



Standard Test Method for Vacuum Drainage of Asbestos-Cement Mixes¹

This standard is issued under the fixed designation C1119/C1119M; 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 test method describes a laboratory procedure for the evaluation of asbestos fiber by measuring the rate of drainage under suction, of an asbestos-cement mixture.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 **Warning**—Breathing of asbestos dust is hazardous. Asbestos and asbestos products present demonstrated health risks for users and for those with whom they come into contact. In addition to other precautions, when working with asbestos-cement products, minimize the dust that results. For information on the safe use of chrysotile asbestos, refer to “Safe Use of Chrysotile Asbestos: A Manual on Preventive and Control Measures.”²

1.4 *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.* See Note 1 and 1.3 for specific hazard warnings.

2. Referenced Documents

2.1 ASTM Standards:³

C150/C150M Specification for Portland Cement

C430 Test Method for Fineness of Hydraulic Cement by the 45- μ m (No. 325) Sieve

C1124/C1124M Test Method for Kerosene Retention of Asbestos

D2590/D2590M Test Method for Sampling Chrysotile Asbestos

D2946 Terminology for Asbestos and Asbestos-Cement Products

D3752 Test Method for Strength Imparted by Asbestos to a Cementitious Matrix

D3879 Test Method for Sampling Amphibole Asbestos (Withdrawn 2009)⁴

D3880/D3880M Test Method for Asbestos Strength Units

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

2.2 ACS Document:

Specifications of the Committee on Analytical Reagents of the American Chemical Society⁵

3. Terminology

3.1 For definitions, refer to Terminology D2946.

4. Summary of Test Method

4.1 The fiber to be evaluated is fiberized to simulate the specific surface area at which it is used in the industrial process, and it is added to the same mix using representative ingredients and process water. If the latter is not available, saturated water may be substituted (see 7.7). The slurry is dewatered on a 177- μ m [No. 80] screen cloth (or in accordance with the Apparatus Section of Test Method D3752) under a vacuum of 90 kPa [70 cm Hg]. The end point is determined as the point when air begins to pass through the filter cake, and the suction drops abruptly. The time taken to reach the end point is recorded and this is a function of the drainage rate of the mix.

5. Significance and Use

5.1 This test method can be used to estimate the speed of drainage and the rate of production of products from the fiber evaluated, in industrial applications. It may be applied to single grades of fiber, or to fiber blends, together with the same binder system and process water used in the process under evaluation.

¹ This test method is under the jurisdiction of ASTM Committee C17 on Fiber-Reinforced Cement Products and is the direct responsibility of Subcommittee C17.03 on Asbestos - Cement Sheet Products and Accessories.

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² Available from The Asbestos Institute, http://www.chrysotile.com/en/sr_use/manual.htm.

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

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ Available from American Chemical Society, 1155 16th St. NW, Washington, DC 20036.

6. Apparatus

6.1 *Drainage Apparatus*, as described in Fig. 1 and Fig. 2. The funnel shown in Fig. 1 shall be cemented to the bottom of Part 3 of Fig. 2 to give an air-tight seal. Alternatively, the apparatus described in Test Method C1124/C1124M or in Test Method D3752, may be used.

6.2 *Vacuum-Actuated Switch*—Set to activate an electric timer when the pressure is between 50 kPa [40 cm Hg vacuum] and 8 kPa [70 cm Hg vacuum]. This switch shall be located at the discharge of the drainage funnel, together with a manometer of from 0 to 50 kPa absolute [0 to 76 cm Hg vacuum] capacity, and a water trap with a capacity of 500 cm.

6.3 *Wet Mixer*, as shown in Fig. 3, Fig. 4, and Fig. 5, capable of maintaining a speed of 62.8 ± 2.6 rad/s [600 ± 25 r/min] under load. Alternatively, the mixing apparatus, as described in Test Method D3880/D3880M, may be used.

6.3.1 The impeller shall rotate clockwise when looking from above, and the vanes shall be pitched so as to impel the slurry downward.

6.3.2 Maximum clearance between the impeller and the conical wall of the wet mixer shall be set at 6.3 mm.

6.3.3 The distance between the bottom of the impeller and the top of the stopper shall be set at 1 ± 0.1 cm.

6.4 *Source of Vacuum*, at 90 ± 0.2 kPa [70 ± 0.2 cm Hg].

