Designation: C1122/C1122M – 90 (Reapproved 2015)

Standard Test Method for Wet Volume of Asbestos[1]

This standard is issued under the fixed designation C1122/C1122M; 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 covers the appraisal of asbestos fiber groups 4 to 7 (see Note 1) in terms of their occupied volumes when immersed in water.

NOTE 1—Quebec Standard designation of chrysotile asbestos grades as determined by Test Method D3639/D3639M.

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 chrysoltile 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.* For a specific hazard warning, see 1.3.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D1193 Specification for Reagent Water

D2590/D2590M Test Method for Sampling Chrysotile Asbestos

D2946 Terminology for Asbestos and Asbestos–Cement Products

D3639/D3639M Test Method for Classification of Asbestos by Quebec Standard Test

D3879 Test Method for Sampling Amphibole Asbestos (Withdrawn 2009)[4]

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

2.2 *Other Standard:*

Quebec Standard Designation of Chrysotile Asbestos Grades[5]

3. Terminology

3.1 *Definitions*—Refer to Terminology D2946.

4. Summary of Test Method

4.1 A test specimen is dispersed in water by means of a mechanically driven inverter. The resulting suspension is then allowed to stand for a fixed period, and the volume occupied by the fiber, as defined by the solid-liquid interface, is recorded.

5. Significance and Use

5.1 Wet volume gives an indication of the degree of loftiness and openness of asbestos fiber.

6. Apparatus

6.1 *Graduated Glass Cylinder*—Meeting the following specification, as shown in Fig. 1:

6.1.1

Capacity	2 dm^3 [2000 cm^3]
Subdivisions	0.02 dm^3 [20 cm^3]
Inside diameter	80 cm
Wall thickness	3 mm
Total height	482 ± 3 mm
Height from inner bottom of base to the 2000 cm^3 mark	398 ± 6 mm

6.1.2 The cylinder must have a full-width mouth reinforced with an exterior beaded rim, without any spout.

6.1.3 The bottom of the graduated cylinder must be flat and must form a clean right angle with the wall of the graduate.

[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 the Asbestos Institute, 1130 Sherbrooke St. West, Ste. 410, Montreal, QC Canada H3A 2M8.

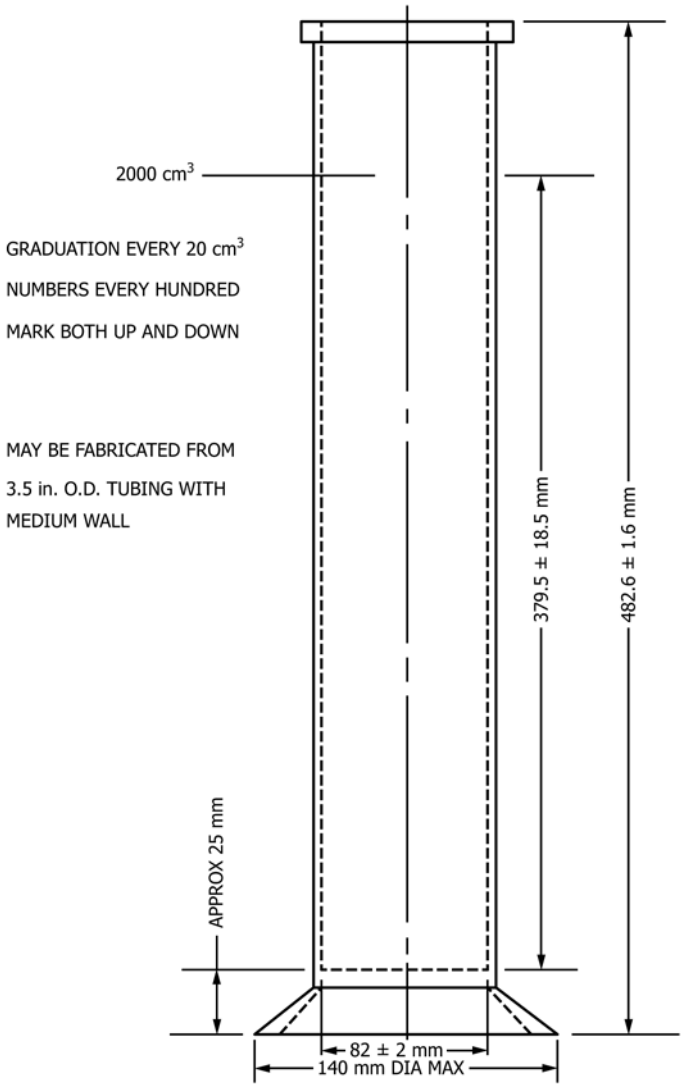

FIG. 1 Graduated Cylinder

6.2 *Mechanically Driven Inverter,* for rotating the graduated cylinder about a horizontal axis at the center of the graduated cylinder at 30 rpm for 30 complete rotations. The inverter may clamp the cylinder in such a way as to seal the mouth, or separate stoppers may be used provided the latter do not project inside the cylinder (see Fig. 2 and Fig. 3).

