



Designation: E 288 – 94 (Reapproved 1998)

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Laboratory Glass Volumetric Flasks¹

This standard is issued under the fixed designation E 288; 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 requirements for glass volumetric flasks of precision and general-purpose grades suitable for laboratory purposes.

1.1.1 *Class A*—Each flask of precision grade shall be marked with the letter “A” to signify compliance with applicable construction and accuracy requirements. Flasks may be marked with an identification number (serial number) at the option of the manufacturer.

1.1.2 *Class B*—General purpose flasks are of the same basic design as Class A flasks. However, volumetric tolerances for Class B flasks shall be within twice the specified range allowed for Class A flasks. These flasks need not be marked with their class designation.

NOTE 1—Specifications for microvolumetric flasks in sizes from 1 mL to 25 mL, inclusive, are given in Specification E 237.

NOTE 2—The Twelfth General (International) Conference on Weights and Measures redefined the litre as a “special name for the cubic decimetre,” but agreed to permit continuance of the terms litre, millilitre, and mL, except in association with measurements of the highest precision. For volumetric glassware the difference between the old and new meanings of litre is negligible. Therefore, either mL or cm³ may be marked on ware covered by this Specification.

2. Referenced Documents

2.1 ASTM Standards:

- E 237 Specification for Microvolumetric Vessels (Volumetric Flasks and Centrifuge Tubes)²
- E 438 Specification for Glasses in Laboratory Apparatus²
- E 542 Practice for Calibration of Volumetric Ware²
- E 675 Specification for Interchangeable Taper-Ground Stopcocks and Stoppers²
- E 694 Specification for Volumetric Ware²
- E 920 Specification for Commercially Packaged Laboratory Apparatus²
- E 921 Specification for Export Packaged Laboratory Apparatus²
- E 1133 Practice for Performance Testing of Packaged Laboratory Apparatus for United States Government Procurements²

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

Current edition approved Feb. 15, 1994. Published April 1994. Originally published as E 288 – 65T. Last previous edition E 288 – 83 (1988).

² *Annual Book of ASTM Standards*, Vol 14.04.

E 1157 Specification for the Sampling and Testing of Reusable Laboratory Glassware²

3. General Requirements

3.1 *Calibration*—Flasks shall be calibrated in accordance with the methods outlined in Practice E 542.

4. Design

4.1 Flasks shall be designed in accordance with Specification E 694. Flask necks may be designed with either taper-ground joints to accept stopper sizes specified in Table 1 or they may have reinforced rims or screw threads for acceptance of cap style closures. The neck may be either straightsided or provided with a mixing bulb located above the graduation line (intermediate bulb style). Any cross section of the neck taken in a plane parallel to the base shall be circular; similar sections of the body shall be either circular or square. The shape shall permit complete emptying and thorough cleaning. The bottom or base shall be such that the volumetric flask will stand solidly on a level surface. The area of the bottom or base shall be of sufficient size so that the volumetric flask (except the 10-mL flask), when empty and without stopper, shall stand on an inclined plane of 15° to the horizontal. The 10-mL flask shall stand on an inclined plane of 10° to the horizontal.

4.2 *Intermediate Bulb Style Flasks*—The bulb in the neck of an Intermediate Bulb-style flask shall hold approximately 10 % of the nominal capacity for sizes up to 1000 mL, inclusive, and 5 % of the nominal capacity for the 2000-mL size.

4.3 *Stoppers*—Where stoppers are provided they may be either glass or plastic, as desired by the user. Stoppers shall prevent leakage of liquid when flask is inverted or shaken.

4.4 *Dimensions*—Flasks shall conform to the essential dimensions given in Table 1.

4.5 *Markings*—All markings shall be permanent and legible.

4.5.1 *Capacity Line*—The capacity line shall be sharply defined and of uniform width (maximum 0.6 mm) in a plane parallel to the base of the flask. The line shall be applied by one of the following methods: etched and filled with a permanent pigment; engraved; etched or engraved through a vertical colored stripe fused into the glass; by application of a stain fired into the glass without etching; by application of an enamel which is fused on the glass without etching. The line shall completely encircle the flask except when the line consists of stain or enamel. If of stain or enamel, the line shall extend a