

AMERICAN NATIONAL STANDARD

ABMA Standard

ISO Standard

Rolling bearings - Needle rollers - Dimensions and tolerances

Secretariat
American Bearing Manufacturers Association

Approved April 1, 1998



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Foreword

(This foreword is not part of ANSI/ABMA/ISO 3096:1998.)

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

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

International Standard 3096 was prepared by Technical Committee ISO/TC4, *Rolling bearings*, Subcommittee 5, *Needle roller bearings*.

This standard was processed and approved for submittal to ANSI by Accredited Standards Committee B3 on Ball and Roller Bearings. Committee approval of this standard does not necessarily imply that all committee members voted for its approval.

Suggestions for the improvement of this standard gained through experience with its use will be welcomed. These should be sent to: American Bearing Manufacturers Association, Secretariat, ANSI ASC B3, 1200 19th Street, NW, Suite 300, Washington, DC 20036-2422.

Rolling bearings — Needle rollers — Dimensions and tolerances

1 Scope

This International Standard specifies dimensions and tolerances for finished steel needle rollers used as rolling elements.

2 Normative references

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 edition 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 4291 :1985, *Methods for the assessment of departure from roundness — Measurement of variations in radius*.

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 figures 1 and 2 and the values given in tables 1 and 3 denote nominal dimensions unless specified otherwise.

3.1 nominal diameter of a needle roller, D_w : Diameter value used for the purpose of general identification of a needle roller diameter. See figures 1 and 2.

3.2 single diameter of a needle roller, D_{ws} : Distance between two tangents to the needle roller surface parallel to each other and in a plane perpendicular to the needle roller axis, i.e. a radial plane.

3.3 mean diameter of a needle roller in a single plane, D_{wmp} : Arithmetical mean of the largest and the smallest actual single diameters of the needle roller in a single radial plane.

3.4 nominal length of a needle roller, L_w : Length value used for the purpose of general identification of a needle roller length. See figures 1 and 2.

3.5 single length of a needle roller, L_{ws} : Distance between the two radial planes which just contain the end extremities of the needle roller.

3.6 single chamfer dimension (of flat end needle roller), r_s . See figure 1.

3.7 smallest permissible single chamfer dimension (of flat end needle roller), $r_{s \min}$.

3.8 largest permissible single chamfer dimension (of flat end needle roller), $r_{s \max}$.

3.9 profile at the ends of rounded end needle rollers, R : Profile which may not necessarily be a true radius but shall fall within the limits of $D_w/2$ and $L_w/2$.

3.10 circularity deviation: Difference between the largest radius and the smallest radius of the measured profile of the workpiece, the values of the radii being taken from the centre of the least squares mean circle, LSC.

3.11 needle roller gauge: Diameter deviation range limited by a high and a low deviation of the mean needle roller diameter D_{wmp} from the nominal diameter, D_w , in a radial plane through the middle of the roller length.

NOTE— A gauge is designated by the high and low deviation expressed in micrometres, for example $-2 -4$.

3.12 gauge lot: Quantity of needle rollers, of the same grade and nominal dimensions, all having a mean diameter D_{wmp} within the same gauge.

NOTE— Needle rollers of any grade and nominal dimensions are supplied in gauge lots. If nothing to the contrary has been agreed between the customer and the supplier, the gauge lots may be of any one or more of the gauges included in table 2.

3.13 variation of gauge lot diameter, V_{DWL} : Difference between the mean diameter D_{wmp} of the needle roller having the largest mean diameter and that of the needle roller having the smallest mean diameter in the gauge lot.

3.14 needle roller grade: Specific combination of diameter and form tolerances for a needle roller, characteristic of its level of accuracy.

NOTE — A needle roller grade is designated by a number.

4 Dimensions

See figures 1 and 2 and table 1.

