
**Rolling bearings — Needle roller
bearing track rollers — Boundary
dimensions, geometrical product
specifications (GPS) and tolerance
values**

*Roulements — Roulements à aiguilles, galets de roulement —
Dimensions d'encombrement, spécification géométrique des produits
(GPS) et valeurs de tolérance*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 5, *Needle, cylindrical and spherical roller bearings*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This third edition cancels and replaces the second edition (ISO 7063:2003), which has been technically revised. The main changes compared to the previous edition are as follows:

- Terms, definitions, symbols and dimensional tolerance indications in figures and tables have been revised according to rules of geometrical product specification (GPS) system.

This corrected version of ISO 7063:2018 incorporates the following correction:

- [Figure 2](#) has been corrected.

Introduction

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

The fundamental rules of ISO GPS given in ISO 8015 apply to this document and the default decision rules given in ISO 14253-1 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 be considered.

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Rolling bearings — Needle roller bearing track rollers — Boundary dimensions, geometrical product specifications (GPS) and tolerance values

1 Scope

This document specifies dimensional characteristics, nominal boundary dimensions and tolerance values for needle roller bearing track rollers, yoke and stud types.

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

ISO 5593, *Rolling bearings — Vocabulary*

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

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

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Symbols

To express that the ISO/GPS system, ISO 8015, is applied, the dimensional characteristics shall be included in the technical product documentation (for example, on the drawing). The dimensional specifications associated to these characteristics are described in [Table 1](#), [Figure 1](#) and [Figure 2](#).

Descriptions for symbols are in accordance with GPS terminology.

A tolerance value associated to a characteristic is symbolised by t followed by the symbol for the characteristic, for example $t_{\Delta D_{mp}}$.

In this document, the ISO default specification operator for size is in accordance with ISO 14405-1, i.e. the two-point size is valid.

Table 1 — Symbols for nominal dimensions, characteristics and specification modifiers

Symbol for nominal dimension (size and distance) ^a	Symbol for characteristic ^a	GPS symbol and specification modifier ^{b,c}	Description ^d	Reference
B	—	—	Nominal inner ring width	Figure 1
	ΔB_s	(LP)	Deviation of a two-point size of inner ring width from its nominal size	Figure 1
B_1	—	(GN)	Distance from face of stud to face of side washer (minimum circumscribed distance)	Figure 2
B_2	—	—	Nominal distance from face of side washer to face of stud on side with thread	Figure 2
	ΔB_2	—	Deviation of distance from face of side washer to face of stud on side with thread	Figure 2
B_3	—	—	Nominal distance from face of side washer to centre of radial lubrication hole on stud	Figure 2
C	—	—	Nominal outer ring width	Figures 1 and 2
	ΔC_s	(LP)	Deviation of a two-point size of outer ring width from its nominal size	Figures 1 and 2
C_1	—	—	Nominal distance from face of outer ring to face of side washer	Figure 2
d	—	—	Nominal bore diameter	Figure 1
	Δd_{mp}	(LP)(SD) ACS	Deviation of a mid-range size (out of two-point sizes) of bore diameter in any cross-section from its nominal size	Figure 1
d_1	—	—	Nominal stud diameter	Figure 2
	Δd_{1s}	(LP)	Deviation of a two-point size of stud diameter from its nominal size	Figure 2
D	—	—	Nominal outside diameter	Figures 1 and 2
	ΔD_{mp}	(LP)(SD) ACS	Cylindrical outside diameter: deviation of a mid-range size (out of two-point sizes) of outside diameter in any cross-section from its nominal size	Figures 1 and 2
		(LP)(SD) ACS (SX)	Crowned outside diameter: deviation of the maximum of mid-range sizes (out of two-point sizes in any cross-section) of a crowned outer ring from its nominal size	Figures 1 and 2
$G \times P$	—	—	Nominal thread diameter (G) and thread pitch (P)	Figure 2
l_G	—	—	Nominal length of thread on stud	Figure 2
	r_s	—	Single chamfer dimension on outer ring	Figures 1 and 2
	r_{1s}	—	Single chamfer dimension on inner ring	Figure 1

^a Symbols as defined in ISO 15241 except for the format used.

