Designation: E1403 – 97 (Reapproved 2013)

Standard Specification for Laboratory Glass Boiling Flasks[1]

This standard is issued under the fixed designation E1403; 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 flat-bottom and round-bottom glass boiling flasks.

NOTE 1—For packaging standards, choose among the following standards, E920, E921, E1133, and E1157.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

E677 Specification for Interchangeable Spherical 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 Boiling flasks shall be in the following types and sizes.

3.1.1 *Type I*—Flat bottomed

3.1.1.1 *Class 1*—Tooled top; long neck in the following sizes: 50 mL, 125 mL, 250 mL, 500 mL, 1 000 mL, 2 000 mL, 3 000 mL, 6 000 mL, and 12 000 mL.

3.1.1.2 *Class 2*—Ring neck, long neck in the following sizes: 500 mL, 1 000 mL, 2 000 mL, 6 000 mL, and 12 000 mL.

3.1.1.3 *Class 3*—Ring neck, long neck, wicker protector in the following size: 500 mL and 1000 mL.

3.1.1.4 *Class 4*—Standard Taper $\bar{\$}$ neck, short neck in the following sizes: 50 mL, 125 mL, 250 mL, 300 mL, 500 mL, and 1000 mL.

3.1.1.5 *Class 5*—Standard Taper $\bar{\$}$ neck, long neck in the following sizes: 250 mL, 500 mL, and 1000 mL.

3.1.2 *Type II*—Round Bottomed

3.1.2.1 *Class 1*—Tooled top, long neck in the following sizes: 25 mL, 50 mL, 100 mL, 250 mL, 500 mL, 1000 mL, 2000 mL, 5000 mL, and 6000 mL.

3.1.2.2 *Class 2*—Ring neck, short neck in the following sizes: 250 mL, 500 mL, 1 000 mL, 2 000 mL, 3 000 mL, 5 000 mL, 12 000 mL, and 22 000 mL.

3.1.2.3 *Class 3*—Standard Taper $\bar{\$}$ neck, short neck in the following sizes: 5 mL, 10 mL, 25 mL, 50 mL, 100 mL, 250 mL, 500 mL, 1 000 mL, 2 000 mL, 3 000 mL, 5 000 mL, and 12 000 mL.

3.1.2.4 *Class 4*—Standard Taper $\bar{\$}$ neck, long neck in the following sizes: 100 mL, 250 mL, 500 mL, and 1000 mL.

3.1.2.5 *Class 5*—Standard Taper $\bar{\$}$ neck, short neck with side arm in the following sizes: 250 mL and 300 mL.

3.1.2.6 *Class 6*—Standard Taper $\bar{\$}$ neck, short neck with thermometer well in the following sizes: 500 mL, 1000 mL, and 2000 mL.

3.1.2.7 *Class 7*—Ball and socket $\bar{\$}$ neck, short neck in the following sizes 250 mL, 500 mL, 1000 mL, and 2000 mL.

3.1.3 *Type III*—Heart-shape bottomed

3.1.3.1 *Class 1*—Standard Taper $\bar{\$}$ neck, short neck in the following sizes: 5 mL, 10 mL, 25 mL, 50 mL, and 100 mL.

NOTE 2—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. Material and Annealing

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.

[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.

Current edition approved Nov. 1, 2013. Published December 2013. Originally approved in 1991. Last previous edition approved in 2008 as E1403 – 97 (2008). DOI: 10.1520/E1403-97R13.

[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.

5. Appearance

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

6. Design

6.1 Necks on all single-neck flasks shall be circular in cross section and perpendicular to the center of the flask body. Neck lengths may be designated “short” or “long”.

6.2 The top shall be strengthened and finished.

6.2.1 Vial finish or tooled top

6.2.2 Beaded rim or ring neck

6.2.3 Standard taper ground glass joint in compliance with Specification E676

6.2.4 Ball and socket ground glass joint, in compliance with Specification E677

6.3 Wall thickness minimums are given for all flasks in Table 1.

6.4 Flat bottoms shall be in a plane perpendicular to the vertical axis through the neck of the flask.

6.4.1 The bottom of the flask shall be flat, however very slight concavity is permitted. The flasks shall stand vertically without rocking or spinning when placed on a level surface.

