
**Rolling bearings — Insert bearings and
eccentric locking collars — Boundary
dimensions and tolerances**

*Roulements — Roulements «insert» et bagues de blocage
excentriques — Dimensions d'encombrement et tolérances*

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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 9628 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 6, *Insert bearings and accessories*.

This second edition cancels and replaces the first edition (ISO 9628:1992), which has been technically revised.

This corrected version incorporates the following corrections:

- on page 3, in Figure 2, the symbol " B_1 " has been replaced by " B " and the figure itself corrected;
- on page 4, in Figure 3, the symbol " B_1 " has been replaced by " B ";
- on page 5, Figures 5 and 6 have been replaced to correctly present the eccentricity;
- on page 6, in 5.6, the wording has been improved;
- on pages 9 and 10, in Table 2, " B_1 " has been replaced by " B ".

Rolling bearings — Insert bearings and eccentric locking collars — Boundary dimensions and tolerances

1 Scope

This International Standard specifies the characteristics, boundary dimensions and tolerances of insert bearings and eccentric locking collars and the radial internal clearances of insert 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 15:1998, *Rolling bearings — Radial bearings — Boundary dimensions, general plan*

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

ISO 5593, *Rolling bearings — Vocabulary*

ISO 15241, *Rolling bearings — Symbols for quantities*

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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

insert bearing

radial rolling bearing with a spherical outside surface and an extended inner ring with a locking device

NOTE The locking device, used for fixing the inner ring to the shaft, may be an eccentric locking collar or set screws either in a concentric locking collar around the inner ring or directly in the inner ring.

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 6 and the values given in Tables 1 to 8 denote nominal dimensions unless specified otherwise.

NOTE Figures 1 to 6 are drawn schematically and sealing devices and cages are not shown in Figures 1 to 4.

| | |
|-------|--|
| A | width of eccentric surface of inner ring |
| A_1 | width of eccentric surface of eccentric locking collar |
| B | width of inner ring |

| | |
|----------------|---|
| B_1 | overall width of inner ring including eccentric locking collar |
| B_2 | width of eccentric locking collar |
| C | width of outer ring |
| C_1 | distance from centre of outer ring to centre of lubrication zone |
| C_2 | width of lubrication zone |
| D | outside diameter of bearing |
| d | bore diameter of bearing and of eccentric locking collar |
| d_1 | outside diameter of eccentric locking collar |
| d_2 | small bore diameter of eccentric surface (at theoretical sharp corner) of eccentric locking collar |
| d_3 | large outside diameter of eccentric surface (at theoretical sharp corner) of inner ring |
| H | eccentricity of inner ring eccentric extension and of eccentric locking collar |
| r_1 | chamfer dimension of eccentric surface of inner ring |
| $r_{1s \min}$ | smallest single chamfer dimension of eccentric surface of inner ring |
| r_2 | fillet radius of eccentric surface of inner ring |
| $r_{2s \max}$ | largest single fillet radius of eccentric surface of inner ring |
| r_3 | fillet radius of eccentric surface of eccentric locking collar |
| $r_{3s \max}$ | largest single fillet radius of eccentric surface of eccentric locking collar |
| r_4 | chamfer dimension of eccentric surface of eccentric locking collar |
| $r_{4s \min}$ | smallest single chamfer dimension of eccentric surface of eccentric locking collar |
| S | distance from centre of raceway to face of inner ring on side opposite locking device |
| S_1 | distance from centre of raceway to face of inner ring or eccentric locking collar limiting overall bearing width on locking device side |
| V_{dsp} | variation of bore diameter of bearing in a single plane |
| Δ_{A1s} | deviation of a single width of eccentric surface of eccentric locking collar |
| Δ_{B2s} | deviation of a single width of eccentric locking collar |
| Δ_{dmp} | deviation of mean bore diameter of bearing in a single plane |
| Δ_{ds} | deviation of a single bore diameter of eccentric locking collar |
| Δ_{d2s} | deviation of a single small bore diameter of eccentric surface of eccentric locking collar |
| Δ_{Hs} | deviation of eccentricity of inner ring eccentric extension and of eccentric locking collar in a single plane |

