INTERNATIONAL STANDARD

Laboratory glassware — Separating funnels and dropping funnels

Verrerie de laboratoire — Ampoules à décanter et ampoules à introduire

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.

International Standard ISO 4800 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, Subcommittee SC 2, *General laboratory glassware (other than measuring).*

This second edition cancels and replaces the first edition (ISO 4800:1977) by incorporating the following changes:

a) dimensions and tolerances have been brought up to date;

b) materials have been modified according to ISO 3585;

c) separating funnels type 2 (pear-shaped) have been modified;

d) separating funnels type 3 (Gilson type) have been cancelled.

A bibliography lists additional ISO standards for other general-purpose laboratory glassware.

Introduction

Separating funnels are used in laboratories for liquid/liquid extractions and they are intended to facilitate the separation into layers of two immiscible liquids of different density.

Dropping funnels have a cylindrical body and are used for adding reagent solutions to a reaction vessel. They are, therefore, often provided with a ground cone at the bottom, for joining to vessels with conical ground necks.

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Laboratory glassware — Separating funnels and dropping funnels

1 Scope

This International Standard specifies details of an internationally acceptable series of glass separating funnels and dropping funnels suitable for general use in laboratories.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents 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 383, *Laboratory glassware — Interchangeable conical ground joints.*

ISO 384, *Laboratory glassware — Principles of design and construction of volumetric glassware.*

ISO 3585, *Borosilicate glass 3.3 — Properties.*

ISO 4803, *Laboratory glassware — Borosilicate glass tubing.*

ISO 4785, *Laboratory glassware — Straight-bore glass stopcocks for general purposes.*

3 Types and sizes

Four types of funnels are specified, of the following sizes:

type 1: separating funnel (conical) (see 7.1), nominal capacity (in millilitres)
50 - 100 - 250 - 500 - 1 000 and 2 000;

type 2: separating funnel (pear-shaped) (see 7.2), nominal capacity (in millilitres)
50 - 100 - 250 - 500 - 1 000 and 2 000;

type 3: dropping funnel (cylindrical) (see 7.3), nominal capacity (in millilitres)
50 - 100 - 250 - 500 and 1 000;

type 4: dropping funnel, graduated (cylindrical) (see 7.4), nominal capacity (in millilitres)
50 - 100 - 250 - 500 and 1 000.

If capacities are required other than those listed above, it is recommended that they should be in accordance with the requirements specified in this International Standard.

4 Materials

4.1 Separating funnels and dropping funnels shall be made from borosilicate glass 3.3 in accordance with ISO 3585. Internal stress and visible defects in the glass shall be reduced to a level sufficient to minimize the possibility of fracture due to thermal or mechanical shock.

4.2 Stopcock keys of separating funnels and dropping funnels shall be manufactured from borosilicate glass 3.3 in accordance with ISO 3585 or shall be manufactured from plastics material with suitable chemical and thermal characteristics, such as polytetrafluoroethylene. They shall be fitted with a suitable retaining device.

5 Construction

5.1 The construction shall be sufficiently robust to withstand normal usage.

5.2 Dropping funnels, supplied with a ground joint fitted below the stopcock, shall comply with the requirements of ISO 383.

Dropping funnels with a ground joint below the stopcock can be provided with a pressure-equalizing tube placed at the back of the funnel when it is in the position of normal use with the handle of the stopcock on the right.

Dropping funnels can be supplied with a Walter drop tip [see Figure 3 d)] to enable control of the drop speed.

5.3 The scale of graduated dropping funnels shall be placed centrally on the cylindrical part of the funnel when it is in the position of normal use with the handle of the stopcock on the right (for graduation and figuring, see ISO 384).

5.3.1 The graduation marks shall be numbered (see 7.4.1)

— in ascending order, or

— in both ascending and descending order (see 7.4.3).

5.3.2 Scales shall be provided with a longitudinal reference line through the midpoint of the graduation lines to facilitate reading when the funnel is in an inclined position.