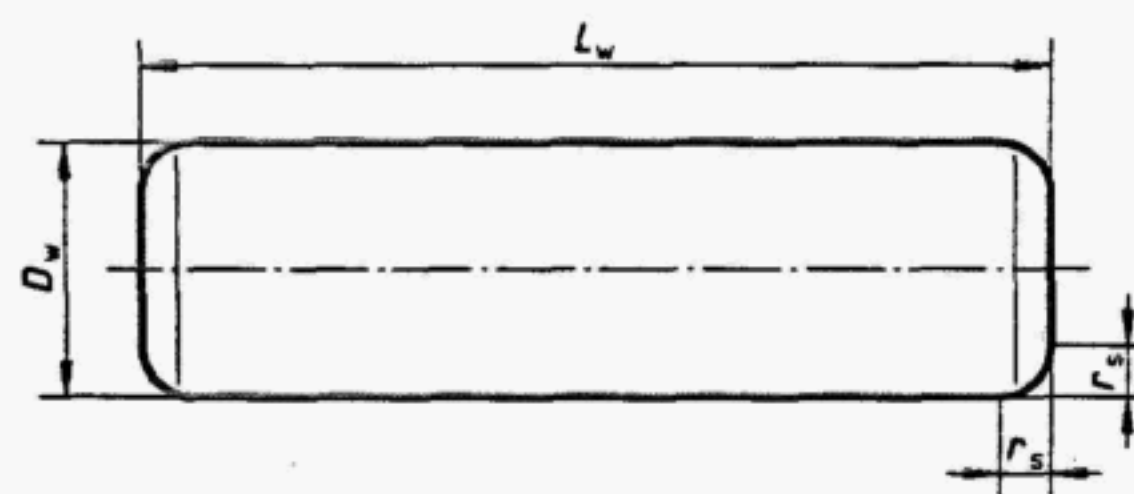


Figure 1 — Flat end needle roller

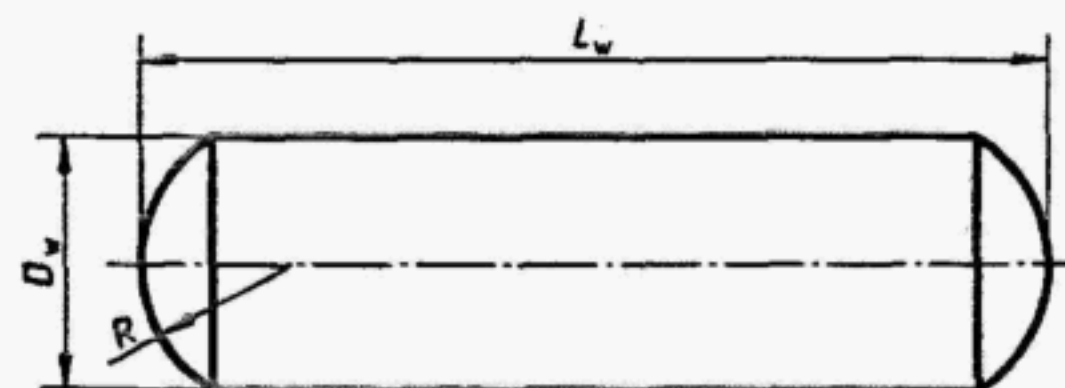


Figure 2 — Rounded end needle roller

Table 1 — Dimensions

Dimensions in millimetres

D_w	L_w																	
	5,8	6,8	7,8	9,8	11,8	13,8	15,8	17,8	19,8	21,8	23,8	25,8	27,8	29,8	34,8	39,8	49,8	59,8
1	X	X	X	X														
1,5	X	X	X	X	X	X												
2		X	X	X	X	X	X	X	X									
2,5			X	X	X	X	X	X	X	X	X							
3				X	X	X	X	X	X	X	X	X	X	X				
3,5					X	X	X	X	X	X	X	X	X	X	X			
4					X	X	X	X	X	X	X	X	X	X	X	X		
5							X	X	X	X	X	X	X	X	X	X	X	
6								X	X	X	X	X	X	X	X	X	X	X

5 Tolerances

5.1 Diameter and circular form

Table 2 gives, for each grade specified:

- maximum variation of gauge lot diameter;
- recommended gauges of needle roller;
- maximum circularity deviation.

In addition, no single diameter within the entire length of a needle roller shall exceed the actual maximum diameter at the middle of its length by more than

- a) 0,5 μm for grade 2;
- b) 0,8 μm for grade 3;
- c) 1 μm for grade 5.

5.2 Length

The tolerance on the single length, L_{ws} , for needle rollers of all grades shall be h13, see ISO 286-2.

5.3 Chamfer dimension (see figure 1)

Chamfer dimension limits for flat end needle rollers of all grades are specified in table 3.

Annex A
(informative)

Bibliography

- [1] ISO 1132 :1980, *Rolling bearings - Tolerances - Definitions*.

