BRITISH STANDARD

BS 675:1953

*Incorporating Amendments Nos. 1 and 2*

CONFIRMED
DECEMBER 2007

## Specification for

# Sugar flasks

# Co-operating organizations

The Scientific Glassware and Related Laboratory Apparatus Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:—

Admiralty*
Air Ministry
Association of British Chemical Manufacturers*
Association of Scientific Workers
Board of Trade
British Association for the Advancement of Science*
British Chemical Ware Manufacturers' Association*
British Laboratory Ware Association*
British Lampblown Scientific Glassware Manufacturers' Association*
British Pharmacopœia Commission
British Scientific Instrument Research Association
Chemical Society
Department of the Government Chemist*
D.S.I.R. — Chemical Research Laboratory
Glass Manufacturers' Federation*
Institute of Petroleum*
Ministry of Education
Ministry of Health*
Ministry of Supply*
National Physical Laboratory*
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Pharmaceutical Society of Great Britain
Royal Institute of Chemistry*
Science Masters' Association
Society of Chemical Industry
Society of Glass Technology*
Society of Public Analysts and Other Analytical Chemists*
Standardization of Tar Products Tests Committee*

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:—

Association of Hospital Management Committees
Guild of Public Pharmacists
Metropolitan Water Board
Office of the High Commissioner for India
University of London (Faculty of Science)
Individual manufacturers

This British Standard, having been approved by the Scientific Glassware and Related Laboratory Apparatus Industry Standards Committee and endorsed by the Chairman of the Chemical Divisional Council, was published under the authority of the General Council on 11 February 1953



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**Amendments issued since publication**

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| 1776 | December 1953 | |
| 4899 | April 1963 | Indicated by a sideline in the margin |
| | | |
| | | |

# Contents

# Foreword

This standard makes reference to the following British Standards:—

BS 615, *Kohlrausch flasks.*

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

This British Standard, which was first published in 1936, specifies two types of flask for use in sugar analysis: a type with two graduation marks suitable for the analysis of sugar factory juices; and a type of greater accuracy, with one graduation mark, suitable for the polarization of sugars.

The flasks with two graduation marks are provided in three sizes, of 50/55 ml., 100/110 ml. and 200/220 ml. capacity respectively. The dimensions are based on a specification drawn up in 1932 by the South African Sugar Technologists' Association in which particular importance was attached to the provision of an adequate air space above the upper graduation mark to ensure thorough mixing of the contents of a flask on shaking. In order to provide the air space considered necessary, without making the flasks unduly tall, the necks are made rather wide, but the accuracy of the flasks fully meets the requirements of juice analysis. The shape adopted for the bulb gives a wide base and minimizes the tendency for bubbles to cling to the walls below the neck.

A single graduation mark only is required for the polarization of sugars and the high degree of accuracy needed demands a narrow neck. Ordinary straight-necked volumetric flasks have been used for this purpose and also Kohlrausch flasks, described in BS 615. A special 100 ml. flask, the Mann sugar flask, was included in the 1936 edition of this standard, but subsequent experience has shown that it does not satisfy all requirements. The polarization flask now specified has been designed to include the best features of the various flasks previously in use and has been approved after test by sugar technologists representing the biggest users in the country. The design allows the maximum possible accuracy combined with convenience in use. The flask combines narrowness of neck at the graduation mark with an upper enlargement, which is a safeguard against overflow when sugar is being washed into the flask and also provides adequate space for mixing when the flask is shaken. It has also the practical advantage that it can be closed with the thumb and shaken with one hand with the utmost ease and with complete assurance that no liquid escapes during the shaking. The pear-shaped bulb is considered more convenient than the conical or rounded form.

In this revision no minimum weights for the flasks have been included, and instead a robust flask is specified in Clause **5**.

SUBSIDIARY STANDARD TEMPERATURE OF 27 °C.

At the Second Meeting, in 1951, of Technical Committee ISO/TC 48 — Laboratory Glassware and Related Apparatus, of the International Organization for Standardization, it was agreed to qualify as follows the acceptance of 20 °C. as the standard temperature for volumetric glassware:—

> "When it is necessary in tropical countries to work at an ambient temperature considerably above 20 °C., and these countries do not wish to use exclusively the standard temperature of 20 °C., it is recommended that they should adopt a temperature of 27 °C."

