



Standard Test Method for Wash Test of Asbestos¹

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1. Scope

1.1 This test method covers the procedure for determining the fines content of asbestos fibers by washing with water on a specified sieve.

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 *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 hazards statement, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:

C 430 Test Method for Fineness of Hydraulic Cement by the 45- μm (No. 325) Sieve²

C 1121 Test Method for Turner and Newall (T and N) Wet-Length Classification of Asbestos³

D 2589 Test Method for McNett Wet Classification of Dual Asbestos Fiber³

D 2590 Test Method for Sampling Chrysotile Asbestos³

D 2946 Terminology for Asbestos and Asbestos-Cement Products³

D 3639 Test Method for Classification of Asbestos by Quebec Standard Test³

D 3879 Test Method for Sampling Amphibole Asbestos³

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁴

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁴

2.2 QAMA Document:

C-5 Method for T & N Wet Classification of Asbestos⁵

3. Terminology

3.1 For terminology, refer to Terminology D 2946.

4. Summary of Test Method

4.1 Specimens are washed on a sieve by means of a standard water nozzle.

4.2 The material retained on the screen is dried and weighed, and the percent loss in weight is calculated and reported.

5. Significance and Use

5.1 The wash test gives a rapid and simple evaluation of the fines content.

5.2 The equipment required and the technique followed are both simple and undemanding.

5.3 The fines content obtained by this test method approximates the equivalent screen classification obtained by Test Methods C 1121 and D 2589.

6. Apparatus

6.1 Standard 74- μm (No. 200) full height 20-cm (8-in.) diameter testing sieve with a standard 1.68-mm (No. 12) backing wire cloth,⁶ as described in Specification E 11.

6.2 For testing floats only, a standard 44- μm (No. 325) full height 20-cm (8-in.) diameter testing sieve with a 1.68-mm (No. 12) backing wire cloth,⁶ as described in Specification E 11, is required.

NOTE 1—In order to prevent the accumulation of water underneath the sieves while washing, several drainage notches may be cut in the sieve frame below the screen cloth, as shown in Fig. 1.

6.3 Standard 20-cm (8-in.) diameter full height sieve frame only for use as a splash guard, as shown in Fig. 1.

6.4 *Spray Nozzle*, as described in Test Method C 430 and shown in Fig. 2.

6.5 *Water Supply System*, consisting of the following elements, connected in series (refer to Note 2):

6.5.1 *Supply of Clean Water*, at constant pressure. A water pressure regulator may be required at some locations.

6.5.2 *Needle Valve*, for regulating the water flow rate.

6.5.3 *Pressure Gage*, capable of tolerating the maximum supply pressure and which may be read to within ± 7 kPa (1

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² *Annual Book of ASTM Standards*, Vol 04.01.

³ *Annual Book of ASTM Standards*, Vol 04.05.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ Published in *Chrysotile Asbestos Test Manual*, 3rd edition, available from Asbestos Institute, 1002 Sherbrooke St. W, Suite 1750, Montréal, QC, Canada H3A 3L6.

⁶ Sieves supplied by W. S. Tyler Company, Ltd., fitted with stainless steel wire cloth, have been found satisfactory for this purpose.

