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Specification for

Apparatus for the determination of distillation range (including flasks and receivers)

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Laboratory Apparatus Standards Policy Committee (LBC/-) to Technical Committee LBC/25, upon which the following bodies were represented:

- British Laboratory Ware Association
- CLEAPSE
- Chemical Industries Association
- Department of Health
- Glass Manufacturers' Federation
- Institute of Medical Laboratory Sciences
- Institute of Science Technology
- Manufacturing, Science and Finance
- Royal Society of Chemistry

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Contents

	Page
Committees responsible	Inside front cover
Foreword	iii
Section 1. General	
1 Scope	1
2 Definitions	1
3 Basis of adjustment	1
Section 2. Distillation flasks	
4 Designation	2
5 Sizes	2
6 Material	2
7 Dimensions	2
8 Details of construction	2
9 Marking	2
Section 3. Receivers	
10 Volumetric accuracy	4
11 Type	4
12 Series of nominal capacities	4
13 Limits of volumetric error	4
14 Material	4
15 Dimensions	4
16 Details of construction	4
17 Graduation and numbering	7
18 Marking	7
Section 4. Condensers	
19 General	8
20 Type 1, fluid-cooled glass condensers	8
21 Type 2, air-cooled glass condensers	8
22 Type 3, metal condensers and cooling baths	9
Section 5. Draught screens	
23 General	12
24 Type A draught screen	12
25 Type B draught screen	12
26 Type C draught screen	12
27 Heat resistant flask support sheets	13
28 Wire gauze	13
Section 6. Heaters	
29 General	18
30 Gas heaters	18
Appendix A Guidance on the assembly of distillation apparatus	19
Figure 1 — Distillation flask	3
Figure 2 — Graduation and numbering of Crow receivers	6
Figure 3 — Type 1 condenser	8
Figure 4 — Type 2 condenser	9
Figure 5 — Straight metal condenser in cooling bath	10
Figure 6 — Top view of arrangement of curved metal condenser tube in cooling bath	11
Figure 7 — Type A draught screen	14
Figure 8 — Type B draught screen	15

	Page
Figure 9 — Removable shutter for draught screen	16
Figure 10 — Type C draught screen	17
Figure 11 — Typical assembly of distillation apparatus with type 1 condenser	20
Figure 12 — Position of thermometer in distillation flask	21
Figure 13 — Typical assembly for electrically heated apparatus with curved metal condenser and type A draught screen	22
Table 1 — Dimensions for distillation flasks	2
Table 2 — Limits of error of capacity for receivers	4
Table 3 — Dimensions of distillation receivers	5
Table 4 — Dimensions of straight metal condenser tube	9
Table 5 — External dimensions of cooling bath for straight metal condenser	9
Publications referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Laboratory Apparatus Standards Policy Committee. It was first published in 1936 and was revised in 1952 and 1962. This edition supersedes the 1962 edition, which is withdrawn.

In the preparation of this revision of BS 658 account was taken of the following:

- a) ISO 918:1983, published by the International Organization for Standardization (ISO), which is technically equivalent to BS 4591;
- b) BS 2000:123, which is identical with IP 123/84, published by the Institute of Petroleum (IP);
- c) BS 2000:195, which is identical with IP 195/81.

Distillation can be used to determine a number of properties (e.g. initial boiling point, final boiling point, boiling range, boiling range of a particular fraction) of a material. This British Standard does not describe the determinations which may be made with the apparatus described in this standard, as these are more properly described in the methods of test associated with the performance requirements of a material. Similarly, special safety requirements that are needed for a specific determination are more appropriately described in the specific test procedure. Advice on the general assembly of the apparatus is given in Appendix A.

The principal differences between this edition and the 1962 edition are as follows:

- a) text associated with the determination of distillation properties (e.g. correction of barometric pressure) has been omitted;
- b) the 130 mL distillation flask has been replaced by a 125 mL distillation flask which is now in widespread use;
- c) a 200 mL distillation flask has been introduced;
- d) the type 2 receivers have been omitted since, for very small volumes, the type 1 receivers should be used and, for larger volumes graduated glass measuring cylinders complying with the requirements of BS 604 are considered suitable;
- e) glass tubing complying with BS 5895 has, where possible, been used;
- f) the type 1 b) glass condenser constructed using rubber tubing has been omitted because it is not in current use;
- g) the two types of draught screen in the previous edition have been retained but a third type, used with electrical heating, has been introduced;
- h) the multiple metal condenser system has been omitted because it is not in current use;
- i) the assembly of the apparatus specified has been transferred to Appendix A and given as guidance;
- j) the appendix giving corrections of barometric readings has been omitted because the information is contained in BS 2520;
- k) all references to asbestos or asbestos based material have been omitted.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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 22, 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.

Section 1. General

1 Scope

This British Standard specifies requirements for a range of components for the following apparatus used in the determination of the distillation characteristics of materials:

- a) distillation flasks of sizes between 50 mL and 750 mL;
- b) three Crow receivers of two classes of accuracy;
- c) glass condensers of air-cooled and fluid-cooled designs;
- d) metal condensers and cooling bath;
- e) draught screens of three types;
- f) heaters using either gas or electricity.

NOTE 1 It is recommended that, unless otherwise specified in the relevant method of test, one of the types of thermometers listed in BS 593, with an immersion length of 100 mm, is used.

NOTE 2 Guidance on how the apparatus may be assembled is given in Appendix A.