^b Symbols as defined in ISO 1101 and ISO 14405-1.

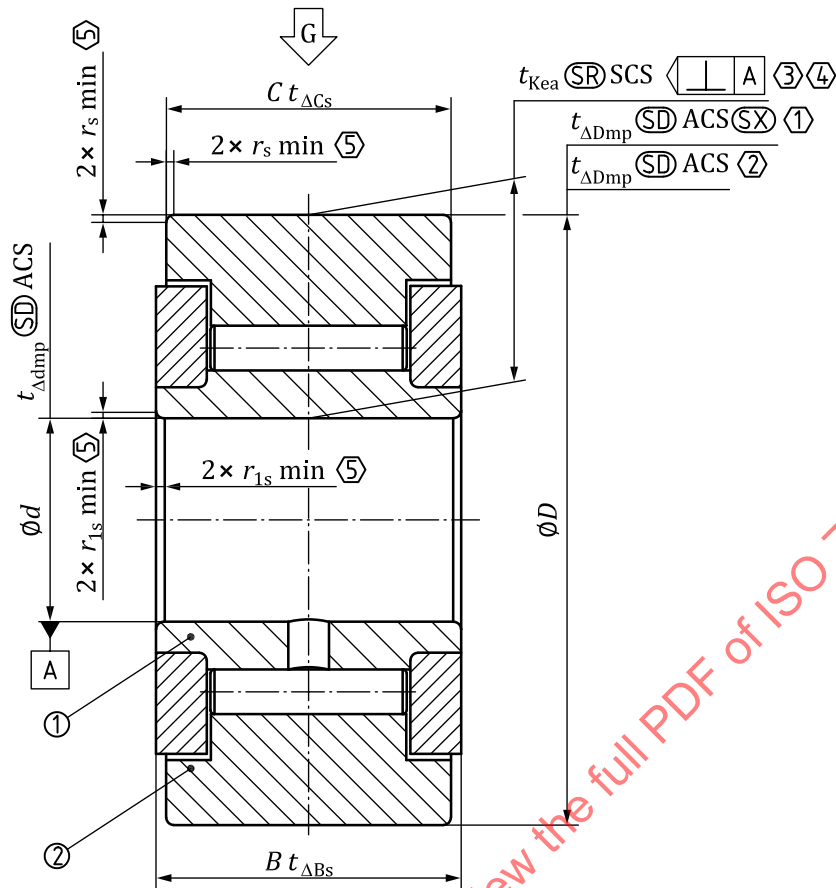
^c Specification modifier (LP) shall not be indicated on a drawing if the two-point size is applied for both specified limits.

^d Description based on ISO 1101, ISO 5459 and ISO 14405-1.

^e Symbols for direction of gravity G, fixed parts FP and movable parts MP, according to ISO/TS 17863 and specific flagnotes; see [Figures 1 and 2](#).

Table 1 (continued)

Symbol for nominal dimension (size and distance) ^a	Symbol for characteristic ^a	GPS symbol and specification modifier ^{b,c}	Description ^d	Reference
	Kea		Yoke type track roller: Range of two-point sizes of section height between inner ring bore surface and outer ring outside surface in a specific cross section perpendicular to datum, i.e. axis, established from the inner ring bore surface Stud type track roller: Range of two-point sizes of section height between needle roller diameter surface and outer ring outside surface in a specific cross section perpendicular to datum, i.e. axis, established from surface of stud diameter d_1	Figure 1 Figure 2
^a Symbols as defined in ISO 15241 except for the format used. ^b Symbols as defined in ISO 1101 and ISO 14405-1. ^c Specification modifier  shall not be indicated on a drawing if the two-point size is applied for both specified limits. ^d Description based on ISO 1101, ISO 5459 and ISO 14405-1. ^e Symbols for direction of gravity G, fixed parts FP and movable parts MP, according to ISO/TS 17863 and specific flagnotes; see Figures 1 and 2.				

