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# Standard Specification for Laboratory Glass Conical Flasks[1]

This standard is issued under the fixed designation E1404; 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 conical flasks suitable for general laboratory use.

NOTE 1—For packaging standards, choose the following standards; E920, E921, 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]

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

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 Conical flasks (Erlenmeyer) shall be in in the following types and capacities.

3.1.1 *Type I*—general purpose, with graduated scale.

3.1.1.1 *Class 1*—Narrow mouth with heavy duty beaded top, in capacities of 25 mL, 50 mL, 125 mL, 250 mL, 300 mL, 500 mL, 1000 mL, 1500 mL, 2000 mL, 4000 mL, and 6000 mL.

3.1.1.2 *Class 2*—Wide mouth with heavy duty beaded top, in capacities of 125 mL, 250 mL, 500 mL, 1000 mL, and 2000 mL.

3.1.2 *Type II*—Tapered ground joint, with graduated scale.

3.1.2.1 *Class 1*—Outer Conical, joint without stopper, in capacities of 50 mL, 125 mL, 250 mL, 500 mL, 1000 mL, and 2000 mL.

3.1.2.2 *Class 2*—with stopper, in capacities of 25 mL, 50 mL, 125 mL, 250 mL, 500 mL, and 1000 mL.

3.1.2.3 *Class 3*—For iodine determination, in capacities of 125 mL, 250 mL, and 500 mL.

3.1.3 *Type III*—Screw thread finish, with graduated scale, in capacities of 50 mL, 125 mL, 250 mL, 500 mL, 1000 mL, and 2000 mL.

3.1.4 *Type IV*—Culture;

3.1.4.1 *Class 1*—Long neck, plain top, in capacities of 50 mL, 125 mL, 250 mL, 500 mL, 1000 mL, and 2000 mL.

3.1.4.2 *Class 2*—Wide base (Fernbach), in capacity of 2800 mL.

3.1.4.3 *Class 3*—Wide base, low form, in a capacity of 2500 mL.

NOTE 2—The term milliliter (mL) is commonly used as a special name for the cubic centimeter ($cm^3$) and similarly the liter (L) for 1000 cubic centimeters, 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 requirements of Type I, Class A of Specification E438.

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

## 5. 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 flask shall stand vertically without rocking or spinning when placed on a level

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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.

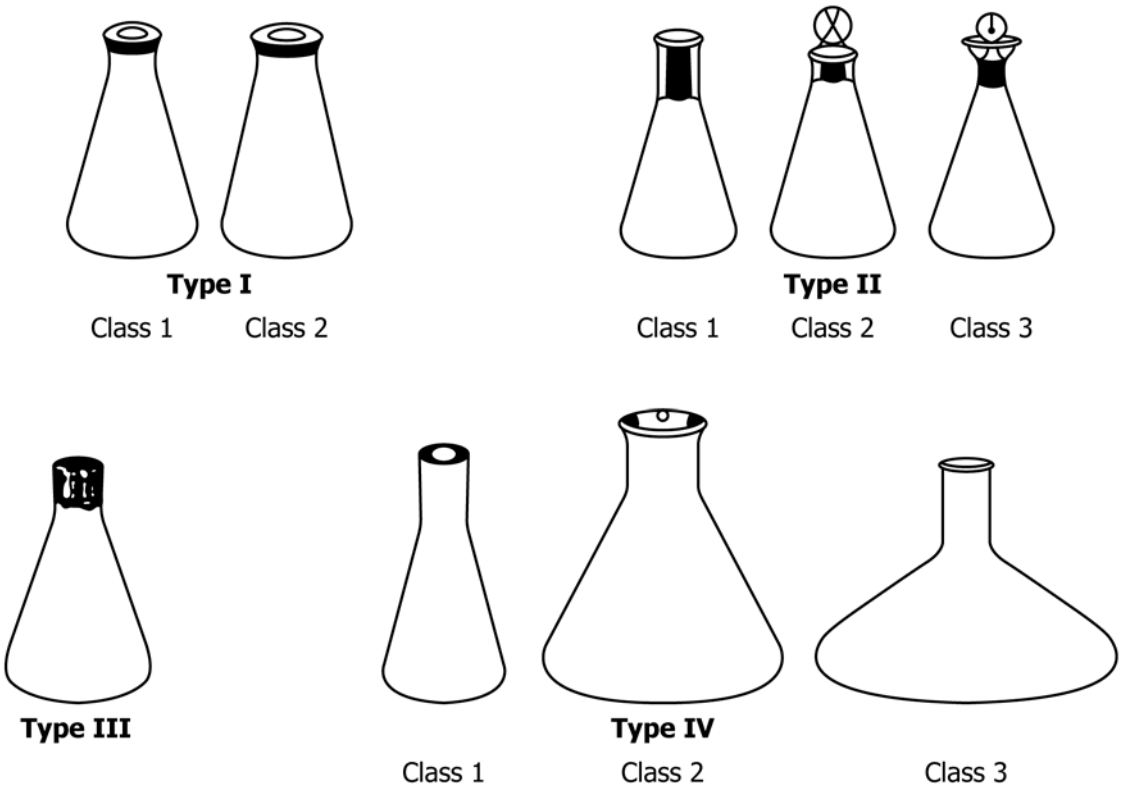


**FIG. 1 General Appearance of Flasks**

surface. Bottom heel radius shall be between 15 and 20 % of the maximum external diameter.

