Designation: C 1335 – 96

Standard Test Method for Measuring Non-Fibrous Content of Man-Made Rock and Slag Mineral Fiber Insulation[1]

This standard is issued under the fixed designation C 1335; 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 determining the non-fibrous content (shot) of man-made rock and slag mineral fiber insulation. The procedure covers a dry sieve analysis method to distinguish between fiberized and non-fiberized (shot) portions of a specimen of man-made rock and slag mineral fiber insulation specimen.

1.2 This test method does not apply to rock or slag materials containing any components other than rock and slag mineral fiber and organic thermal setting binders. Products containing other types of fibers, inorganic binders, or refractory clays are excluded.

1.3 The values stated in inch-pound 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.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 168 Terminology Relating to Thermal Insulating Materials[2]

C 390 Criteria for Sampling and Acceptance of Preformed Thermal Insulation Lots[2]

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

E 178 Practice for Dealing with Outlying Observations[3]

3. Terminology

3.1 *Definitions*—Terminology C 168 shall be considered as applying to the terms used in this test method.

3.2 *Definition of Term Specific to This Standard:*

3.2.1 *shot*—material that cannot be brushed or mechanically shaken through a No. 100 (150 μm) sieve.

4. Significance and Use

4.1 Inorganic fibrous thermal insulation can contain varying amounts of non-fibrous material. Non-fibrous material does not contribute to the insulating value of the insulation and therefore a procedure for determining that amount is desirable. Several specifications refer to shot content and percent (%) retained on various screen sizes determined by this test method.

5. Apparatus

5.1 *Furnace*, capable of maintaining 1100 ± 10°F (593 ± 5.6°C) for rock and slag wool.

5.2 *U.S.A. Standard Sieve Shaker Machine.*

5.3 *Balance Scale*, capable of weighing to an accuracy of 0.00035 oz (0.01 g).

5.4 *Sieves*—Three 8 in. (203 mm) diameter U.S.A. Standard Sieves. Nos. 20 (850 μm), 50 (300 μm), and 100 (150 μm) nested in order with bottom receiver pan. All sieve design and construction shall be in accordance with Specification E 11.

5.5 *Brush*—Approximately 1 in. (25 mm) diameter plastic bristle brush, and approximately 1 in. (25 mm) wide soft paint brush.

5.6 *Crucible Weighing Dish*, tared.

5.7 *Stoppers*, rubber, No. 12 or 13.

5.8 *Cork Borer*, approximately 0.8 in. (20 mm) diameter.

6. Sampling and Preparation of Test Specimen

6.1 For the purposes of standard tests, sampling shall be in accordance with Criteria C 390 and Practice E 178 with a minimum of three specimens per lot to be tested.

6.1.1 *Specimen*—This test method requires approximately a 0.35 oz (10 g) specimen.

6.2 *Specimen Preparation:*

6.2.1 Obtain a representative specimen utilizing a 0.8 in. (20 mm) cork borer for blanket or board and random specimens for loose fill. Fire the specimen in a tared dish at 1100 ± 10°F (593 ± 5.6°C) for 15 min. Remove tared dish with specimen and allow to cool for approximately 20 min.

6.2.2 Weigh the crucible weighing dish and fiber on balance scale to the nearest 0.00035 oz (0.01 g), subtract tare dish weight, noting the mass of specimen after firing as *WT*.

7. Procedures

7.1 *Shot–Fiber Separation Procedure A (Includes Shaker Machine):*

7.1.1 Assemble a nest of sieves (Nos. 20, 50, and 100) starting with a cover and the coarsest sieve on the top and a pan on the bottom.

7.1.2 Place the specimen on the top sieve with receiver(s) in place.

7.1.3 With the plastic bristle brush or rubber stopper,

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[1] This test method is under the jurisdiction of ASTM Committee C-16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.32 on Mechanical Properties.

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[2] *Annual Book of ASTM Standards*, Vol 04.06.

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

brush to brake-up the specimen through the No. 20 sieve.

7.1.4 Deposit one rubber stopper on each sieve screen before final assembly.

7.1.5 Place the entire nested sieve-assembly with specimen on the motor-driven testing sieve shaker and operate the automatic shaker-hammer for 20 min or until all fibrous materials are passed through to the pan.

7.1.6 Carefully remove all material retained on each sieve and weigh individually (without sieve and stopper) on the balance pan.

7.1.6.1 Weigh the material retained on each sieve to the nearest 0.00035 oz (0.01 g).

7.2 *Shot–Fiber Separation Procedure B (Manual Operation):*

7.2.1 Place the specimen on the top sieve with receivers in place.

7.2.2 With the plastic bristle brush or rubber stopper, brush the specimen through the No. 20 and No. 50 sieves.

7.2.3 With the soft paint brush, brush the specimen through the No. 100 sieve. On all sieves, be certain that all fibrous material is brushed through.

7.2.4 Carefully remove all material retained on each sieve and weigh individually (without sieve) on the balance pan.

7.2.4.1 Weigh the material retained on each sieve to the nearest 0.00035 oz (0.01 g).

8. Calculation

8.1 Calculate the percentage of non-fibrous material for one specimen retained on the No. 20 sieve, No. 50 sieve, and No. 100 sieve, respectively.

8.1.1 Add the No. 20 sieve plus No. 50 sieve plus No. 100 sieve masses together noting as *WP* and calculate as follows:

$$WC = \frac{WP\,(100)}{WT}$$

where:

WC = % mass of non-fibrous material for one specimen,
WP = mass of material on all sieves, and
WT = mass of specimen after firing.

8.2 Adding the total percentages of all *WC*(s) (minimum of three specimens/tests) and dividing by the number of *WC*(s) equals the average total percent of shot (shot content).

9. Report

9.1 Report the following information:

9.1.1 A description of the material being tested, including specimen source (company name and manufacturing location), color, production code, or any other information that will help identify specimen.

9.2 The percentage by weight retained for each sieve size, as well as the total percent non-fibrous material (shot content) to the nearest tenth of a percent. The total percentage shot content will be reported for the average of at least three separate specimen results in accordance with 6.1.

9.3 The temperature at which the material was fired and the time the U.S.A. Standard Sieve Shaker Machine was operated.

10. Precision and Bias

10.1 The precision and bias of this test method are not known because inter-laboratory data are not available. Inter-laboratory data are being obtained and a precision and bias statement will be added with the next revision.

11. Keywords

11.1 insulation; mineral fiber insulation; rock and slag; shot; shot content