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# INTERNATIONAL STANDARD



# 4800

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Laboratory glassware — Separating funnels and dropping funnels

*Verrerie de laboratoire — Ampoules à décanter et ampoules à introduire*

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**Descriptors** : laboratory equipment, laboratory glassware, funnels, specifications, dimensions, marking.

Price based on 7 pages

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4800 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in March 1976.

It has been approved by the member bodies of the following countries :

Austria	Hungary	Romania
Belgium	India	South Africa, Rep. of
Canada	Israel	Spain
Chile	Italy	Turkey
Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Netherlands	U.S.A.
France	Philippines	U.S.S.R.
Germany	Poland	

The member body of the following country expressed disapproval of the document on technical grounds :

Australia

# Laboratory glassware – Separating funnels and dropping funnels

## 0 INTRODUCTION

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

The stem of a separating funnel should be short and must be reasonably wide in order to avoid the formation of a liquid column, which could lead to unsatisfactory separation.

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.

Some confusion has been caused in the past by incorrect references to a pear-shaped funnel as a “dropping funnel”, and a cylindrical funnel as a “separating funnel”.

## 1 SCOPE AND FIELD OF APPLICATION

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

## 2 REFERENCES

ISO 383, *Laboratory glassware – Interchangeable conical ground joints.*

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

ISO 4803, *Laboratory glassware – Borosilicate glass tubing.*<sup>1)</sup>

## 3 TYPES AND SIZES

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

**type 1** : separating funnel (conical) (see 7.1), nominal capacity 100 – 250 – 500 and 1 000 ml;

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

**type 3** : separating funnel (Gilson type) (see 7.3), nominal capacity 50 – 100 – 250 – 500 – 1 000 and 2 000 ml;

**type 4** : dropping funnel (cylindrical) (see 7.4), nominal capacity 50 – 100 – 250 – 500 and 1 000 ml;

**type 5** : dropping funnel, graduated (cylindrical) (see 7.5), nominal capacity 50 – 100 – 250 – 500 and 1 000 ml.

## 4 MATERIAL

Separating funnels and dropping funnels shall be made from clear glass of suitable chemical and thermal properties.

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.

## 5 CONSTRUCTION

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

**5.2** Dropping funnels may be supplied with a ground joint fitted below the stopcock, complying with the requirements of ISO 383.

Dropping funnels with a ground joint below the stopcock may 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.

**5.3** The scale of graduated dropping funnels is 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).

1) At present at the stage of draft.

**5.3.1** The graduation marks may be figured (see 7.5.1)

- in ascending order, or
- in both ascending and descending order (see 7.5.3).

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

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

## 6 INSCRIPTIONS

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

- the nominal capacity, except for graduated dropping funnels;
- the symbol  $\text{cm}^3$  or the symbol ml;
- the maker's or vendor's name or mark.

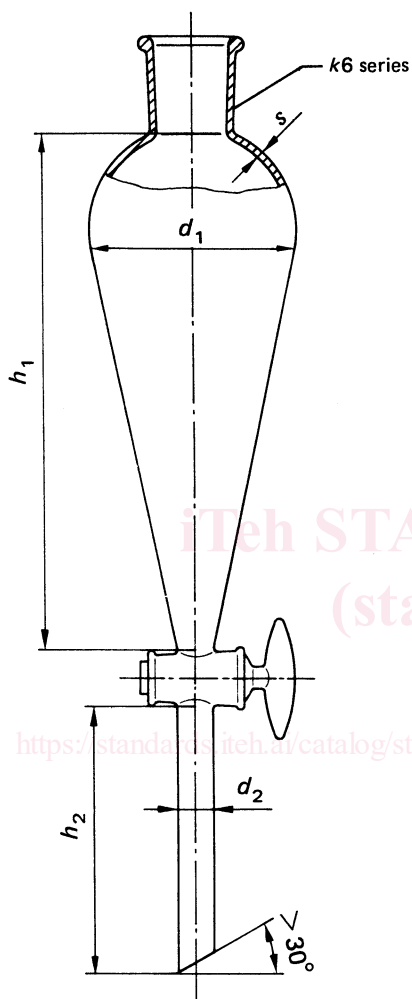
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7 DIMENSIONS

