

Specification for

Jig bushes —

Part 2: Metric units

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This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Executive Board on 31 December 1976

Gauge and Tool Makers’ Association	Society of British Aerospace Companies Limited
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Foreword

This Part of this British Standard has been prepared under the authority of the Mechanical Engineering Standards Committee in order to meet the growing demand for jig bushes manufactured to metric dimensions. Part 1 of this standard specifies requirements for jig bushes dimensioned in imperial units.

In formulating this Part of this standard, account has been taken of the practices of continental manufacturers and users; the dimensions and tolerances shown have been selected after discussions within the International Organization for Standardization (ISO) and are those shown in ISO 4247, except that for bore sizes of renewable bushes an overlap between ranges has been adopted in accordance with accepted UK practice.

The tolerances on the outside diameters of press fit bushes and liners vary slightly from those shown in Part 1 of this standard, but a tolerance of H6 (see BS 4500-1) in jig plate holes will ensure that the bushes are a good fit.

A detailed study of the phenomenon of “closing-in” disclosed that whatever control is exercised the actual amount of closing-in is unpredictable. In those instances therefore where results of maximum precision are required, or where appreciable closing-in would prevent acceptance of a standard reamer, the user is recommended to make measurements of the outside diameters of the bushes before boring holes in jig plates or, alternatively, to lap the bore of the bushes, after assembly, to the required size.

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

This British Standard relates to bushes to be fitted to jigs for the purpose of guiding metric twist drills and reamers as specified in BS 328-1 and BS 122-2 respectively.

Provision is made for the following types of bush:

- a) press fit bushes, which may be either headed or headless (plain);
- b) renewable bushes, fixed type;
- c) renewable bushes, slip type;
- d) liners, which may be either headed or headless (plain);
- e) renewable bushes in which the head details of the fixed type and of the slip type may be incorporated into one bush at the manufacturer's discretion.

Jig bushes dimensioned in imperial units are dealt with in Part 1 of this standard.

2 References

The titles of the publications 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

press fit bush

a bush pressed directly into the appropriate hole in the jig and used for guiding a drill or reamer in cases where it is not anticipated that replacement of the bush will be necessary, or where the dimensions between the centres of adjacent holes are such as to preclude the use of renewable bushes and liners. A press fit bush may be with or without a head (See Figure 1.)

3.2

renewable bush

a bush intended for insertion in a liner that has been fitted directly into the jig. There are two types of renewable bushes: the "slip" bush designed to facilitate rapid changing in cases where, for instance, several differing operations and tools are required to follow the same general guide, and the "fixed" type intended to remain in the jig until too worn for further use (See Figure 2 and Figure 3.)

3.3

liner

a bush, with or without a head, fitted permanently in a jig plate for the purpose of accommodating renewable bushes (See Figure 4.)

3.4

locking device

a means for ensuring that renewable bushes do not turn or otherwise move during operation (See Appendix A and Figure 5 and Figure 6.)

4 General features of design

4.1 General. All bores shall be provided with a chamfer or radius at the upper edge. (See Figure 1 to Figure 4.)

4.2 Headed bushes and headed liners. These shall be provided with an undercut, the form of which is left to the manufacturer. (See Figure 1 to Figure 4.)

4.3 Renewable bushes. Both fixed and slip types of renewable bush shall have a washer face on the underside of the head to facilitate removal; they may also be knurled on the periphery of the head.

The dimensions of the washer face shall be in accordance with columns 12 and 13 of Table 2.

4.4 Press fit bushes and renewable bushes.

Bore sizes up to 8 mm diameter may be counterbored.

5 Finish

5.1 All sharp edges shall be removed.

5.2 All surfaces of bushes and liners shall be free from cracks and other surface defects.

5.3 When assessed in accordance with BS 1134-1, the surface texture of the ground bore and outside diameters shall have a roughness value not exceeding $0.4 \mu\text{m } R_a$.

6 Hardness

The bushes shall be hardened to a minimum hardness value of 746 HV. (See BS 427-1.)

7 Dimensions and tolerances

7.1 General. The dimensions and tolerances of jig bushes shall be in accordance with Table 1 to Table 5 inclusive and with the provisions of clause 7.

7.2 Bore tolerances

7.2.1 Drill bushes. The tolerances on the bores of bushes for use with twist drills, Table 4, are related to the tolerances on the cutting diameters of drills as specified in BS 328-1.

7.2.2 Reamer bushes. The tolerances on the bores of bushes for use with reamers, Table 5, are related to the tolerances on the cutting diameters of reamers as specified in BS 122-2, up to 50 mm bore. Tolerances on bores above 50 mm shall be as agreed between customer and manufacturer.