

Specification for

Dimensions of housings for hydraulic seals for reciprocating applications

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Committees responsible for this British Standard

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- British Compressed Air Society
- British Fluid Power Association
- British Hydromechanics Research Association
- British Industrial Truck Association
- British Rubber Manufacturers' Association
- Engineering Equipment and Materials Users' Association
- Ministry of Defence
- Society of British Aerospace Companies Limited
- Society of Motor Manufacturers and Traders Limited

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Foreword

This British Standard has been prepared under the direction of the Machinery and Components Standards Committee and is a revision of BS 5751:1979, which is withdrawn. It implements a draft revision of International Standard ISO 5597 being prepared by the International Organization for Standardization (ISO).

It is intended that this British Standard should be adopted in the design of new hydraulic equipment; BS 1658 has been retained as an obsolescent standard for replacement purposes. The dimensions given in this British Standard, although providing the necessary basis for standardization in the manufacture and application of hydraulic seals, should not be regarded as providing all the information required for design purposes. For example, it is desirable to consult the seal manufacturer on the disposition of the tolerances on the inner and outer diameters to ensure that proper interference is provided between the seal and its mating surface.

Housings for two series of seal are covered by this British Standard. The regular series, which was included in the 1979 edition, is intended for use in applications where there are no significant space limitations. The special series, which is introduced in this edition of the standard, has reduced cross-sectional dimensions and should be used after careful consideration has been given to the design of the proposed installation.

The regular series of seals is normally used in hydraulic cylinders manufactured in accordance with BS 6331-1, BS 6331-3 and BS 6331-4, while the special series was specifically introduced for use in the compact series of hydraulic cylinders specified in BS 6331-2, although its use in other applications is not excluded.

The ranges of cylinder bore and piston rod diameters specified in this British Standard have been selected from BS 5755.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, 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 specifies the dimensions and associated tolerances for two series of hydraulic cylinder rod and piston seal housings for reciprocating applications in the following range of dimensions:

- a) for cylinders of diameter 16 mm to 500 mm;
- b) for rods of diameter 6 mm to 360 mm.

It does not give details of seal design, since the manner of construction of seals varies with each manufacturer. The design and material of the seal and any incorporated anti-extrusion feature will be determined by conditions such as temperature and pressure.

Guidance on the application of this standard is given in Appendix A.

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

2 Letter symbols

Letter symbols used in this British Standard are as follows:

- C* lead-in chamfer
- L* seal housing, axial length
- d* seal housing, inside diameter (rod diameter or piston seal groove diameter)
- D* seal housing, outside diameter (bore diameter or rod seal groove diameter)
- G* rod clearance diameter
- J* rod seal housing, clearance diameter
- P* piston seal housing, clearance diameter
- S* seal housing, radial width, $(D - d)/2$.

3 Dimensions

3.1 General

The dimensions for piston seal housings shall be as shown in Figure 1 and as given in Table 1, Table 2 and Table 3. The dimensions for rod seal housings shall be as shown in Figure 2 and as given in Table 3, Table 4 and Table 5.

NOTE Guidance on the determination of the extrusion gaps, dimension *P* or *J*, is given in Appendix A.

3.2 Lead-in chamfer

3.2.1 The lead-in chamfer length, dimension *C*, shall be not less than that given in Table 3. The lead-in chamfer angle shall be not less than 20° or greater than 30° to the axis of the cylinder or rod.

3.2.2 In the case of special series seals, the end of the cylinder bore shall have a lead-in chamfer in accordance with **3.2.1** or a 0.4 mm minimum radius.

4 Tolerances

The component diametral tolerances shall be selected in such a manner that the seal housing radial space is within the limits given in Table 6. The tolerances of the housing axial length, *L*, shall be in accordance with Table 6.

NOTE Formulae for calculating the diametral tolerances to be applied to ϕd (see Figure 1) or ϕD (see Figure 2) are given in Table 6.

5 Surface texture

5.1 Sliding surfaces

The surface texture of components that are in sliding contact with the seal shall not exceed 0.4 μm R_a and 1.6 μm R_z , when measured in accordance with BS 1134-1.

5.2 Static surfaces

The surface texture of components that are in relatively static contact with the seal shall not exceed 1.6 μm R_a and 6.3 μm R_z , when measured in accordance with BS 1134-1.

5.3 Exceptional conditions

Exceptional service conditions may necessitate the selection of other grades of surface texture; reference should be made to BS 5242-1 for steel tubes and BS 5242-2 for non-ferrous tubes.