
**Rolling bearings — Steel cylindrical
rollers — Dimensions and tolerances**

Roulements — Rouleaux cylindriques en acier — Dimensions et tolérances

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12297 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 5, *Needle, cylindrical and spherical roller bearings*.

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Rolling bearings — Steel cylindrical rollers — Dimensions and tolerances

1 Scope

This International Standard specifies requirements for finished steel cylindrical rollers for rolling bearings. The maximum roller diameter is 40 mm.

2 Normative references

The following referenced documents are indispensable for the application 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 1132-1:2000, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 5593:1997, *Rolling bearings — Vocabulary*

ISO 15241, *Rolling bearings — Symbols for quantities*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1132-1 and ISO 5593 and the following apply.

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3.1 roller diameter

D_w

diameter value used for the general identification of roller diameter

[ISO 5593:1997, definition 05.05.01]

3.2 single roller diameter

D_{ws}

distance between two tangents to the actual surface of a roller parallel to each other and in a radial plane

NOTE Adapted from ISO 5593:1997, definition 05.05.02.

3.3 mean roller diameter in a single plane

D_{wmp}

arithmetical mean of the largest and the smallest of the single roller diameters in a single radial plane

[ISO 5593:1997, definition 05.05.03]

3.4 variation of mean roller diameter

$V_{D_{wmp}}$

difference between the largest and the smallest of the mean roller diameters measured in two radial planes in the cylindrical part of the roller arranged symmetrically to the middle of the roller

3.5
variation of roller diameter in a single plane

V_{Dwsp}

difference between the largest and the smallest of the single roller diameters in a single radial plane

[ISO 5593:1997, definition 05.05.04]

3.6
roller length

L_w

length value used for the general identification of roller length

NOTE Adapted from ISO 5593:1997, definition 05.05.05.

3.7
chamfer dimension

r

roller chamfer dimension value used for reference purposes

3.8
single chamfer dimension

r_s

(radial) distance, in a single axial plane, between the imaginary sharp corner of a roller and the intersection of a chamfer surface and the roller end face

NOTE Adapted from ISO 1132-1:2000, definition 5.4.2.

3.9
single chamfer dimension

r_s

(axial) distance, in a single axial plane, between the imaginary sharp corner of a roller and the intersection of a chamfer surface and the roller outside diameter surface

NOTE Adapted from ISO 1132-1:2000, definition 5.4.2.

3.10
smallest single chamfer dimension

$r_s \text{ min}$

(minimum limit) smallest permissible radial and axial single chamfer dimensions of a roller

NOTE Adapted from ISO 1132-1:2000, definition 5.4.3.

3.11
largest single chamfer dimension

$r_s \text{ max}$

(maximum limit) largest permissible radial and axial single chamfer dimensions of a roller

NOTE Adapted from ISO 1132-1:2000, definition 5.4.4.

3.12
axial runout of roller end face with respect to the roller axis

S_{Dw}

difference between the largest and the smallest of the axial distances of the end surface at a certain radial distance from the roller axis

3.13
deviation from circular form of roller outside diameter surface

Δ_{Rw}

radial distance between the smallest circumscribed circle and the greatest inscribed circle, with their centres common to the least squares circle centre

3.14**surface roughness**

surface irregularities with relatively small spacing, which usually include irregularities resulting from the method of manufacture being used and/or other influences

NOTE These irregularities are considered within the limits that are conventionally defined, e.g. within the limits of the sampling length.

3.15**roller diameter gauge**

amount by which the mean diameter of a roller diameter gauge lot should differ from the nominal roller diameter, this amount being one of an established series

NOTE 1 Each roller diameter gauge is a whole multiple of the roller diameter gauge interval established for the roller grade in question.

NOTE 2 A roller diameter gauge, in combination with the roller grade and nominal roller diameter, should be considered as the most exact roller size specification to be used by a customer for ordering purpose.

3.16**interval of roller diameter gauge**

I_{GDW}

amount by which the permitted mean diameter of roller diameter gauge lot is divided

3.17**roller length gauge**

amount by which the mean length of a roller length gauge lot should differ from the nominal roller length, this amount being one of an established series

NOTE Each roller length gauge is a whole multiple of the roller length gauge interval established for a certain nominal roller length.