*In order to meet the requirements of such tropical countries* it has been decided to amend the British Standards for volumetric glassware to permit 27 °C., as an alternative to 20 °C.

In the present British Standard this amendment applies to Clauses **3** and **9**, to Appendix B, and to Figure 1 and Figure 2.

In accordance with the recommendations of Technical Committee ISO/TC 48 — Laboratory Glassware and Related Apparatus, of the International Organization for Standardization (ISO), use of the inscription "In" is now recommended in place of "C" to indicate that the flask is graduated "to contain". It is intended that this change shall become mandatory, when a revised edition of the standard is published.

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 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.

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## 1 Scope

This British Standard specifies two types of graduated flask suitable for use in sugar analysis.

## 2 Types and sizes

Two types of sugar flask are specified, as follows:—

*Type* 1, in which the flask is provided with 2 graduation marks. Three sizes are specified, of nominal capacity 50/55 ml., 100/110 ml. and 200/220 ml. respectively, as illustrated in Figure 1.

*Type* 2, in which the flask is provided with a single graduation mark and the neck is widened at the top to form a cup. One size is specified, of nominal capacity 100 ml., as illustrated in Figure 2.

## 3 Definition of capacity

The capacity of the flask corresponding to a given graduation mark is defined as the volume of water at 20 °C., expressed in millilitres, required to fill the flask to that mark at 20 °C., when determined as described in Appendix B.

## 4 Material

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

## 5 Construction

Each flask shall be of pear shape with a wide base as shown in Figure 1 and Figure 2. The edge of the base shall be slightly ground so that the flask stands firmly without rocking. The flask shall not topple when placed empty on a surface inclined at an angle of 10° to the horizontal.

The neck or that portion of it bearing the graduation mark shall be cylindrical and the upper end shall be fused and slightly flanged.

The flask shall be sufficiently robust in construction to withstand normal usage and the wall thickness shall show no local departures from uniformity.

## 6 Dimensions

The flasks shall conform to the appropriate dimensions given in Table 1.

**Table 1 — Mandatory dimensions for sugar flasks**

All dimensions are in millimetres

| Dimension | Nominal capacity | | | |
|---|---|---|---|---|
| | Type 1 | | | Type 2 |
| | 50/55 ml. | 100/110 ml. | 200/220 ml. | 100 ml. |
| Overall height, not to exceed | 150 | 195 | 240 | 165 |
| Diameter of base, to be at least | 30 | 40 | 50 | 40 |
| Length of cylindrical neck below lower graduation mark, to be at least | 5 | 5 | 5 | — |
| Distance between graduation marks, to be at least | 35 | 45 | 55 | — |
| Distance from upper graduation mark to top of neck, to be at least | 40 | 50 | 60 | — |
| Length of cylindrical neck above and below graduation mark, to be at least | — | — | — | 5 |
| Length of wide part of neck, to be at least | — | — | — | 50 |
| Length of narrow part of neck, to be at least | — | — | — | 25 |
| Internal diameter of wide part of neck | — | — | — | 16 ± 1 |
| Internal diameter of narrow part of neck | — | — | — | 9.5 ± 0.5 |

## 7 Graduation marks

The graduation marks shall be fine cleanly etched permanent lines of uniform thickness, extending completely round the neck, lying in planes at right angles to the axis of the neck and horizontal when the flask is standing on a level surface. On Type 1 flasks each graduation mark shall be appropriately numbered as shown in Figure 1.

## 8 Tolerances on capacity

Two sets of tolerances are specified for Type 1 flasks, namely Class A and Class B, as shown in Table 2. One tolerance only is provided for Type 2 flasks as shown in Table 2.