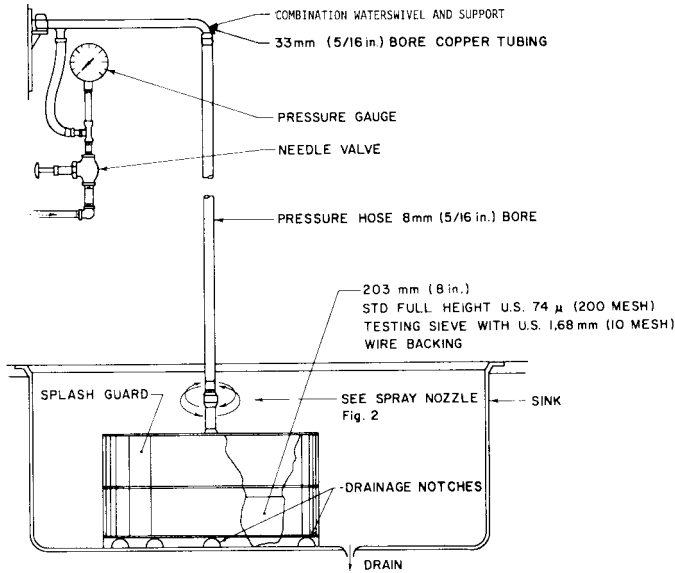


FIG. 1 Wash Test Apparatus

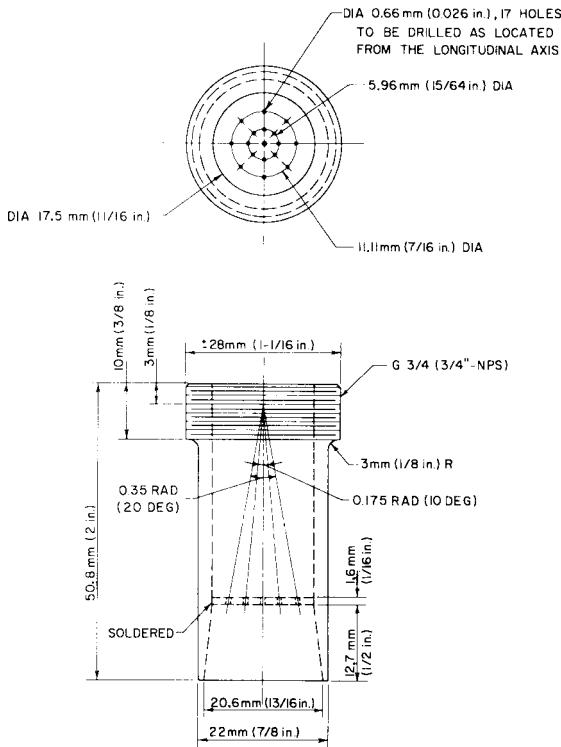


FIG. 2 Spray Nozzle Detail

7. Hazards

7.1 When handling asbestos use reasonable precautions to avoid creating dust, or wear an efficient respiratory protector. Prolonged or frequent breathing of significant concentrations of airborne asbestos dust may cause serious bodily harm.

8. Sampling

8.1 Take a sample in accordance with Test Method D 2590 in the case of chrysotile asbestos, or in accordance with Test Method D 3879 in the case of amphibole asbestos.

8.2 At least 20 g of sample is required to derive duplicate specimens.

8.3 Weigh out two specimens of 10 ± 0.05 g each.

9. Calibration and Standardization

9.1 By means of the needle valve, regulate the water flow rate so that a pressure of 138 ± 7 kPa (20 ± 1 psig) will register on the gage.

9.2 Determine the time required for 2 dm^3 (2 L) to flow through the nozzle by collecting the discharge in a graduated cylinder.

9.3 The time required shall be between 23 and 26 s. If the time is shorter, check the nozzle openings for precision of bore. If the time is longer, check nozzle openings for blockage, or for the presence of burrs on new nozzles. If nozzle openings are satisfactory, verify the accuracy of the pressure gage.

10. Procedure

10.1 For Quebec Standard (as determined by Test Method D 3639), Group 3 to 7 fibers, select a 74- μm (No. 200) sieve. For floats use a 44- μm (No. 325) sieve.

10.2 Fit the sieve with a splash guard and spread the test specimen on the screen surface.

10.3 Wet the specimen thoroughly with a gentle spray at approximately 14 kPa (2 psig). A few seconds is sufficient time for this operation. Do not exceed 15 s to avoid loss of fines at this stage.

10.4 Adjust the pressure at 138 ± 7 kPa (20 ± 1 psig).

10.5 Start a timer and begin the washing cycle.

10.6 Washing Cycle:

10.6.1 Keep the nozzle 127 ± 7 mm (5 ± 0.25 in.) above the screen surface by means of the support and move the spray in a circular motion alternately in the clockwise and counter-clockwise directions so that all the fiber is thoroughly and uniformly washed.

10.6.2 In order to ensure a thorough washing, occasionally change the position of the specimen on the screen by directing the spray obliquely onto the fiber. This motion could possibly be described as a chasing action and is critical in the performance of the test.

NOTE 2—A motorized device which imparts a planetary circular motion to the nozzle may be used provided this yields the same results.

NOTE 3—Blinding of the screen is indicated by an accumulation of water on the sieve. This condition materially reduces the effectiveness of the spray and should be corrected by tilting the sieve and directing the nozzle on the blinded areas to dislodge the small particles from the mesh.

10.6.3 After washing for 120 s (2 min), transfer the fiber to a Büchner funnel and filter it on a previously dried and weighed filter paper.

psig). Mount the gage in the run of a tee-pipe fitting.

6.5.4 Wall-Mounted Swivel Hose Support, as described in Fig. 1.

6.5.5 Pressure Hose, with a 6 to 13-mm (0.25 to 0.5-in.) bore just long enough to suspend the nozzle from the swivel to a level 127 ± 7 mm (5 ± 0.25 in.) above the screen surface of the sieve.

6.6 Ashless Filter Paper, thin, rapid filtering, hardened to provide adequate wet strength and resistance to wetting.

6.7 Drying Apparatus, such as an oven or an infrared dryer.

- 10.7 Dry the residues to constant weight.
- 10.8 Invert the sieve and clean it with the spray by back washing.
- 10.9 Wash the second specimen as described above.

11. Calculation or Interpretation of Results

11.1 If the dry weights of the retained fractions from both specimens differ by 0.2 g or less, accept the results. Otherwise, wash additional specimens until results on two of the specimens are acceptable.

11.2 *Calculation*—Calculate the fines content by subtracting the dry weight of the retained fraction from the specimen weight and express the loss in mass as the percent fines content based on the specimen weight.

12. Report

12.1 Report the fines content as the average of two acceptable results.

12.2 Fully identify the sample as to designation and origin.

13. Precision and Bias

13.1 *Precision*—The single-apparatus multi-operator precision is ± 1.0 percent (two sigma limits) as defined in Practice E 177, over the range of 12.6 to 98.6 percent fines content.

13.2 *Bias*—In comparison with the results obtained by Test Methods C 1121 and D 2589 for fractions passing through the 74- μm sieve (for fiber Groups 3 to 7) and the 44- μm sieve (for floats), no statistically significant bias has been obtained.

14. Keywords

14.1 asbestos; fines content; wash test; wet sieving

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