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3.18**interval of roller length gauge**

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I_{GLW}

amount by which the permitted mean length of roller length gauge lot is divided

3.19**roller diameter gauge lot**

quantity of rollers of the same roller grade and nominal dimensions, all having the mean roller diameter in a single plane within the same roller diameter gauge

3.20**mean diameter of roller diameter gauge lot**

D_{wmL}

arithmetical mean of the mean diameter of the largest roller and the smallest roller in a roller diameter gauge lot

3.21**roller length gauge lot**

quantity of rollers, all having the mean roller length within the same roller length gauge

3.22**mean length of roller length gauge lot**

L_{wmL}

arithmetical mean of the mean length of the longest roller and the shortest roller length in a roller length gauge lot

3.23**variation of roller diameter gauge lot diameter**

V_{DwL}

difference between the mean diameter in a single plane of the roller having the largest such diameter and that of the roller having the smallest such diameter in a roller diameter gauge lot

3.24
variation of roller length gauge lot length

V_{LwL}
difference between the mean length of the roller having the largest such length and that of the roller having the smallest such length in a roller length gauge lot

3.25
roller grade

G
specific combination of dimensional, form, surface roughness and sorting tolerances for rollers

[ISO 5593:1997 definition 05.05.10]

3.26
hardness

measure of resistance to penetration as determined by a specific method, such as Rockwell hardness test

3.27
roller outside diameter surface

surface generated by the available roller length when rotating around the roller axis

NOTE The available roller length is given by $L_a = L_w - 2r$.

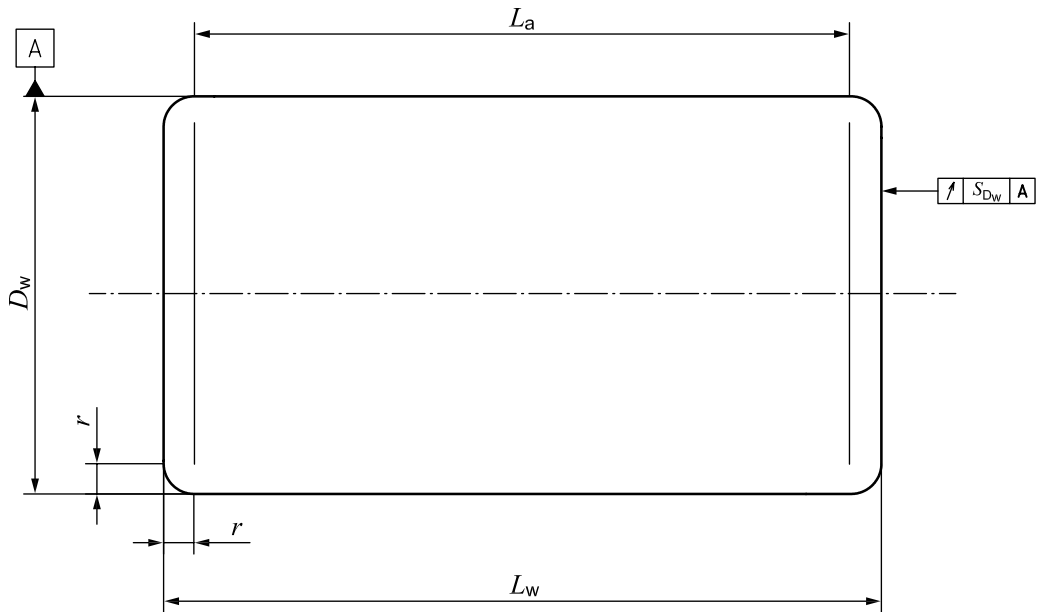
4 Symbols

For the purposes of this document, the symbols given in ISO 15241 and the following apply.

The symbols (except those for tolerances) shown in Figure 1 and the values given in Table 1 denote nominal dimensions, unless specified otherwise.

D_w	roller diameter	https://standards.iteh.ai/catalog/standards/sist/a56dd2d0-7d50-4f82-aa58-418e91836040/iso-12297-2012
D_{wML}	mean diameter of roller diameter gauge lot	
G	roller grade	
I_{GDw}	interval of roller diameter gauge	
I_{GLw}	interval of roller length gauge	
L_a	available roller length, $L_a = L_w - 2r$	
L_w	roller length	
L_{wML}	mean length of roller length gauge lot	
r	chamfer dimension	
r_s	single chamfer dimension	
$r_{s \min}$	smallest single chamfer dimension	
$r_{s \max}$	largest single chamfer dimension	
S_{Dw}	axial runout of roller end face with respect to the roller axis	
V_{DwL}	variation of roller diameter gauge lot diameter	
V_{Dwmp}	variation of mean roller diameter	
V_{Dwsp}	variation of roller diameter in a single plane	

- V_{LWL} variation of roller length gauge lot length
- Δ_{RW} deviation from circular form of roller outside diameter surface



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Figure 1 — Cylindrical roller
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5 Dimensions

The dimensions of the cylindrical rollers are given in Table 1.

Table 1 — Dimensions for cylindrical rollers

Dimensions in millimetres

D_w	L_w	$r_s \text{ min}^a$	$r_s \text{ max}$
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

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Table 1 (continued)

D_w	L_w	r_s min ^a	r_s max
8	16	0,3	0,8
8	20	0,3	0,8
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
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

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