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# Standard Specification for Laboratory Glass Filter Flasks[1]

This standard is issued under the fixed designation E1406; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification provides standard dimensional requirements for glass filtering flasks suitable for general laboratory use.

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

E438 Specification for Glasses in Laboratory Apparatus

E671 Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus

E676 Specification for Interchangeable Taper-Ground Joints

E920 Specification for Commercially Packaged Laboratory Apparatus

E921 Specification for Export Packaged Laboratory Apparatus

E1133 Practice for Performance Testing of Packaged Laboratory Apparatus for United States Government Procurements

E1157 Specification for Sampling and Testing of Reusable Laboratory Glassware

## 3. Classification

3.1 Filtering flasks shall be in the following types and capacities:

3.1.1 *Type I*—Plain, heavy wall, in capacities of 250, 500, 1000, 2000, or 4000 mL.

3.1.2 *Type II*—With integral side-arm.

3.1.2.1 *Class 1*—With grooved or barbed side-arm in capacities of 25, 50, 125, 250, 500, 1000, 2000, and 4000 mL.

3.1.2.2 *Class 2*—With threaded side-arm in capacities of 125, 250, 500, 1000, 2000, and 4000 mL.

3.1.3 *Type III*—With replaceable side-arm.

3.1.3.1 *Class 1*—Straight style, in capacities of 250, 500, 1000, 2000, and 4000 mL.

3.1.3.2 *Class 2*—45 % angle side-arm, in capacities of 125, 250, 500, 1000, 2000, and 4000 mL.

3.1.3.3 *Class 3*—Two 45 % angle side-arm, in capacities of 500, 1000, and 2000 mL.

NOTE 1—The term millilitre (mL) is commonly used as a special name for the cubic centimetre ($cm^3$ ) and similarly the liter (L) for 1000 cubic centimetres, in accordance with the International System of Units (SI).

## 4. Material and Manufacturing

4.1 Flasks shall be made of borosilicate glass conforming to the requirement of Type I, Class A of Specification E438.

4.2 Maximum residual thermal stress shall be such as to conform to Specification E671.

## 5. Workmanship, Finish, and Appearance

5.1 The general appearance of the flasks shall be as illustrated in Fig. 1.

## 6. Design

6.1 Conical flasks shall have flat bottoms. However, concavity in the bottom shall be permitted. The flasks shall stand vertically without rocking or spinning when placed on a level surface. Bottom heel radius shall be smooth and shall be not less than that given in Table 1.

6.2 Neck finish shall be strengthened and may be tapered or cylindrical or, alternatively, it may be manufactured with an interchangeable taper-ground joint of appropriate size (see Specification E676).

6.3 Side-arm or Type II and III shall be located above or straddling the neck to body juncture. It shall be located sufficiently below the top finish to avoid blockage by an inserted stopper.

6.3.1 Type II shall have an integral glass side-arm.

6.3.1.1 *Type II*—Class 1 side-arms (grooved or barbed) shall be capable of accepting rubber tubing (see Fig. 1).

6.3.1.2 *Type II*—Class 2 side-arms shall be threaded so as to accept a threaded connector designed to accept rubber tubing (see Fig. 1).

6.3.2 Type III shall be designed to accept a neoprene grommet which in turn accepts a replaceable side-arm.

6.3.2.1 Type III, Class 1, shall have a replaceable glass side-arm that fits within the grommet, 90° from the axis of the flask.

[1] This specification is under the jurisdiction of ASTM Committee E41 on Laboratory Apparatus and is the direct responsibility of Subcommittee E41.01 on Laboratory Ware and Supplies.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

