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Specification for

Copper hot water storage combination units for domestic purposes

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The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Technical Committee entrusted with the preparation of this British Standard:

Association of Manufacturers of Domestic Electrical Appliances	Institute of Building
British Non-ferrous Metals Federation	London Boroughs Association
Copper Cylinder and Boiler Manufacturers	Manufacturers' Association of Radiators and Convectors Ltd.
Copper Development Association	Royal Institute of Public Health and Hygiene
Copper Tube Fitting Manufacturers' Association	Solid Fuel Advisory Service
Electricity, Supply Industry in England and Wales	Thames Water Authority Metropolitan Water Division
Galvanizers' Association	Zinc Development Association
	Individual expert

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Foreword

This British Standard has been prepared under the authority of the Building Services Standards Committee. It has been revised in terms of metric units and now provides details of the essential requirements for hot water storage units, in capacities between 65 litres and 180 litres, of a type which incorporates a cold water feed cistern. These appliances, known as “combination units”, are designed for use with water heating appliances which are connected by pipework, but provision can also be made to use either an electric immersion heater or gas circulator fitted to the unit itself either as an auxiliary or as the sole method of heating. An “indirect” type of combination unit is intended for service where it is essential that the circulating water is kept separate from the domestic hot water. There is provision for both single feed and double feed indirect types. Single feed indirect units should not be used in sealed systems and they have limited application on direct pump circulation.

There has been general rationalization to align the standard with BS 699 and BS 1566-1 and BS 1566-2, which include a specification for area of heating surfaces of primary heaters and revised performance tests.

Appendix F gives a list of information that should be supplied by the purchaser with an enquiry or order.

The drafting committee is considering the question of the requirement in clause 5 of measuring thickness of copper sheet before forming, and it is the intention to deal with this matter in the revision of BS 699 and BS 1566-1 and BS 1566-2. When this matter is resolved, it is intended to issue an amendment to this standard.

The requirements specified in this standard are those considered to be necessary to ensure good performance and reliability of the appliance whilst leaving the manufacturers free to develop actual design, and for this reason, careful consideration has been given to the inclusion of requirements for materials, construction and performance tests rather than to dimensions, which have been omitted as far as possible.

The inclusion of integral plastics cold feed cisterns was considered but it was decided to omit reference to these. This matter will be kept under review.

The following is a list of standards covering water storage vessels, mainly for domestic use, to which others may be added when considered necessary.

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

BS 417-1, *Imperial units.*

BS 417-2, *Metric units.*

BS 699, *Copper cylinders for domestic purposes.*

BS 1565, *Galvanized mild steel indirect cylinders, annular or saddle-back type.*

BS 1565-1, *Imperial units.*

BS 1565-2, *Metric units.*

BS 1566, *Copper indirect cylinders for domestic purposes.*

BS 1566-1, *Double feed indirect cylinders.*

BS 1566-2, *Single feed indirect cylinders.*

BS 2777, *Asbestos-cement cisterns.*

BS 4213, *Cold water storage cisterns (polyolefin or olefin copolymer) and cistern covers*.

This revised British Standard supersedes BS 3198:1960 which is now withdrawn. Since manufacturers will require time to change existing procedures for testing, certification to BS 3198:1960 will remain valid until 31 March 1982.

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 British Standard specifies requirements for direct, double feed indirect and single feed indirect types of combination hot water storage units having hot water storage capacities in a series of ranges between 65 litres and 210 litres, in which, when water is drawn off from the hot water storage vessel, there is automatically:

- a) replacement of water withdrawn by that from a cold water feed cistern incorporated in the unit and adjacent to the hot water vessel; and
- b) controlled replacement of the water in the cold water feed cistern from the water supply by means of a float operated valve.

NOTE The preferred hot water storage capacities are 85, 115, 130, 140, 150, 180 and 210 litres.

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

feed cistern

the cistern, attached to the hot water storage vessel, for supplying cold water to that vessel to replace the hot water as it is drawn off

3.2

primary feed and expansion cistern

the cistern for supplying water to the primary circuit and for accommodating the expansion of water therefrom

3.3

hot water storage vessel

the container in which the heated water is stored

3.4

hot water storage capacity

the actual volume of secondary water which can be stored in the hot water storage vessel

3.5

inter-connection

the arrangements for connecting the feed cistern and hot water storage vessel by means of which there takes place an adequate flow of cold water from the feed cistern into the storage vessel to replace the hot water as it is drawn off

3.6

warning pipe

an overflow pipe so fixed that its outlet, whether inside or outside a building, is in a conspicuous position where the discharge of any water therefrom can be readily seen

3.7

combination hot water storage unit

a) *Direct type*. A hot water storage vessel which has provision for an immersion heater or which can be coupled by pipework to an external water heating appliance and to which cold water is fed from an attached feed cistern.

b) *Double feed indirect type*. A hot water storage vessel similar to the direct type except that the stored water is heated indirectly by the water circulating in an integral primary heater. This type requires an additional cistern open to atmosphere from which the feed is taken to the primary circuit and into which the primary circuit is vented. The increase in volume of primary water due to expansion is accommodated in this primary feed and expansion cistern which may be incorporated in the combination unit.

c) *Single feed indirect type*. A hot water storage vessel similar to the direct type except that the stored water is heated indirectly by the water circulating in an integral primary heater but the primary feed and venting arrangement is an integral part of the primary heater within the hot water section of the combination unit. The increase in volume of the primary water due to expansion is accommodated within the primary heater and is prevented from coming into contact with the secondary water.

3.8

primary heater

a heat exchanger mounted inside a hot water storage vessel for the transfer of heat to the stored water from circulating primary hot water

3.9

primary water

the water in the primary circuit including the water in the primary heater, boiler, radiators, pipework, and associated fittings

3.10

primary capacity

the total volume of primary water

3.11

secondary water

the water that can be drawn off for use