

Standard Test Method for Classification of Asbestos by Quebec Standard Test¹

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 ε^1 NOTE—Units information was editorially corrected in February 2012.

1. Scope

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1.1 This test method covers a procedure for dry classification of chrysotile asbestos fiber by length distribution.

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. See 1.3 for a specific hazard warning.

2. Referenced Documents

2.1 ASTM Standards:³

D2590 Test Method for Sampling Chrysotile Asbestos

D2946 Terminology for Asbestos and Asbestos–Cement Products

D2987 Test Method for Moisture Content of Asbestos Fiber

- D3879 Test Method for Sampling Amphibole Asbestos (Withdrawn 2009)⁴
- E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves
- E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
- 2.2 ASTM Adjunct:
- Quebec Asbestos Testing Machine Construction and Operation Instructions⁵
- 2.3 Quebec Asbestos Mining Association Documents:
- Quebec Standard Classification of Chrysotile Asbestos Grades⁶
- Specifications and Drawings for Quebec Standard Asbestos Testing Machine Model No. 2⁶

3. Terminology

3.1 *Definitions*—Refer to Terminology D2946 and the Terminology Section of Test Method D2590.

4. Summary of Test Method

4.1 A 454-g [16-oz] sample is sifted through three progressively finer screens, and the mass fraction retained by each is determined, and reported in ounces (1 oz = 28.35 g).

5. Significance and Use

5.1 The Quebec Standard Testing Machine classifies milled chrysotile asbestos grades according to the mass fractions retained on each screen. Specimens that are not properly conditioned prior to testing or that have excessive moisture content (above 3 % in accordance with Method D2987), or both, may give erratic and false results.

5.2 Some amphibole asbestos fibers may be classified by this test method but a standard classification for these has not been established.

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 $^{^{2}\}mbox{ Available from The Asbestos Institute, http://www.chrysotile.com/en/sr_use/manual.htm.}$

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 ASTM International Headquarters. Order Adjunct No. ADJD3639. Original adjunct produced in 1977.

⁶ Available from the Quebec Asbestos Mining Association, 1130 Sherbrooke St. West, Montreal, QC Canada H3A 2M8.



6. Apparatus

6.1 *Quebec Standard Testing Machine, Model No.* 2, conforming to, and operated in accordance with, the specifications⁷ (Fig. 1).

Note 1—At some locations the Model 3 is in use, directly driven by V-belts (without the use of a countershaft), and fitted with a solenoid-activated pony brake.

Note 2—Stainless steel screen cloth may be substituted for the required bronze provided it meets the same tolerances. 6

6.2 *Scoop Balance*, 500-g or 16-oz capacity, with graduations of 5 g or 0.2 oz and a sensitivity of 3 g [0.1 oz].

6.3 *Mixing Table*, smooth-surfaced, with a surface area of approximately 1 m^2 [1 yd²].

7. Sampling

7.1 The sampling procedure shall be in accordance with Test Method D2590 for chrysotile and Test Method D3879 for amphiboles.

7.2 Warning—see 1.3.

8. Test Specimen

8.1 Mix thoroughly, and weigh accurately into the scoop of the balance, a 454 \pm 3-g [16 \pm 0.1-oz] representative portion of fiber free from lumps.

9. Calibration and Standardization

9.1 Calibrate the Quebec Standard Testing Machine at least once per month, prior to use.

9.2 Use standard samples of known test, with fiber length comparable to that of the specimens under analysis.

10. Conditioning

10.1 Condition the test specimens in accordance with Test Method D2590 or D3879.

11. Procedure

11.1 Place the screen boxes and the pan on the machine, ensuring that they are lined up true to the platform and that the ends of the boxes face the same way each time they are used.

11.2 Spread the specimen in Box No. 1 of the testing machine along its longest axis, by letting it fall loosely from the scoop. Hold the scoop 150 to 250 mm [6 to 10 in.] above the screen cloth. Take care that when the cover of the testing machine is closed, the fiber shall not be compressed.

11.3 Start the machine and allow it to run until it stops automatically. Remove each box and deposit the fiber retained in each box onto the table, in individual piles, picking up and adding the loose fiber adhering to the screen cloth to the corresponding fraction.

11.4 Weigh and record separately, in ounces, the fiber recovered from each box.



FIG. 1 Quebec Standard Asbestos Testing Machine, Model 2.

⁷ An abstract of construction and operating specifications is available from ASTM Headquarters, 100 Barr Harbor Drive, W. Conshohocken, PA 19428, at a nominal price. Request Adjunct ADJD3639. Specifications for the Model 2 tester, as well as the name and address of the current authorized suppliers, are available. Model 2 is illustrated in Fig. 1.



12. Report

12.1 Report to the nearest 3 g [0.1 oz], the fiber retained in each box as the Quebec Standard Test of the fiber sample. An example of the test results on a long fiber and on a short fiber could be:

	Box 1 ½ in.	Box 2 4 Mesh	Box 3 10 Mesh	Box 4 Pan	Total
Long fiber	3.2	9.4	2.8	0.6	16.0 oz
Short fiber	0	0	6.2	9.8	16.0 oz

Note 3—Results must be reported in U.S. customary units to comply with the Quebec Standad Classification of Chrysotile Asbestos Grades.⁷

13. Precision and Bias

13.1 Precision:

13.1.1 The single-operator-machine reproducibility is \pm 7 g [\pm 0.25 oz] (2S) obtained on any fraction, with long fibers, as defined in Practice E177.

13.1.2 The equivalent precision on shorter fibers is \pm 3 g [\pm 0.1 oz].

13.2 *Bias*—Bias for asbestos fibers cannot be estimated for lack of a referee method.

13.2.1 Bias associated with each of the sieves used may be determined as described in the appendixes to Specification E11.

13.2.2 It has been observed that the retention of fibers on each sieve may be a function of the degree to which the screen cloth is worn.

14. Keywords

14.1 amphibole; asbestos; Canadian; chrysotile; classification; dry test; evaluation; fiber; Q.S.; Quebec standard screening test

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