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**Rolling bearings — Needle roller
bearings, dimension series 48, 49
and 69 — Boundary dimensions and
tolerances**

**AMENDMENT 1: Tolerances for shaft
raceway**

*Roulements — Roulements à aiguilles, séries de dimensions 48, 49 et
69 — Dimensions d'encombrement et tolérances*

AMENDEMENT 1: Tolérances du chemin de roulement de l'arbre



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Case postale 56 • CH-1211 Geneva 20
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Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Rolling bearings — Needle roller bearings, dimension series 48, 49 and 69 — Boundary dimensions and tolerances

AMENDMENT 1: Tolerances for shaft raceway

Page 1, Scope

Add the following sentence at the end of the scope: “Recommended values for the tolerances for shaft raceways for needle roller bearings without inner ring are given in Annex A.”

Page 8, Clause 7

Insert the following new Annex A after Clause 7.

Annex A **(informative)**

Tolerances for shaft raceways for needle roller bearings without inner ring

A.1 General

Proper function of needle roller bearings without inner rings depends on the shaft raceway supplied by the user. This annex shows suggested tolerances for shaft raceway.

Table values are informative only. In all cases, users should check the installed bearing clearance.

A.2 Raceway hardness and case-hardened depth

The shaft raceway is hardened and finish ground; surface hardness is minimum 670 HV (58 HRC).

In the case of using case hardening bearing steel, case-hardened depth of raceway is minimum of 0,3 mm to 0,8 mm, depending on bearing size, rolling element diameter, shaft heat treatment method and load condition. If in doubt, consult the bearing manufacturer for specific advice. Case-hardened depth should be in accordance with ISO 2639:2002, 3.1.

A.3 Tolerances for shaft raceways

Table A.1 shows suggested tolerances for shaft raceways for needle roller bearings without inner ring.

Table A.1 — Tolerances for shaft raceways for needle roller bearings without inner ring

Shaft raceway tolerances for needle roller bearings without inner ring ^a					
Bore diameter of needle roller complement F_w		Deviation of shaft raceway diameter from F_w^b	Surface roughness μm	Roundness ^{cd}	Variation of mean diameter ^d
mm					
>	\leq	Tolerance class	max.	max.	max.
6	80	h5 [Ⓔ]	Ra 0,2 (Rz 1)	IT3	IT3
80	200	g5 [Ⓔ]			
200	400	f6 [Ⓔ]			
<p>^a The limit deviation relating to the tolerance class and the value of the standard grades are given in ISO 286-1 and ISO 286-2.</p> <p>^b Tolerance classes apply with housing tolerances of H7 to K7; for tighter housing tolerance classes, check bearing clearance.</p> <p>^c Roundness is measured using the least squares centre (LSC) method according to ISO 4291 and ISO 1101.</p> <p>^d If cylindricity is used instead of variation of mean diameter, tolerance values for cylindricity can be different from the values of variation of mean diameter. If in doubt consult the bearing manufacturer for specific advice. Cylindricity should be in accordance with ISO 1101.</p>					

Page 9, Bibliography

Add the following five references after Reference [1]:

- [2] ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits*
- [3] ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*
- [4] ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*
- [5] ISO 2639:2002, *Steels — Determination and verification of the depth of carburized and hardened cases*
- [6] ISO 4291, *Methods for the assessment of departure from roundness — Measurement of variations in radius*

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