BRITISH STANDARD

BS 5404-4: 1979

Specification for

Plastics laboratory ware —

Part 4: Wash bottles

Confirmed November 2011

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Cooperating organizations

The Laboratory Apparatus Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Agricultural Research Council
Association for Science Education*
Association of Scientific, Technical and Managerial Staffs
British Laboratory Ware Association*
British Lampblown Scientific Glassware Manufacturers' Association
British Pharmacopoeia Commission
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Society of Glass Technology
Standardization of Tar Products Test Committee

The 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:

British Society of Scientific Glassblowers
Consortium of Local Education Authorities for the Provision of Science Equipment
Institute of Medical Laboratory Science
Medical Research Council
Individual expert

This British Standard, having been prepared under the direction of the Laboratory Apparatus Standards Committee, was published under the authority of the Executive Board and comes into effect on
31 August 1979

The following BSI references relate to the work on this standard:
Committee reference LBC/28
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Amendments issued since publication

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Foreword

This British Standard has been prepared under the direction of the Laboratory Apparatus Standards Committee to specify plastics wash bottles suitable for general use in laboratories.

The wash bottles specified in this British Standard are intended for use with aqueous solutions between 0 °C and 60 °C. Before using these wash bottles for strong acids or alkalis, oxidizing agents or non-aqueous solutions or at other temperatures, users should satisfy themselves that the wash bottles are suitable for such applications either by laboratory tests or by reference to the manufacturer or supplier.

There is currently a great variety of design of plastics wash bottles but no particular methods of construction are specified in this British Standard. The wash bottles are however required to possess a minimum stability when standing on the bench and are required to be so constructed that both unintentional ejection of the contents during manipulation and leakage from the filler cap are minimized.

The force required to eject a convenient stream of liquid from a plastics wash bottle depends, inter alia, on the shape, size, wall thickness and material of construction. It has not been found possible to specify limits for this force without restricting the design, and in view of the range of personal preference on the part of the user, no such requirements have been included in the specification. Nevertheless, the flexibility of the wash bottle should be such that undue fatigue is not caused in normal use.

Users may find the use of coloured caps to be convenient for the ready identification of the contents.

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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 details of flexible (squeeze type) plastics wash bottles for general laboratory use.

2 References

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

3 Capacity

3.1 The working capacity, which shall not exceed 80 % of the brim-full capacity, shall be greater than 175 ml and not greater than 475 ml.

3.2 The working capacity may be durably marked on the wash bottle by means of a horizontal line, together with the words "fill line" or other suitable wording.

NOTE This line is intended to indicate the manufacturer's recommended maximum level of the contents.

4 Materials for container, cap and dispensing tube

4.1 General. Wash bottles shall be constructed of plastics materials of suitable chemical and physical properties and shall be as free as possible from moulding defects and stress.

4.2 Translucency. The wash bottles shall be constructed in such a manner that, when containing transparent liquids, the meniscus can be seen through the container wall. The cap may be coloured and/or opaque.

4.3 Resistance to extraction of ionic material by water at 20 °C

4.3.1 General. When tested according to the procedure given in Appendix A, the wash bottle shall give an aqueous extract free of suspended matter and shall comply with the requirements of **4.3.2** or **4.3.3** as appropriate.

4.3.2 For wash bottles having a working capacity of 325 ml or greater, the electrical conductivity of the extract shall not be more than 200 μS/m greater than that of the original water used for the extraction.

NOTE 200 μS/m is equivalent to the conductivity of water containing approximately one part per million of sodium chloride.

4.3.3 For wash bottles having a working capacity less than 325 ml, the electrical conductivity of the extract shall not be more than 250 μS/m greater than that of the original water used for the extraction.

5 Details of construction

5.1 Cap

5.1.1 The cap shall either bear a screw thread (preferably complying with the requirements of BS 1918-1) or shall be of the "snap-on" type, and shall not be dislodged when the wash bottle, filled to the working capacity, is squeezed.

5.1.2 The cap may provide support for the dispensing tube.

5.2 Dispensing tube

5.2.1 The end of the dispensing tube, which may be either integral with the container or supported by the cap or container, shall reach to within 7 mm of the base and shall not be self-sealing.

5.2.2 The nozzle may be integral with or separate from the dispensing tube. If the nozzle is detachable from the dispensing tube, it shall be so fixed that the nozzle is not dislodged when the wash bottle, filled to the working capacity, is squeezed.

5.2.3 The nozzle shall be internally tapered to an internal diameter, at the outlet, of between 0.5 mm and 1.0 mm.

NOTE It is envisaged that users requiring a larger orifice will cut back the nozzle as required.

5.3 Container

5.3.1 The wall thickness of the container shall be not less than 0.5 mm at any point.

5.3.2 The internal diameter of the neck shall be not less than 19 mm.

5.3.3 The base shall enable the wash bottle to stand vertically on a plane horizontal surface without any tendency to spin or rock.

6 Leakage

When filled with water to the fill-line (if marked) or filled to 80 % of the brim-full capacity, and with the nozzle sealed, the leakage when the wash bottle is inverted for 2 min shall not exceed one detached drop.

7 Stability

When filled with water to the fill line (if marked) or filled to 80 % of the brim-full capacity, the wash bottle, irrespective of its orientation, shall remain standing on a non-slip plane surface that slopes at 12 ± 1° to the horizontal.

8 Flexibility

When the wash bottle is filled with water to the fill-line (if marked) or is filled to 80 % of the brim-full capacity and picked up from the bench with a finger and thumb at the half-full level, water shall not be expelled through the nozzle. In the case of wash bottles having a non-circular cross section, the finger and thumb shall contact the most flexible points of the container, at the half-full level, during this test.

9 Inscriptions

The following inscriptions shall be durably and legibly marked on the wash bottle.

a) The maker's and/or vendor's name or readily identifiable mark.

b) The number of this British Standard, i.e. BS 5404.

Appendix A Test for ionic material extracted by water at 20 °C

A.1 Apparatus and solutions required

The following items are required.

A.1.1 *Conductivity meter*, suitable for measurement of the electrical conductivity of water.

A.1.2 *Deionized water*, complying with the requirements of BS 3978 except that the conductivity shall be less than 200 μS/m when measured by the procedure detailed in method 6 of BS 2690-9.

A.1.3 *Detergent solution*, having a concentration of approximately 1 % *V*/*V*.

A.2 Procedure

Thoroughly wash the wash bottle, dispensing tube and cap with hot water and detergent solution, then rinse well with hot water, followed by cold water and finally with liberal quantities of deionized water. Fill the wash bottle to the fill-line (if marked) or to 80 % of the brim-full capacity with deionized water at 20 ± 20 °C, replace the cap and dispensing tube and allow them to stand in an inverted position for 3 h at the same temperature.

Examine the extract for the presence of any suspended matter for compliance with the requirement specified in **4.3.1**. Then measure the electrical conductivity of the extract by the procedure detailed in method 6 of BS 2690-9 and deduct from the value obtained the conductivity of the original water used to prepare the extract, also measured at 20 °C. Note the difference in conductivity in microsiemens per metre.

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Publications referred to

BS 1918, *Glass container finishes.*

BS 1918-1, *Specification for continuous thread finish.*

BS 2690, *Methods of testing water used in industry.*

BS 2690-9, *Appearance (colour and turbidity), odour, suspended and dissolved solids and electrical conductivity.*

BS 3978, *Water for laboratory use.*

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