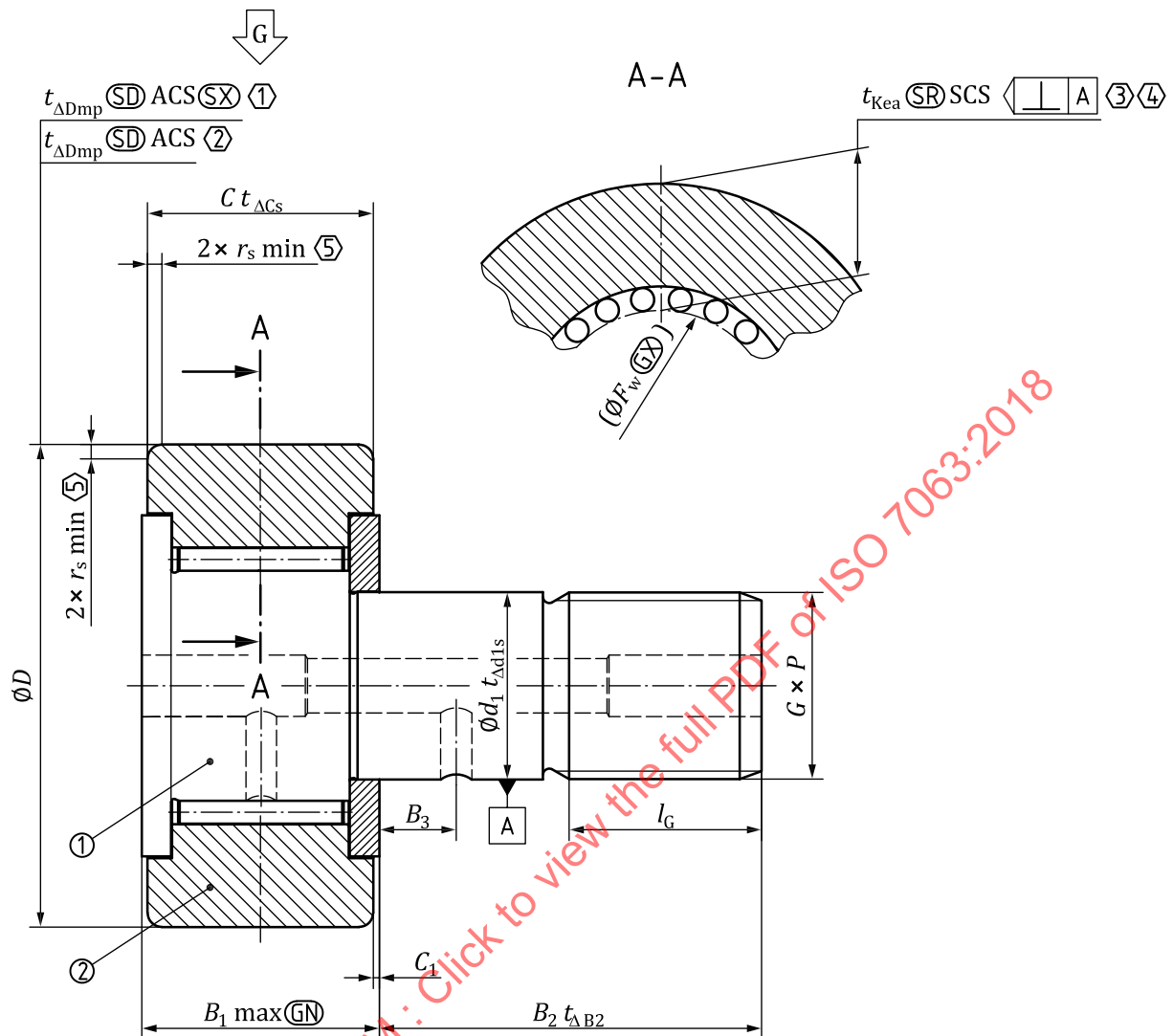


Key

- ① apply to crowned outside surface
- ② apply to cylindrical outside surface
- ③ FP ① - MP ② , G
- ④ the requirement applies at any specific location of the FP for any location of the MP in relation to the direction of gravity where the rolling elements are in contact with both the raceways of the inner ring and the outer ring
- ⑤ no material is allowed to project beyond an imaginary circular arc, which has a radius $r_s \text{ min.}$ or $r_{1s} \text{ min.}$ in an axial plane and is tangential to the outer ring outside surface and to the outer ring face or to the inner ring bore surface and to the inner ring face

Figure 1 — Yoke type track roller

The yoke type track rollers may be manufactured with or without a cage and with or without seals.

**Key**

- ① apply to crowned outside surface
- ② apply to cylindrical outside surface
- ③ FP ① ~ MP ② , G
- ④ the requirement applies at any specific location of the FP for any location of the MP in relation to the direction of gravity where the rolling elements are in contact with both the raceways of the stud and the outer ring
- ⑤ no material is allowed to project beyond an imaginary circular arc, which has a radius $r_s \min$ in an axial plane and is tangential to the outer ring outside surface and to the outer ring face

Figure 2 — Stud type track roller

Stud type track rollers may be manufactured with or without a cage and with or without seals. The provision of an axial hole for lubrication in the threaded end of the stud is optional. A radial hole in the shank of the stud is also optional, but where such provision is made for lubrication purposes, dimension B_3 applies. Lubrication hole diameters are not specified.

