
**Rolling bearings — Accessories for
sleeve type linear ball bearings —**

Part 1:

**Boundary dimensions and tolerances for
series 1 and 3**

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Roulements — Accessoires pour douilles à billes linéaires —
Partie 1: Dimensions d'encombrement et tolérances pour les séries 1
et 3
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ISO 13012-1:2009

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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 13012-1 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 11, *Linear motion rolling bearings*.

This first edition of ISO 13012-1 cancels and replaces ISO 13012:1998, which has been technically revised. It also incorporates the Technical Corrigendum ISO 13012:1998/Cor.1:1999.

ISO 13012 consists of the following parts, under the general title *Rolling bearings — Accessories for sleeve type linear ball bearings*:

- *Part 1: Boundary dimensions and tolerances for series 1 and 3*
- *Part 2: Boundary dimensions and tolerances for series 5*

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Introduction

The use of sleeve type linear ball bearings can be facilitated by the selection of bearing housings, shafts, shaft support blocks, and shaft support rails. These items, referred to as accessories, can aid in the application of the sleeve type linear ball bearings to achieve the desired criteria of smooth, accurate, low friction linear motion free from chatter or stick-slip.

The appropriate selection of bearing housing type, shaft, and shaft support should be established between the manufacturer and the user.

This part of ISO 13012 was developed to be used with ISO 10285.

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Rolling bearings — Accessories for sleeve type linear ball bearings —

Part 1: Boundary dimensions and tolerances for series 1 and 3

1 Scope

This part of ISO 13012 specifies the boundary dimensions, other relevant dimensions and their tolerances of accessories for sleeve type linear ball bearings which are specified in ISO 10285.

This part of ISO 13012 applies to:

housings —

- closed and adjustable flangeless housings for series 1 sleeve type linear ball bearings,
- closed and adjustable flanged housings for series 3 sleeve type linear ball bearings,
- open flanged housings for series 3 sleeve type linear ball bearings,
- closed and adjustable flangeless housings for series 3 sleeve type linear ball bearings,
- open and open adjustable flangeless housings for series 3 sleeve type linear ball bearings;

shaft support rails —

- standard height shaft support rails for series 3 sleeve type linear ball bearings,
- low height shaft support rails for series 3 sleeve type linear ball bearings;

shaft support blocks —

- flanged shaft support blocks for series 1 and 3 sleeve type linear ball bearings,
- flangeless shaft support blocks for series 1 and 3 sleeve type linear ball bearings;

shafts —

- solid and tubular shafts for series 1 and 3 sleeve type linear ball bearings.

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

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 3754, *Steel — Determination of effective depth of hardening after flame or induction hardening*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 10285:2007, *Rolling bearings — Sleeve type linear ball bearings — Boundary dimensions and tolerances*

ISO 15241, *Rolling bearings — Symbols for quantities*

ISO 24393, *Rolling bearings — Linear motion rolling bearings — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1132-1, ISO 5593, ISO 10285, ISO 24393 and the following apply.

3.1 flangeless housing
(sleeve type linear ball bearing) bearing housing which has a face with bolt holes or threaded holes for attachment to a support surface nominally parallel to the bearing axis

3.2 flanged housing
(sleeve type linear ball bearing) bearing housing which has a mounting face with projecting lugs having bolt holes for attachment to a support surface nominally parallel to the bearing axis

3.3 closed housing
(sleeve type linear ball bearing) bearing housing in which the bearing seating is circumferentially continuous

3.4 adjustable housing
(sleeve type linear ball bearing) bearing housing with a longitudinal slit across its bearing seating which facilitates the mechanical adjustment of the bearing seating diameter

3.5 open housing
(sleeve type linear ball bearing) bearing housing with a longitudinal section removed to provide clearance over a shaft and support rail unit

3.6 open adjustable housing
(sleeve type linear ball bearing) bearing housing which has the features of both open and adjustable sleeve type linear ball bearing housings

3.7 shaft support rail
longitudinal pedestal which provides continuous support to a shaft

NOTE Shaft support rails may be used with open sleeve type linear ball bearings.

