BRITISH STANDARD

BS 676:1982

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Specification for

Flasks with graduated necks (phenols type)

UDC 542.3:542.231.3:666.172.7:531.732

Cooperating organizations

The Laboratory Apparatus Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

Agricultural Research Council
Association for Science Education
British Educational Equipment Association
British Laboratory Ware Association*
British Lampblown Scientific Glassware Manufacturers' Association Ltd.*
British Pharmacopoeia Commission
Chemical Industries Association
Department of Health and Social Security*
Department of Industry (Laboratory of the Government Chemist)*
Institute of Petroleum
Ministry of Defence*
Pharmaceutical Society of Great Britain
Royal Society of Chemistry
Scientific Instrument Manufacturers' Association
Society of Chemical Industry*
Society of Glass Technology
Standardization of Tar Products Tests Committee

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 Clinical Biochemists
Glass Manufacturers' Federation
Institute of Medical Laboratory Sciences
Coopted member

This British Standard, having been prepared under the direction of the Laboratory Apparatus Standards Committee, was published under the authority of the Board of BSI and comes into effect on
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The following BSI references relate to the work on this standard:
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Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

Foreword

This British Standard has been prepared under the direction of the Laboratory Apparatus Standards Committee. It was first published in 1936 under the title "Three special flasks with graduated necks" and was revised and correlated with other British Standards for volumetric glassware in 1953. This revision specifies three flasks with graduated necks that are primarily intended for the following purposes:

45 ml *flask with* 5 ml *scale*, for the polymerization test specified in BS 244 & BS 290.

150 ml *flask with* 10 ml *scale*, for the determination of phenols in essential oils by the official method of the Analytical Division of the Royal Society for Chemistry (formerly the Society for Analytical Chemistry) and also for the determination of aldehydes and ketones; and for the determination of small quantities of phenols in light and middle oils, in refined lower boiling point products and in creosote oils, by the official methods of the Standardization of Tar Products Tests Committee.

200 ml *flask with* 25 ml *scale*, for the determination of phenols in light and middle oils, in refined lower boiling point products and in creosote oils, by the official methods of the Standardization of Tar Products Tests Committee.

The flasks have been designed in accordance with BS 5898 and for this reason an alternative standard reference temperature of 27 °C is permitted when it is necessary to work at an ambient temperature considerably above 20 ° C.

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 4, 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 flasks with graduated necks, designed for the special purposes referred to in the foreword.

2 References

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

3 Definition

3.1
capacity (of an interval on the scale)

the additional volume of water at 20 °C (see note), expressed in millilitres, required to be added to fill the flask, in the manner described in Appendix A, from the zero line to any graduation line corresponding to the scale interval in question

NOTE When the flask is required for use in a country which has adopted a reference temperature of 27 °C (see foreword), this value should be substituted for 20 °C.

4 Sizes

Three sizes of flasks are specified, having the capacities and scales given in Table 1.

Table 1 — Bulb capacities and scales of flasks with graduated necks

Nominal capacity of bulb	Scale	
	Range	Subdivision
ml	ml	ml
45	5	0.1
150	10	0.1
200	25	0.2

5 Material

The flasks shall be made of clear glass, as free as possible from visible defects, and shall be well annealed.

6 Construction

The general shape of the flasks shall be as shown in Figure 1 to Figure 3, the 45 ml flask having a cylindrical bulb and the 150 ml and 200 ml flasks having a conical bulb. Each flask shall stand vertically on its base without rocking and shall not topple when placed empty on a surface inclined at an angle of 15° to the horizontal.

The flange at the top of the neck shall be turned over sharply and the mouth shall not be belled to any considerable distance from the top of the neck.

NOTE A ground glass stopper may be fitted to the 200 ml flask if desired and if so should preferably be one of the sizes specified in BS 572.

7 Dimensions

The flasks shall conform to the dimensions specified in Table 2.

8 Graduation lines

The graduation lines shall be fine clean permanent lines of uniform thickness not exceeding 0.3 mm. Marking and filling shall comply with the durability requirements specified in BS 3996.

NOTE Where long graduation lines should extend completely round the neck, a gap, not exceeding 10 % of the circumference, is permitted.

The scales shall be numbered from the bottom upwards with numbering and subdivisions as shown in Figure 1, Figure 2 and Figure 3. The numbered graduation lines and also the lines midway between them on the 200 ml flask, shall be carried completely round the neck. The shortest graduation lines shall be carried half-way round the neck, and the remaining graduation lines shall be intermediate in length and shall project equally at each end beyond the shortest graduation lines.