NOTE 3 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

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

2.1

standard reference temperature

the temperature at which the receiver is intended to contain its nominal capacity (nominal volume)

2.2

capacity

the volume, in millilitres, of water, at the standard reference temperature, contained by a receiver at any graduation line when the meniscus is set so that the plane of the upper edge of the graduation line is horizontally tangential to the lowest point of the meniscus, the line of sight being in the same plane

3 Basis of adjustment

3.1 Unit of volume

The unit of volume shall be the millilitre (mL).

NOTE The millilitre is commonly used as the special name for the cubic centimetre, in accordance with the International System of Unit (SI).

3.2 Standard reference temperature

The standard reference temperature shall be 20 °C.

NOTE See 2.1.

Section 2. Distillation flasks

4 Designation

The size of flask shall be designated as two-thirds of the nominal bulb capacity in millilitres.

NOTE 1 The bulb capacity is determined by the bulb diameter.
NOTE 2 Distillation should not normally be carried out in a flask more than two-thirds full.

5 Sizes

The sizes of flasks shall be as given in Table 1.

6 Material

The flasks shall be made from either colourless borosilicate glass 3.3, as defined in BS 2598-1, or other glasses of at least equivalent strength.
NOTE Flasks should be as free as possible from visible defects and reasonably free from internal stress.

7 Dimensions

The dimensions of flasks shall be as given in Table 1.

8 Details of construction

8.1 Design

The general design of flasks shall be as shown in Figure 1.

8.2 Bulb

The bulb of each flask shall be spherical.

8.3 Top of the flask

The top of each flask shall be smoothly finished with a strengthening bead [see Figure 1(a)] or flange [see Figure 1(b)], and shall be at right angles to the axis of the flask.

8.4 Side tube

The side tube shall be smoothly joined to the neck and shall slope downwards in the same plane as the axis of the flask.
The end of the side tube shall be fire-polished and there shall be no constriction.

NOTE For certain determinations, e.g. pharmaceutical, ground glass joints are used.

9 Marking

The following shall be permanently and legibly marked on all flasks:

- a) the size of the flask, e.g. 150 mL;
- b) the maker's and/or vendor's name or trademark;
- c) the number and date of this British Standard, i.e. BS 658:1989¹⁾.

Table 1 — Dimensions for distillation flasks

Dimension	Size							
	50 mL	100 mL	125 mL	150 mL	200 mL	250 mL	500 mL	750 mL
	mm	mm	mm	mm	mm	mm	mm	mm
Internal diameter of neck	16 ± 1	16 ± 1	17 ± 1	18 ± 1	20 ± 1	20 ± 1	24 ± 1.5	28 ± 1.5
Wall thickness of side tube	1 ± 0.10	1 ± 0.10	1 ± 0.10	1 ± 0.10	1 ± 0.10	1.5 ± 0.20	1.5 ± 0.20	1.5 ± 0.20
External diameter of side tube	6 ± 0.4	6 ± 0.4	7 ± 0.4	7 ± 0.4	7 ± 0.4	8 ± 0.4	10 ± 0.4	11 ± 0.4
Minimum wall thickness of neck and bulb	0.75	0.75	0.75	1.0	1.0	1.0	1.0	1.5
Length of side tube	100 ± 3	100 ± 3	100 ± 3	120 ± 4	127 ± 3	124 ± 4 ^a 160 ± 4	140 ± 4	160 ± 5
Overall height base to top of neck	201 ± 3	215 ± 3	214 ± 3	216 ± 3	220 ± 3	226 ± 3	240.5 ± 3	251.5 ± 3
Distance from base of bulb to centre of side tube	126.5 ± 3	137 ± 3	137 ± 3	141 ± 3	147 ± 3	151.5 ± 3	165.5 ± 3	176.5 ± 3
External bulb diameter	50 ± 2	65 ± 2	69 ± 1	74 ± 2	82 ± 2	85 ± 2	106 ± 3	125.5 ± 3
Angle of inclination of side arm (in degrees)	75 ± 3°							
^a Alternative lengths of side tube are provided for the 250 mL flasks.								

¹⁾ Marking BS 658:1989 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

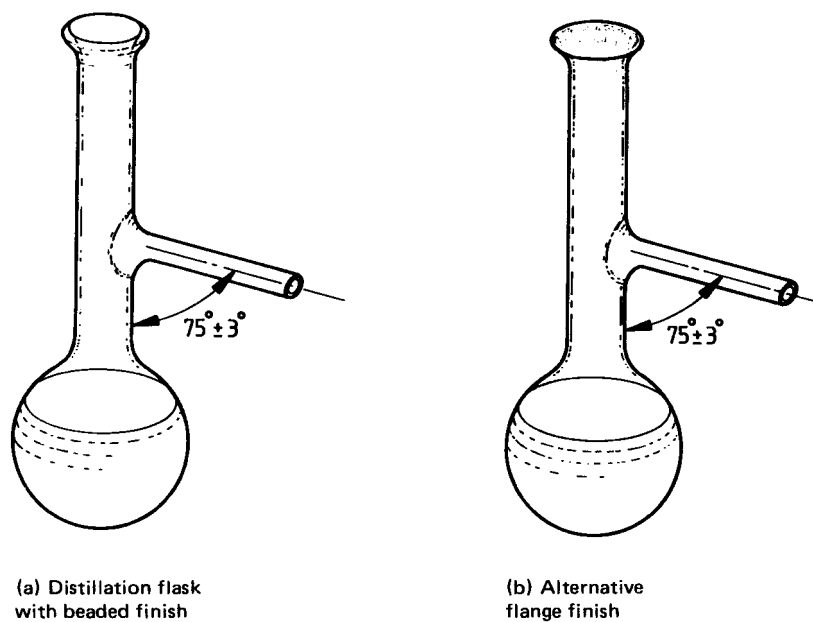


Figure 1 — Distillation flask