3.8 shaft support block
block which provides support to a shaft

NOTE Shaft support blocks are normally used to support the shaft at its ends and can be used with closed sleeve type, adjustable sleeve type or open sleeve type linear ball bearings.

3.9**shaft**

basically cylindrical rod along which a linear ball bearing traverses.

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 10, and the values given in Tables 1 to 11, denote nominal dimensions unless specified otherwise.

NOTE Figures 1 to 10 are drawn schematically and do not necessarily show all design details.

4.1 Closed and adjustable flangeless housings for series 1 sleeve type linear ball bearings

See Table 1 and Figure 1.

A (overall) width

D_a seating diameter

F_w bore diameter of ball complement of sleeve type linear ball bearing (reference)

G designation of screw thread of attachment hole

H distance from mounting face to centreline of seating diameter

H_1 (overall) height

J centre distance between mounting bolt holes (length)

L length of housing

N diameter of bolt hole

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4.2 Closed and adjustable flanged housings for series 3 sleeve type linear ball bearings

See Table 2 and Figure 2.

A (overall) width

A_1 width of seating

D_a seating diameter

F_w bore diameter of ball complement of sleeve type linear ball bearing (reference)

H distance from mounting face to centreline of seating diameter

H_1 height of flange

H_2 (overall) height

J centre distance between bolt holes (length)

J_1 centre distance between bolt holes (width)

L length of housing

N diameter of bolt hole

4.3 Open flanged housings for series 3 sleeve type linear ball bearings

See Table 3 and Figure 3.

- A (overall) width
- A_1 width of seating
- D_a seating diameter
- E width of sector opening (at diameter D_a)
- F_w bore diameter of ball complement of sleeve type linear ball bearing (reference)
- H distance from mounting face to centreline of seating diameter
- H_1 height of flange
- H_2 (overall) height
- J centre distance between bolt holes (length)
- J_1 centre distance between bolt holes (width)
- L length of housing
- N diameter of bolt hole
- α angle of sector opening

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4.4 Closed and adjustable flangeless housings for series 3 sleeve type linear ball bearings

See Table 4 and Figure 4.

- A (overall) width
- D_a seating diameter
- F_w bore diameter of ball complement of sleeve type linear ball bearing (reference)
- G designation of screw thread of attachment hole
- H distance from mounting face to centreline of seating diameter
- H_1 (overall) height
- J centre distance between bolt holes (length)
- J_1 centre distance between bolt holes (width)
- L length of housing
- L_1 distance from side face to centreline of seating diameter
- N diameter of bolt hole

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4.5 Open and open adjustable flangeless housings for series 3 sleeve type linear ball bearings

See Table 5 and Figure 5.

- A (overall) width
- D_a seating diameter
- E width of sector opening (at diameter D_a)

F_w	bore diameter of ball complement of sleeve type linear ball bearing (reference)
G	designation of screw thread of attachment hole
H	distance from mounting face to centreline of seating diameter
H_1	(overall) height
J	centre distance between bolt holes (length)
J_1	centre distance between bolt holes (width)
L	length of housing
L_1	distance from side face to centreline of seating diameter
N	diameter of bolt hole
α	angle of sector opening

4.6 Standard height shaft support rails for series 3 sleeve type linear ball bearings

See Table 6 and Figure 6.

A	(overall) width
d	outside diameter of shaft (reference)
H	distance from mounting face to centreline of shaft
H_1	height of flange
J	centre distance between bolt holes (length)
J_1	centre distance between bolt holes (width)
M	width of shaft support
N	diameter of bolt hole
N_1	diameter of bolt hole (shaft attachment)

4.7 Low height shaft support rails for series 3 sleeve type linear ball bearings

See Table 7 and Figure 7.

A	(overall) width
d	outside diameter of shaft (reference)
H	distance from mounting face to centreline of shaft
H_1	height of flange
H_2	distance from mounting face to top of attachment screw head
J	centre distance between bolt holes (length)
J_1	centre distance between bolt holes (width)
M	width of shaft support
N	diameter of bolt hole
N_1	diameter of bolt hole (shaft attachment)
β	angle of shaft support