INTERNATIONAL STANDARD

ISO 12307-2

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Plain bearings — Checking of wrapped bushes —

Part 2: Checking the inside diameter

Paliers lisses — Contrôle des bagues roulées —

Partie 2: Contrôle du diamètre intérieur

Reference number
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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 3.

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 part of ISO 12307 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12307-2 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 5, *Quality analysis and assurance*.

ISO 12307 consists of the following parts, under the general title *Plain bearings — Checking of wrapped bushes*:

— *Part 1: Checking the outside diameter*

— *Part 2: Checking the inside diameter*

Plain bearings — Checking of wrapped bushes —

Part 2: Checking the inside diameter

1 Scope

This part of ISO 12307 specifies in accordance with ISO 12301 the checking of the inside diameter of wrapped bushes (method C according to ISO 3547-2:1999) and describes the necessary checking methods and measuring equipment.

Wrapped bushes in the free condition are flexible, but after insertion, they adapt largely to the shape of the housing bore due to the interference between the outside diameter of the bush and the housing bore.

NOTE 1 All dimensions in this part of ISO 12307 are given in millimetres.

NOTE 2 The dimensions and tolerances of wrapped bushes are given in ISO 3547-1.

NOTE 3 Checking of the wall thickness is the subject of ISO 12306.

NOTE 4 Checking of the outside diameter of wrapped bushes is the subject of ISO 12307-1.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 12307. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 12307 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3547-1:1999, *Plain bearings — Wrapped bushes — Part 1: Dimensions*.

ISO 3547-2:1999, *Plain bearings — Wrapped bushes — Part 2: Test data for outside and inside diameter*.

3 Symbols and units

See Table 1.

Table 1 — Symbols and units

Symbol	Parameter	Unit
B	Nominal width of the bush	mm
$b_{ch,1}$	Width of the ring gauge ($b_{ch,1} = B + 9$ mm)	mm
$b_{ch,2}$	Width of the plug gauge ($b_{ch,2} = B + 5$ mm)	mm
D_i	Nominal inside diameter of the bush	mm
$D_{i,ch}$	Inside diameter of the bush in the ring gauge	mm
D_o	Nominal outside diameter of the bush	mm
$d_{ch,1}$	Inside diameter of the ring gauge	mm
$d_{ch,2}$	Outside diameter of the plug gauge	mm

4 Method of checking

The free diameter of a wrapped bush is not measured directly because of the flexible nature of the component.

To check the inside diameter $D_{i,ch}$ the bush is to be pressed into a ring gauge, whose nominal diameter corresponds to the dimension of the housing. For bushes specified in ISO 3547-1, the tolerance class of housing bore is normally H7.

When the bush is pressed into the ring gauge it is possible that there will be a permanent reduction in the outside diameter.

The inside diameter $D_{i,ch}$ is to be measured with a three-point measuring instrument or with a “GO” and “NO GO” gauge.

NOTE In order to enable the manufacturer and the customer to compare results of this test it should be agreed whether results should be obtained by measuring or by gauging.

5 Test equipment

5.1 Ring gauge

Unless otherwise agreed between manufacturer and customer the dimensions shown in Figure 1 and given in Table 2 are valid for the ring gauge.

Surface roughness values in micrometres

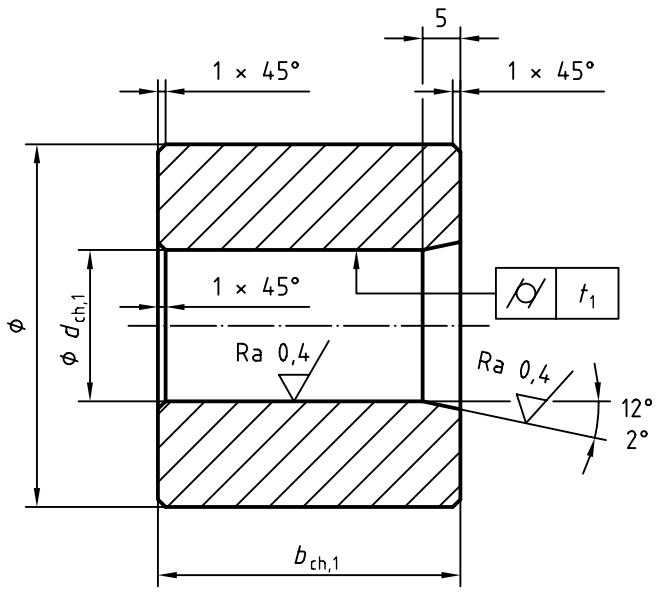


Figure 1 — Ring gauge

Table 2 — Dimensions, manufacturing tolerances and wear limits for ring gauges and plug gauges

D_o nom.		>	—	10	18	30	50	80	120
		⩽	10	18	30	50	80	120	180
$d_{ch,1}$	Target size[a]		$D_o + 0{,}008$	$D_o + 0{,}009$	$D_o + 0{,}011$	$D_o + 0{,}013$	$D_o + 0{,}015$	$D_o + 0{,}018$	$D_o + 0{,}020$
	Manufacturing tolerance		$^{+0{,}003}_{0}$						$^{+0{,}005}_{0}$
	Wear limit		$+ 0{,}005$						$+ 0{,}007$
$d_{ch,2}$	Manufacturing tolerance		$^{0}_{-0{,}003}$						$^{0}_{-0{,}005}$
	Wear limit		$- 0{,}005$						$- 0{,}007$
t_1	Manufacturing tolerance		0,002						0,003
	Wear limit		0,004						0,005

For bushes with $D_o > 180$ mm, agreement shall be reached between the manufacturer and customer.

