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Rolling bearings — Cylindrical rollers —

Part 1:
Boundary dimensions, geometrical product specifications (GPS) and tolerance values for steel rollers

Roulements — Rouleaux cylindriques —

Partie 1: Dimensions d'encombrement, spécification géométriques des produits (GPS) et valeurs de tolérance pour rouleaux en acier

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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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

This second edition cancels and replaces the first edition (ISO 12297:2012), which has been technically revised to integrate GPS.

A list of all parts in the ISO 12297 series can be found on the ISO website.

Introduction

This document is a machine element geometry standard as defined in the geometrical product specification system (GPS system) as described in the framework document of ISO 14638.[9]

The fundamental rules of ISO GPS given in ISO 8015[3] apply to this document and the default decision rules given in ISO 14253-1[7] 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 ISO 14253-2[8] is considered.

Rolling bearings — Cylindrical rollers — Part 1: Boundary dimensions, geometrical product specifications (GPS) and tolerance values for steel rollers

1 Scope

This document specifies dimensional and geometrical characteristics, limit deviations from nominal size and tolerance values for finished steel cylindrical rollers for rolling bearings. The maximum roller diameter is 40 mm.

Annexes A and B give the sorting principles for roller length tolerances and gauges, respectively

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

ISO 5593:1997, *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 purpose of this document the terms and definitions given in ISO 1101, ISO 5593, ISO 14405-1 and the following apply.

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

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

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

3.1
roller grade
G
specific combination of dimensional, form, roughness profile parameter and sorting tolerances for rollers

[SOURCE: ISO 5593:1997, 05.05.10]

4 Symbols

To demonstrate that the ISO GPS system, ISO 8015[3], has been applied, the dimensional and geometrical characteristics shall be included in the technical product documentation (for example, on the drawing). The dimensional and geometrical specifications, associated to these characteristics are described in Table 1 and Figure 1.

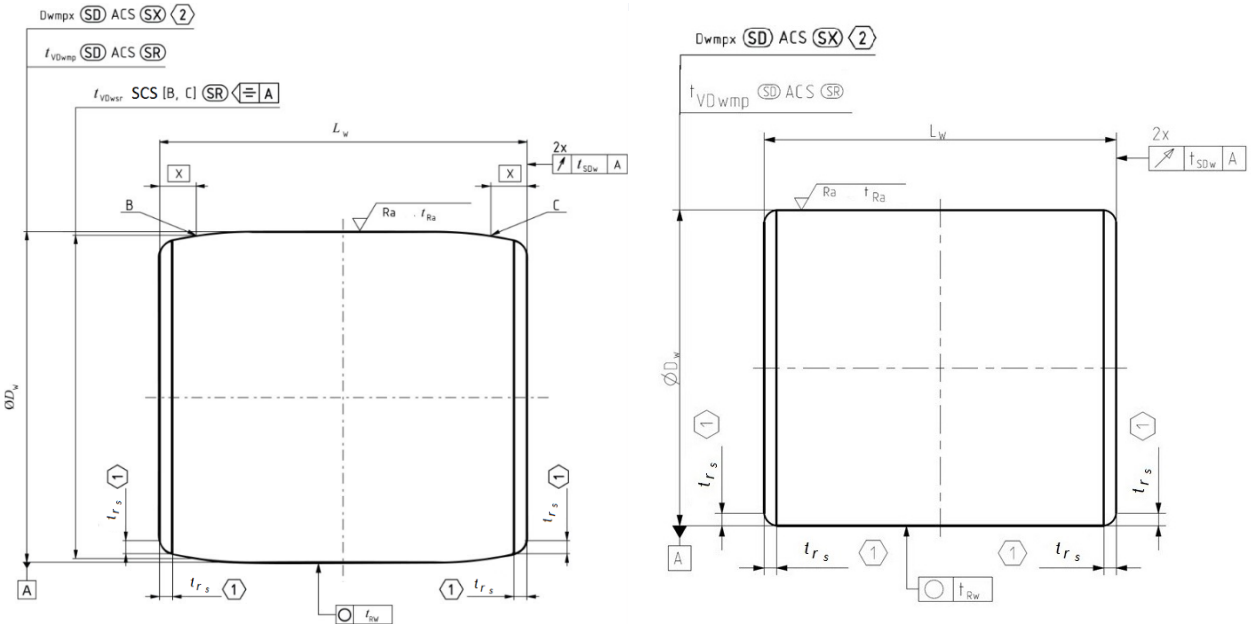
A tolerance value associated to a characteristic is symbolized by *t* followed by the symbol for the characteristic, for example t_{VDwmp}.