NOTE   The scales of graduated dropping funnels only indicate approximately the volumes of liquid contained.

6 Marking

The following shall be marked on all separating funnels and dropping funnels:

— the nominal capacity, except for graduated dropping funnels;

— the symbol cm^3 or the symbol ml;

— the maker's or vendor's name or mark.

7 Dimensions

7.1 Type 1 — Separating funnels (conical type)

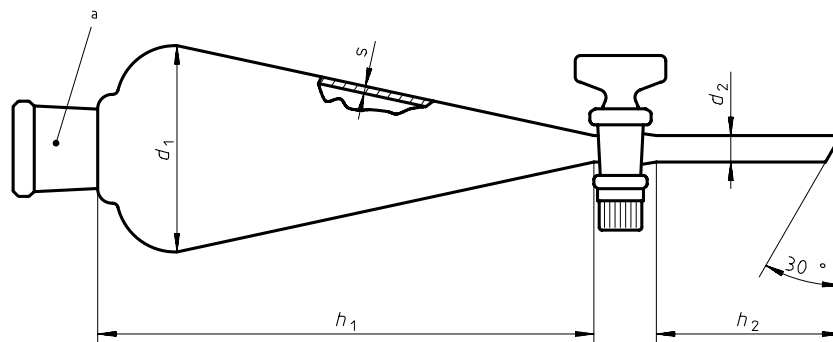Dimensions shall be as shown in Figure 1 and given in Table 1.

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Figure 1 — Conical separating funnel

Table 1 — Dimensions of conical separating funnels

Dimensions in millimetres

Nominal capacity, ml		50	100	250	500	1000	2000
Height of body, h_1	max.	120	145	190	230	300	350
Diameter of body, d_1	max.	50	65	85	100	135	155
Wall thickness of body, s	min.	1		1,2		1,5	
Diameter of stem a), d_2	min.	9		10			13
Length of stem, h_2	max.	70					
Nominal bore of stopcock b)	min.	1,5		2,5		4	
Size of stopper (see ISO 383)		14/23 or 19/26		24/29 or 29/32		29/32	
Length of tube between bulb and stopcock	max.	15					
Wall thickness of tube between bulb and stopcock	min.	1,2	1,5			2	
a) Medium-walled tubing in accordance with ISO 4803.							
b) Stopcocks in accordance with ISO 4785, series I.							