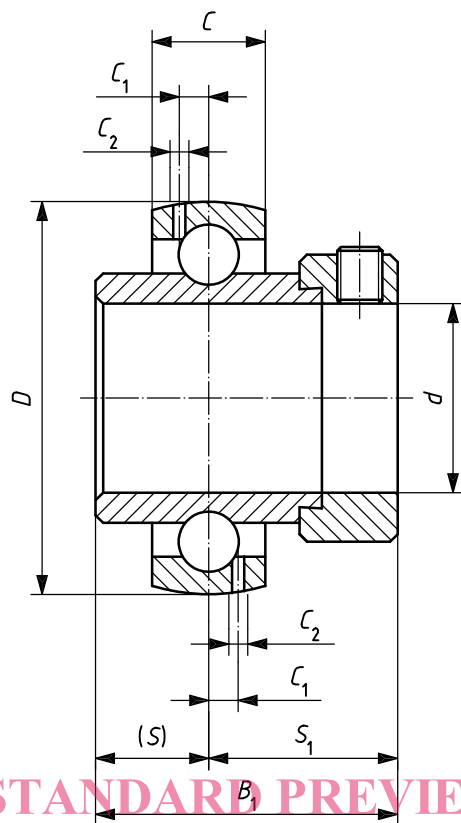


Figure 1 — Bearing with eccentric locking collar — Wide overall width

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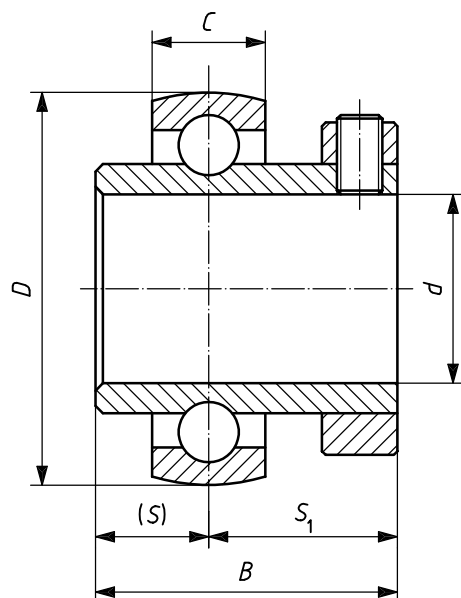


Figure 2 — Bearing with concentric locking collar around the inner ring — Intermediate overall width

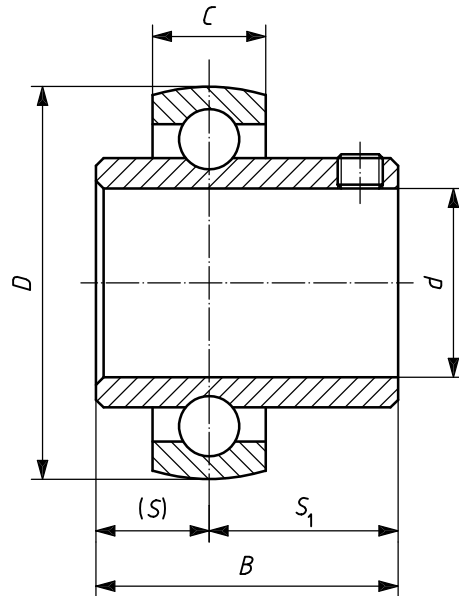


Figure 3 — Bearing with set screws in the inner ring — Intermediate overall width

