INTERNATIONAL STANDARD

ISO 4796-1

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Laboratory glassware — Bottles —

Part 1: Screw-neck bottles

Verrerie de laboratoire — Flacons —

Partie 1: Flacons à col à vis

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 4796 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 4796-1 was prepared by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, Subcommittee SC 2, *General laboratory glassware (other than measuring apparatus)*.

Parts 1 and 2 of ISO 4796 cancel and replace ISO 4796:1977 by incorporating the following changes:

a) bottles with capacities of 25 ml, 15 000 ml and 20 000 ml have been added;

b) the material has been more precisely defined;

c) the International Standard has been divided into three parts.

ISO 4796 consists of the following parts, under the general title *Laboratory glassware — Bottles*:

— *Part 1: Screw-neck bottles*

— *Part 2: Conical neck bottles*

— *Part 3: Aspirator bottles*

Laboratory glassware — Bottles —

Part 1: Screw-neck bottles

1 Scope

This part of ISO 4796 specifies a series of screw-neck bottles suitable for the storage of fluid liquid and solid chemicals and reagents in general laboratory use. These bottles are also suitable for the preparation and storage of microbiological growth media.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 4796. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 4796 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3585:1998, *Borosilicate glass 3.3 — Properties.*

3 Capacities

3.1 The nominal capacities of screw-neck bottles shall be chosen from the following series:

25 ml — 50 ml — 100 ml — 250 ml and 500 ml;

1 l — 2 l — 5 l — 10 l — 15 l and 20 l.

3.2 The nominal capacity of a bottle indicates the quantity of liquid which a bottle of average wall thickness shall contain when the bottle is filled to the turn of the shoulder.

3.3 The design of the bottle shall be such that the total capacity to the base of the neck shall be approximately 15 % greater than that to the shoulder.

4 Dimensions

The dimensions and tolerances of screw-neck bottles are given in Figures 1 and 2 and in Table 1.

Table 1 — Dimensions

Nominal capacity	Total height	Height to shoulder	Outside diameter	Wall thickness	Internal neck diameter
	h_1	h_2	d_1	s	d_2
ml	mm approx.	mm approx.	mm approx.	mm min.	mm min.
25	70	41	36	1,0	12,5
50	87	50	46	1,0	15
100	100	60	56	1,5	27
250	138	90	70	1,5	27
500	176	110	86	1,5	27
1 000	225	153	101	1,7	27
2 000	260	170	136	2,0	27
5 000	330	208	181	2,0	27
10 000	410	265	227	2,7	27
15 000	445	285	268	2,7	27
20 000	505	330	288	3,0	27

5 Construction

5.1 Material

5.1.1 Bottles shall be constructed of clear, colourless or amber borosilicate glass 3.3 in accordance with ISO 3585.

5.1.2 Internal stress and visible defects in the glass (such as bubbles near the surface) shall be reduced to a level sufficient to minimize the possibility of fracture due to thermal or mechanical shock.

5.2 Design

5.2.1 The base of the bottle shall be constructed so as to enable the bottle to stand firmly on a flat surface without rocking or spinning.

5.2.2 The base of the bottle shall have a suitable radius so as to provide a smooth transition between the base and the side. The main portion of the side shall be:

— cylindrical for bottles with nominal capacities of 25 ml to 2 000 ml;

— slightly tapered for bottles with nominal capacities 5 l to 20 l with the smaller diameter at the base of the bottle.

The diameters d_1 shall be as given in Table 1.

5.2.3 The shoulder of the bottle shall have a suitable radius in order to provide a smooth transition between the side and the conical upper proportion of the bottle.

5.2.4 The upper portion of the shoulder shall be of conical shape. The transition radius from the shoulder to the neck shall be as small as possible to be compatible with good manufacturing practice.

5.2.5 The bottle shall be blown so as to evenly distribute the glass in the mould avoiding sudden changes in the wall thickness. The thinnest areas shall not have a thickness less than the minimum value specified in Table 1.

5.2.6 The neck of the bottle shall be stoutly constructed and finished with a strengthening lip designed to facilitate pouring without liquid running down the outside of the bottle. A clip-on anti-drip ring of plastics material fitting into a slightly recessed channel on the outside of the neck is a permitted alternative form of construction.

NOTE There are suitable national standards for the dimensions and design of the thread of the screw neck.

5.2.7 The outer glass surface of the bottles may be coated with a suitable plastics material as a protection and to limit leakage of liquid if the bottle is damaged. The coating shall be resistant to steam sterilization at 135 °C.