7.2 Type 2 — Separating funnels (pear-shaped type)

Dimensions shall be as shown in Figure 2 and given in Table 2.
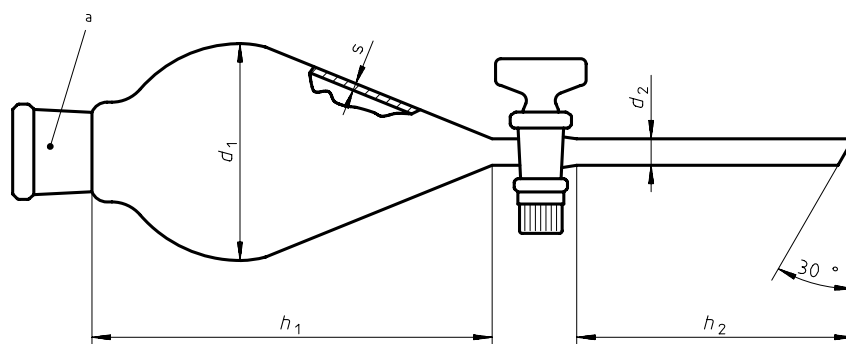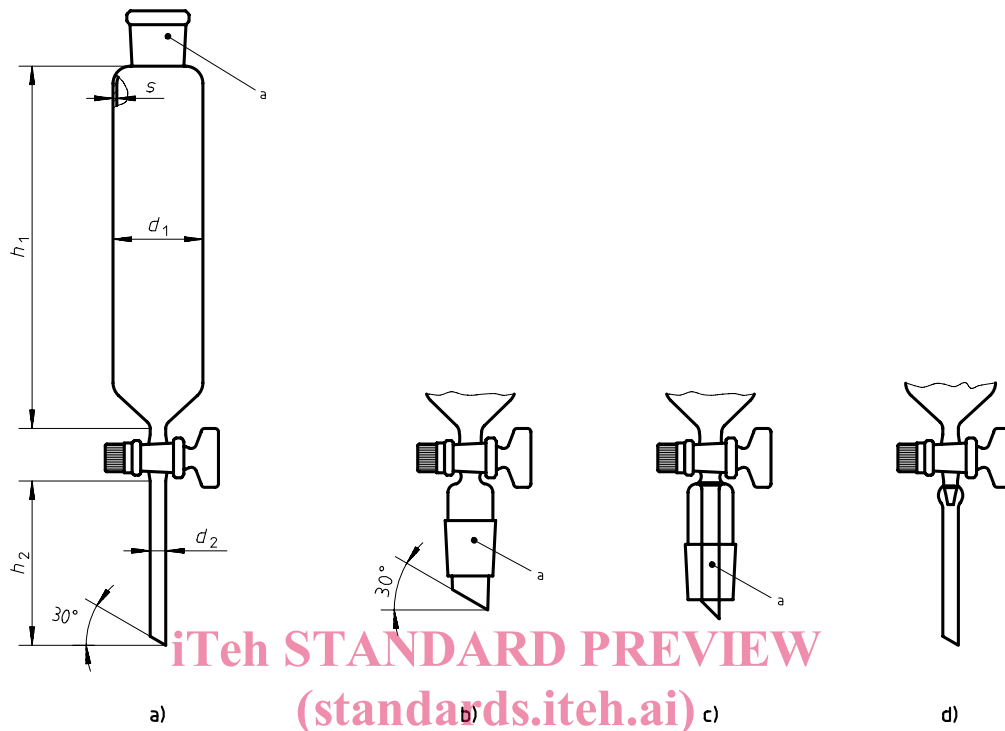

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Figure 2 — Pear-shaped separating funnel

Table 2 — Dimensions of pear-shaped separating funnels

Dimensions in millimetres

Nominal capacity, ml		50	100	250	500	1000	2000
Height of body, h_1	max.	95	120	160	200	250	295
Diameter of body, d_1	max.	53	66	87	107	134	169
Wall thickness of body, s	min.	0,8		0,9		1,3	1,5
Diameter of stem a), d_2	min.	9		10		13	
Length of stem, h_2	max.	100					
Nominal bore of stopcock b)	min.	1,5		2,5	4		
Size of stopper (see ISO 383)		14/23 or 19/26		24/29 or 29/32		29/32	
a) Medium-walled tubing in accordance with ISO 4803.							
b) Stopcocks in accordance with ISO 4785, series I.							

7.3 Type 3 — Dropping funnels

Dimensions shall be as shown in Figure 3 and given in Table 3.

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Figure 3 — Dropping funnels

Table 3 — Dimensions of dropping funnels

Dimensions in millimetres

Nominal capacity, ml		50	100	250	500	1000
Height of body, h_1	min.	120	140	210	260	330
Diameter of body, d_1	max.	34	44	54	67	88
Wall thickness of body, s	min.	0,8		0,9		1,3
Diameter of stem a), d_2	min.	10			13	
Length of stem, h_2	max.	100				
Nominal bore of stopcock b)	min.	1,5	2,5		4	
Size of stopper (see ISO 383)		14/23 or 19/26		24/29 or 29/32		29/32
Length of tube between bulb and stopcock	max.	15				
Wall thickness of tube between bulb and stopcock	min.	2				
a) Medium-walled tubing (see ISO 4803).						
b) Stopcocks in accordance with ISO 4785, series I.						