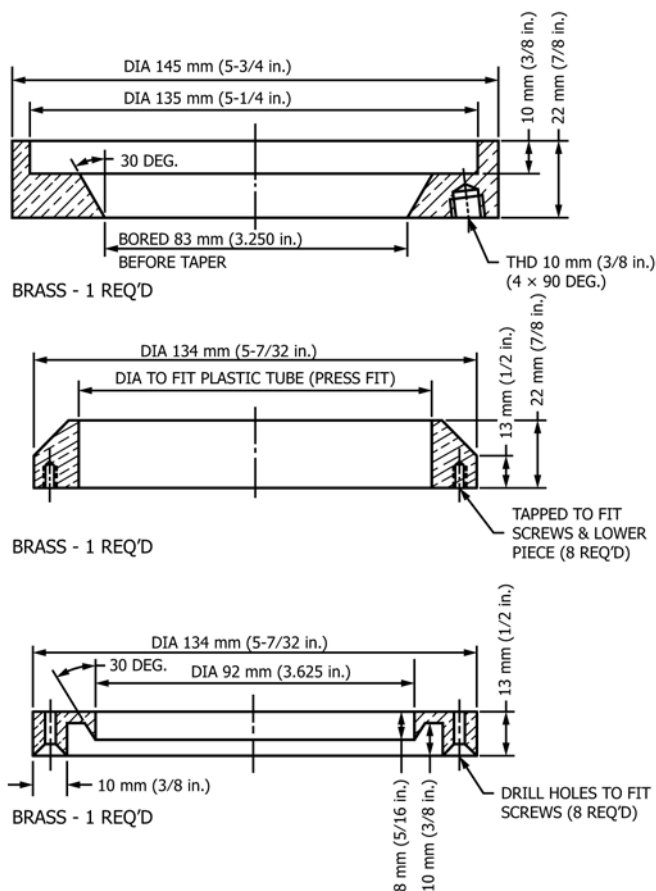


FIG. 2 Drainage Funnel Detail

6.5 *Fiberizer*, such as described in Test Method D3752. This is needed only if the fiber to be evaluated is not available at the required degree of fiberization.

7. Reagents and Materials

7.1 *Reagents and Materials*—(See Note 1 and Note 2.)

7.2 *Calcium Hydroxide* [$\text{Ca}(\text{OH})_2$], conforming to the ACS Specifications.⁶ Other grades may be used provided it is first ascertained that the reagents are of sufficiently high purity to permit their use without lowering the accuracy of the determination.

7.3 *Calcium Sulfate (Gypsum)*—($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), conforming to the ACS specifications.

NOTE 1—Calcium hydroxide and calcium sulfate are required only if white water from the process evaluated is not available.

7.4 *Silica*, from the same source that used in the process being evaluated, or alternatively ground quartz (SiO_2), conforming to the following specifications:

SiO_2 content; 99 percent minimum.

7.4.1 Wet sieve analysis by the technique described in Test Method C430.

U.S. Sieve No.	Minimum Percent Passing
80	99
100	90
200	85

NOTE 2—Silica is required only when testing asbestos-cement mixes

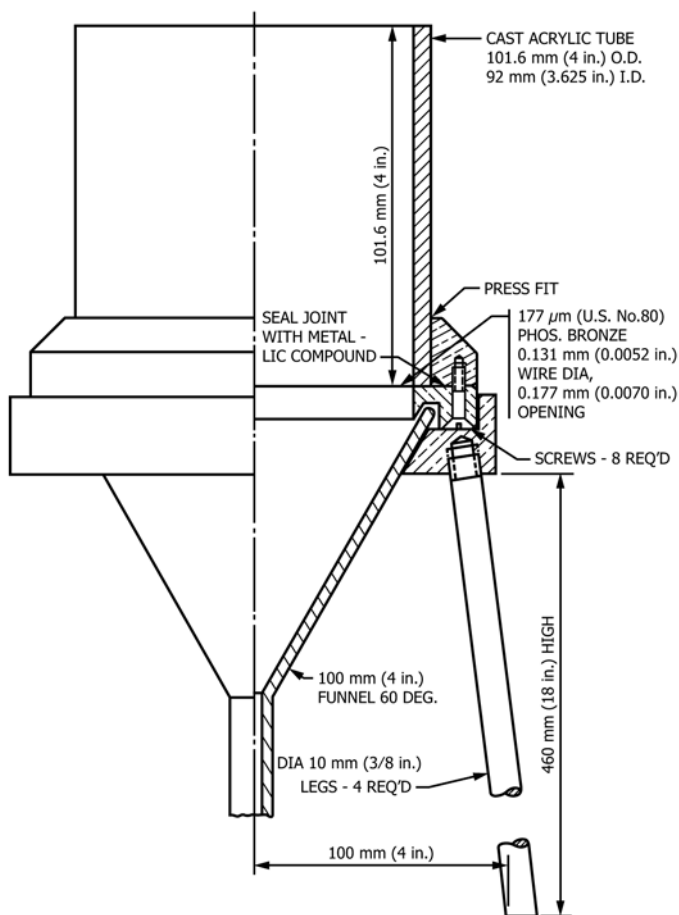


FIG. 1 Drainage Funnel Assembly