



BS 4480 : Part 1 : 1974

UDC 621.022.5 : 669.35'67 - 462.3

**Specification for
Plain bearings : metric series**

Part 1. Sintered bronze bushes

**Gr 6
British Standards Institution**



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Committee reference MEE/119 Draft for comment 72/36714

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Association of Bronze and Brass Founders	Motor Cycle Association of Great Britain
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British Plastics Federation	Society of Motor Manufacturers and Traders Ltd
Copper Development Association	Individual companies

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Foreword

This part of this British Standard has been prepared under the authority of the Mechanical Engineering Industry Standards Committee. It is based on ISO/DIS 2795 'Plain bearings made from sintered materials — dimensions and tolerances'.

This standard supersedes the former BS 4480 : Part 1 published in 1969, which was issued in order to satisfy the need within the United Kingdom for an agreed range of stock metric bearing sizes until such time as an acceptable international series could be published. 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 plastics bushes

Part 3 Solid copper alloy bushes (in course of preparation)

The former BS 4480 : Part 1 : 1969 was the metric standard parallel to BS 1131 'Plain bearings (metal)', Part 5 'Bronze oil-retaining bushes and thrust washers'. Experience in the use of BS 1131 : Part 5 revealed that the demand for standard thrust washers was very small, consequently these were omitted from BS 4480 : Part 1 : 1969 and also from this revision. Details of spherical bushes have been included in this revision because they are specified in the related ISO standard. A statement of the chemical composition has been retained because the exact composition affects the dimensions and tolerances of the bushes in the 'as manufactured' condition before they are fitted into a housing.

A brief guide to the use of oil-retaining bushes is included in appendix A.

British Standard Specification for Plain bearings : metric series

Part 1. Sintered bronze bushes

0. Introduction

NOTE. The terms used in this introduction are defined in clause 3.

Bronze oil-retaining bushes are made by compressing powders in suitable dies and then sintering. They remain porous and can absorb 25 % to 30 % by volume of lubricating oil. In use this oil lubricates the journal running in the bush, and the amount contained in the body of the bush serves as a reservoir, thus enabling the bearings to run for long periods without attention. The normal oil content will generally provide sufficient lubrication under the recommended conditions of load, speed and temperature for long periods. If, however, operating conditions make it necessary, provision can be made for extra oil to be added from time to time in order to fill up the reservoir, without dismantling the bushes by such means as oil-soaked felt or wick feed lubricators.

The greatest use of these bushes is for light load conditions, but the load can be increased to substantial values if the speed of running is decreased, and particularly if the loading is intermittent. Appendix A gives guidance on loading in relationship to speed. If in doubt, the manufacturer should be consulted.

Due to its porous structure sintered bronze possesses a lower compressive strength than solid bronze. The method of fitting consequently differs from that employed in ordinary bearing practice.

It is assumed, for the purposes of this standard, that the bearing housing is of adequate mechanical strength and is rigid. It should be noted that there is a limit to the working temperature at which oil-retaining bushes should be used; normally they may be used up to an ambient temperature of the immediate surroundings of the bearing of 60 °C; beyond this point the manufacturer should be consulted.

Assembly. A bush is pressed into its housing by means of a hardened shouldered fitting pin and an arbor press or similar tool. Owing to the ductility of the material, the required interference fit is higher than would be used with ordinary solid metal bushes. The contraction of the bearing bore, which occurs during assembly, is controlled within fine limits by the use of a hardened fitting pin of the correct diameter (insertion pin tolerance is given at the foot of tables 1 and 2). A lead-in is provided at the entry of the housing to prevent damage to the bush.

Storage. The bushes should be stored in a closed non-absorbent container and kept at normal room temperature to avoid contamination and loss of oil. It is advantageous to dip the bushes in the grade of lubricating oil specified by the manufacturer before they are fitted into the housing. This oil will normally be plain mineral oil of viscosity range $(45-60) \times 10^{-6} \text{ m}^2/\text{s}$ (45-60 centistokes or about 180-240 Redwood No. 1 seconds) at 60 °C.

1. Scope

This part of BS 4480 specifies the fitted* dimensions and tolerances, the material, the strength and the oil content of plain and flanged oil-retaining (sintered bronze) bushes and spherical bushes. The range of sizes specified is from 1 mm to 60 mm inside diameter for plain and flanged bushes and from 1 mm to 20 mm inside diameter for spherical bushes.

2. References

The titles of the British Standards referred to in this standard are listed on the inside back cover.

3. Definitions

For the purposes of this British Standard the following definitions apply.

3.1 bearing. An element of a mechanism which provides support and location for a moving part with respect to other parts of the mechanism, and allows force to be transmitted between them.

3.2 plain bearing. A bearing with wholly sliding surfaces (i.e. with no balls or rollers).

3.3 bush. A bearing in the form of a complete (360°) tube (see figure 1).

3.4 plain bush. A bush without a flange (see figure 1).

* The sizes of bearings before fitting cannot be specified, as the sizes can vary according to different production techniques.