

SLOVENSKI STANDARD
oSIST ISO/DIS 12090-2:2008
01-julij-2008

Kotalni ležaji - Linearno gibanje, ležaji s kroženjem kroglic in kotalk, vrsta z linearnimi vodili - 2. del: Glavne mere in tolerance za seriji 4 in 5

Rolling bearings - Linear motion, recirculating ball and roller bearings, linear guideway type - Part 2: Boundary dimensions and tolerances for series 4 and 5

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Roulements - Guidages linéaires (à recirculation de billes) et de rouleaux, de type rail de guidage - Partie 2: Dimensions d'encombrement et tolérances pour les séries 4 et 5

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ICS:

21.100.20 Kotalni ležaji Rolling bearings

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Rolling bearings — Linear motion, recirculating ball and roller bearings, linear guideway type —

Part 2: Boundary dimensions and tolerances for series 4 and 5

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ICS 21.100.20

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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 12090-2 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 11, *Linear motion rolling bearings*.

ISO 12090 consists of the following parts, under the general title *Rolling bearings — Linear motion, recirculating ball and roller bearings, linear guideway type*:

— *Part 1: Boundary dimensions and tolerances for series 1, 2 and 3*

— *Part 2: Boundary dimensions and tolerances for series 4 and 5*

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Rolling bearings — Linear motion, recirculating ball and roller bearings, linear guideway type —

Part 2: Boundary dimensions and tolerances for series 4 and 5

1 Scope

This standard establishes the boundary dimensions and tolerances for series 4 and 5 of the guideway type of recirculating linear motion ball and roller bearings.

These bearings consist of guideways with carriages, which can support forces from all perpendicular directions and moments around all axes. The internal design of these recirculating linear motion ball and roller bearings is at the discretion of the manufacturer.

An assembly as specified by the manufacturer may comprise one or more carriages on a guideway. Therefore the interchange or combination of these elements can only be carried out within the limits permitted by the manufacturer.

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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, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 5593, *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.

3.1

recirculating linear ball bearing, linear guideway type

linear ball bearing consisting of a (ball) carriage and a (profiled) guideway

3.2

recirculating linear roller bearing, linear guideway type

linear roller bearing consisting of a (roller) carriage and a (profiled) guideway

3.3

(ball) carriage

basically rectangular part of a linear guideway type recirculating linear ball bearing provided with a number of closed loops of recirculating balls

**3.4
(roller) carriage**

basically rectangular part of a linear guideway type recirculating linear roller bearing provided with a number of closed loops of recirculating rollers

**3.5
(profiled) guideway**

rail with a profiled cross section having one or more longitudinal raceways along which a carriage traverses

NOTE The carriage and guideway have bolt holes (and/or internal screw threads) provided for ease of mounting

**3.6
nominal carriage width**

distance between the two theoretical side faces of a carriage

**3.7
nominal distance between the reference side faces (of carriage and guideway assembly)**

distance between the two theoretical side faces of carriage and guideway (of carriage and guideway assembly)

**3.8
actual distance between the reference side faces (of carriage and guideway assembly)**

distance between a point on the actual reference side face of the carriage and a point of intersection of a straight line through that point on the carriage and perpendicular to the reference side face of the guideway and a plane tangential to the actual reference side face of the guideway

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**3.9
deviation of the actual distance between the reference side faces (of carriage and guideway assembly)**

difference between the actual distance between the reference side faces (of carriage and guideway assembly) and the nominal distance between the reference side faces (of carriage and guideway assembly),

$$\Delta_{A1s} = A_{1s} - A_1$$

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**3.10
variation of the actual distance between the reference side faces (of carriage and guideway assembly)**

difference between the largest and the smallest of the actual distances between the reference side faces (of carriage and guideway assembly), $V_{A1s} = A_{1s \max} - A_{1s \min}$

**3.11
nominal carriage length**

distance between the two theoretical end faces of the carriage designated to bound its length

**3.12
nominal height (of carriage and guideway assembly)**

distance between the theoretical bottom face of the guideway and the theoretical top face of the carriage

**3.13
actual height (of carriage and guideway assembly)**

distance between a point on the actual top face of the carriage and a point of intersection of a straight line through that point on the carriage and perpendicular to the bottom face of the guideway and a plane tangential to the actual bottom face of the guideway

**3.14
deviation of the actual height (of carriage and guideway assembly)**

difference between the actual height (of carriage and guideway assembly) and the nominal height (of carriage and guideway assembly) $\Delta_{Hs} = H_s - H$

3.15**variation of the actual height (of carriage and guideway assembly)**

difference between the largest and the smallest of the actual heights (of carriage and guideway assembly),
 $V_{Hs} = H_{s \max} - H_{s \min}$

3.16**nominal height between the bottom faces of carriage and guideway**

distance between the theoretical bottom face of the guideway and that of the carriage designated to bound the clearance under the carriage

3.17**nominal guideway width**

distance between the two theoretical side faces of the guideway

3.18**running parallelism of carriage height of assembled linear bearing**

difference between the largest and smallest of the height distances between the reference face of the guideway, in different longitudinal positions of the guideway, and a point in a fixed position relative to the carriage

NOTE For a measurement to be valid, at the longitudinal position of the point mentioned, or on each side and close to it, the rolling elements shall be in contact with both the guideway and carriage raceways.

3.19**running parallelism of carriage face of assembled bearing**

difference between the largest and smallest of the lateral distances between the reference face of the guideway, in different longitudinal positions of the guideway, and a point in a fixed position relative to the carriage

NOTE For a measurement to be valid, at the longitudinal position of the point mentioned, or on each side and close to it, the rolling elements shall be in contact with both the guideway and carriage raceways.

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 Figures 1 to 3 and the values given in Tables 1 to 5 denote nominal dimensions unless specified otherwise.

A	carriage width
A_1	distance between reference side faces of carriage and guideway assembly
A_{1s}	actual distance between the reference side faces of carriage and guideway assembly
B	carriage length
G	designation of the internal screw thread of carriage
G_1	designation of the internal screw thread of guideway
H	height of carriage and guideway assembly
H_s	actual height of carriage and guideway assembly
H_1	height between the bottom faces of carriage and guideway

H_2	height of reference face
h	depth of bolt hole counterbore of guideway
J	centre distance between bolt holes of carriage (width)
J_1	centre distance between bolt holes of carriage (length)
J_2	centre distance between bolt holes of guideway (length)
J_3	distance from the end face to the first bolt hole of guideway
J_4	centre distance between bolt holes of guideway (width)
K_{ca}	running parallelism of carriage height of carriage and guideway assembly
l_G	length of internal screw thread of carriage
N_1	diameter of bolt hole of guideway
N_2	diameter of bolt hole counterbore of guideway
S_{ca}	running parallelism of carriage face of carriage and guideway assembly
V_{A1s}	variation of the actual distance between the reference side faces of carriage and guideway assembly
V_{Hs}	variation of the actual height of carriage and guideway assembly
W	guideway width
Δ_{A1s}	deviation of the actual distance between the reference side faces of carriage and guideway assembly
Δ_{Hs}	deviation of the actual height of carriage and guideway assembly

5 Design types

Design types of guideways are given in Table 1.

Table 1 — Carriage and guideway assemblies

Series	Design	Type
4	Miniature	4M
5	Miniature, wide	5W