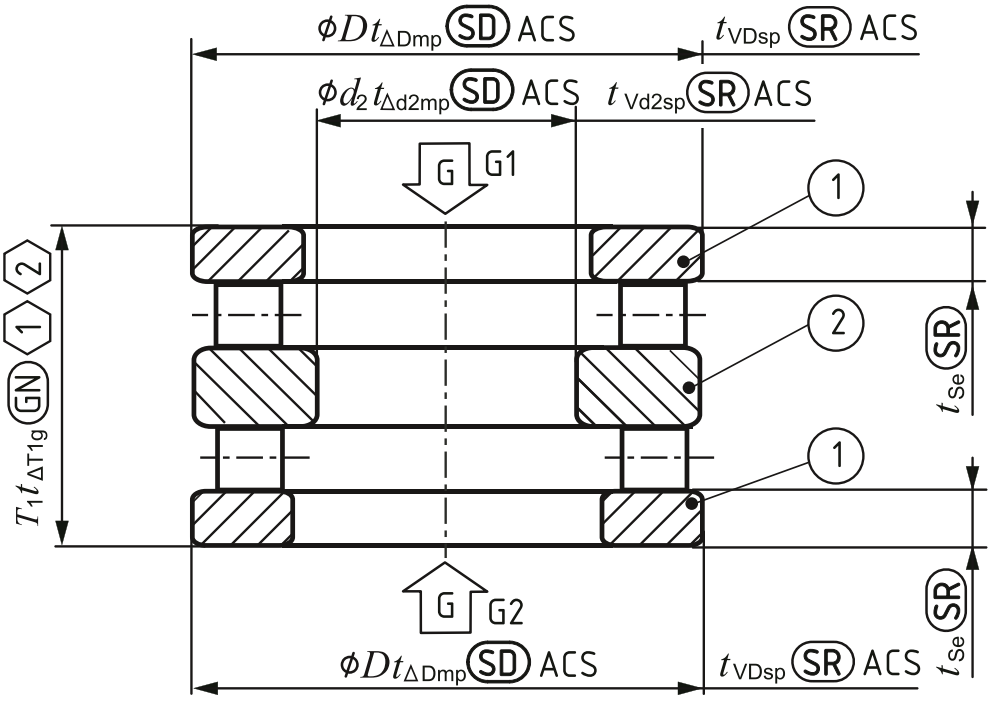
〈1〉 = G1 or G2

〈2〉 = the rolling elements shall be in correct functional contact with both central shaft and housing washer raceways

1 housing washer

2 central shaft washer

Figure 3 — Size specification for double-direction thrust bearing — Thrust ball bearing



Key

〈1〉 = G1 or G2

〈2〉 = the rolling elements shall be in correct functional contact with both central shaft and housing washer raceways

1 housing washer

2 central shaft washer

Figure 4 — Size specification for double-direction thrust bearing — Thrust cylindrical roller bearing

6 Deviation limits and tolerance values

6.1 General

Deviation limits and tolerance values for single-direction and double-direction thrust bearings are given in Tables 3 to 10.

In Tables 3 to 10, the symbols U and L are used as follows:

— U = upper deviation limit;

— L = lower deviation limit.

The symbol "—" in Tables 3 to 10 is used when no values have been established.

6.2 Tolerance class Normal

See Tables 3 and 4.

Table 3 — Shaft washer, central shaft washer, and bearing height — Tolerance class Normal

Deviation limits and tolerance values in micrometres

d, d_2 mm		$t_{\Delta dmp}$, $t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si} [a] [b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	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	1 000	0	−100	75	45	+80	−1 000	—	—
1 000	1 250	0	−125	95	50	+100	−1 400	—	—
1 250	1 600	0	−160	120	60	+120	−1 600	—	—
1 600	2 000	0	−200	150	75	+140	−1 900	—	—
2 000	2 500	0	−250	190	90	+160	−2 300	—	—

NOTE For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 4 — Housing washer — Tolerance class Normal

Deviation limits and tolerance values in micrometres

D mm		$t_{\Delta Dmp}$		t_{VDsp}	t_{Se} [a]
>	≤	U	L		
10	18	0	−11	8	Identical to t_{Si} of shaft washer of the same bearing.
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	1 000	0	−100	75	
1 000	1 250	0	−125	95	
1 250	1 600	0	−160	120	
1 600	2 000	0	−200	150	
2 000	2 500	0	−250	190	
2 500	2 850	0	−300	225	

NOTE For double-direction thrust bearings, the values apply only up to and including D = 360 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

6.3 Tolerance class 6

See Tables 5 and 6.