TABLE 1 Specimen Size and Test Duration

Group[2] No.	Specimen weight, g	Sedimentation time	
		ks	h
4 to 6	30 ± 0.1	7.2	2
7	20 ± 0.1	14.4	4

7. Hazards

7.1 **Warning**—see 1.3.

8. Sampling, Test Specimens, and Test Units

8.1 *Sampling:*

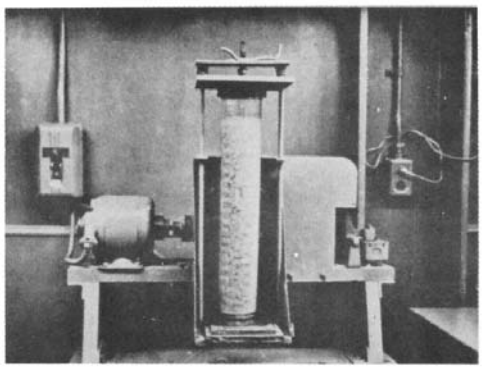

FIG. 2 Mechanically Driven Inverter

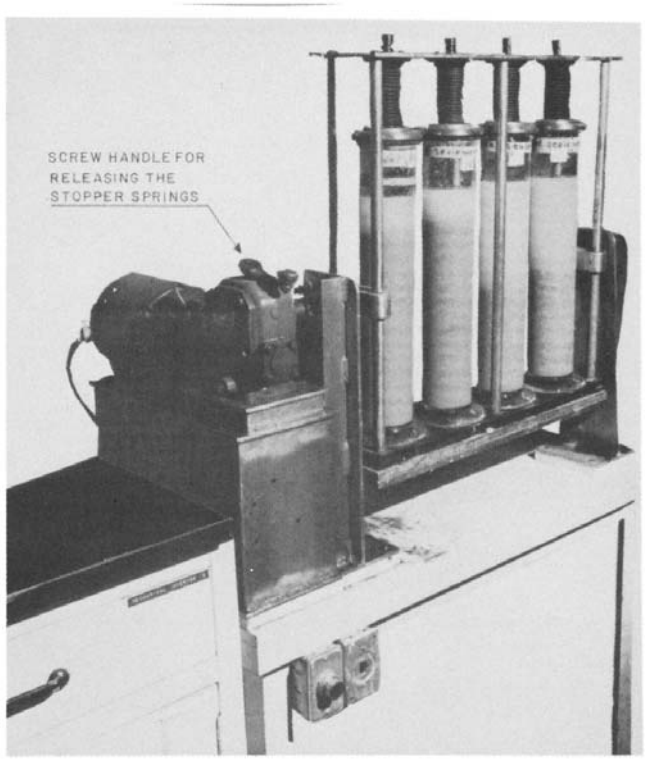

FIG. 3 Alternative Design of Mechanically Driven Inverter

8.1.1 Select a sample in accordance with Test Methods D2590/D2590M, in the case of chrysotile asbestos, or D3879 in the case of amphibole asbestos.

8.2 *Test Specimens:*

8.2.1 Refer to Table 1 for specimen sizes required. Take two specimens in each case.

9. Procedure

9.1 Fill the cylinder with distilled water (see Note 2) or Type IV reagent water as defined in Specification D1193, at 25 ± 2°C [77 ± 3°F] to the 1000 cm^3 mark of the cylinder.

NOTE 2—It is recognized that clean water from different locations may affect results slightly. Therefore, when results from one laboratory will be compared with the results of another laboratory, distilled water should be used.

9.2 Pour the test specimen into the cylinder and add distilled or reagent water to the 2000 cm^3 mark.

9.3 Clamp the cylinder on the mechanical inverter and rotate through 6.3 rad (360°) 30 times in one min. Let stand for 10 min and then repeat the rotation cycle.

9.4 Remove the cylinder and place carefully on a levelled vibration free table.

9.5 Record the wet volume of the fiber suspended in water in cm^3 after 7.2 ks (2 h) for Groups 4, 5, and 6 fibers, and after 14.4 ks (4 h) for Group 7 fibers.

9.6 Repeat the test until two concordant volumes are observed on the sample as required in 11.1.

10. Report

10.1 Report the average of two acceptable results expressing the wet volume in units of cm^3 (or mL).

10.2 Fully identify the samples as to grade and origin.

11. Precision and Bias[6]

11.1 Results are acceptable if the difference in wet volume of the two specimens does not exceed ±5 %.

11.2 *Precision:*

11.2.1 The single-laboratory multi-apparatus-operator-day precision (repeatability) is± 4 % (two sigma limits expressed in units of percentage) (2S %) as defined in Practice E177 over the wet volume range from 306 to approximately 1700 cm^3.

11.2.2 A partial verification of the repeatability that confirmed the above data, RR:C17-1001 is on file at ASTM Headquarters, and a copy is available upon request.

11.3 *Bias:*

11.3.1 No justifiable statement can be made on the bias of this test method since the true value of the wet volume cannot be established by an accepted referee test method.

12. Keywords

12.1 asbestos; bulk; buoyancy; volume; wet bulk; wet volume

[6] Supporting data is available from ASTM International Headquarters. Request RR:C17-1001.