

Copper indirect cylinders for domestic purposes

Part 1: Open vented copper cylinders — Requirements and test methods

ICS 91.140.60

Committees responsible for this British Standard

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Foreword

This part of BS 1566 has been prepared by Subcommittee B/504/10. It supersedes BS 1566-1:2002, which is withdrawn.

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags **[A1]** **[A1]**.

This part of BS 1566 now includes both directly and indirectly heated cylinders. The original cylinder grades 1, 2 and 3 are included. Grade 4 cylinders are no longer included. The reheat performance requirements of indirectly heated cylinders have been increased and the average insulation requirements for all cylinders have been increased. Three types of cylinder construction (G, P and D) have been identified, with type P cylinders having been introduced in this edition as an option with no restriction placed on their height or diameter (in contrast to type G and type D cylinders, which are restricted to the sizes given in Table 1) and their hot water capacity and heat exchanger efficiency determined in accordance with the type tests given in Annex A. For corrosion resistance, aluminium protector rods have been replaced by an increase in the thickness of the cylinder base and corrosion resistance testing.

This part of BS 1566 is complementary to BS 1566-2.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its 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 17 and a back cover.

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1 Scope

This part of BS 1566 specifies requirements for open vented, vertically mounted copper cylinders for the storage of hot water where the water is either heated indirectly by primary (boiler) water circulating in an integral primary heater and/or directly via either an external heat source or an electric immersion heater fitted inside the cylinder.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 2779:1986, *Specification for pipe threads for tubes and fittings where pressure-tight joints are not made on the threads (metric dimensions)*.

BS 2901-3:1990, *Filler rods and wires for gas-shielded arc welding — Part 3: Specification for copper and copper alloys*.

BS EN 1044:1999, *Brazing — Filler metals*.

BS EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*.

BS EN 1653, *Copper and copper alloys — Plate, sheet and circles for boilers, pressure vessels and hot water storage units*.

BS EN 1982:1999, *Copper and copper alloys — Ingots and castings*.

BS EN 12449, *Copper and copper alloys — Seamless, round tubes for general purposes*.

BS EN 12452, *Copper and copper alloys — Rolled, finned, seamless tubes for heat exchangers*.

3 Terms and definitions

For the purposes of this part of BS 1566, the following terms and definitions apply.

3.1

cylinder

closed cylindrical vessel for the heating and storage of hot water

3.2

hot water capacity

volume of water that can be heated by the heat source

3.3

metal thickness before forming

minimum nominal thickness of copper from which cylinders are manufactured

3.4

model range

cylinders which share the same common diameter, heat exchanger design and general overall configuration

3.5

nominal storage capacity

total volume of water, in litres, that can be stored in the cylinder, excluding the primary water in type G and type P cylinders

3.6

primary heater

heat exchanger mounted inside a type G or type P cylinder for the transfer of heat from the primary water to the stored water

3.7

primary water

water circulating through the primary heater in type G and type P cylinders

3.8

reheat performance

primary heater performance, measured in kilowatts

3.9

reheat time

time taken for the hot water capacity of type P (or type G) cylinders to reheat to 60 °C

3.10

stored water

water contained in the body shell of the cylinder, excluding the primary water

4 Information to be supplied by the purchaser

The following information shall be supplied by the purchaser at the time of enquiry or order:

- a) where applicable, the BS 1566 type reference of the cylinder as specified in Table 1;
- b) for type P cylinders, the height, diameter and nominal storage capacity of the cylinder if other than as specified in Table 1 (see 7.3 and Clause 13);

NOTE 1 If the type P cylinder ordered by the purchaser conforms to Table 1, the BS 1566 type reference may be given.