## 9 Inscriptions

Each flask shall have permanently and legibly marked on it:

a) Either (for Type 1 flasks) the abbreviation "ml." to signify that the flask is calibrated in terms of the millilitre, or (for Type 2 flasks) the nominal capacity of the flask, i.e. "100 ml."

b) Either the inscription "In 20 °C" *or* the inscription "C20 °C" to indicate that the flask is graduated for content at 20 °C.

c) An identification number. This inscription is mandatory on Class A flasks of Type 1 and on flasks of Type 2 and is optional on Class B flasks of Type 1.

d) The maker's or vendor's name or mark.

e) The number of this British Standard, i.e. "BS 675",[1)] and also, on Type 1 flasks, the letter "A" or "B" to indicate the class of accuracy for which the flask has been graduated.

**Table 2 — Tolerances for sugar flasks**

| Tolerance | Nominal capacity | | | | | | |
|---|---|---|---|---|---|---|---|
| | Type 1 | | | | | | Type 2 |
| | 50/55 ml. | | 100/110 ml. | | 200/220 ml. | | 100 ml. |
| | Class A | Class B | Class A | Class B | Class A | Class B | |
| Maximum error allowed at any graduation mark ± ml. | 0.06 | 0.1 | 0.1 | 0.15 | 0.15 | 0.25 | 0.03 |
| Maximum difference allowed between errors at the two graduation marks ml. | 0.06 | 0.1 | 0.1 | 0.15 | 0.15 | 0.25 | — |

[1)] The mark BS 675 on the product, is an indication by the manufacturer that it purports to comply with the requirements of this British Standard.
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## Appendix A Testing of British Standard sugar flasks

The National Physical Laboratory is prepared to accept Class A flasks of Type 1 and flasks of Type 2 for examination for compliance with the requirements of this British Standard. Certificates of values will be issued for satisfactory flasks, if required. Particulars of the fees charged can be obtained on application to the Director, National Physical Laboratory, Teddington, Middlesex.

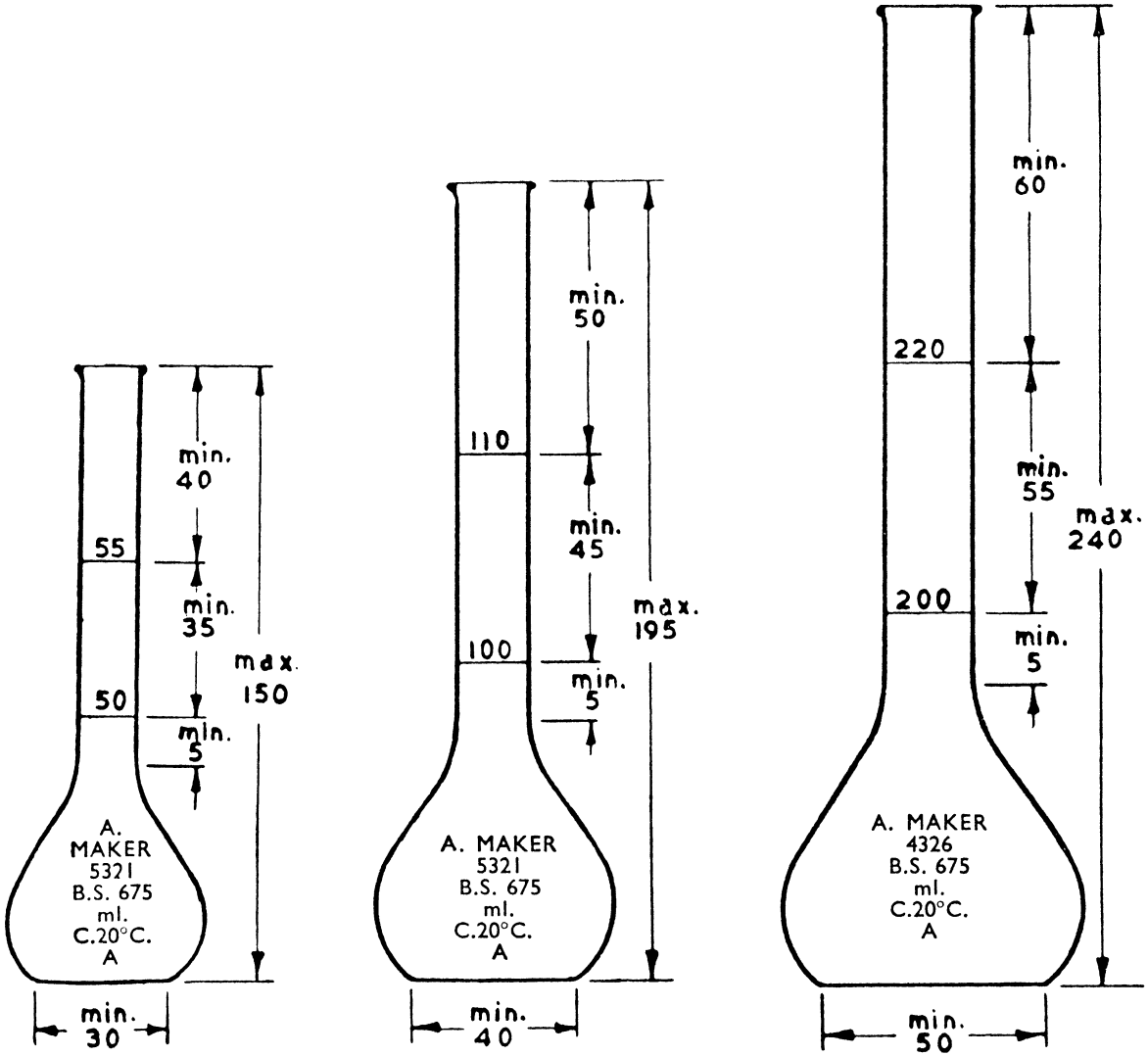
## Appendix B Method for the determination of capacity

