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Standard Specification for Laboratory Glass Distillation Flasks[1]

This standard is issued under the fixed designation E1405; 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 covers standard dimensional requirements for glass distillation flasks. It includes general purpose flasks and flasks designed for specific tests especially in the petroleum testing area.

NOTE 1—For packaging standards, choose among Specifications E920, E1157, and E1133.

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]

D20 Test Method for Distillation of Road Tars
D86 Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure
D216 Method of Test for Distillation of Natural Gasoline (Withdrawn 1988)[3]
D233 Test Methods of Sampling and Testing Turpentine
D246 Test Method for Distillation of Creosote and Creosote-Coal Tar Solutions (Withdrawn 2006)[3]
D285 Test Method for DISTILLATION OF CRUDE PETROLEUM (Withdrawn 1985)[3]
D402 Test Method for Distillation of Cutback Asphalt
D447 Test Method for Distillation Of Plant Spray Oils (Withdrawn 1998)[3]
D801 Test Methods for Sampling and Testing Dipentene
D802 Test Methods for Sampling and Testing Pine Oils
D850 Test Method for Distillation of Industrial Aromatic Hydrocarbons and Related Materials
D1078 Test Method for Distillation Range of Volatile Organic Liquids
D2569 Test Method for Distillation of Pitch (Withdrawn 2006)[3]
E3 Guide for Preparation of Metallographic Specimens
E4 Practices for Force Verification of Testing Machines
E438 Specification for Glasses in Laboratory Apparatus
E671 Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus
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

2.2 *Other Documents:*

U.S. Bureau of Mines Technical Paper 323B Method 100.13[4]

3. Classification

3.1 Distillation flasks shall be of the following types and sizes:

3.1.1 *Type I*—General purpose distilling flasks shall be of the following nominal capacities: 10 mL; 25 mL; 50 mL; 125 mL; 200 mL; 250 mL; 500 mL; 1000 mL; 2000 mL.

3.1.2 *Type II*—Special purpose distilling flasks shall be of the following classes:

3.1.2.1 *Class 1*—Barrett, 200 mL.

3.1.2.2 *Class 2*—Church, in the following sizes: 300 mL; 500 mL.

3.1.2.3 *Class 3*—Engler, 100 mL.

3.1.2.4 *Class 4*—Hempel, 500 mL.

3.1.2.5 *Class 5*—Saybolt, 250 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 cm^3, in accordance with the International System of Units (SI).

4. Materials and Manufacture

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

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

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, http://dodssp.daps.dla.mil.

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 illustrated in Fig. 1.

6. Design

6.1 Necks on all distilling flasks shall be circular in cross section and perpendicular to center of flask body.

6.2 Top shall be tooled or beaded.

6.3 Sidearms on all distilling flasks shall be circular in cross section. Sidearms shall be sealed at an angle of 75 ± 3° from the neck.

6.4 Bottoms of flasks shall be spherical in shape to the point of juncture with the flask neck. The 10-, 25-, and 50-mL sizes may have heart-shaped bottoms if desired.

7. Dimensions, Mass and Possible Variations

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

8. Product Marking

8.1 Each flask shall be permanently marked with the name or known trademark of the manufacturer and the nominal capacity.

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

9. Keywords

9.1 distilling; flasks; glass

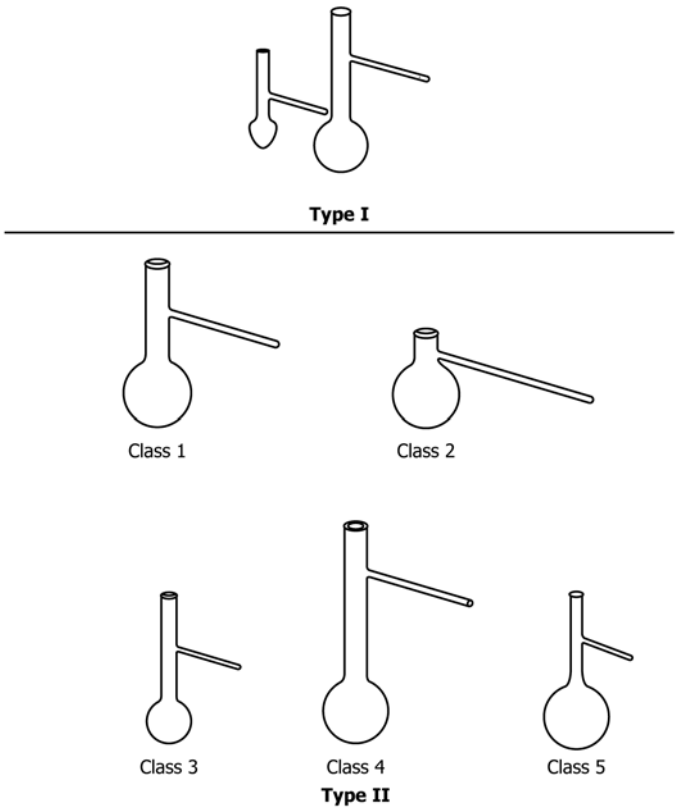

FIG. 1 General Appearance of Glass Distillation Flasks

TABLE 1 Capacity and Dimensions for Class Distilling Flasks

Classification		Nominal Capacity, mL	Body OD, max	Body Wall Thickness, min, mm	Stopper Size	Overall Height, max	Sidearm OD ±0.5 mm	Sidearm Length ±3 mm	Distance from Center Sidearm To ±3 mm	
Type	Class								Top	Bottom
I	...	10	30	0.8	00	113	6	100	34	...
I	...	25	43	0.8	0 or 1	160	7	100	77	...
I	...	50	51	0.8	0 or 1	166	7	100	77	...
I	...	125	70	0.8	2	217	7	100	...	137
I	...	200	78	0.8	3	203	9	130	77	...
I	...	250	88	0.8	3 or 4	253	9	130	77	...
I	...	500	105	0.8	4	271	9	130	77	...
I	...	1000	133	0.8	5	324	11	180	77	...
I	...	2000	166	1.1	8	363	11	180	77	...
II	1	200	77	0.8	3	182	7	100	...	120
II	2	300	88	0.8	4	133	10[A]	220	...	...
II	2	500	105	0.8	5	138	10[A]	220	...	...
II	3	100	66	0.8	2	218	6	100	...	137
II	4	500	103	0.8	5	357	8	172	...	...
II	5	250	88	0.8	1	218	6	100	...	150

[A] Stem inside diameter.

APPENDIX

(Nonmandatory Information)

X1. PROCEDURE CROSS REFERENCE

X1.1 *Type 1* flask, 125-mL size is referenced in the following: Test Method D86; Test Methods D233; Test Method D447; Test Methods D801; and Test Methods D802.

X1.2 *Type II, Class 1* flask is referenced in the following: Test Method D850; Test Method D1078; Practices E4; Methods E3.

X1.3 *Type II, Class 2* flask is referenced in the following: Test Method D20; Method D246; Test Method D402; Test Method D2569.

X1.4 *Type II, Class 3* flask is referenced in the following: Test Method D86; Method D216; U.S. Bureau of Mines Technical Paper 323B Method 100.13.

X1.5 *Type II, Class 4* flask is referenced in the following: Method D285.

X1.6 *Type II, Class 5* flask is referenced in the following: Test Method D86; Test Method D447.