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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Compressibility and Recovery of Asbestos[1]

This standard is issued under the fixed designation C 1123; 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 the determination of the bulking factor of spinning grade fiber. These include grade 4A and longer.[2]

1.2 Results obtained on other grades may be considered as an evaluation of their bulk fiber resilience.

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

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 statement, see Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*

D 2590 Test Method for Sampling Chrysotile Asbestos[3]
D 2946 Terminology Relating to Abestos[3]
D 3879 Test Method for Sampling Amphibole Asbestos[3]
E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods[4]

3. Terminology

3.1 *Definitions:* Terms relating to asbestos are found in Terminology D 2946.

4. Summary of Test Method

4.1 The height of a weighed specimen obtained in compliance with sampling Test Methods D 2590 or D 3879 is determined under a heavy ram in a graduated cylinder. The ram is then removed and the height of the specimen is again measured. Measurements are repeated until no change is noted in the readings.

4.2 The heights of the specimen under pressure, and after pressure release, are termed "compression" and "recovery," respectively. The percentage difference is reported as "percent recovery."

5. Significance and Use

5.1 The value of compression (as described in 9.5) is proportional to the bulk under moderate pressure.

5.2 The value of percent recovery is a measure of springiness or bulk fiber resilience.

6. Apparatus

6.1 *Graduated Cylinder and Weighed Ram*, as described in Fig. 1.

NOTE 1—The scale shall be calibrated in SI units, and alternatively in other units.

7. Hazards

7.1 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.

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*—Take two specimens of 113.4 ± 0.1 g (4± 0.005 oz) each.

9. Procedure

9.1 Pour a specimen into the graduated cylinder.

NOTE 2—It may be advantageous to use a wide-mouth funnel for pouring the specimen.

NOTE 3—It may be necessary to obstruct the observation slot in the wall of the graduated cylinder while pouring in the shorter fibered, and the more free-flowing grades of asbestos, to prevent specimen loss. This may be done by wedging a wooden rod of appropriate thickness and length, into the slot. Take care that the obstruction does not project inside the cylinder.

9.2 Fit the ram and cap assembly into position and simply allow the ram to compress the specimen under the force of gravity for 60 s (1 min).

9.3 If the observation slot was obstructed during specimen admission, remove the obstruction. Note the height of the

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[1] This test method is under the jurisdiction of ASTM Committee C-17 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] QAMA standard designation of chrysolite asbestos grades. Available from Asbestos Institute, 1130 W. Sherbrooke St., Suite 410, Montreal, QC Canada, H3A 2M8.

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

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

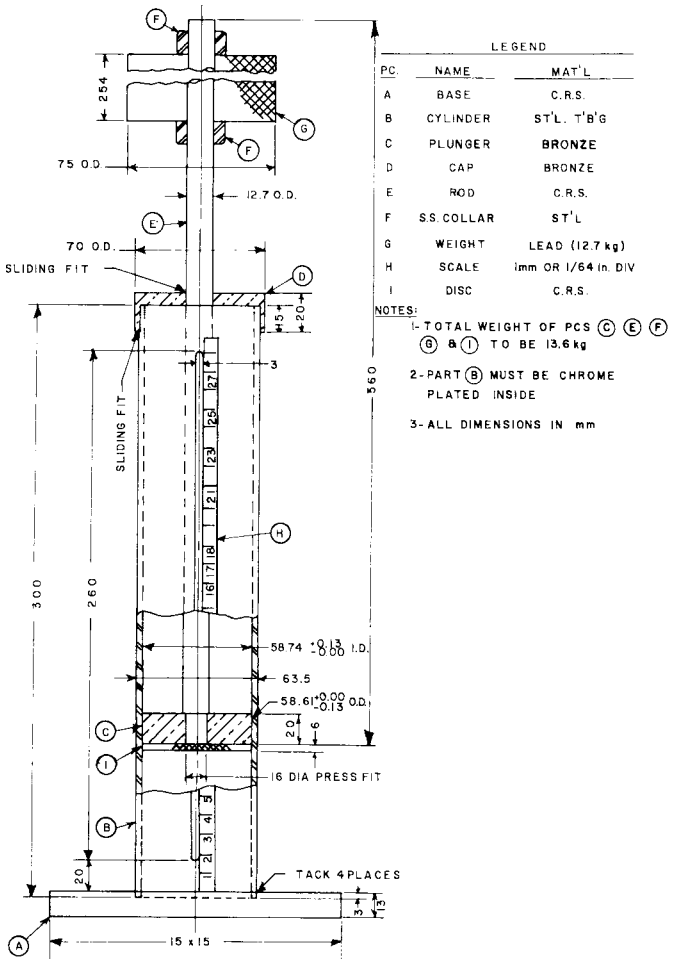

FIG. 1 Compressibility and Recovery Apparatus

specimen at the end of the 60 s dwell period to the nearest 0.5 mm (±1⁄64 in.).

NOTE 4—It is permissible at this point in the procedure to insert a thin pointer, such as a needle, through the observation slot, and to let this rest atop the asbestos surface to facilitate reading the scale with precision.

9.4 Upon removal of the ram, the height of the specimen may change. Note this new height, to the same precision.

9.5 Repeat the compression cycle until the released measurement, and measurements under pressure, become constant. Record these measurements as recovery and compression, respectively.

9.6 Repeat 9.1-9.5 for the second specimen.

10. Calculation

10.1 Calculate percent recovery as follows:

$$\text{Percent Recovery} = (\text{Recovery} - \text{Compression}) \times 100/\text{Compression} \quad (1)$$

10.2 Calculate the average compression and the average percent recovery for both specimens and determine the deviation from the average in each case.

11. Report

11.1 Fully identify the sample as to designation and origin.

11.2 Report average compression for the two acceptable specimens to ± 0.5 mm (±1⁄64in.).

11.3 Record the average of two concordant results and report the percent recovery to the nearest 0.5 %.

12. Precision and Bias

12.1 *Acceptable Results*—If the deviation for either determination from the average result exceeds 5 %, then test additional specimens until a pair of specimens meet these criteria, and accept only the latter.

12.2 *Precision*:

12.2.1 Based upon a study carried out in 1972 at one laboratory on spinning grades only, the following measures of precision were established, as defined in Practice E 177.

12.2.1.1 Repeatability, meaning single-laboratory-apparatus multi-operator-day precision, was established at 28.1 % (relative difference two-sigma limits in percent (RD2S%)) for percent recovery over the range from 8 to 14 % recovery.

12.2.1.2 Repeatability was 3.43 % (relative difference two-sigma limits in percent (RD2S%) for compression over the range from 79 to 104 mm (3⁶⁄64 to 4⁷⁄64 in.) of compression.

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

13. Keywords

13.1 asbestos; bulk resilience; bulking factor; compressibility; compressibility and recovery; recovery; resilience; springiness