



Designation: ~~E676-02~~ Designation: E 676 – 02 (Reapproved 2007)

Standard Specification for Interchangeable Taper-Ground Joints¹

This standard is issued under the fixed designation E 676; 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 designations, dimensions, and tolerances for only the ground surfaces of interchangeable taper-ground joints for laboratory and industrial equipment in full-length, medium-length, short-length, and international-length (ISO K-6 series) grindings.

NOTE 1—The dimensions pertaining to full-length, medium-length, and short-length joints, other than for the tolerance on length of grind, were taken directly from the now obsolete Commercial Standard CS 21.

NOTE 2—Tolerances on the diameters of the international-length joints do not agree with those given in ISO Recommendation R383. These tolerances have been established to agree with those of CS 21 in order to prevent the negative projection (large end of inner joint being smaller than large end of outer joint) permitted by ISO.

NOTE 3—Although glass is the most commonly used material for ground joints, other materials may be used as specified. Taper-ground joints constructed from glass should be of suitable chemical and thermal properties in accordance with Specification E 438. Joints should be as free as possible of visible defects and conform to Specification E 671.

1.2 The following precautionary caveat pertains only to the Test Method portion, Section 4, of this specification. *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

E 438 ~~Specification for Glasses in Laboratory Apparatus— Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets~~

E 671 ~~Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus²— Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets~~

E 920 ~~Specification for Commercially Packaged Laboratory Apparatus²— Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets~~

E 921 ~~Specification for Export Packaged Laboratory Apparatus²— Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets~~

E 1133 ~~Practice for Performance Testing of Packaged Laboratory Apparatus—United States Government Procurement²~~

E 1157 ~~Specification for Sampling and Testing Reusable Laboratory Glassware²— Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets~~

2.2 U.S. Department of Commerce Standard:

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

2.3 ISO Standard:

R 383 Interchangeable Conical Ground Glass Joints⁴

3. Requirements

3.1 Designations, dimensions, and tolerances shall be as shown in Fig. 1 and in Table 1, Table 2, Table 3, and Table 4.

3.2 *Surface Finish*—The roughness average (R_a) of the ground surface shall not exceed 1 μm (40 μin).

3.3 *Taper*—All taper-ground joints shall have a taper of 1 ± 0.006 mm of diameter per 10 mm of length (1 to 10).

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 Oct. 10, 2002. Published November 2002. Originally published as E676-79. Last previous edition E676-84(1998).

² 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, 2007. Published December 2007. Originally approved in 1979. Last previous edition approved in 2002 as E 676 – 02.

³ 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*, Vol 14.04, volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ *Discontinued 1979*—U.S. Department of Commerce, Washington, DC 20234.

⁵ Available from American National Standards Institute, 1430 Broadway, New York, NY 10018.

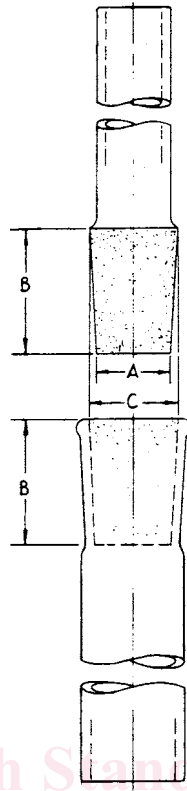


FIG. 1 Taper-Ground Joint

TABLE 1 Full-Length Taper-Ground Joints

Joint Size Designation	A Approximate Diameter at Small End, mm	B Approximate Length of Ground Zone, mm ^A	C Diameter at Large End of Ground Zone, mm ^B
7/25	5.0	25	7.5
10/30	7.0	30	10.0
12/30	9.5	30	12.5
14/35	11.0	35	14.5
19/38	15.0	38	18.8
24/40	20.0	40	24.0
29/42	25.0	42	29.2
34/45	30.0	45	34.5
40/50	35.0	50	40.0
45/50	40.0	50	45.0
50/50	45.0	50	50.0
55/50	50.0	50	55.0
60/50	55.0	50	60.0
71/60	65.0	60	71.0
103/60	97.0	60	103.0

^A A tolerance of ± 1.5 mm is allowed on both inner and outer members.

^B A tolerance of $+ 0.15$ mm is allowed on inner members, and a tolerance of $- 0.15$ mm on outer members.

3.4 *Leakage*—Using the leak test apparatus illustrated in Fig. 2, or one functionally similar to it, with the average differential pressure during the test kept above 600 mm Hg, the leak rate calculated from the test data (see 4.9) shall not exceed 0.05 torr·litres/s (or Pa·litres/s) when the inner and outer joints are assembled dry.

4. Test Method

4.1 Clean both joints to be tested with distilled water, and then dry them with a clean paper towel. Next, wipe the ground zones with a clean chamois to remove any remaining particles.

4.2 Tightly close the unground end of the joint to be connected to the manometer system, using a rubber stopper containing a concentric hole (or rubber tubing, depending upon the joint size under test) sized to fit snugly on the manometer connection, and mount the joint on the connection in an upright position.