NOTE For an alternative scheme of graduation suitable for class B flasks, see clause **10**.

9 Tolerances on capacity

The bulb of the flask shall have a capacity approximating to the nominal capacity, within the limits given in Table 2. The tolerances permitted for the graduated necks shall be of two classes, namely class A and class B, as shown in Table 3.

The tolerance represents the maximum permissible error at any point on the scale and also the maximum permissible difference between the errors at any two points. Thus, for example, the scale of a class A flask of 150 ml nominal capacity may be in error by ± 0.04 ml at any point, provided that the difference between the errors at any two points does not exceed 0.04 ml.

Table 2 — Dimensions for flasks with graduated necks

Dimensions		Nominal capacity		
		45 ml	150 ml	200 ml
Capacity of flask to zero graduation line	ml	45 (minimum)	150 ± 7	200 ± 10
Minimum distance of highest graduation line from top of neck	mm	15	20	25
Length of scale	mm	50 to 60	150 to 170	125 to 150
[a]Minimum length of neck below lowest graduation line	mm	3	10	10
[a]Maximum length of neck	mm	—	205	190
Overall height	mm	162 ± 3	—	—
External diameter of bulb at widest part	mm	36 ± 2	75 ± 3	83 ± 3
Approximate diameter of base	mm	—	55	60

[a] Measured to the point at which the neck begins to expand at the junction with the bulb.

10 Alternative scheme of graduation for class B flasks

Flasks intended to comply with the class B tolerances may, if desired, have graduation lines confined to the front of the neck instead of those specified in clause **8**. The length of these lines shall be suitably varied so as to emphasize the same lines as are emphasized by the provisions of clause **8** and shall comply with the requirements of graduation pattern III of BS 5898:1980.

11 Marking

Each flask shall have permanently and legibly marked on it:

a) The abbreviation "cm^3" or "ml"

b) The inscription "In 20 °C" to indicate that the flask is graduated for content at 20 °C (see note 2).

c) An identification number. This inscription is mandatory on class A flasks and optional on class B flasks, and shall be repeated on the stopper of the 200 ml flask if one is provided that does not meet the requirements of BS 572.

d) The manufacturer's and/or vendor's name or readily identifiable mark.

e) The number of this British Standard, i.e. "BS 676" and also the letter "A" or "B" to indicate the class of accuracy for which the flask has been graduated.

NOTE 1 Marking BS 676 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, British Standards Institution, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

NOTE 2 When the flask is required for use in a country which has adopted a reference temperature of 27 °C (see foreword and clause **4**), this temperature should be substituted for 20 °C.

Table 3 — Tolerances on capacity of graduated necks

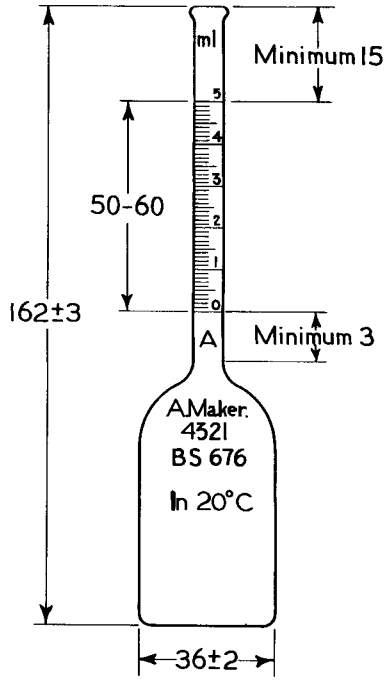
Nominal capacity of bulb	Tolerance on capacity of neck	
	Class A	Class B
ml	ml	ml
45	± 0.04	± 0.08
150	± 0.04	± 0.08
200	± 0.1	± 0.2

Appendix A Method for the determination of capacity

When determining the capacity of any interval on the scale the flask shall first be thoroughly cleaned and dried. If hot air is used to hasten the process of drying, care shall be taken to ensure that the flask settles down to room temperature before testing.

The clean weighed flask shall then be filled with distilled water to a few millimetres above the zero line, care being taken to avoid wetting the neck of the flask above the water surface and also to avoid trapping any air bubbles on the walls of the flask. The lowest point of the water meniscus[1)] shall be adjusted to the top edge of the zero line by withdrawing small amounts of water by means of a glass tube drawn out to a jet at its lower end. The apparent mass in air of the water in the flask shall then be determined. More distilled water shall be added to the flask and the meniscus adjusted by the same method to the graduation line to be tested, and the apparent mass in air of water in the flask shall again be determined.