5 Dimensions

5.1 Track rollers — Yoke type

Boundary dimensions for yoke type track rollers are given in [Tables 2](#) and [3](#).

Table 2 — Track rollers — Yoke type — Light series

Dimensions in millimetres

D^a	d	B	C	r_s^b min.	$r_{1s}^{b,c}$ min.
16	5	12	11	0,15	0,15
19	6	12	11	0,15	0,15
24	8	15	14	0,3	0,3
30	10	15	14	0,6	0,3
32	12	15	14	0,6	0,3
35	15	19	18	0,6	0,3
40	17	21	20	1	0,3
47	20	25	24	1	0,3
52	25	25	24	1	0,3
62	30	29	28	1	0,3
72	35	29	28	1	0,6
80	40	32	30	1	0,6
85	45	32	30	1	0,6
90	50	32	30	1	0,6
^a The outside surface may be cylindrical or crowned. ^b No maximum values are specified for single chamfer dimensions r_s and r_{1s} . ^c A circumferential counter bore may be provided as an alternative to the chamfer on the inner ring.					

Table 3 — Yoke type — Heavy series

Dimensions in millimetres

D^a	d	B	C	r_s^b min.	$r_{1s}^{b,c}$ min.
32	10	18	17	0,6	0,3
37	12	21	20	1	0,3
42	15	24	22	1	0,3
47	17	27	25	1	0,3
58	20	34	32	1	0,3
72	25	40	38	1	0,3
85	30	48	46	1,5	0,3
100	35	56	54	1,5	0,6
110	40	63	61	2	0,6
125	45	71	69	2	0,6
140	50	80	76	2,5	0,6
^a The outside surface may be cylindrical or crowned. ^b No maximum values are specified for single chamfer dimensions r_s and r_{1s} . ^c A circumferential counter bore may be provided as an alternative to the chamfer on the inner ring.					

Table 3 (continued)

D^a	d	B	C	r_s^b min.	$r_{1s}^{b,c}$ min.
160	60	90	86	2,5	0,6
190	70	103	99	2,5	0,6
210	80	115	111	2,5	1
240	90	132	128	3	1
^a The outside surface may be cylindrical or crowned.					
^b No maximum values are specified for single chamfer dimensions r_s and r_{1s} .					
^c A circumferential counter bore may be provided as an alternative to the chamfer on the inner ring.					

