



Designation: E 1405 – 98 (Reapproved 1999)^{ε1}

Standard Specification for Laboratory Glass Distillation Flasks¹

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ε¹ NOTE—Keywords were added editorially in March 2000.

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 E 920, E 1157, and E 1133.

2. Referenced Documents

2.1 ASTM Standards:

- D 20 Test Method for Distillation of Road Tars²
- D 86 Test Method for Distillation of Petroleum Products³
- D 216 Method of Test for Distillation of Natural Gasoline³
- D 233 Test Methods of Sampling and Testing Turpentine⁴
- D 246 Method for Distillation of Creosote and Creosote-Coal Tar Solutions⁵
- D 285 Method of Test for Distillation of Crude Petroleum⁶
- D 402 Test Method for Distillation of Cut-Back Asphaltic (Bituminous) Products²
- D 447 Test Method for Distillation of Plant Spray Oils³
- D 801 Test Methods for Sampling and Testing Dipentene⁴
- D 802 Test Methods for Sampling and Testing Pine Oil⁴
- D 850 Test Method for Distillation of Industrial Aromatic Hydrocarbons and Related Materials⁷
- D 1078 Test Method for Distillation Range of Volatile Organic Liquids⁷
- D 2569 Test Method for Distillation of Pitch³
- E 3 Methods of Preparation of Metallographic Specimens⁸
- E 4 Practices for Force Verification of Testing Machines⁸
- E 438 Specification for Glasses in Laboratory Apparatus⁹
- E 671 Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus⁹

¹ This specification is under the jurisdiction of ASTM Committee E-41 on Laboratory Apparatus and is the direct responsibility of E41.01 on Apparatus.

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² Annual Book of ASTM Standards, Vol 04.03.

³ Annual Book of ASTM Standards, Vol 05.01.

⁴ Annual Book of ASTM Standards, Vol 06.03.

⁵ Annual Book of ASTM Standards, Vol 04.10.

⁶ Discontinued, see 1985 Annual Book of ASTM Standards, Vol 05.01.

⁷ Annual Book of ASTM Standards, Vol 06.04.

⁸ Annual Book of ASTM Standards, Vol 03.01.

⁹ Annual Book of ASTM Standards, Vol 14.04.

E 920 Specification for Commercially Packaged Laboratory Apparatus⁹

E 921 Specification for Export Packaged Laboratory Apparatus⁹

E 1133 Practice for Performance Testing of Packaged Laboratory Apparatus for United States Government Procurements⁹

E 1157 Specification for Sampling and Testing of Reusable Laboratory Glassware⁹

2.2 Other Documents:

U.S. Bureau of Mines Technical Paper
323B Method 100.13¹⁰

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 (cm³) and similarly the litre (L) for 1000 cm³, 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 E 438.

4.2 Maximum residual thermal stress shall be such as to conform to Specification E 671.

5. Workmanship, Finish and Appearance

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

¹⁰ Available from Naval Publications and Forms Center, 5801 Tabor Ave., Philadelphia, PA 19120.

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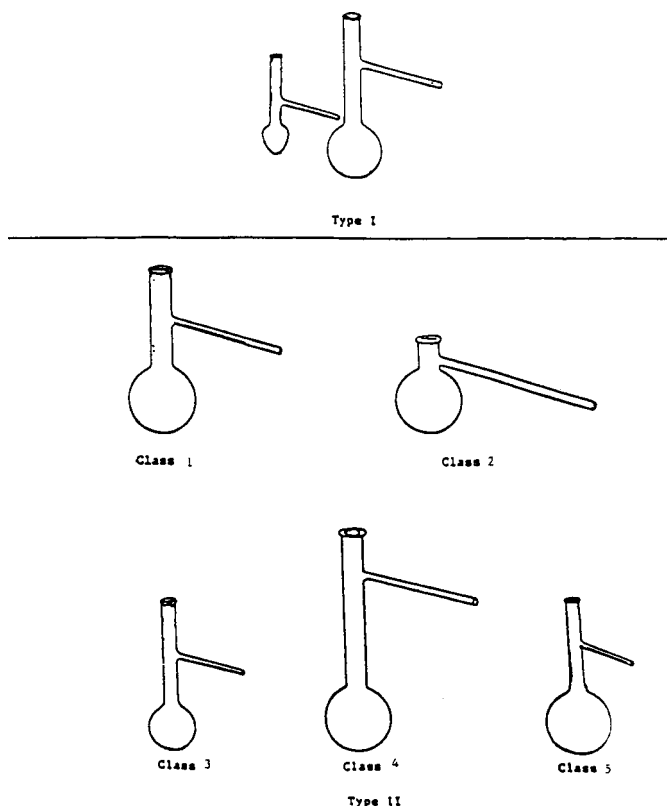


FIG. 1 General Appearance of Glass Distillation Flasks

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 $75 \pm 3^\circ$ 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.

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

^AStem inside diameter.