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ISO/DIS 3548-2

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Plain bearings — Thin-walled half bearings with or without flange —

Part 2:
Measurement of wall thickness and flange thickness

Paliers lisses — Demi-coussinets minces à collerette ou sans collerette —

Partie 2: Mesurage de l'épaisseur de paroi et de l'épaisseur de collerette

ICS: 21.100.10

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO 3548-2 was prepared by Technical Committee ISO/TC 123, *Plain Bearings*, Subcommittee SC 5, *Quality analysis and assurance*.

This second edition cancels and replaces the first edition (ISO 3548-2:2009), which has been technically revised.

The main changes compared to the previous edition are as follows:

xxx xxxxxxx xxx xxxx

A list of all parts in the ISO 3547- series can be found on the ISO website.

Plain bearings — Thin-walled half bearings with or without flange —

Part 2: Measurement of wall thickness and flange thickness

1 Scope

This part of ISO 3548 specifies in accordance with ISO 12301 the checking of the wall-thickness of thin-walled half bearings with or without flange and describes the necessary checking methods and measuring equipment. This standard applies to a maximum bearing diameter of 150 mm. If this standard should be applied to bigger diameter, an agreement between supplier and user is necessary.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3548-1, *Plain bearings — Thin-walled half bearings with or without flange — Part 1: Tolerances, design features and methods of test*

ISO 12301, *Plain bearings — Quality control techniques and inspection of geometrical and material quality characteristics*

3 Terms and definition

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

For the purposes of thisdocument, the following definitions apply:

3.1
wall thickness, s_3
radial distance between the opposing measuring points at the inner and outer cylindrical surfaces (see Figure 1)

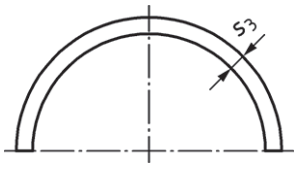


Figure 1 — Wall thickness, s_3

3.2
measuring points [lines]
agreed points [lines] established to facilitate agreement on checking

Note 1 to entry: The establishment of measuring points [lines] does not preclude the need to comply with dimensional specifications in other areas.

3.3
tolerance
range between the upper specified limit and the lower specified limit

3.4
uncertainty of measurement
deviation of the measured value from the real value caused by statistical or systemic reasons

4 Symbols and units

For the purposes of this International Standard, the symbols and units are as given in Table 1.

Table 1 — Symbols and units

Symbol	Parameter	Unit
a_{ch}	Distance to measuring position	mm
α	Angle to measuring position	°
α_2	Angle to measuring position from parting line	°
B	Width	mm
C_i	Inner chamfer width	mm
D_0	Nominal outside diameter	mm
e_B	Eccentricity of bore centre to outside diameter centre	mm
F_{pin}	Measuring Pin load	N
H	Distance to measuring position from bearing parting line	mm
s_a	wall thickness at angle α	mm
s_3	Wall thickness at crown	mm
u	wall thickness reduction at angle α_2	mm
x_1	Center point of nominal outside diameter	mm
x_2	Center point of eccentric bore	mm

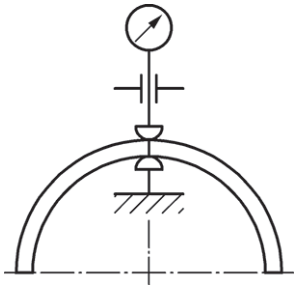
5 Purpose of checking

In order to ensure the required bearing clearance and consequently the operational efficiency of the plain bearing unit, it is necessary to keep to the wall thickness tolerances as specified in ISO 3548-1.