7.1 Type 1 – Conical separating funnels

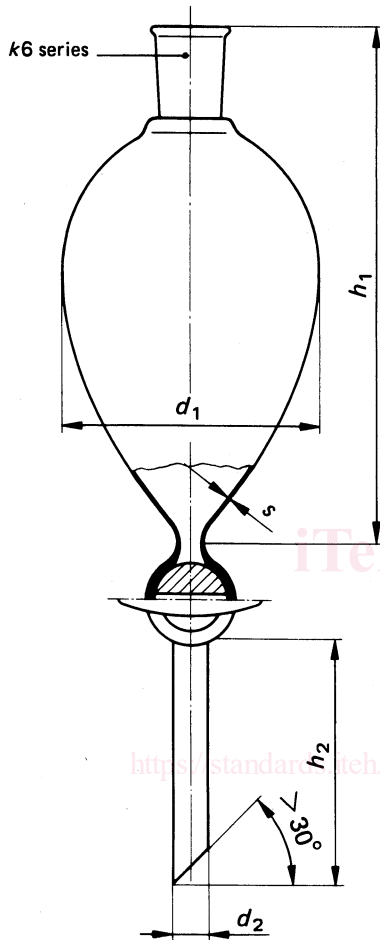


Dimensions in millimetres

Nominal capacity, ml	100	250	500	1 000	
Height of body, $h_1$	135	185	210	300	
Diameter of body, $d_1$	55	75	95	110	
Wall thickness of body, $s$	min.	1	1,2	1,5	1,5
Diameter of stem <sup>1)</sup> , $d_2$	$\pm 0,5$	10,5	12,5	12,5	12,5
Length of stem, $h_2$	$\pm 10$	70	70	70	70
Nominal bore of stopcock	min.	2	3	3	3
Size of stopper (see ISO 383)	k6 series				
Length of tube between bulb and stopcock	max.	15	15	15	15
Wall thickness of tube between bulb and stopcock	min.	1,5	1,5	1,5	2

1) Medium-walled tubing (see ISO 4803).

7.2 Type 2 – Pear-shaped separating funnels



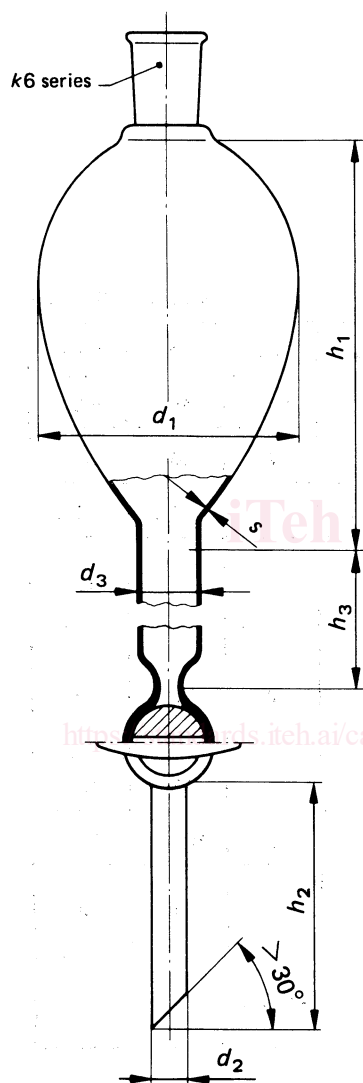
Dimensions in millimetres

Nominal capacity, ml	50	100	250	500	1 000	2 000
Height of body, $h_1$	80	100	130	160	200	250
Diameter of body, $d_1$	51	64	85	105	131	166
Wall thickness of body, $s$ min.	0,8	0,8	0,9	0,9	1,3	1,5
Diameter of stem <sup>1)</sup> , $d_2$ min.	9	9	10	10	13	13
Length of stem, $h_2$	60	60	60	60	60	60
Size of stopper (see ISO 383)	k6 series					
Nominal bore of stopcock min.	2	2	4	4	6	6

1) Medium-walled tubing (see ISO 4803).

