

Specification for

Plain bearings: metric series —

Part 4: Dimensions, tolerances and methods of checking wrapped bushes

[ISO title: Plain bearings — Wrapped bushes — Dimensions, tolerances and methods of checking]

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The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Association of Bronze and Brass Founders	Motor Cycle Association of Great Britain
British Plastics Federation	Plastics and Rubber Institute
Copper Development Association	Individual experts
International Tin Research Institute	

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on 31 October 1979

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National foreword

This Part of this British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee and is identical with ISO 3547 “Plain bearings — Wrapped bushes — Dimensions, tolerances and methods of checking” published by the International Organization for Standardization (ISO).

The list of standards in this metric series is as follows:

BS 4480 Plain bearings: metric series

- Part 1: Sintered bronze bushes;
- Part 2: Solid plastic bushes;
- Part 3: Dimensions and tolerances of solid copper alloy bushes;
- Part 4: Dimensions, tolerances and methods of checking wrapped bushes;
- Part 5: Dimensions, tolerances and methods of checking thin-walled half bearings.

Further Parts will be issued when they become available, subject to approval by the United Kingdom of the corresponding International Standards.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “International Standard” appear, referring to this standard, they should be read as “British Standard”.

Cross-references

International Standard	Corresponding British Standard
ISO 497:1973	BS 2045:1965 <i>Preferred numbers</i> (Technically equivalent)
ISO/R 1101:1969	BS 308 <i>Engineering drawing practice</i> Part 3:1972 <i>Geometrical tolerancing</i> (Technically equivalent)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope and field of application

This International Standard lays down the main dimensions and tolerances of a range of wrapped bushes, with external diameters of between 6 and 150 mm, for plain bearings.

These limits are not the result of present manufacturing techniques but are intended to cover the most widely used sizes. Below 6 mm and above 150 mm, manufacture is generally still possible.

NOTE All the dimensions and tolerances are expressed in millimetres, unless otherwise indicated.

Clause 2 defines and describes a wrapped bush, in order to avoid confusion with other parts of similar shape but for different use, such as, for example, split dowel pins, and to draw attention to certain peculiarities in the construction of wrapped bushes. However, work has not yet been completed on vocabulary and all terms in this International Standard must be considered as temporary only.

As certain dimensions and tolerances of wrapped bushes cannot, because of the very nature of these parts, be directly measured, it was considered necessary to specify the methods for checking these dimensions and tolerances in clause 4.

2 Definition and description

A wrapped bush is a cylindrical bearing, having a continuous split from one end to the other, manufactured from rolled material. This split may or may not be parallel to the axis of the cylinder. In its free state, the wrapped bush may not be perfectly cylindrical, and its split may be open. The split is closed when the wrapped bush is fitted in its housing.

In certain cases, wrapped bushes with the split closed by a suitable interlocking (clinched) joint may be produced.

Defects on the backs of bushes that have been caused by details made on the strip material before forming, such as holes, grooves or indentations, are permitted.

Wrapped bushes may, in general, be supplied with or without an allowance for machining in the bore. In the first case, they will be finished in a suitable way after they have been fitted in their housings.

3 Dimensions and tolerances

3.1 Dimensions

The basic nominal dimensions — housing (internal) diameter and bush wall thickness — are given in Table 1.

3.2 Housing diameter tolerances

The ISO tolerances H8, H7 or H6 shall be chosen according to the available machining facilities and the final precision required.

In the case of non-rigid housings or housings made of material with a high thermal expansion coefficient, grades 8, 7 or 6 shall be maintained but the deviation may be different from H.

3.3 Shaft diameter tolerances

These shall be chosen according to the application and in particular according to the operational clearances permitted by the user.

3.4 Wall thickness tolerances

These depend on the materials used and the manufacturing techniques. Slight surface depressions are acceptable on the outside surface of the bushes provided that they are randomly distributed; however, thickness measurement shall not be carried out in these areas.

3.4.1 Bushes to be finished by the user

The manufacturing tolerances shall be:

- $\pm 0,035$ on 0,75 thickness
- $\pm 0,05$ on 1 – 1,5 – 2 and 2,5 thicknesses
- $\pm 0,065$ on 3 – 3,5 and 4 thicknesses

Finer tolerances may be agreed between user and manufacturer, especially when the wrapped bushes are finished by methods other than machining.

3.4.2 Bushes finished by the manufacturer, known as “precision bushes”

Although only the thickness of a wrapped bush is directly measurable, one may, by applying the method of checking given in 4.3.4, check the internal diameter obtained when the bush is fitted in a rigid housing of known diameter and calculate the coaxiality of the bore by measuring the thickness at diametrically opposed points of minimum and maximum wall thickness.

The method of indication of coaxiality (see Table 2) is shown in Figure 1. The method and its interpretation are in accordance with ISO/R 1101.

The axis to the dimension of which the tolerance frame is connected shall be contained in a cylinder of diameter “e” coaxial with the axis of the datum A.