6.4.2 The diameter of the flat base of the flask shall be 45 to 65 % of the maximum external diameter.

6.4.3 Type I, Class 3 flat-bottomed flasks shall have a woven wicker insulation collar around the neck.

6.5 Round-bottomed flasks shall be spherical in shape to the point of juncture with the flask neck.

6.5.1 Type II, Class 5 round-bottom flasks shall have a side-arm opening to accommodate a thermometer or bleed tube into the interior of the flask content.

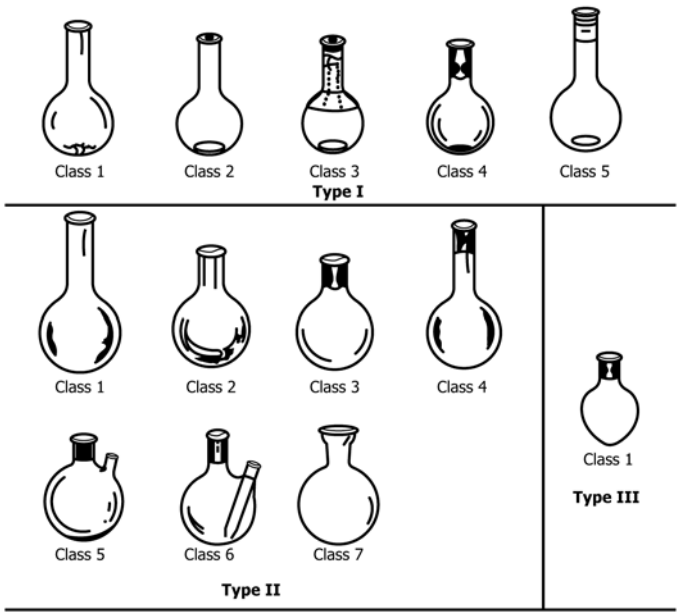

FIG. 1 General Appearance of Flasks

TABLE 1 Capacity and Dimensions for Glass Boiling Flask

Nominal capacity, mL	Outside Diameter Body Widest Point max, mm	Stopper[A] size	Overall Height—Maximum Without Stopper			Wall thickness[B] min, mm
			Flat bottom, mm	Round bottom, mm	Heart-shaped bottom, mm	
5	26	...	...	52	55	0.8
10	32	...	...	60	65	0.8
25	43	1	...	92	80	0.8
50	52	1	103	108	99	0.8
100	66	2	113	122	117	0.8
125	70	2 or 3	122	...	...	0.8
200	76	5	...	130	...	0.8
250	87	5	150	155	...	0.8
300	89	5	150	155	...	0.8
500	107	6	190	210	...	0.8
1000	134	8	220	250	...	0.8
2000	170	8 or 10	295	315	...	1.1
3000	192	9 or 10	333	260	...	1.4
5000	223	11	...	390	...	1.5
6000	239	11	375	360	...	1.8
12000	298	11	395	385	...	2.0
22000	352	14	...	432	...	2.5

[A] Rubber stopper style only.
[B] Neck seal zones may be a minimum of 70 % of these values.

6.5.2 Type II, Class 6 round-bottom flasks shall have a thermometer well within the flask but not open to the content of the flask.

6.6 Heart-shape-bottomed flasks (sometimes called pear shaped) shall be shaped to concentrate small amounts of liquid in the bottom center of the flask.

7. Capacity and Dimensions

7.1 The nominal capacity of a flask shall not exceed the actual capacity to the base of the neck. Dimensions shall conform to the requirements of Table 1.

8. Sampling and Testing

8.1 See Specification E1157.

9. Product Marking

9.1 Each flask shall be permanently marked with the name or known trademark of the manufacturer and the nominal capacity. If applicable, the standard taper or ball and socket joint size shall be marked on each flask.

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

10. Packaging and Package Marking

10.1 Select from one of Specifications E920, E921, and Practice E1133.

11. Keywords

11.1 boiling; flasks; glass