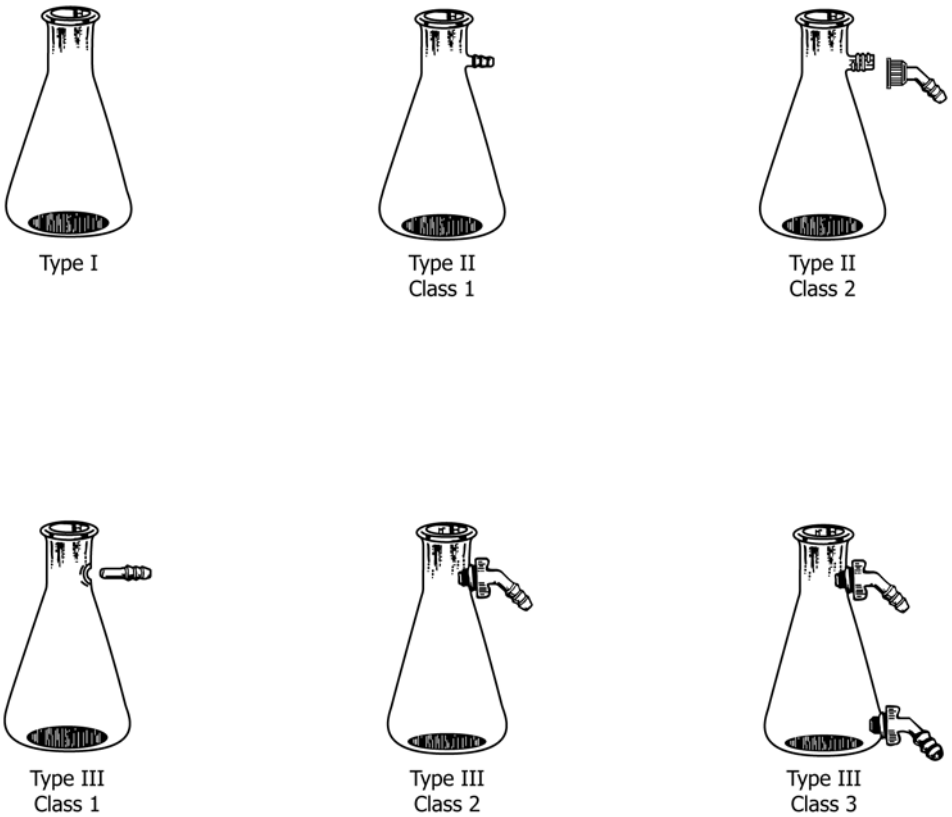


**FIG. 1 General Appearance of Glass Filter Flasks**

**TABLE 1 Capacity and Dimensions**

| Capacity, mL | Body Outside Diameter Widest Diameter, max, mm | Overall Height max, mm | Rubber Stopper Size (neck) | Wall Thickness Bottom and Heel min, mm | Base/Heel Radius min, mm |
|---|---|---|---|---|---|
| 25 | 41 | 77 | 3 | 1.0 | 6 |
| 50 | 52 | 85 | 4 | 1.5 | 6 |
| 125 | 71 | 115 | 5 | 1.5 | 12 |
| 250 | 86 | 160 | 6 | 1.8 | 12 |
| 500 | 108 | 190 | 7 | 2.0 | 15 |
| 1000 | 138 | 245 | 8 | 2.0 | 20 |
| 2000 | 170 | 305 | 9 | 2.5 | 23 |
| 4000 | 210 | 385 | 12 | 3.0 | 26 |

6.3.2.2 Type III, Class 2 shall have a replaceable polypropylene side arm that fits within the grommet initially at 90° from the axis of the flask, but then bent at a 45° angle.

6.3.2.3 Type III, Class 3 shall be like Type III, Class 2 except to have a second neoprene grommet and polypropylene side-arm located in the heel of the flask and in line with the first side arm in the neck area. (This second opening must be closed during filtration.)

## 7. Capacity and Dimensions

7.1 Conical filtering flasks shall conform to the requirements of Table 1.

## 8. Pressure Resistance

8.1 Filter flasks shall be so constructed as to withstand a pressure differential (external-internal) of 29 psi, or twice the pressure in normal use, when tested in accordance with the test method specified in Annex A1.

## 9. Sampling and Testing

9.1 Refer to Specification E1157.

## 10. Product Markings

10.1 Each flask shall be permanently marked with the name or known trademark of the manufacturer and the nominal capacity. Flasks may also be marked with approximate graduation markings that have a limit of error of ±5 % of full capacity.

10.2 There shall be an area on one side of the flask for marking with a pencil.

## 11. Packaging

11.1 Refer to either Specification E920, Specification E921, or Practice E1133.

## 12. Keywords

12.1 flasks; filtering; glass; laboratory

## ANNEX

**(Mandatory Information)**

## A1. HYDRAULIC EXTERNAL PRESSURE TESTS

A1.1 The filter flask should be tested in a pressure vessel connected to a suitable water supply and fitted with a pressure gage of appropriate range. Alternatively, pressure may be applied by means of a ram pump connected to a water reservoir with a release valve discharging back to the reservoir. A suitable arrangement is shown in Fig. A1.1. Quick-action fastening for the lid of the pressure vessel is desirable to avoid waste of time in tightening ordinary nuts and bolts.