6.2 Conical sides of the flask shall extend inwardly for the bottom and shall terminate in a short cylindrical neck.

6.2.1 Type I and Type IV flasks shall have flask mouth finished with a tooled, heavy duty bead.

6.2.2 Type II, Class 1 shall have taper-ground joint neck finish in accordance with Specification E676.

6.2.3 Type II, Class 2 and Class 3 shall have taper-ground stopper neck finish to comply with E675. The Class 3 flasks shall also have a funnel neck flare. Stopper shall be tall enough to facilitate removal from flask.

6.2.4 Type III flasks shall have screw thread neck finish in accordance with Glass Packaging Institute (G.P.I.) standard finishes except as noted below. Dimensions shall be the same as Type I (Table 1).

6.2.4.1 G.P.I. thread finishes shall be 24 to 410 for the 50 and 125 mL sizes, 28 to 410 for the 250 mL size and 38 to 430 for the 500, 1000 and 2000 mL sizes except that the 38 to 430 may be modified to have the thread begin near the rim rather than approximately 0.55 in. below it.

6.3 Necks on all flasks shall be circular in cross-section. Top shall be tooled or beaded.

**TABLE 1 Capacity and Dimensions For Type I and Type III Conical Flasks W/O Caps or Stoppers**

| Capacity, mL | Body OD widest point (maximum), mm | Overall height (maximum), mm | Neck-rubber stopper fit | | Wall thickness (minimum) mm | Minimum graduated range mL | Maximum graduated subdivision mL |
|---|---|---|---|---|---|---|---|
| | | | Class 1 | Class 2 | | | |
| 25 | 42 | 67 | 0 | ... | 0.9 | 10 to 25 | 5 |
| 50 | 52 | 83 | 1 | ... | 0.9 | 20 to 50 | 10 |
| 125 | 69 | 117 | 5 | 6 | 0.9 | 50 to 125 | 25 |
| 250 | 84 | 138 | 6 | 8 | 0.9 | 50 to 200 | 25 |
| 300 | 90 | 146 | 6 | ... | 0.9 | 100 to 300 | 25 |
| 500 | 105 | 186 | 7 | 10 | 1.0 | 100 to 500 | 50 |
| 1000 | 131 | 222 | 9 | 11 | 1.0 | 250 to 1000 | 50 |
| 1500 | 151 | 247 | 9 | ... | 1.1 | 400 to 1400 | 100 |
| 2000 | 166 | 282 | 10 | 13 | 1.1 | 600 to 2000 | 200 |
| 4000 | 210 | 360 | 10 | ... | 1.8 | 1000 to 4000 | 500 |
| 6000 | 237 | 409 | 10 | ... | 1.9 | 1500 to 6000 | 500 |

**TABLE 2 Capacity and Dimensions For Type II Conical Flasks Without Stoppers[A]**

| Capacity, mL | Body OD Widest Point (Max.) mm | Overall Height (Max.) mm | | | Neck Finish | | |
|---|---|---|---|---|---|---|---|
| | | Class 1 | Class 2 | Class 3 | Joint Class 1 | Stopper Class 2 | Special Class 3 |
| 25 | 41 | ... | 67 | ... | ... | 16 | ... |
| 50 | 51 | 108 | 80 | ... | 19/38 | 19 | ... |
| 125 | 69 | 136 | 121 | 127 | 24/40 | 22 | 22 |
| 250 | 84 | 164 | 143 | 165 | 24/40 | 27 | 22 |
| 500 | 105 | 203 | 182 | 202 | 24/40 | 32 | 22 |
| 1000 | 132 | 238 | 210 | ... | 24/40 | 32 | ... |
| 2000 | 166 | 292 | ... | ... | 24/40 | ... | ... |

[A] See Table 1 for wall thickness, minimum graduated range, and maximum graduated subdivision.

**TABLE 3 Capacity and Dimension For Type IV Conical Flasks Without Stoppers[A]**

| Capacity, mL | Body OD widest point (maximum) mm | Overall height (maximum) mm | Nominal neck OD mm Class 1 | Neck-rubber stopper fit Classes 2 and 3 | Wall thickness (minimum) mm |
|---|---|---|---|---|---|
| 50 | 51 | 107 | 18 | ... | 0.8 |
| 125 | 67 | 128 | 25 | ... | 0.9 |
| 250 | 84 | 143 | 38 | ... | 0.9 |
| 500 | 105 | 187 | 38 | ... | 1.0 |
| 1000 | 131 | 234 | 38 | ... | 1.0 |
| 2000 | 166 | 292 | 38 | ... | 1.1 |
| 2500 | 260 | 205 | ... | 6.5 | 1.5 |
| 2800 | 209 | 235 | ... | 13 | 1.5 |

[A] See Table 1 for graduation range and subdivision if applicable.

## 7. Capacity and Dimensions

7.1 Conical flasks shall conform to the requirements of Table 1, Table 2, and Table 3.

## 8. Sampling and Testing

8.1 For sampling and testing refer to Specification E1157.

## 9. Product Markings

9.1 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. The graduation range and subdivision shall comply with the tables.

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

## 10. Packaging

10.1 For packaging, select from Specifications E920 or E921, or Practice E1133.

## 11. Keywords

11.1 conical; flasks; glass