



Standard Test Method for Kerosene Retention of Asbestos¹

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1. Scope

1.1 This test method covers the determination of the kerosene retention capacity of asbestos fiber by filtering after mixing and measuring the volume of liquid retained by difference.

1.2 The values stated in inch-pound 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.* See Section 8.

2. Referenced Documents

2.1 ASTM Standards:

- D 1655 Specification for Aviation Turbine Fuels²
- D 2590 Test Method for Sampling Chrysotile Asbestos³
- D 2946 Terminology Relating to Asbestos³
- 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 Other Standards:

- US Federal Specifications, VV-K-211 d, Kerosene⁵
- Canadian Government Specifications Board CAN 2-3.3-M85 Kerosene⁶
- United Kingdom, Ministry of Defense Specification DEF-2403-A⁷

3. Terminology

- 3.1 *Definitions*—Refer to Terminology D 2946.

¹ This test method is under the jurisdiction of ASTM Committee C-17 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 *Annual Book of ASTM Standards*, Vol 05.01.

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

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

⁵ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁶ Available from The Secretary, Canadian General Standard Board, Ottawa, ONT, Canada K1A 1G6.

⁷ Available from Her Majesty's Stationery Office, London, England.

4. Summary of Test Method

4.1 A slurry of asbestos fiber is formed by mixing in a known volume of kerosene. The slurry is then drained on a standard 177 μm (U.S. No. 80) screen as defined in Specification E 11, and the kerosene that drains out in 15 min is measured. The quantity of kerosene retained is obtained by difference.

5. Significance and Use

5.1 The kerosene retention value is an indication of the degree of fiberization and of the absorptivity of a given grade of asbestos.

5.2 Since the retention of the fibrous fractions is much greater than that of the non-fibrous fractions, this test method may be used to compare the fibrous content of otherwise similar grades of asbestos.

6. Apparatus

6.1 *Kerosene Drainage Apparatus*—Described in Fig. 1 and Fig. 2.

7. Reagents and Materials

7.1 *Kerosene*, meeting one of the following specifications:

7.1.1 US Federal Specifications, VV-K-211 d, Kerosene.

7.1.2 Jet A Kerosine specified in Specification D 1655.

7.1.3 United Kingdom, Ministry of Defense Specification DEF-2403-A.

7.1.4 Kerosine CGSB Spec CAN 2-3.3-M85.

8. Hazards

8.1 When handling asbestos use reasonable precautions to avoid creating dust. Prolonged or frequent breathing of significant concentrations of airborne asbestos dust may cause serious bodily harm.

9. Sampling, Test Specimens, and Test Units

9.1 Sampling:

9.1.1 Take samples in accordance with Test Methods D 2590 in the case of chrysotile asbestos or Test Method D 3879 in the case of amphibole asbestos.

9.2 Test Specimens:

9.2.1 Two specimens each of 50 ± 0.05 g are required.

10. Procedure

10.1 Put a 50 g specimen into a 400 cm^3 beaker and add 325

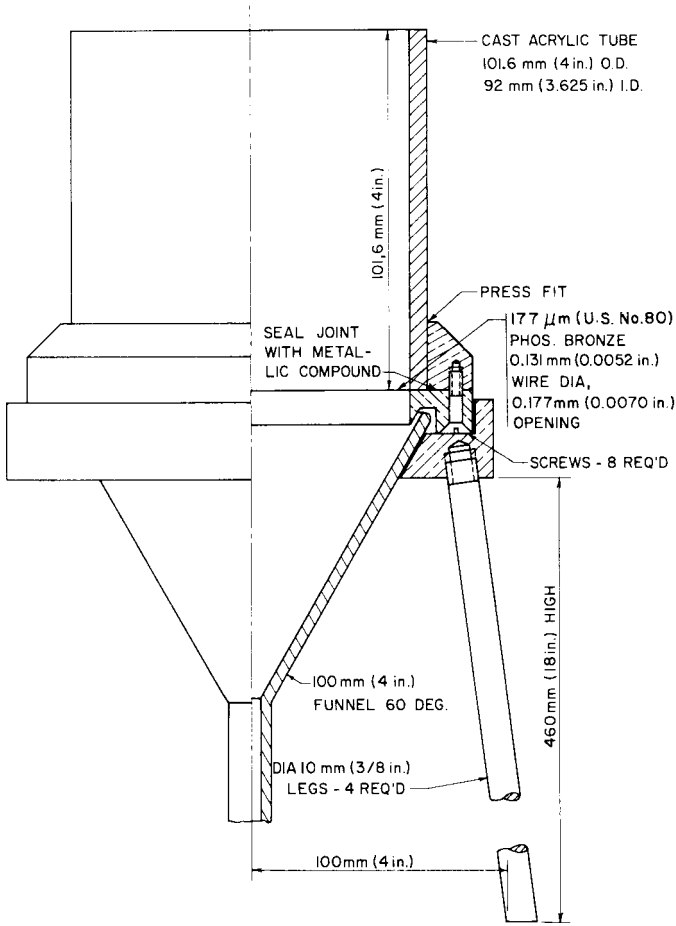


FIG. 1 Kerosene Retention Apparatus Assembly

± 1 cm³ of kerosene.

