# INTERNATIONAL STANDARD

ISO 3245

Second edition 1997-02-15

### Rolling bearings — Needle roller bearings, drawn cup without inner rings — Boundary dimensions and tolerances iTeh STANDARD PREVIEW

## (standards.iteh.ai)

Roulements — Douilles à aiguilles sans bague intérieure — Dimensions d'encombrement et tolérances

https://standards.iteh.ai/catalog/standards/sist/da8631ce-25d0-4cc9-8c2af95a1e436bb1/iso-3245-1997



Reference number ISO 3245:1997(E)

#### 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.

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.

## iTeh STANDARD PREVIEW

International Standard ISO 3245 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Sub-Committee SC 5, *Needle roller bearings*.

This second edition cancels and replaces the first edition (ISO 3245:1974), which has been technically revised in particular/it updates the first edition-25d0-4cc9-8c2aby defining the symbols used and by giving the bore of the gauge ring used to measure the tolerance for the needle roller complement bore diameter.

Annex A forms an integral part of this International Standard.

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International Organization for Standardization

Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

# Rolling bearings — Needle roller bearings, drawn cup without inner rings — Boundary dimensions and tolerances

#### 1 Scope

This International Standard specifies the boundary dimensions and preferred dimensions to be used for drawn cup needle roller bearings without inner ring as well as the minimum limit of chamfer dimensions and, for closed end drawn cups, thickness dimensions of the end.

In addition dimensional tolerances and a method for checking of the needle roller complement bore diameter are specified. (standards.iteh.ai)

#### <u>ISO 3245:1997</u>

#### 2 Normative references.ndards.iteh.ai/catalog/standards/sist/da8631ce-25d0-4cc9-8c2a-

f95a1e436bb1/iso-3245-1997

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-2 :1988, ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.

ISO/TR 9274:1991, Rolling bearings — Measuring and gauging principles and methods.

ISO 10579:1993, Technical drawings — Dimensioning and tolerancing — Non-rigid parts.

#### 3 Terms, definitions and symbols

For the purposes of this International Standard, the following terms and definitions apply. The symbols (except those for tolerances) shown in figure 1. The dimensions given in tables 1 to 4 denote nominal dimension unless specified otherwise.

**3.1** needle roller complement bore diameter,  $F_w$ : Diameter of the theoretical cylinder inscribed within the needle roller. See figure 1.

**3.2** actual needle roller complement bore diameter,  $F_{ws}$ : Diameter of the cylinder inscribed within the needle roller complement bore.

NOTE — The actual needle roller complement bore diameter is the diameter of the cylinder which, when placed in the needle roller complement bore, results in zero radial clearance in at least one radial direction.

 $\Delta F_{\rm WS} = F_{\rm WS} - F_{\rm W}$ 

- 3.4 drawn cup outside diameter, D. See figure 1.
- **3.5** drawn cup width, C. See figure 1.
- **3.6** end thickness of profiled end drawn cup, C<sub>1</sub>. See figure 1.
- **3.7** end thickness of flat end drawn cup, C<sub>2</sub>. See figure 1.

NOTE — Flat ends may have small stiffening ribs in which case their overall thickness is included in the C2 dimension.

- **3.8** single chamfer dimension, *r*<sub>s</sub>. See figure 1.
- 3.9 smallest permissible single chamfer dimension, r<sub>s min</sub>.

#### 4 Boundary dimensions (see figure 1)

The main dimensions of drawn cup needle roller bearings, without inner ring, closed and open ends, of diameter series 1D are given in table 1, those of diameter series 2D are given in table 2.

Underlined values are the preferred dimensions.

The maximum limits of  $C_1$  and  $C_2$  are given to enable the customer to avoid contact between the shaft end and the drawn cup end. If this contact should be required, the customer should consult the supplier.







b) Closed-ended bearings

Figure 1

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Table 1 — Diameter series 1D

Dimensions in millimetres

Fw         D         21D         31D         41D         51D         61D         71D         81D         91D         C1 max.11         C2 max.11 $r_{smm^2}$ 4         8         7         8         9         - <th></th> <th></th> <th colspan="6">Dimension series</th> <th></th> <th></th> <th></th> <th></th>			Dimension series										
Fw       D       Imax.1       C       C1       C2       rs.min <sup>2</sup> 4       8       7       8       9             max.1       max			21D   31D   41D   51D   61D   71D   81D   91D										
Image: Normal biology of the sector of th	$F_{\rm vv}$	D	C							<i>C</i> <sub>1</sub>	<i>C</i> <sub>2</sub>	$r_{ m s\ min}^{2)}$	
4       8       7       8       9											max. <sup>1)</sup>	max. <sup>1)</sup>	
5       9       7       8       9       9       10       10       10       12       10       12       11       7       8       9       10       12       10       12       11       11       7       8       9       10       12       10       12       11       11       7       8       9       10       12       14       10       11	4	8	7	<u>8</u>	9								0,3
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7       11       7       8       9       10       12        1.9       1.9       1         8       12       7       8       9       10       12       14        1.9       1         9       13       7       8       9       10       12       14         1.9       1         12       16       7       8       9       10       12       14	6	10	7	8	<u>9</u>	10							
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1) No minimum limit is specified for end thickness.	70	78	14	16	18	20	24	28	32	36			
	1) No m	1) No minimum limit is specified for end thickness.											
2) No maximum limit is specified for chamfer dimensions.													