7.3 Type 3 – Gilson type separating funnels

Dimensions as shown in 7.2, except the following :



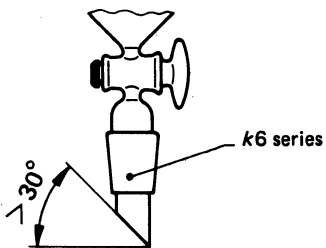
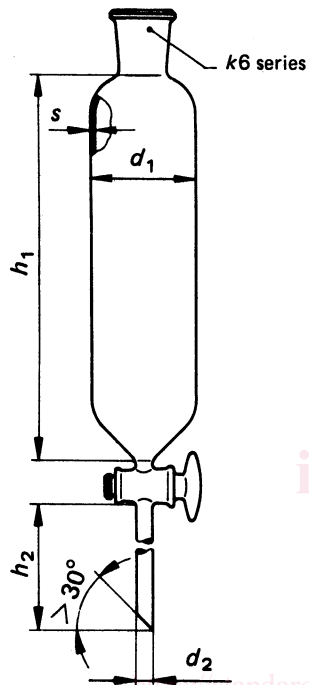
Dimensions in millimetres

Nominal capacity, ml	50	100	250	500	1 000	2 000
Length of tube between bulb and stopcock, $h_3$	100	100	125	150	200	200
Diameter of tube between bulb and stopcock, $d_3$	16	16	20	22	30	38
Nominal bore of stopcock min.	2	2	2	4	4	6

1) Medium-walled tubing (see ISO 4803)..

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7.4 Type 4 – Cylindrical dropping funnels



Alternative design with conical ground joint

Dimensions in millimetres

Nominal capacity, ml	50	100	250	500	1 000
Height of body, $h_1$	115	135	200	245	295
Diameter of body, $d_1$	32	42	52	65	85
Wall thickness of body, $s$ min.	0,8	0,8	0,9	0,9	1,3
Length of tube between bulb and stopcock max.	15	15	15	15	15
Wall thickness of tube between bulb and stopcock min.	2	2	2	2	2
Diameter of stem <sup>1)</sup> , $d_2$ max.	10	10	10	13	13
Length of stem, $h_2$ min.	100	100	100	100	100
Nominal bore of stopcock min.	1	2	2	4	4
Size of stopper (see ISO 383)	k6 series				

1) Medium-walled tubing (see ISO 4803).



**7.5 Type 5 – Graduated cylindrical dropping funnels**

Dimensions as shown in 7.4.

**7.5.1 Graduation**

Values in millilitres

Nominal capacity	50	100	250	500	1 000
Subdivided in	1	2	5	10	20
Numbered every	10	20	50	100	200
Lowest graduation line	5	10	25	50	100

**7.5.2 Total capacity based on average wall thickness**

Nominal capacity, ml	50	100	250	500	1 000
Total capacity, ml	60	118	288	562	1 100
Percentage above nominal	20	18	15	13	10

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**7.5.3 Scales**

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Nominal capacity				
50 ml	100 ml	250 ml	500 ml	1 000 ml
0 — 50	0 — 100	0 — 250	0 — 500	0 — 1 000
10 — 40	20 — 80	50 — 200	100 — 400	200 — 800
20 — 30	40 — 60	100 — 150	200 — 300	400 — 600
30 — 20	60 — 40	150 — 100	300 — 200	600 — 400
40 — 10	80 — 20	200 — 50	400 — 100	800 — 200

