

Specification for

**Galvanized mild steel
indirect cylinders
annular or saddle-back
type —**

Part 1: Imperial units

Co-operating organizations

The Hardware and Ironmongery Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives of the following Government departments and scientific and industrial organizations:—

- British Ironfounders Association
- British Lock and Latch Manufacturers Association
- British Metal Window Manufacturers Association
- British Plastic Hardware Association
- British Plastics Federation
- Cast Butt Hinge Manufacturers Association
- Department of Scientific and Industrial Research*
- Distributors of Builders Supplies Joint Council*
- Institution of Municipal Engineers*
- London County Council
- Ministry of Health*
- Ministry of Works*
- National Brassfoundry Association
- National Federation of Building Trades Employers
- National Federation of Ironmongers
- Royal Institute of British Architects*

The Government department and scientific and industrial 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 standard:—

- Air Ministry
- Associated Master Plumbers and Domestic Engineers
- Association of Heating, Ventilating and Domestic Engineering Employers
- British Electrical Development Association
- British Iron and Steel Federation
- British Non-ferrous Metals Research Association
- British Waterworks Association
- Copper Cylinder and Boiler Manufacturers Association
- Copper Development Association
- Electric Water Heater Manufacturers Association
- Galvanized Tank Manufacturers Association
- Institute of Builders
- Institute of Plumbers
- Institution of Electrical Engineers
- Institution of Gas Engineers
- Institution of Heating and Ventilating Engineers
- Institution of Water Engineers
- Metropolitan Boroughs Standing Joint Committee
- Metropolitan Water Board
- Ministry of Fuel and Power
- Royal Sanitary Institute
- Society of British Gas Industries
- Urban District Councils Association

This British Standard, having been approved by the Hardware and Ironmongery Industry Standards Committee and endorsed by the Chairman of the Building Divisional Council, was published under the authority of the General Council on 19 July 1949

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Foreword

This British Standard requires reference to the following:—

BS 84, *Screw threads of Whitworth form.*

BS 729, *Methods of testing the zinc coating on galvanized articles.*

BS 1555, *Thermostats for electrically-heated domestic hot water supply.*

BS 1556, *Electric immersion heaters for domestic hot water supply.*

This standard forms one of a series of British Standards relating to domestic hot water storage vessels. The other standards in this series are:—

BS 417, *Galvanized mild steel cisterns, tanks and cylinders.*

BS 699, *Copper cylinders for domestic purposes.*

BS 1566, *Copper indirect cylinders, annular type (water-to-water).*

In deciding to produce standards for indirect cylinders it was arranged to deal first with the type which had been in greatest demand for domestic applications, i.e. vessels in which the primary heater is of annular or saddle-back form.

The range of sizes and classes has been selected in order to afford manufacturers an opportunity of concentrating their production while at the same time providing a sufficiently comprehensive choice for all practical purposes.

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 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.

NOTE When ordering cylinders to this British Standard the purchaser should provide the manufacturer with the following information:—

- a) Class of cylinder, i.e. Class B or Class C.
- b) B.S. size number, i.e. BSG 1, BSG 2, etc.
- c) Method of manufacture (see Clause 7).
- d) Type of top and whether a handhole is required (see Clause 9).
- e) Which form the accommodation for the immersion heater should take (see Clause 12).

The class of a cylinder depends upon the maximum permissible working head for which it has been manufactured (see Table 1). The class letters are the same as those for the equivalent grades of cylinders in BS 417; hence, Class A has been omitted as cylinders for a working head of 100 ft. are not included in this standard.

1 Scope

This British Standard applies to galvanized mild steel indirect cylinders in two classes and eight sizes. The approximate capacities are from 24 to 100 gallons. The cylinders are intended primarily for fixing in the vertical position and are shown in Figure 1, Figure 2 and Figure 3.

2 Definitions

For the purposes of this British Standard, the following definitions shall apply:—

cylinder

a closed cylindrical vessel with domed ends, for circulation or storage of hot water

primary heater

a heater of annular or saddle-back form mounted inside a cylinder and fed by means of a water-heating apparatus

screwed connection

any threaded connection to which pipes or other apparatus can be fitted

3 Sizes and classes

The sizes of cylinders, the number of classes and the thicknesses of material appropriate to each class shall conform to the details given in Table 1.

The diameter of a cylinder shall be measured internally, and the height externally from base to top of dome, excluding any screwed connection.

4 Primary heaters

The minimum heating surfaces and the thicknesses of material shall be as specified in Table 1.

Cylinders of sizes BSG 1, BSG 2 and BSG 3 may be fitted either with an annular or with a saddle-back type of primary heater. The remaining sizes shall be fitted with an annular heater.

5 Tolerances

The following shall be the permissible variations from the dimensions laid down in Table 1:—

- a) Position of screwed connections: $\frac{1}{8}$ in. in any direction.
- b) Diameter of cylinder: $\pm \frac{3}{16}$ in.
- c) Height of cylinder: $\pm \frac{1}{4}$ in.
- d) Thickness of mild steel sheet before galvanizing: minus 5 per cent.

6 Material

The cylinders shall be made from mild steel plate or sheet which shall be free from defects.

7 Manufacture

Cylinders shall be soundly constructed and may be welded, riveted, or partly welded and partly riveted. Should the purchaser specifically require one or other of these methods of manufacture, this shall be stated in the enquiry and order.

8 Radius of curvature

Both ends of cylinders shall have a radius of curvature of not less than one diameter nor more than $1\frac{1}{3}$ times the diameter of the cylinder.

9 Bolted ends and handholes

Cylinders of 50 gallons capacity and greater shall be fitted with a detachable top, and smaller cylinders shall be so fitted when specially required by the purchaser. The detachable top shall be fitted to an external mild steel angle ring of a minimum section of $1\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. $\times$ $\frac{3}{16}$ in., which shall be welded externally to the shell of the cylinder. The bolts shall be not less than $\frac{1}{2}$ in. dia. B.S.W. and the pitch between centres of bolts shall be not more than 3 in. If a handhole is required, other than for mounting an immersion heater, it shall be of such design and size, and shall be placed in such position, as shall be agreed between the purchaser and manufacturer.

10 Galvanizing

Cylinders shall be galvanized, after manufacture, by pickling in acid and subsequent dipping in a bath of molten virgin spelter (containing not more than $2\frac{1}{2}$ per cent impurities) at a temperature suitable to produce a complete and uniformly adhesive coating of zinc complying with the requirements of BS 729, "*Methods of testing the zinc coating on galvanized articles, etc.*" The weight of coating shall be not less than $1\frac{1}{8}$ ounces per superficial foot on each side, and shall be evenly applied on all surfaces of the cylinder and primary heater.