- c) the grade of cylinder (see Clause 5);
- d) the metal thickness of the top and bottom of the cylinder and the rest of the cylinder shell if they are required to be thicker than as specified in Table 1 (see Clause 7);
- e) the designation and height above datum of the secondary feed connection if other than as specified in Table 1 (see 8.2);
- f) for type G and type P cylinders, the designation and height above datum of the primary flow and return connections (if other than those specified in Table 3 in the case of type G cylinders) (see 8.4);
- g) whether a secondary return connection is required and, if required, its designation and height above datum if other than those specified in Table 1 (see 8.5);
- h) whether an immersion heater connection is required and, if required, whether it is to be located in the cylinder top or body. If an immersion heater connection is to be located in the cylinder body, the purchaser shall also indicate the required height above datum if other than as specified in Table 1 (see 8.7);
- i) The internal working pressure of the primary heater if greater than as specified in 10.2.1.
- j) Whether the cylinder is required to be corrosion resistant in accordance with this standard (see Clause 11) or whether an aluminium protector rod is required as the means of corrosion protection (see Note 2 to Clause 11);

NOTE 2 The manufacturer should advise the purchaser to consult the manufacturer's literature prior to ordering. This is particularly important for type P cylinders.

5 Grades and types of cylinders

Cylinders shall conform to one of three grades (1, 2 or 3, according to the maximum working head of the cylinder), as given in Table 1. Cylinders of each grade shall also conform to one of three types of construction (G, P or D) as given in Table 2.

Table 1 — Dimensional requirements for all cylinders

BS 1566 type reference ^a	Diameter	Height	Nominal storage capacity	Metal thickness before forming						Height of connections above datum			Secondary feed and return connection designation ^a
				Grade 1 (maximum working head 25 m)		Grade 2 (maximum working head 15 m)		Grade 3 (maximum working head 10 m)		Secondary return (if required)	Secondary feed	Immersion heater connection	
				$\frac{A_1}{A_2}$ Domed bottom section mm	Top and rest of shell mm	$\frac{A_1}{A_2}$ Domed bottom section mm	Top and rest of shell mm	$\frac{A_1}{A_2}$ Domed bottom section mm	Top and rest of shell mm				
	mm	mm	l							mm	mm	mm	
0	300	1 600	96	1.6	1.2	1.6	0.9	1.6	0.7	1 250	100	150	G1
1	350	900	72	1.6	1.2	1.6	0.9	1.6	0.7	700	100	150	G1
2	400	900	96	1.8	1.2	1.6	0.9	1.6	0.7	700	100	150	G1
3	400	1 050	114	1.8	1.2	1.6	0.9	1.6	0.7	800	100	150	G1
4	450	675	84	2.0	1.6	1.6	1.0	1.6	0.7	450	100	150	G1
5	450	750	95	2.0	1.6	1.6	1.0	1.6	0.7	550	100	150	G1
6	450	825	106	2.0	1.6	1.6	1.0	1.6	0.7	625	100	150	G1
7	450	900	117	2.0	1.6	1.6	1.0	1.6	0.7	700	100	150	G1
8	450	1 050	140	2.0	1.6	1.6	1.0	1.6	0.7	800	100	150	G1
9	450	1 200	162	2.0	1.6	1.6	1.0	1.6	0.7	950	100	150	G1
9E	450	1 500	206	2.0	1.6	1.6	1.0	1.6	0.7	1 200	100	150	G1
10	500	1 200	190	2.5	1.8	1.8	1.2	1.6	0.9	950	150	200	G1½
11	500	1 500	245	2.5	1.8	1.8	1.2	1.6	0.9	1 200	150	200	G1½
12	600	1 200	280	2.8	2.0	2.5	1.4	2.0	1.2	950	150	200	G2
13	600	1 500	360	2.8	2.0	2.5	1.4	2.0	1.2	1 200	150	200	G2
14	600	1 800	440	2.8	2.0	2.5	1.4	2.0	1.2	1 350	150	200	G2

^a The secondary connection designations are in accordance with BS 2779.

^a The secondary connection designations are in accordance with BS 2779.