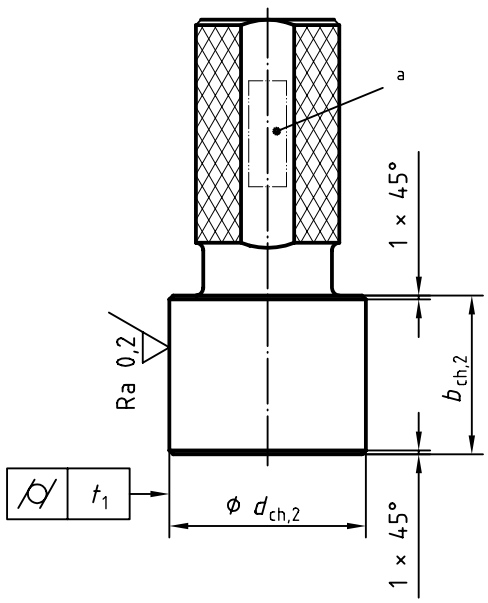
[a] The target size of the ring gauge inside diameter is made up of D_o and the rounded average value of the tolerance class H7. In ISO 3547-1, H7 is recommended as the tolerance class for the housing bore.

5.2 Plug gauge

Unless otherwise agreed between manufacturer and customer the following dimensions are valid for the plug gauge (see Figures 2 and 3 and Table 2):

The nominal plug gauge diameter can be obtained from Table 4 in ISO 3547-1:1999.

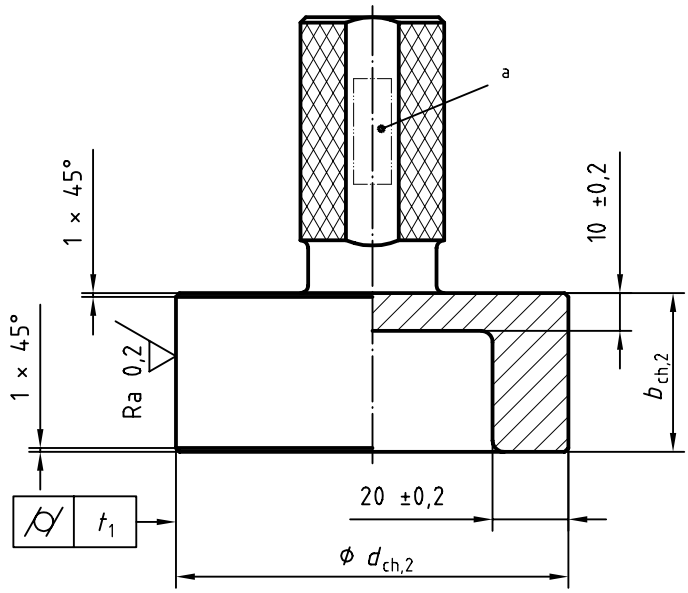
Surface roughness values in micrometres



[a] Field for marking

Figure 2 — Plug gauge, solid, for $d_{ch,2} \leqslant 80$ mm

Surface roughness values in micrometres



[a] Field for marking

Figure 3 — Plug gauge, example with blind hole, for $d_{ch,2} > 80$ mm

5.3 Measuring equipment requirements

The ring gauge and plug gauge must be from hardened (60 HRC to 64 HRC) and non-ageing steel.

5.4 Measuring errors

Frequent measuring errors are:

a) ring gauge and plug gauge damaged or worn;

b) ring gauge and plug gauge have no lead-in chamfer;

c) the bush is misaligned when introduced into the ring gauge;

d) the plug gauge is misaligned when introduced into the bush;

e) the width of the ring gauge is less than the width of the bush;

f) grease, dirt, damages, burrs and swelling around features on the bush and test equipment.

6 Procedure

The bush shall be introduced into the ring gauge from that side having the lead-in chamfer.

Subsequently the inside diameter has to be determined by means of

a) three-point measuring instrument;

b) the “GO” plug gauge (see Figures 2 and 3) shall be inserted by a minimum effort; the “NO GO” plug gauge shall not be inserted by manual pressure (maximum force 250 N). Where the maximum force requires to be limited, it should be agreed between customer and manufacturer.

Bibliography

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

[2] ISO 12306, *Plain bearings — Measurement of wall thickness of thin-walled half-bearings and thin-walled bushes*.

[3] ISO 12307-1, *Plain bearings — Wrapped bushes — Part 1: Checking the outside diameter*.

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