5.3 Closures

Bottles shall be provided with closures of a suitable inert plastics material, for example polypropylene. Closures shall form a liquid-tight seal with the threaded bottle neck.

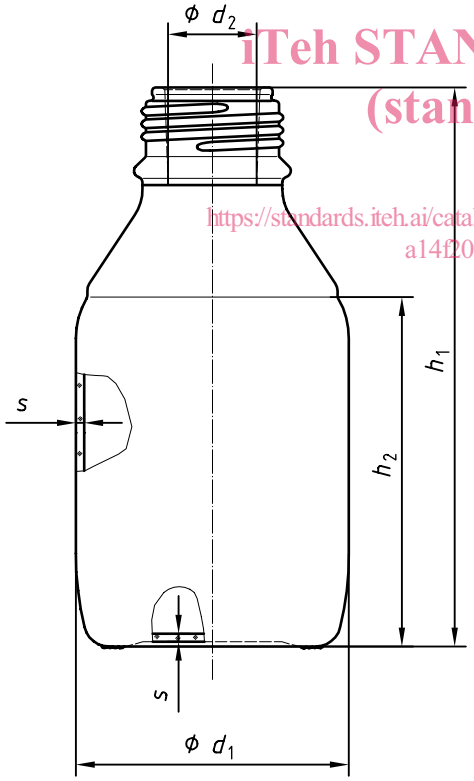
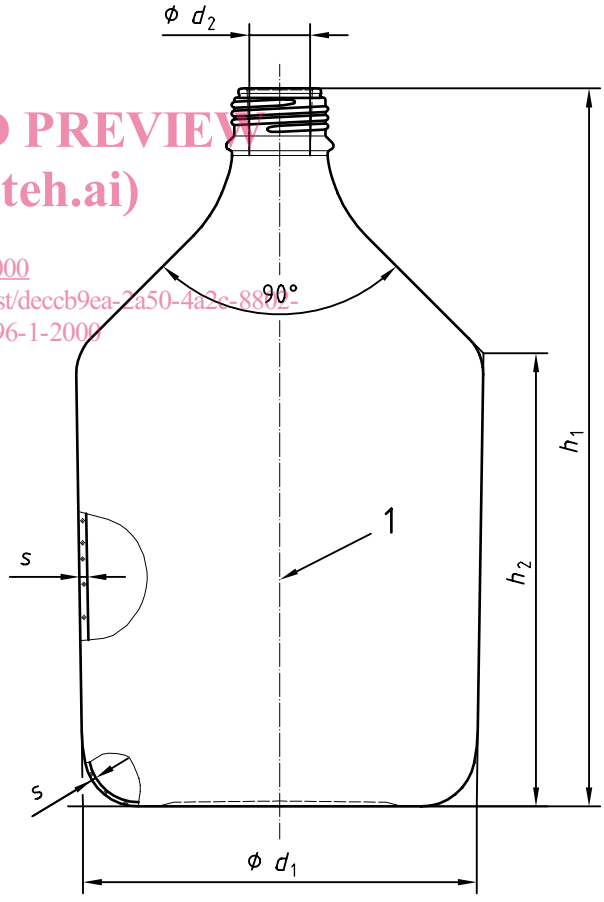


Figure 1 — Bottles with nominal capacities 25 ml to 2 000 ml



Key

1 Taper 1:30

Figure 2 — Bottles with nominal capacities 5 l to 25 l

6 Designation

If a designation of bottles is required, this shall be by reference to this part of ISO 4796, i.e. ISO 4796-1, together with the nominal capacity of the bottle.

EXAMPLE For a bottle with a nominal capacity of 500 ml, the designation would be as follows:

Laboratory bottle ISO 4796-1 - 500

7 Marking

7.1 Bottles complying with this part of ISO 4796 shall be marked with:

a) the nominal capacity;

b) the maker's and/or vendor's name or trade mark;

c) the number of this International Standard, i.e. ISO 4796-1, or appropriate reference to the corresponding national standard.

In addition, each bottle can bear an area with a surface suitable for marking with a pencil.

Marks a) to c) may be moulded into the recessed base of the bottle, if the method of manufacture permits; otherwise they may be indelibly marked, in any convenient position, by etching, sandblasting or with vitreous enamel.

7.2 The closures of the bottles shall be marked with the maximum permitted temperature for use or for sterilization, for example "max. 100 °C".

NOTE 1 Closures not marked with a temperature can only be used at ambient temperature.

NOTE 2 During sterilization the closure may not be screwed more than one turn to enable pressure release. Otherwise, pressure increase in the bottle can result in fracture.