Table 5 — Shaft washer, central shaft washer, and bearing height — Tolerance class 6

Deviation limits and tolerance values in micrometres

d, d_2 mm		$t_{\Delta dmp}, t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si} [a b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	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

NOTE For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 5 *(continued)*

d, d_2 mm		$t_{\Delta dmp}$, $t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si} [a] [b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	L
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	1 000	0	−100	75	30	+80	−1 000	—	—
1 000	1 250	0	−125	95	35	+100	−1 400	—	—
1 250	1 600	0	−160	120	40	+120	−1 600	—	—
1 600	2 000	0	−200	150	45	+140	−1 900	—	—
2 000	2 500	0	−250	190	50	+160	−2 300	—	—

NOTE For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 6 — Housing washer — Tolerance class 6

Deviation limits and tolerance values in micrometres

D mm		$t_{\Delta Dmp}$		t_{VDsp}	t_{Se}[a]
>	≤	U	L		
10	18	0	−11	8	Identical to t_{Si} of shaft washer of the same bearing.
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	1 000	0	−100	75	
1 000	1 250	0	−125	95	
1 250	1 600	0	−160	120	
1 600	2 000	0	−200	150	
2 000	2 500	0	−250	190	
2 500	2 850	0	−300	225	

NOTE For double-direction thrust bearings, the values apply only up to and including D = 360 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

6.4 Tolerance class 5

See Tables 7 and 8.

Table 7 — Shaft washer, central shaft washer, and bearing height — Tolerance class 5

Deviation limits and tolerance values in micrometres

d, d_2 mm		$t_{\Delta dmp}, t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si}[a b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	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

NOTE For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 7 *(continued)*

d, d_2 mm		$t_{\Delta dmp}$, $t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si} [a] [b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	L
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	1 000	0	−100	75	15	+80	−1 000	—	—
1 000	1 250	0	−125	95	18	+100	−1 400	—	—
1 250	1 600	0	−160	120	25	+120	−1 600	—	—
1 600	2 000	0	−200	150	30	+140	−1 900	—	—
2 000	2 500	0	−250	190	40	+160	−2 300	—	—

NOTE For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 8 — Housing washer — Tolerance class 5

Deviation limits and tolerance values in micrometres

D mm		$t_{\Delta Dmp}$		t_{VDsp}	t_{Se}[a]
>	≤	U	L		
10	18	0	−11	8	Identical to t_{Si} of shaft washer of the same bearing.
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	1 000	0	−100	75	
1 000	1 250	0	−125	95	
1 250	1 600	0	−160	120	
1 600	2 000	0	−200	150	
2 000	2 500	0	−250	190	
2 500	2 850	0	−300	225	

NOTE For double-direction thrust bearings, the values apply only up to and including D = 360 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

6.5 Tolerance class 4

See Tables 9 and 10.

Table 9 — Shaft washer, central shaft washer, and bearing height — Tolerance class 4

Deviation limits and tolerance values in micrometres

d, d_2 mm		$t_{\Delta dmp}, t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si}[a b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	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

NOTE For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 9 *(continued)*

d, d_2 mm		$t_{\Delta dmp}$, $t_{\Delta d2mp}$		t_{Vdsp}, t_{Vd2sp}	t_{Si} [a] [b]	$t_{\Delta Tg}$		$t_{\Delta T1g}$	
>	≤	U	L			U	L	U	L
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 For double-direction thrust bearings, the values apply only up to and including d_2 = 190 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

[b] Does not apply to central shaft washer.

Table 10 — Housing washer — Tolerance class 4

Deviation limits and tolerance values in micrometres

D mm		$t_{\Delta Dmp}$		t_{VDsp}	t_{Se} [a]
>	≤	U	L		
10	18	0	−7	5	Identical to t_{Si} of shaft washer of the same bearing.
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	1 000	0	−60	45	

NOTE For double-direction thrust bearings, the values apply only up to and including D = 360 mm.

[a] Applies only to thrust ball bearings with 90° contact angle and thrust cylindrical roller bearings with 90° contact angle.

Bibliography

[1] ISO 104, *Rolling bearings — Thrust bearings — Boundary dimensions, general plan*

[2] ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits*

[3] ISO 582, *Rolling bearings — Chamfer dimensions — Maximum values*

[4] ISO 14253-1, *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 1: Decision rules for verifying conformity or nonconformity with specifications*

[5] ISO 14253-2, *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 2: Guidance for the estimation of uncertainty in GPS measurement, in calibration of measuring equipment and in product verification*

[6] ISO 14638, *Geometrical product specifications (GPS) — Matrix model*

[7] ISO 15241, *Rolling bearings — Symbols for physical quantities*

[8] ISO 17450-3, *Geometrical product specifications (GPS) — General concepts — Part 3: Toleranced features*

(Continued from second cover)

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO/TS 17863 Geometrical product specifications (GPS) — Tolerancing of moveable assemblies	IS 18231 : 2023/ISO/TS 17863 : 2013 Geometrical product specifications (GPS) — Tolerancing of moveable assemblies	Identical

The Committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard: .

International Standard	*Title*
ISO 22872	Rolling bearings – Geometrical product specifications (GPS) –Vocabulary and representation of symbols

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*).’ The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Amendments Issued Since Publication

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