A1.2 The filter flask shall be closed by appropriate means, for example stoppers. To ensure submersion, it is necessary to hold the filter flask in some suitable device or, alternatively, weights wrapped in paper or cloth may be placed inside it.

A1.3 After the filter flask is placed in position and the lid fastened the pressure vessel shall be filled with water, and the pressure brought up to 29-lb gage pressure, and maintained at that pressure for 1 min.

A1.4 A test of this duration indicates that a vessel passing it could be expected to withstand indefinitely a pressure differential (external-internal) of 14.5 lb provided that the glass is not abraded, bruised, or otherwise damaged in subsequent service.

A1.5 Nevertheless, when the flask is in use, precautions against its collapse under pressure should be observed.

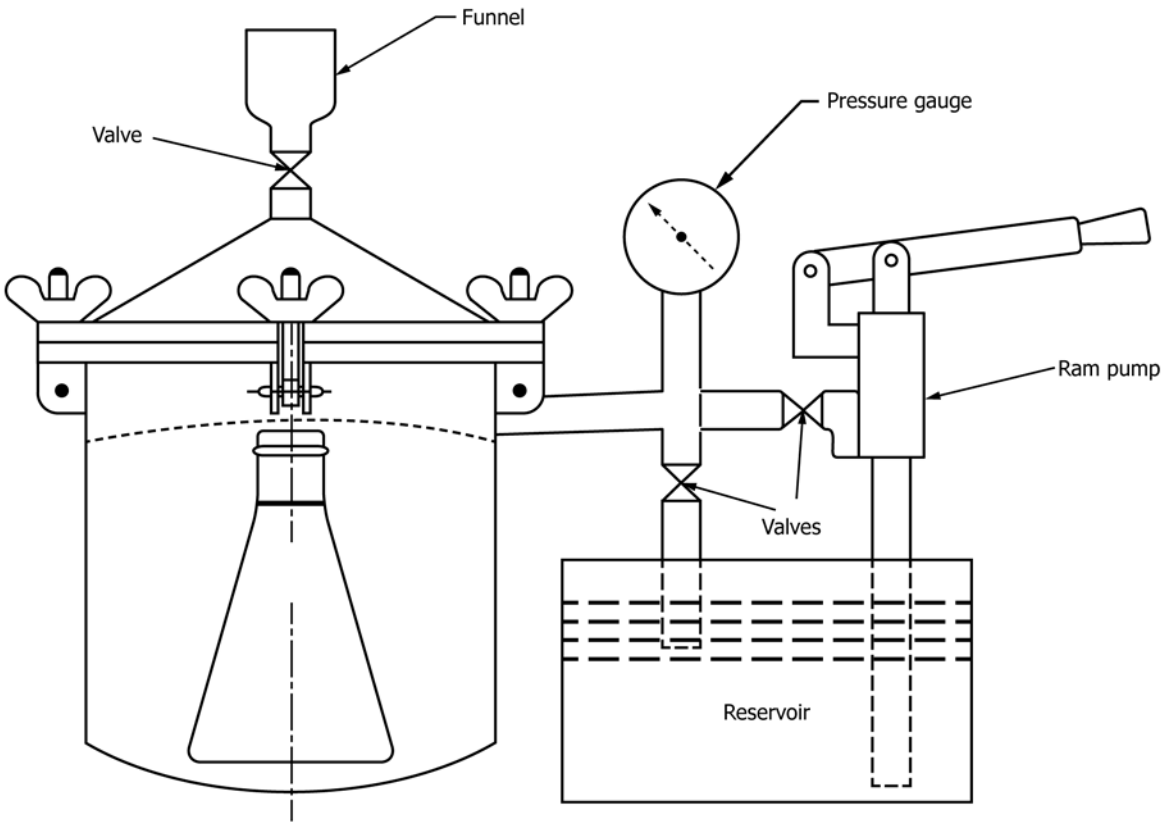


**FIG. A1.1 Hydraulic Test Rig for Filter Flasks**