All operations shall be carried out at room temperature. The volume of water contained by the flask at 20 °C[2)] between the zero line and the graduation line tested, shall be calculated from the apparent mass of air thus determined (see BS 1797), by applying a correction for water temperature.



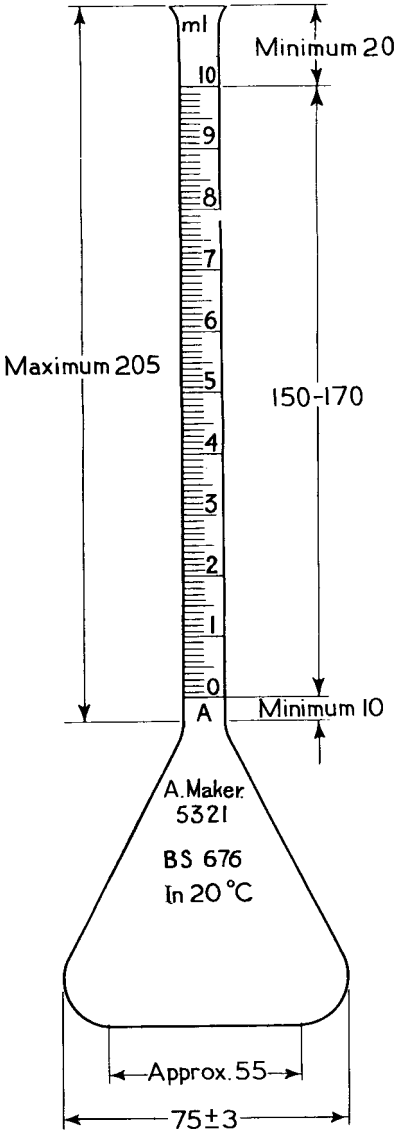
All dimensions are in millimetres.

NOTE Where 27 °C has been chosen as the reference temperature (see clause 4) the inscription "In 20 °C" should be replaced by "In 27 °C".

Figure 1 — 45 ml flask with 5 ml scale

[1)] The meniscus can be clearly defined by folding a strip of black paper round the neck, the top edge of the paper being not more than 1 mm below the graduation line on which the setting is to be made. The meniscus, so shaded, is viewed against a white background.

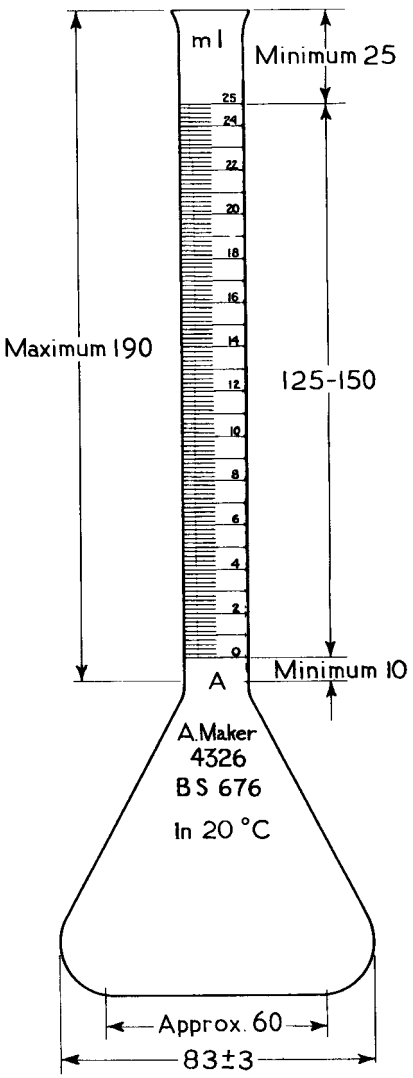
[2)] Or 27 °C where this is chosen as the reference temperature.



All dimensions are in millimetres.

NOTE Where 27 °C has been chosen as the reference temperature (see clause 4) the inscription "In 20 °C" should be replaced by "In 27 °C".

Figure 2 — 150 ml flask with 10 ml scale



All dimensions are in millimetres.

NOTE Where 27 °C has been chosen as the reference temperature (see clause 4) the inscription "In 20 °C" should be replaced by "In 27 °C".

Figure 3 — 200 ml flask with 25 ml scale

Publications referred to

BS 244 & BS 290, *Turpentine for paints.*

BS 572, *Interchangeable conical ground glass joints.*

BS 1797, *Tables for use in calibration of volumetric glassware.*

BS 3996, *Specification for colour coding for one-mark and graduated pipettes (including requirements for the service performance of the colour coding enamels).*

BS 5898, *Specification for principles of design and construction of volumetric glassware for laboratory use.*

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