10.2 Mix with a spatula for 120 s (2 min).

10.3 Wet the drainage cylinder and screen with kerosene and drain 1 min.

10.4 Place a 250-cm³ graduated cylinder beneath the drainage cylinder outlet.

10.5 Immediately transfer the slurry in one continuous motion to the drainage cylinder.

10.6 Start a stopwatch simultaneously.

10.7 After draining for 900 s (15 min), read the volume of kerosene drained into the graduate, and record this value to the nearest cm³.

10.8 Discard the asbestos retained on the screen, rinse clean with running hot water, and dry the apparatus.⁸ Thus it will be ready for the next test.

10.9 Repeat this procedure with the second specimen.

11. Calculation

11.1 For each of the two readings, subtract the value obtained, in cm³, from the initial quantity of kerosene (325 cm³). Multiply these differences by two to obtain the kerosene retention values per 100 g of asbestos fiber.

11.2 *Example*—If the reading on the graduated cylinder was 215 cm³, then the kerosene retention

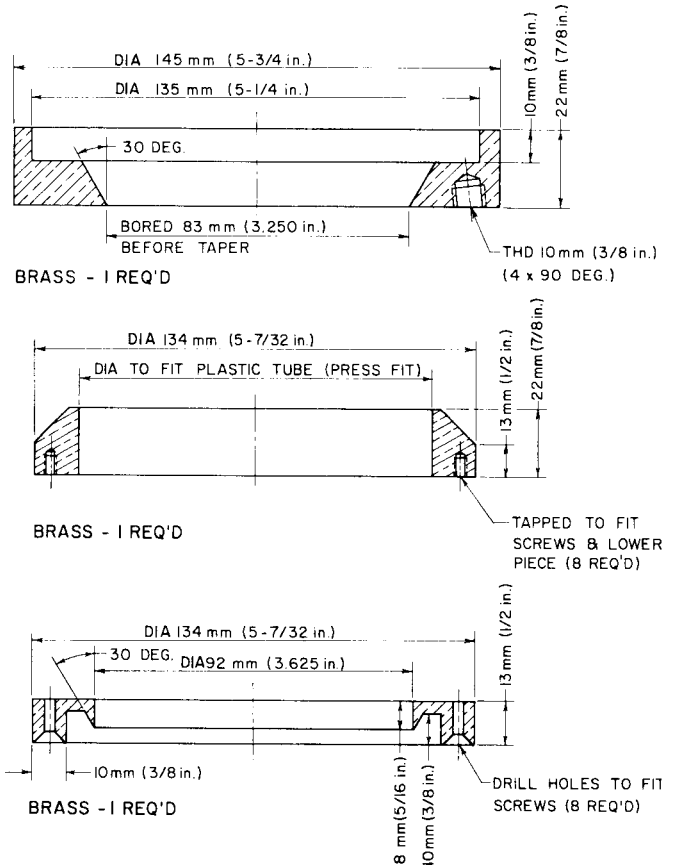


FIG. 2 Retention Apparatus Detail

$$\text{value} = (325 - 215) \times 2 = 220 \text{ cm}^3/100 \text{ g.}$$

12. Report

12.1 Report the average of two kerosene retention values in cm³/100 g.

12.2 Fully identify the sample tested as to designation and origin.

13. Precision and Bias

13.1 *Acceptance of Results:*

13.1.1 Results on two specimens must agree within 2 % of the average. If this is not attained, repeat the test until two results within 2 % from the average are obtained.

13.2 *Precision:*

13.2.1 The single-laboratory, multi-operator-apparatusday precision (repeatability) is ± 2 % (two sigma limits expressed in units of percentage) as defined in Practice E 177 over the range of 200 to 400 cm³/100 g.

13.3 *Bias:*

13.3.1 No justifiable statement on the bias of this test method can be made since the true values cannot be established by an accepted referee method.

13.3.2 A partial verification of the repeatability that confirmed the above data is on file. A copy is available upon request.⁹

⁸ A jet of clean dry compressed air may be used to accelerate the drying.

⁹ Supporting data is available from ASTM Headquarters. Request RR: C17-1002.

14. Keywords

14.1 absorption; asbestos; kerosene; kerosene retention; oil;
oil absorption; retention capacity

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