



Standard Test Method for Loose Density of Asbestos¹

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^{ε1} NOTE—Asbestos warning was moved from 7.1 to 1.3 in September 2004.

1. Scope

1.1 This test method covers the determination of the loose density of asbestos fiber for Groups 5 to 9, inclusive.^{2,3}

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.”⁴

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:⁵

- D 2590 Test Method of Sampling Chrysotile Asbestos
- D 2946 Terminology Relating to Asbestos
- D 3639 Test Method for Classification of Asbestos by Quebec Standard Test
- D 3879 Test Method for Sampling Amphibole Asbestos

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 As determined by Test Method D 3639.

³ The classification is available from the Asbestos Institute, 1130 Sherbrooke St. West, Suite 410 Montreal, QC, Canada, H3A 2M8.

⁴ Available from The Asbestos Institute, http://www.chrysotile.com/en/sr_use/manual.htm.

⁵ 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.

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2.2 Other Standard:

Quebec Standard Designation of Chrysotile Asbestos Fiber Grades³

3. Terminology

3.1 *Definitions*—Refer to Terminology D 2946.

4. Summary of Test Method

4.1 The test method consists of measuring the weight of a 1770-cm³ (1/16 ft³) volume of asbestos fiber, and of computing the loose density in kilograms per cubic meter (pounds per cubic foot).

5. Significance and Use

5.1 Loose density gives an indication of the degree of fiberization, harshness, and loftiness of asbestos fiber.

6. Apparatus

6.1 *Container*, 1770 cm³ (1/16 ft³) in volume made of plastic tubing 12.7 cm (5 in.) inner diameter, with 6-mm (0.25-in.) thick walls and 13.4-cm (5.5-in.) internal height (commercially available tubing). The bottom consists of a flat disk of the same plastic cemented to the tubing.

6.2 *Scoop*, capable of holding at least 2.8 dm³ (0.1 ft³).

6.3 *Straight-edged Spatula or Ruler*.

7. Safety Hazards

7.1 **Warning**—see 1.3.

8. Sampling, Test Specimens, and Test Units

8.1 *Sampling*—Take samples in accordance with Test Method D 2590 in the case of chrysotile asbestos or Test Method D 3879 in the case of amphibole asbestos.

8.2 Test Specimens:

8.2.1 The test specimen must exceed the volume of the container by approximately 50 %. Therefore its volume must be at least 2.8 dm³ (0.1 ft³).

8.2.2 Two specimens are required.

9. Procedure

9.1 Place the specimen in the scoop and hold the latter 8 to 10 cm (3 to 4 in.) above the container.

9.2 Pour the specimen into the container using a continuous shaking motion and fill the container to overflowing.

9.3 Using the spatula, or a ruler, immediately level off the fiber to the top of the container. Do this in several passes to avoid compressing the fiber.

9.4 Determine the mass of fiber contained in the measure to the nearest 2 g (0.1 oz).

NOTE 1—The mass in ounces is equivalent to the loose density in pounds per cubic foot.

9.5 Repeat the procedure on the second specimen.

10. Calculation

10.1 Calculate the loose density in kilograms per cubic centimetre (pounds per cubic foot).

10.2 Average the results of the two specimens.

10.3 If equivalent units are desired, divide results in kilograms per cubic metre by 16.03 to get pounds per cubic foot.

11. Report

11.1 Report results in kilograms per cubic centimetre (pounds per cubic foot).

11.2 Fully identify the sample as to designation and origin.

12. Precision and Bias

12.1 *Precision:*

12.1.1 The single-laboratory-apparatus multi-operator/day precision (repeatability) is $\pm 2\%$ (two sigma limits expressed in units of percentage) ($2S\%$) as defined in Practice E 177 over the range of 160 to 1600 kg/m³ (10 to 100 lb/ft³).

12.1.2 A partial verification of the repeatability that confirmed the above data is on file at ASTM Headquarters.⁶

12.2 *Bias*—No justifiable statement on the bias can be made since the true values of loose density cannot be established by an accepted referee method.

13. Keywords

13.1 asbestos; bulk; bulk density; loose density

⁶ Research Report available at ASTM International Headquarters. Request RR:C17-1003.

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