Designation: ~~E1096 – 86 (Reapproved 2011)~~ E1096 – 86 (Reapproved 2018)

Standard Specification for Laboratory Glass Separatory Funnels[1]

This standard is issued under the fixed designation E1096; 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.

INTRODUCTION

Separatory funnels are used in laboratories primarily for liquid extractions, and are intended to facilitate the separation of two immiscible liquids of different densities into separate layers. Some funnels are used to add reagent solution into a reaction vessel. They are, therefore, often provided with a tapered ground joint at the bottom of the delivery stem for joining to vessels having similarly tapered ground necks. They may also be provided with pressure equalizing side arms.

1. Scope

1.1 This specification provides standard dimensional requirements for glass separatory funnels for general laboratory use.

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

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
E675 Specification for Interchangeable Taper-Ground Stopcocks And Stoppers
E676 Specification for Interchangeable Taper-Ground Joints
E694 Specification for Laboratory Glass Volumetric Apparatus
E911 Specification for Glass Stopcocks with Polytetrafluoroethylene (PTFE) Plugs

3. Classification

3.1 Separatory funnels shall be in the following types and sizes:
3.1.1 *Type 1A*—Cylindrical shape with open top.
3.1.1.1 *Sizes*—60, 125, and 250 cm^3.
3.1.2 *Type 1B*—Cylindrical with stopper finish top.
3.1.2.1 *Sizes*—60, 125, 250, 500, and 1000 cm^3.
3.1.3 *Type 1C*—Cylindrical with stopper finish top, graduated.
3.1.3.1 *Sizes*—125, 250, 500, and 1000 cm^3.
3.1.4 *Type 2*—Globe shape with stopper finish top.
3.1.4.1 *Sizes*—60, 125, 250, 500, 1000, 2000, and 4000 cm^3.
3.1.5 *Type 3*—Globe shape, "French," with stopper finish top.
3.1.5.1 *Sizes*—125, 250, 500, and 1000 cm^3.
3.1.6 *Type 4*—Pear shape, Squibb, with stopper finish top.
3.1.6.1 *Sizes*—20, 60, 125, 250, 500, 1000, 2000, and 4000 cm^3.

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

Current edition approved ~~Dec. 1, 2011~~Jan. 1, 2018. Published ~~December 2011~~January 2018. Originally approved in 1986. Last previous edition approved in ~~2006~~2011 as E1096 – 86 (~~2006~~)(2011) DOI: ~~10.1520/E1096-86R11.~~10.1520/E1096-86R18.

[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.

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

4. Materials and Annealing

4.1 Separatory funnels shall be made of borosilicate glass conforming to the requirement of Type 1, Class A of Specification E438.

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

5. Design

5.1 Type 1 cylindrical separatory funnels shall have straight sides and comply with the dimensions given in Table 1. (Type 1A stem length shall comply with Table 2.) See Fig. 1, Type 1A; 1B; and 1C.

5.2 Type 2 globe-shaped separatory funnels shall be roughly globular in shape and have dimensions complying with those given in Table 2. See Fig. 2, Type 2.

5.3 Type 3 separatory funnels shall be like Type 2, however, a straight-walled portion shall be between the globe and the stopcock assembly and shall meet the dimensions listed in Table 2, except for stem length which shall have a maximum length of 40 mm. See Fig. 2, Type 3.

5.4 Type 4 Squibb separatory funnels shall be pear-shaped or conical-shaped and meet the requirements of Table 3. See Fig. 2, Type 4.

5.5 Type 1 and 4 separatory funnels may be supplied with a taper-ground joint below the stopcock, (see Specification E676 and Fig. 1C. Type 1 funnels with this feature may also have pressure equalizing tubes placed at the back or opposite side of the funnel when it is in the position of normal use with the handle of the stopcock on the right. See Fig. 1B).

5.6 All types except Type 1A shall have stoppers or be taper-ground to receive stoppers in accordance with Specifications E675 or E676. Stoppers of suitable inert plastic material may be permitted as an alternative to glass but must also comply with Specification E675. All stoppers shall bear a size identification.

5.7 All types shall have stopcock assemblies. They shall be designed to permit smooth and precise control of outflow and to meet the permissible leakage rate requirements allowed in Specification E675. Stopcocks shall be made of glass or from suitable inert plastic material such as polytetrafluoroethylene (PTFE) and must comply with Specification E911, or form a seal by having PTFE plug ends butt against a constriction in the glass shell.

5.8 Delivery stems for Types 1B and C, 3, and 4 should have a bore wide enough to avoid formation of a liquid column, that could lead to unsatisfactory separation. Type 1A and Type 2 funnel stems shall conform to stem dimensions of Table 2. Stem tip shall be at an angle of 30 or 45°.

6. Graduations

6.1 Type 1C separatory funnels shall have a graduated scale placed centrally about the vertical axis of the funnel when it is in position of normal use with the handle of the stopcock on the right. See Table 4 for specifications. (For graduation pattern and figuring see Specification E694.)

6.1.1 The graduation marks may be figured in ascending order or in both ascending and descending order.

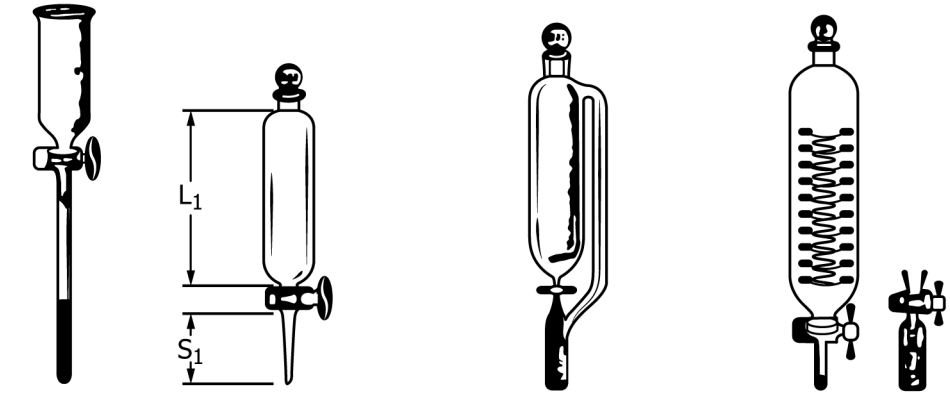

FIG. 1 Cylindrical Body Funnels