
**Rolling bearings — Cylindrical
rollers —**

**Part 2:
Boundary dimensions, geometrical
product specifications (GPS) and
tolerance values for ceramic rollers**

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Roulements — Rouleaux cylindriques —

*Partie 2: Dimensions d'encombrement, spécification géométrique des
produits (GPS) et valeurs de tolérance pour rouleaux en céramique*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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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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) described in the framework document 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 connections between functional requirements, measuring technique and measuring uncertainty are considered. For measurement uncertainty, ISO 14253-2 is considered.

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Rolling bearings — Cylindrical rollers —

Part 2:

Boundary dimensions, geometrical product specifications (GPS) and tolerance values for ceramic rollers

1 Scope

This document specifies dimensional and geometrical characteristics, nominal boundary dimensions and tolerance values for finished silicon nitride cylindrical rollers for rolling bearings.

[Annexes A](#) and [B](#) give the sorting principles for roller diameter and roller length tolerances and gauges, respectively.

[Annex C](#) gives examples of imperfection types and methods of inspection.

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 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

ISO 26602, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Silicon nitride materials for rolling bearing balls and rollers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/>

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

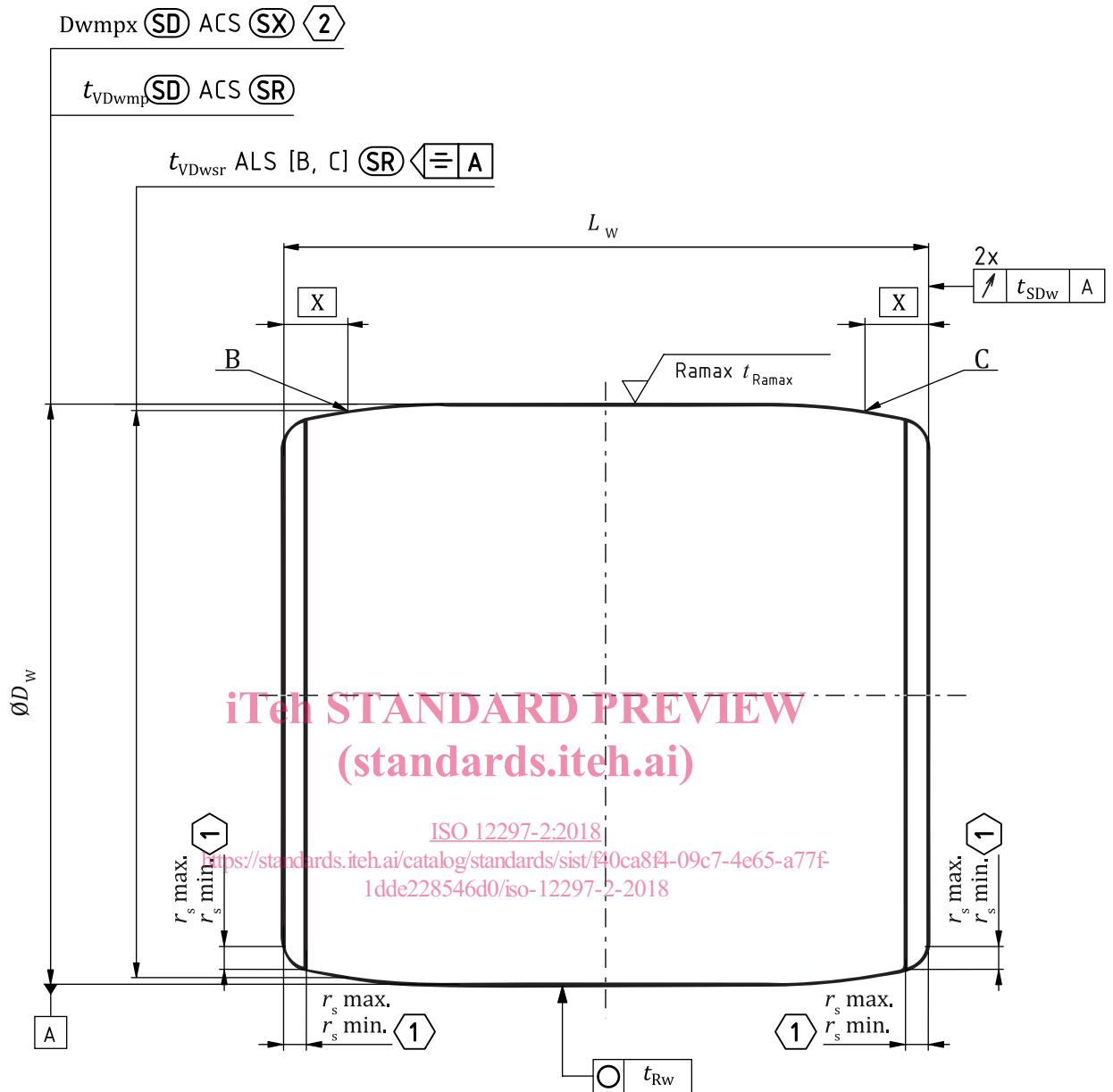
To demonstrate that the ISO GPS system, ISO 8015, has been applied, the dimensional and geometrical characteristics shall be included in the technical product documentation (for example, on the drawing). The dimensional and geometrical specifications associated with these characteristics are described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

A tolerance value associated with 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.

Table 1 — Symbols for dimensions, characteristics and specification modifiers

Symbol for dimensions (size or distance)	Symbol for characteristic	GPS symbol and specification modifier	Description
D_w			Nominal roller diameter
	D_{wmpx}	$(LP) (SD) ACS (SX)$	Maximum of mid-range sizes of roller diameter in any cross-section (only to calculate VD_{wL})
	VD_{wL}		Difference between D_{wmpx} of the largest and the smallest roller in a lot
	VD_{wmp}	$(LP) (SD) ACS (SR)$	Range of mid-range sizes (out of two-point sizes) of roller diameter obtained from any cross-sections of cylindrical part of the roller
	VD_{wsr}	$(LP) ALS [B,C] (SR) \langle \equiv A \rangle$	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 any longitudinal section
L_w			Nominal roller length
R_{amax}			Roughness profile parameter
	$r_s \text{ max.}$		Largest permissible radial or axial single chamfer dimensions of a roller
	$r_s \text{ min.}$		Smallest permissible radial or axial single chamfer dimensions of a roller
	R_w	\bigcirc	Roundness of roller
	SD_w	\nearrow	Axial circular run-out of a roller end face with respect to datum, i.e. axis, established from the roller's outside surface



Key

- 1 No roller 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 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 — Ceramic cylindrical roller

5 Dimensions

The nominal dimensions of the ceramic cylindrical rollers are given in [Table 2](#).

Table 2 — Dimensions for cylindrical rollers

Dimensions in millimetres

D_w	L_w	r_s min.	r_s max.
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
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
9	9	0,3	1,0

Table 2 (continued)

D_w	L_w	r_s min.	r_s max.
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
14	14	0,3	1,2
14	15	0,3	1,2
14	20	0,3	1,2
14	22	0,3	1,2
15	15	0,4	1,2
15	16	0,4	1,2
15	17	0,4	1,2
15	22	0,4	1,2
15	24	0,4	1,2
16	16	0,4	1,2
16	17	0,4	1,2

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