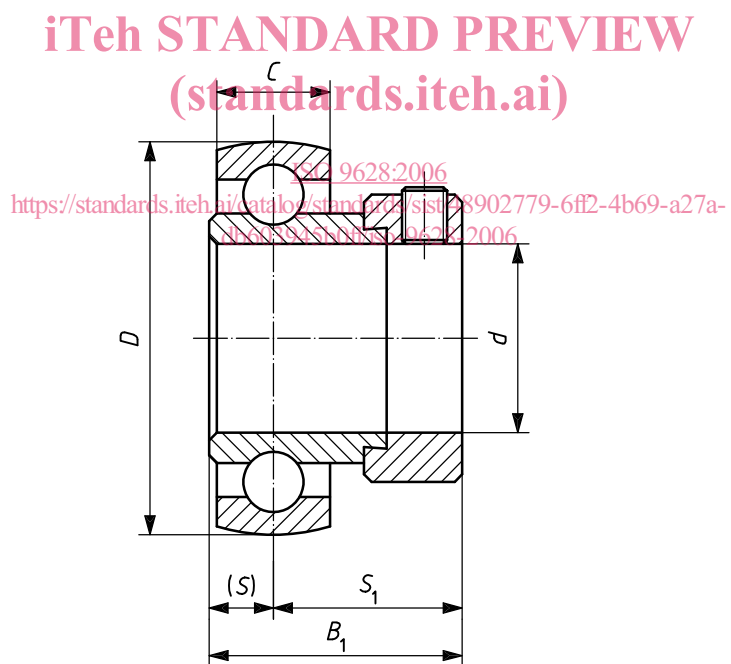


Figure 4 — Bearing with eccentric locking collar — Narrow overall width

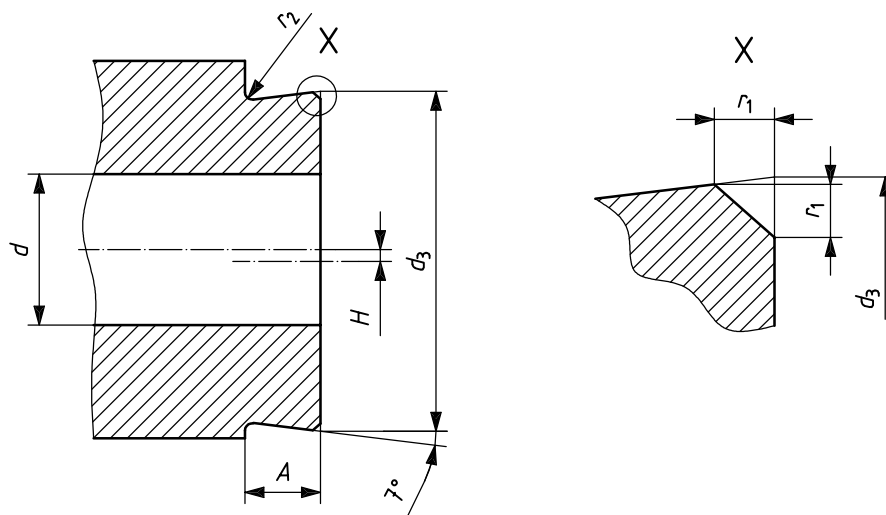
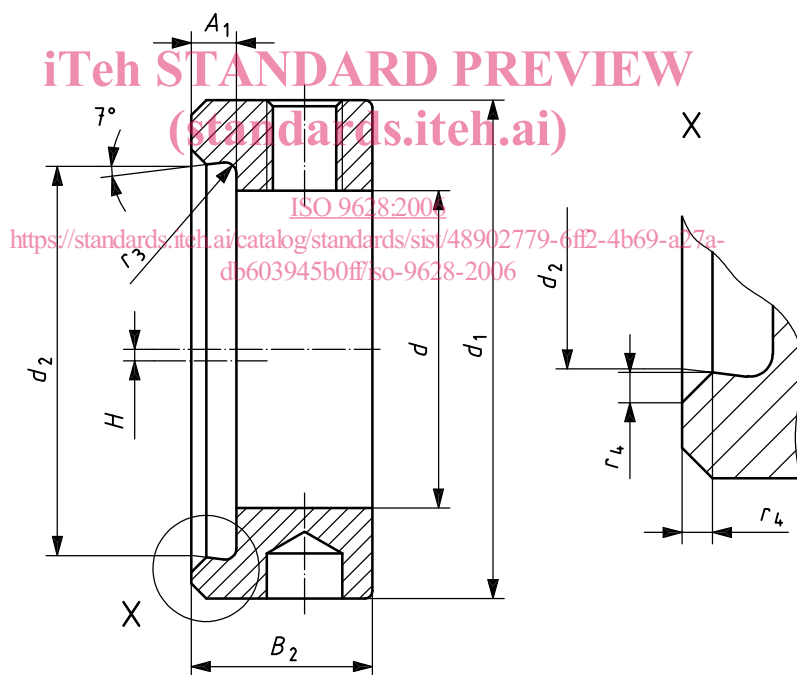


Figure 5 — Eccentric extension of inner ring



NOTE The relative angular position of the plain and tapped holes to each other and to the eccentricity is optional.

Figure 6 — Eccentric locking collar

5 Characteristics

5.1 General

The bearings on one shaft are, as a rule, mounted in two or more separate housings, which are not always perfectly aligned. The outer ring has a spherical outside surface so that the bearing can be mounted in a housing with a matching spherical seating to accommodate permanent angular misalignment.

The bore surface of the bearing inner ring and the eccentric locking collar may be plated or treated with a surface treatment to reduce corrosion during operation.

5.2 Bore diameter

For bearings with eccentric locking collar, the size of the eccentric feature on the inner ring and the locking collar is generally common for one metric and several inch inner ring bore sizes. The non-preferred inch bore sizes, which are given in parentheses in Tables 1 to 3, should be avoided whenever possible.

Contrary to general rolling bearing practice, the inner ring bore diameter tolerance is on the plus side of the nominal bore diameter, in order that the bearing and collar can be slipped over standard size shafting.