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.

According to ISO 8015 specifications need to be completed with Specification Operators, e.g. filtration. These may be agreed between manufacturer and customer case by case.

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

Symbol for dimensions (size or distance)	Symbol for characteristic	GPS symbol and specification modifier	Description
D_w			Nominal roller diameter
	Dwmpx	(LP) (SD) ACS (SX)	Maximum of mid-range sizes of roller diameter in any cross section (only to calculate VDwL)
	VDwL		Difference between Dwmpx of the largest and the smallest roller in a lot
	VDwmp	(LP) (SD) ACS (SR)	Range of mid-range sizes (out of two-point sizes) of roller diameter obtained from any cross-sections of cylindrical part of the roller
	VDwsr	(LP) SCS [B, C] (SR) ⌯ A	Range of two-point sizes of roller diameter obtained from two cross-sections B and C in a certain and same distance from both ends of the roller in specific fixed cross section
L_w			Nominal roller length
Ra			Roughness profile parameter
	r_s		single chamfer dimension
	Rw	○	Roundness of roller
	SDw	↗	Axial circular run-out of a roller end face with respect to datum, i.e. axis, established from the roller outside surface



a) Crowned profile or logarithmic profile

b) Straight profile

1 No roller material is allowed to project beyond an imaginary circular arc, which has a radius r_sL. in an axial plane and is tangential to the roller face and to the outside surface of the roller.

2 Characteristic used only to calculate VDwL for a roller lot.

NOTE Distance "X" from the end of the roller and t_{VDwsr} are subject to agreement between the customer and the supplier

Figure 1 — Cylindrical roller

5 Dimensions

The nominal size of the cylindrical rollers as well as the upper and lower limits of chamfer dimensions are given in Table 2.

Table 2 — Dimensions for cylindrical rollers

Dimensions in millimetres

D_w	L_w	t_{rs}	
		L	*U*
3	3	0,1	0,7
3	4	0,1	0,7
3	5	0,1	0,7
3,5	5	0,1	0,7
4	4	0,2	0,7
4	6	0,2	0,7

Table 2 (*continued*)

D_w	L_w	t_{rs}	
		L	*U*
4	8	0,2	0,7
4,5	4,5	0,2	0,7
4,5	6	0,2	0,7
5	5	0,2	0,7
5	8	0,2	0,7
5	10	0,2	0,7
5,5	5,5	0,2	0,7
5,5	8	0,2	0,7
6	6	0,2	0,7
6	8	0,2	0,7
6	9	0,2	0,7
6	10	0,2	0,7
6	12	0,2	0,7
6,5	6,5	0,2	0,8
6,5	8	0,2	0,8
6,5	9	0,2	0,8
7	7	0,2	0,8
7	10	0,2	0,8
7	14	0,2	0,8
7,5	7,5	0,2	0,8
7,5	9	0,2	0,8
7,5	10	0,2	0,8
7,5	11	0,2	0,8
8	8	0,3	0,8
8	10	0,3	0,8
8	12	0,3	0,8
8	14	0,3	0,8
8	16	0,3	0,8
8	20	0,3	0,8

Table 2 (*continued*)

D_w	L_w	tr_s	
		L	*U*
9	9	0,3	1,0
9	10	0,3	1,0
9	12	0,3	1,0
9	13	0,3	1,0
9	14	0,3	1,0
10	10	0,3	1,0
10	11	0,3	1,0
10	14	0,3	1,0
10	15	0,3	1,0
10	16	0,3	1,0
10	17	0,3	1,0
10	25	0,3	1,0
11	11	0,3	1,0
11	12	0,3	1,0
11	13	0,3	1,0
11	15	0,3	1,0
11	20	0,3	1,0
12	12	0,3	1,0
12	14	0,3	1,0
12	16	0,3	1,0
12	17	0,3	1,0
12	18	0,3	1,0
12	21	0,3	1,0
12	22	0,3	1,0
13	13	0,3	1,2
13	18	0,3	1,2
13	20	0,3	1,2