



Standard Specification for Interchangeable Taper-Ground Stopcocks And Stoppers¹

This standard is issued under the fixed designation E675; 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 The specification provides standard dimensional requirements for obtaining, within practical limits, interchangeability in stopcocks and stoppers for ordinary laboratory and industrial applications. It covers dimensional interchangeability of the ground surfaces only and does not involve design characteristics of the item except where specified.

NOTE 1—The dimensions pertaining to stopcocks and stoppers were taken from the Commercial Standard CS 21 of the U.S. Department of Commerce.

NOTE 2—Although glass is the most commonly used material for stopcocks and stoppers, other materials may be used as specified. Stopcocks and stoppers constructed from glass should conform to Specifications E438 and E671.

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
- 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 U.S. Department of Commerce Standard:

- CS 21 Interchangeable Taper-Ground Joints, Stopcocks, Stoppers, and Spherical-Ground Joints³

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, 2012. Published November 2012. Originally approved in 1979. Last previous edition approved in 2007 as E675 – 02(2007). DOI: 10.1520/E0675-02R12.

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 *Discontinued 1979*—U.S. Department of Commerce, Washington, DC 20234.

3. Requirements for Single Straight-Bore Taper-Ground Stopcocks

3.1 The designations and dimensions for single straight-bore stopcocks shall be as shown in Fig. 1 and Table 1.

3.2 *Taper*—All straight-bore stopcocks shall have a taper of 1 ± 0.006 mm of diameter per 10 mm of length (1 to 10).

3.3 *Master Gages*—Dimensions and tolerances for master gages shall be as shown in Fig. 2 and Fig. 3, and Table 2 and Table 3. Overall diameter of ring gage shall be approximately twice the diameter of the bore at the reference line in the window, but not less than 25 mm.

3.3.1 *Plug Gage*—Plug shall have two short axial lines $180 \pm 0.5^\circ$ apart intersecting the reference line for checking location of bore hole. In addition to the two axial lines 180° apart intersecting the reference line on the 4 and 6-mm plugs, two additional axial lines shall be provided on each of these plugs for checking the location of the bore hole of T-bore and 120-deg bore stopcocks. These two additional axial lines shall be placed 90 and $120^\circ (\pm 0.5^\circ)$ from one of the first two axial lines.

3.3.2 *Ring Gage*—The central milled recess, or window, shall be placed approximately midway between the ends of the ring gage. Width of recess measured parallel with the axis shall be approximately one fourth of the length of the ring, and the width of the opening at the inner surface of ring, measured perpendicular to the axis, shall not exceed one fourth of the length of the ring. Reference line in recess shall be placed approximately midway between ends of ring gage.

3.3.3 *Fit of Product in Working Gages*—The product (both inner and outer members) shall fit the corresponding working gages so that the centerline through the bore corresponds with the reference line on the gage within ± 0.3 mm for 1, $1\frac{1}{2}$, and 2-mm bores; ± 0.5 mm for 3 and 4-mm bores; and ± 1.0 mm for 5-mm and larger bores.

4. Requirements for Single Oblique-Bore Stopcocks

4.1 Design, dimensions, and tolerances for 1, $1\frac{1}{2}$, 2, 3, and 4-mm oblique-bore stopcocks shall be as shown in Fig. 4 and Table 4.

4.2 *Taper*—All single oblique-bore stopcocks shall have a taper of 1 ± 0.006 mm of diameter per 10 mm of length (1 to 10).