5.3 Outside diameter of bearing

The outside diameter of the bearing corresponds (with respect to the metric bore diameter) to the diameter series 2 of ISO 15:1998.

5.4 Width of inner ring and locking device

The inner ring width (with respect to the metric bore diameter) does not conform to the requirements of dimension series 02 of ISO 15:1998. It is determined by the requirements of space for sealing and locking devices and by the axial extension of the shaft support considered suitable for various applications.

Where the locking device extends axially beyond the inner ring, the width over the locking device, called the overall width, and the location with respect to the outer ring centreline of the side face limiting the overall width, are important dimensions and are therefore specified in this International Standard.

Three series of overall widths are given, designated wide, intermediate and narrow. Each of Figures 1 to 4 shows one example only of locking device design.

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5.5 Width of outer ring

For bearings with a spherical outside surface the width of the outer ring is not important, provided the range of width is known so that assembly slots in the housing can be properly dimensioned. This International Standard therefore gives outer ring widths which range from a minimum that conforms to dimension series 02 in ISO 15:1998, to a maximum that provides sufficient space for various seals and relubrication holes.

5.6 Relubrication

Depending on the application, these bearings are supplied with or without means for relubrication, for example, one or more small radial holes drilled through the outer ring. The exact design and location of such means are not specified in this International Standard. However, the width and location of a zone in which any relubrication means, provided on one or both sides of the outer ring, should intersect such that lubricant will satisfactorily feed into the bearing from the housing bore groove covering the zone.

6 Boundary dimensions

Boundary dimensions for insert bearings and eccentric locking collars are given in Tables 1 to 5.

Table 1 — Insert bearings — Wide overall width — Axially extending eccentric locking collar
(see Figure 1)

| d | | D | B_1 | (S) | S_1 | C^a | | C_1^b | C_2^b |
|----------|-----------|-----|------------|-------|------------|-------|------|---------|---------|
| mm | in | | max. mm | | max. mm | min. | max. | | |
| 12 | — | 40 | 37,3 | 13,9 | 23,4 | 12 | 15 | 3,4 | 2 |
| 12,7 | 1/2 | | | | | | | | |
| (14,288) | (9/16) | | | | | | | | |
| 15 | — | | | | | | | | |
| 15,875 | 5/8 | | | | | | | | |
| 17 | — | 47 | 43,7 | 17,1 | 26,6 | 14 | 17 | 3,7 | 2 |
| (17,462) | (11/16) | | | | | | | | |
| 19,05 | 3/4 | | | | | | | | |
| 20 | — | | | | | | | | |
| (20,638) | (13/16) | 52 | 44,4 | 17,5 | 26,9 | 15 | 17 | 3,9 | 2,5 |
| 22,225 | 7/8 | | | | | | | | |
| (23,812) | (15/16) | | | | | | | | |
| 25 | — | | | | | | | | |
| 25,4 | 1 | | | | | | | | |
| (26,988) | (1-1/16) | 62 | 48,4 | 18,3 | 30,1 | 16 | 19 | 5 | 2,5 |
| 28,575 | 1-1/8 | | | | | | | | |
| 30 | — | | | | | | | | |
| 30,162 | 1-3/16 | | | | | | | | |
| (31,75) | (1-1/4) | | | | | | | | |
| 31,75 | 1-1/4 | 72 | 51,1 | 18,8 | 32,3 | 17 | 20 | 5,7 | 3 |
| (33,338) | (1-5/16) | | | | | | | | |
| 34,925 | 1-3/8 | | | | | | | | |
| 35 | — | | | | | | | | |
| 36,512 | 1-7/16 | | | | | | | | |
| 38,1 | 1-1/2 | 80 | 56,3 | 21,4 | 34,9 | 18 | 21 | 6,2 | 3 |
| (39,688) | (1-9/16) | | | | | | | | |
| 40 | — | | | | | | | | |
| (41,275) | (1-5/8) | | | | | | | | |
| 42,862 | 1-11/16 | | | | | | | | |
| 44,45 | 1-3/4 | 85 | 56,3 | 21,4 | 34,9 | 19 | 22 | 6,4 | 3 |
| 45 | — | | | | | | | | |
| (46,038) | (1-13/16) | | | | | | | | |
| (47,625) | (1-7/8) | | | | | | | | |
| 49,212 | 1-15/16 | | | | | | | | |
| 50 | — | 90 | 62,7 | 24,6 | 38,1 | 20 | 24 | 6,5 | 3,5 |
| (50,8) | (2) | | | | | | | | |