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Copper indirect cylinders for domestic purposes —

Part 1: Specification for double feed indirect cylinders

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- Association of Manufacturers of Domestic Electrical Appliances
- British Copper Cylinder Association
- British Gas Corporation
- British Non-ferrous Metals Federation
- Chartered Institute of Building
- Copper Cylinder and Boiler Manufacturers
- Copper Development Association
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property Services Agency)
- Electricity Supply Industry in England and Wales
- Galvanizers' Association
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- National Water Council
- Royal Institute of British Architects
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- Solid Fuel Advisory Service
- Thames Water Authority (Metropolitan Water Division)
- Water Companies Association
- Zinc Development Association
- Coopted member

This British Standard, having been prepared under the direction of the Building Services Standards Committee, was published under the authority of the Board of BSI. It comes into effect on 31 July 1984

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Foreword

This British Standard has been prepared under the direction of the Building Services Standards Committee. It is a revision of BS 1566-1:1972, but will not become effective until six months after the date of publication (see back cover), to allow time for manufacturers to comply with the new requirements. In the meantime, BS 1566-1:1972 remains as the current standard.

This revision has been prepared in conjunction with BS 699 "*Copper direct cylinders for domestic purposes*" and is complementary to BS 1566-2 "*Single feed indirect cylinders*".

A new size 9E has been added to provide an additional size of cylinder suitable for off-peak electric water heating systems. The dimensions and positioning of connections are unaltered. The original cylinder grades 2 and 3 are included. A new grade 4 covers cylinders specifically designed for installations which are subject to a lower maximum working head than the maximum permitted in the previous grade 3, thus enabling a reduction to be made in the thickness of copper sheet used.

Annular type primary heaters are no longer included as current demand indicates that these have been replaced almost entirely by coil type primary heaters which are preferred for virtually all applications. This omission has enabled the addition of a grade 1 cylinder with a 25 m working head, which brings this standard in line with BS 699.

Metal thicknesses are now specified both before and after forming.

Attention is drawn to the preferred sizes of cylinders in Table 1.

This standard now specifies material and heat loss performance requirements for thermal insulation where this is applied to cylinders by the manufacturer at the factory. In the interest of energy saving, it is recommended that all cylinders are either insulated at the factory or are provided with an insulating jacket complying with BS 5615.

A specification for aluminium protector rods is now included. It is recommended that these be fitted to copper cylinders during manufacture to help to ensure long service in those supply waters that have been known to cause or are expected to cause premature failure by pin hole corrosion. When required it is important that they be specified at the time of ordering. It is rarely possible and never satisfactory to install aluminium protector rods after the cylinder has been put into service. Leaflet MP. 538 published by BNF Metals Technology Centre, Grove Laboratories, Denchworth Road, Wantage, Oxon, OX12 9BJ gives further information.

Copper cylinders require careful handling during transit and installation to avoid damage. Factory insulation is recommended to help prevent such damage (see 11.6).

Parts 1 and 2 of this standard and BS 417, BS 699, BS 1565, BS 2777, BS 3198 and BS 4213 cover water storage vessels mainly for domestic use and now form a series to which others may be added when such a course is considered necessary.

NOTE BSI Sales Department will respond to purchase orders for BS 1566-1 by supplying copies of the 1984 edition. Copies of the 1972 edition may be obtained by quoting the number "BS 1566-1/72".

Certification. It is strongly recommended that in view of the nature of this specification, manufacturers and purchasers should make use of the certification facilities described on the inside back cover of this standard.

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 to iv, pages 1 to 14, 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 Part of this British Standard specifies requirements for copper cylinders, with or without the optional features listed in clause 11, for the storage of hot water where the water is heated indirectly by the water circulating in an integral primary heater. Four grades and 16 sizes are specified. The storage capacities are from 72 L to 440 L. The cylinders are intended for fixing in the vertical position and are all of the type in which the bottom is domed inwards.

The information to be supplied with an enquiry or order is set out in Appendix A.

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

2 Definitions

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

2.1 cylinder

a closed cylindrical vessel with domed ends

2.2 primary heater

a coil type heat exchanger constructed from tube and mounted inside a cylinder for the transfer of heat to the stored water from circulating hot water

2.3 screwed connections

any threaded connection to which pipes or apparatus can be fitted

2.4 length of threaded portion (of screwed connection)

the distance measured from the front face of the connection (including any chamfer or radius) to either the leading face of a plug or screw ring gauge which has been screwed as far as possible by hand into or onto the connection or in the case of a fully threaded female connection, to the back face

2.5 metal thickness before forming

the nominal thickness of copper sheet (which is subject to the tolerances specified in BS 2870) from which units are manufactured

2.6 storage capacity

the total volume of water that can be stored in the cylinder, excluding the water content of the primary heater

3 Sizes and grades

The size of cylinder, the grade and the thickness of material appropriate to each grade shall comply with Table 1.

NOTE For thicknesses of materials after forming see clause 8.

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

4 Primary heater

The minimum areas of heating surface and the tube diameter of the primary heater shall be as specified in Table 1.

5 Designation of double feed copper cylinders for ordering purposes

For ordering purposes, double feed copper indirect cylinders shall be designated "BS 1566: DF" followed by "C" to indicate coil type and the appropriate BS type reference and grade from Table 1, e.g. BS 1566: DF, C, Ref.3, Grade 2.

6 Tolerances

The maximum tolerances on the dimensions given in Table 1 shall be as follows:

- a) position of screwed connections: 6 mm in any direction;
- b) diameter and height of cylinder: ± 6 mm;
- c) thickness of material: the tolerances specified in BS 2870 apply.

7 Materials

The cylinders shall be made from copper sheet complying with section eight of BS 2870:1980.

NOTE Where joints are to be welded in copper thicker than 1.2 mm, material designated C106 is preferred.

Screwed connections shall be made of copper, gunmetal or alpha brass (inhibited against dezincification), and shall be attached to the cylinder by either brazing, welding or mechanical means. Filler alloys for brazing shall be types CP1 or CP2 of BS 1845, or other corrosion resistant alloy that does not undergo dezincification and does not produce brittle joints. Filler rods for welding shall be types C7, C8, C9 or C21 of BS 2901-3.

Aluminium protector rods shall be made from alloy 1050A complying with BS 1475.