6 Checking methods

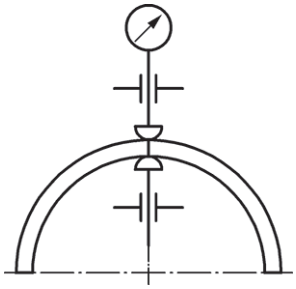
6.1 Measuring principle of wall thickness

The gauging axis of the measuring device shall be in the radial direction and perpendicular to the outside surface of the test piece in order to find the minimum value of the wall thickness. The measured values may be recorded by a single measurement or by sum measurement, which are symbolically represented in Figure 2.



single measurement by contact
(mechanical/electronic gauge)

a) Single wall thickness measurement



sum measurement by contact/non-contact
(electronic/pneumatic gauge)

b) Sum wall thickness measurement

Figure 2

The presence of lubricating holes, oil pockets, oil grooves, markings or special chamfers may require deviation from the measuring lines and measuring points specified in the following and shall be agreed between customer and supplier.

Any wall thickness not conforming to the specified values due to the manufacturing process, because of deformation of the bearing backing in the area of marking or at non-load bearing places, shall be agreed between customer and supplier.

6.2 Line measurement around the circumference

Measurement of the wall thickness around the circumference shall be carried out at the measuring lines specified in Figure 3 and Table 2.

Key

C_i inner chamfer width

a Measuring lines M.

Figure 3 — Position of measuring lines

Table 2 — Distance to measuring position a_{ch}

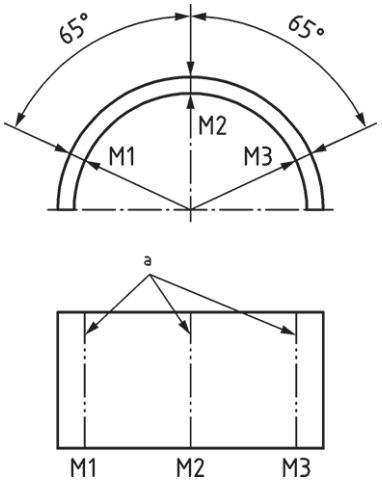
Width B	Distance to measuring position a_{ch}	Number of measuring lines M
$B \leq 15$	$B/2 - C_i$	1
$15 < B \leq 50$	4	2
$B > 50$	6	2

6.3 Line measurement in axial direction

Measurement of the wall thickness in axial direction shall be carried out by using the definition of measuring lines specified in Figure 4 a) (Method A) or by using the definition of measuring lines specified in Figure 4 b) and Table 3 (Method B).

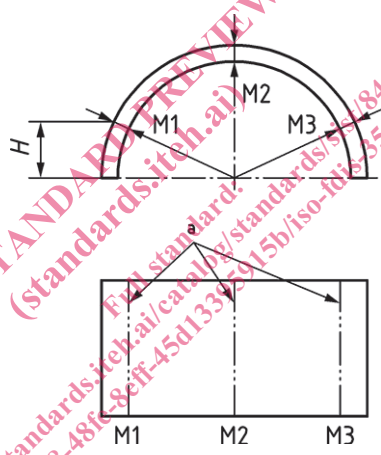
For Method B it has to be ensured, that the distance to the measuring position H does not result into measurement within the crush relief area.

The position of the measuring lines for bearings >150 mm nominal outside diameter is subject to agreement between manufacturer and customer.



a) Position of measuring lines – Method A

a Measuring lines M.



b) Position of measuring lines – Method B

a Measuring lines M.

Figure 4

Table 3 — Distance to measuring position

Nominal outside diameter D_0 [mm]	Distance to measuring position H [mm]
$25 < D_0 \leq 40$	$6 < H \leq 8$
$40 < D_0 \leq 90$	$9 < H \leq 13$
$90 < D_0 \leq 120$	$H = 13$
$120 < D_0 \leq 150$	$H = 20$

6.4 Point measurement

Point-by-point measurement of wall thickness shall be carried out by using the definition of measuring points specified in Figure 5 or Figure 6 a) (Method A) or Figure 6 b) and Table 3 (Method B) for widths of $B \leq 90$ mm. In the case where $B > 90$ mm, the selection of the measurement method (Method A