5.2 Track rollers — Stud type

Boundary dimensions for stud type track rollers are given in [Tables 4](#) and [5](#).

Table 4 — Track rollers — Stud type — Light series

Dimensions in millimetres

D^a	d_1	C	$G \times P$	l_G	B_1^b max.	B_2	B_3	C_1	r_s^c min.
13	5	9	M5 × 0,8	7,5	10	13	—	0,5	0,15
16	6	11	M6 × 1	8	12,2	16	—	0,6	0,15
19	8	11	M8 × 1,25	10	12,2	20	—	0,6	0,15
22	10	12	M10 × 1 ^d	12	13,2	23	—	0,6	0,3
26	10	12	M10 × 1 ^d	12	13,2	23	—	0,6	0,3
30	12	14	M12 × 1,5	13	15,2	25	6	0,6	0,6
32	12	14	M12 × 1,5	13	15,2	25	6	0,6	0,6
35	16	18	M16 × 1,5	17	19,6	32,5	8	0,8	0,6
40	18	20	M18 × 1,5	19	21,6	36,5	8	0,8	1
47	20	24	M20 × 1,5	21	25,6	40,5	9	0,8	1
52	20	24	M20 × 1,5	21	25,6	40,5	9	0,8	1
62	24	29	M24 × 1,5	25	30,6	49,5	11	0,8	1
72	24	29	M24 × 1,5	25	30,6	49,5	11	0,8	1
80	30	35	M30 × 1,5	32	37	63	15	1	1
85	30	35	M30 × 1,5	32	37	63	15	1	1
90	30	35	M30 × 1,5	32	37	63	15	1	1
^a The outside surface may be cylindrical or crowned.									
^b No minimum dimensions are specified for B_1 .									
^c No maximum values are specified for single chamfer dimension r_s .									
^d These track rollers are also manufactured with M10 × 1,25.									

Table 5 — Track rollers — Stud type — Heavy series

Dimensions in millimetres

D^a	d_1	C	$G \times P$	l_G	B_1^b max.	B_2	B_3	C_1	r_s^c min.
13	6	9	M6 × 1	8	10	15	—	0,5	0,3
16	8	11	M8 × 1,25	10	12	19	—	0,5	0,3
19	10	11	M10 × 1 ^d	12	12	22	—	0,5	0,3
24	12	14	M12 × 1,5	14	15	26	—	0,5	0,3
32	14	17	M14 × 1,5	16	18	30	7	0,5	0,6
37	16	20	M16 × 1,5	18	21	35	8	0,5	1
42	20	22	M20 × 1,5	21	24	41	10	1	1
47	24	25	M24 × 1,5	25	27	48	11	1	1
58	30	32	M30 × 1,5	30	34	59	14	1	1
72	36	38	M36 × 3	41	40	76	17	1	1
85	42	46	M42 × 3	46	48	87	20	1	1,5
100	48	54	M48 × 3	53	56	100	23	1	1,5
110	56	61	M56 × 4	61	63	115	—	1	2
125	64	69	M64 × 4	68	71	129	—	1	2
140	72	76	M72 × 4	73	79	143	—	2	2,5
160	80	86	M80 × 4	80	89	157	—	2	2,5
190	80	99	M80 × 4	80	102	160	—	2	2,5
210	90	111	M90 × 4	88	114	178	—	2	2,5
240	100	128	M100 × 4	96	131	197	—	2	3

^a The outside surface may be cylindrical or crowned.

^b No minimum dimensions are specified for B_1 .

^c No maximum values are specified for single chamfer dimension r_s .

^d These track rollers are also manufactured with M10 × 1,25.

6 Tolerances

6.1 General

In [Tables 6](#) to [9](#), the symbols U and L are used as follows:

U = upper limit deviation

L = lower limit deviation

6.2 Track rollers — Yoke type

Tolerances for yoke type track rollers are given in [Tables 6](#) and [7](#).