		Dimension series									
		22D	32D	42D	52D	62D	72D	82D			
F <sub>w</sub>	D				С				C <sub>1</sub> max. <sup>1)</sup>	C <sub>2</sub> max. <sup>1)</sup>	$r_{\rm s\ min}^{2)}$
8	14	10	12	14							
9	15	10	12	14	16						
10	16	10	12	14	16						0.4
12	18	10	12	14	16	18					0,4
14	22	12	14	16	18	20	24				
15	23	12	14	16	18	20	24		2,8	1,3	
16	24	12	14	16	18	20	24				
17	25	12	14	16	18	20	24				
18	26	12	14	16	18	20	24				
20	28	12	14	16	18	20	24				
22	30	12	14	16	18	20	24				
25	35	14	16	18	20	24	28	32			
28	38	14	16	18	20	24	28	32			0.8
30	40	14	16	18	20	24	28	32			0,0
32	42	14	16	18	20	24	28	32			
35	45	14	16	18	20	A 24 T	28D1	32	3,4	1,6	
38	48	14	16	18	20	24	28	32	4 ♥♥		
40	50	14	16	1 <mark>8st</mark>		<b>rd45.i</b>	te <sup>2</sup> 8.a	32			
42	52	14	16	18	20	24	28	32			
45	55	14	16	18	20 <mark>ISC</mark>	0 32 <del>4</del> 4:199	7 28	32			
1) No minimum limit is specified to send thickness ai/catalog/standards/sist/da8631ce-25d0-4cc9-8c2a-											
2) No maximum limit is specified for chamfer dimensions: 436bb1/iso-3245-1997											

#### Table 2 — Diameter series 2D

Dimensions in millimetres

#### 5 Dimensional tolerances

#### 5.1 Tolerance for the needle roller complement bore diameter, $F_{\rm W}$

Drawn cup needle bearings are non-rigid parts according to the definition in ISO 10579 and require the drawn cup outside diameter to be restrained in a gauge ring for verification of the needle roller complement bore diameter deviations  $\Delta F_{ws}$ .

NOTE — The free state condition defined in ISO 10579 is valid for the tolerances applied to dimensions C, C1, C2 and rs.

The deviations  $\Delta F_{WS}$  given in tables 3 and 4 for the needle roller complement bore diameter  $F_{WS}$  are valid on the condition that the drawn cup be held in a suitable solid gauge ring having the bore diameter given in tables 3 and 4. The gauge ring bore diameter is equal to the low limit of tolerance class N6 (see ISO 286-2) when applied to the nominal drawn cup outside diameter *D*.

If the bore diameter of the gauge ring deviates from this dimension, the limit deviations of the needle roller complement bore diameter ( $F_{WS}$ ) shall be corrected depending on the actual gauge ring bore diameter. However, the maximum permissible limit of the gauge ring bore diameter is the corresponding high limit of tolerance class N6 (see ISO 286-2).

$F_{\sf W}$	$D^{1)}$	Gauge ring bore	$\Delta F_{\rm WS}$					
			upper	lower				
mm	mm	mm	μm					
4	8	7,984						
5	9	8,984	+28	+10				
6	10	89,984						
7	11	10,98						
8	12	11,98	+31	±13				
9	13	12,98	тот	T15				
10	14	13,98						
12	16	15,98						
14	20	19,976						
15	21	20,976	+34	+16				
	22	21,976		110				
	23A	22,976		¥ ♥				
18	(stan	dar <sup>23</sup> . <sup>976</sup> teh	ai) —					
20	26	25,976						
22	28	ISO 3245:1997						
http <del>2</del> 5/standa	rds.ite <sup>32</sup> ai/catal	og/standards/stst/da863	1ce-25d0-4cc9	-8c2a <sup>+20</sup>				
28	35 <mark>195a1</mark> 0	436bb134093245-199	7					
30	37	36,972						
32	39	38,972						
35	42	41,972						
38	45	44,972						
40	47	46,972	+50	+25				
42	49	48,972						
45	52	51,967						
50	58	57,967						
55	63	62,967						
60	68	67,967	+60	+30				
65	73	72,967						
70	78	77,967						
1) No devia shall ensure	1) No deviations are specified for drawn cup outside diameter <i>D</i> . The supplier shall ensure a fit corresponding to the function.							

#### Table 3 — Diameter series 1D

F <sub>w</sub>	<i>D</i> <sup>1)</sup>	Gauge ring bore	$\Delta F_{\rm WS}$			
			upper	lower		
mm	mm	mm	μm			
8	14	13,98				
9	15	14,98	+31	+13		
10	16	15,98				
12	18	17,98				
14	22	21,976		+16		
15	23	22,976	+34			
16	24	23,976	104			
17	25	24,976				
18	26	25,976				
20	28	27,976				
22	30	29,976				
25	35	34,972	+41	+20		
28	38	37,972				
30	40	39,972				
32	42	41,972				
35	45	44,972				
38	48	47.972	150	125		
40	50	49,972				
42		51,967	T RE V J			
45	55	and 54,967 s it	eh ai)			
1) No deviations are specified for drawn cup outside diameter $D$ . The supplier shall ensure a fit corresponding to the function.						

#### Table 4 — Diameter series 2D

https://standards.iteh.ai/catalog/standards/sist/da8631ce-25d0-4cc9-8c2af95a1e436bb1/iso-3245-1997

#### 5.2 Tolerance for the drawn cup width, C

The tolerance, over width *C*, is as follows:

-0 mm -0,3

#### 6 Gauging methods for the actual needle roller complement bore diameter, $F_{WS}$

For gauging the actual diameter of the needle roller complement bore the methods described in ISO/TR 9274:1991, 7.2.2, shall be used.

## Annex A

(informative)

## Bibliography

- [1] ISO 582:1995, Rolling bearings Chamfer dimensions Maximum values.
- [2] ISO 1132:1980, Rolling bearings Tolerances Definitions.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 3245:1997 https://standards.iteh.ai/catalog/standards/sist/da8631ce-25d0-4cc9-8c2af95a1e436bb1/iso-3245-1997