Designation: D 3639 – 92 (Reapproved 2002)

Standard Test Method for Classification of Asbestos by Quebec Standard Test[1]

This standard is issued under the fixed designation D 3639; 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 a procedure for dry classification of chrysotile asbestos fiber by length distribution.

1.2 The values stated in inch-pound units are to be regarded as the standard. The equivalent SI units may be approximate.

1.3 *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 7.2 for a specific warning statement.

2. Referenced Documents

2.1 *ASTM Standards:*

D 2590 Test Method for Sampling Chrysotile Asbestos Fiber[2]

D 2946 Terminology for Asbestos and Asbestos–Cement Products[2]

D 2987 Test Method for Moisture Content of Asbestos Fiber[2]

D 3879 Test Method for Sampling Amphibole Asbestos[2]

E 11 Specification for Wire-Cloth and Sieves for Testing Purposes[3]

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods[3]

2.2 *Quebec Asbestos Mining Association Documents:*

Quebec Standard Classification of Chrysotile Asbestos Grades[4]

Specifications and Drawings for Quebec Standard Asbestos Testing Machine Model No. 2[4]

3. Terminology

3.1 *Definitions:*

3.1.1 Refer to Terminology D 2946 and the Terminology Section of Test Method D 2590.

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 D 2987), 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.

6. Apparatus

6.1 *Quebec Standard Testing Machine, Model No. 2,* conforming to, and operated in accordance with, the specifications[5] (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.[4]

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 yd^2).

7. Sampling

7.1 The sampling procedure shall be in accordance with Test Method D 2590 for chrysotile and Test Method D 3879 for amphiboles.

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

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[2] *Annual Book of ASTM Standards*, Vol 04.05.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

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

[5] 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.[4] Model 2 is illustrated in Fig. 1.

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

7.2 **Warning—**When handling asbestos fibers, avoid creating dust. Breathing asbestos dust may cause serious bodily harm.

8. Test Specimen

8.1 Mix thoroughly, and weigh accurately into the scoop of the balance, a 454 ± 3-g (16 ± 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 D 2590 or D 3879.

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.

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 1 / 2 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.[5]

13. Precision and Bias

13.1 *Precision*:

13.1.1 The single-operator-machine reproducibility is ± 7 g (± 0.25 oz) (2S) obtained on any fraction, with long fibers, as defined in Practice E 177.

13.1.2 The equivalent precision on shorter fibers is ± 3 g (± 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 E 11.

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