When determining the capacity of a flask the vessel shall first be thoroughly cleaned and dried. If hot air is used to hasten the process of drying, care shall be taken 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 graduation mark to be tested, care being taken to avoid wetting the neck of the flask above the water surface and also to avoid trapping air bubbles on the walls of the flask. The lowest point of the water meniscus[2)] shall be adjusted to the top edge of the graduation mark to be tested by withdrawing small amounts of water by means of a glass tube drawn out to a jet at its lower end. The weight of the water in the flask shall then be determined.

All operations shall be carried out at room temperature. The volume of water contained by the flask at 20 °C. shall be calculated from the weight thus determined by applying corrections for water temperature, and, where necessary, air temperature and pressure (see BS 1797[3)]).

[2)] 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 mark on which the setting is to be made. The meniscus, so shaded, is viewed against a white background.
[3)] BS 1797. "*Tables for use in the calibration of volumetric glassware*".




All linear dimensions are in millimetres

**Figure 1 — Type 1 sugar flask**

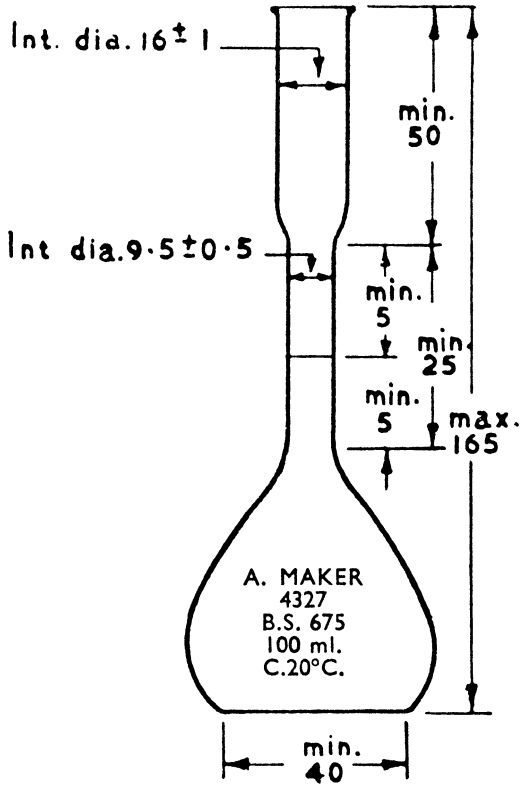



**Figure 2 — Type 2 sugar flask**

## British Standards

The following are available on application:
YEARBOOK
Including subject index and numerical list of British Standards 15*s*.
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BSI
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