



Standard Test Method for Determining the Moisture Content of Organic and Inorganic Insulation Materials by Weight¹

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^{e1} NOTE—8.3 was editorially corrected in November 2007.

1. Scope

1.1 This test method will determine the moisture content, as a percentage of the dry weight of organic and inorganic insulation materials.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

- C 168 Terminology Relating to Thermal Insulation
- C 302 Test Method for Density and Dimensions of Preformed Pipe-Covering-Type Thermal Insulation
- C 303 Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation
- C 390 Practice for Sampling and Acceptance of Thermal Insulation Lots

3. Terminology

3.1 *Definitions*—For definitions used in this specification, see Terminology C 168.

3.2 *Symbols:*

M = moisture content weight, percent

W_i = initial specimen weight, lb (g)

W_{MF} = moisture-free specimen weight (g) M , lb

¹ This test method is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.33 on Insulation Finishes and Moisture.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

4. Summary of Test Method

4.1 This test method is based upon weighing specimens of the insulation material and then drying the specimens by heating them in an oven to remove any moisture. Then the moisture content is determined using the calculation procedure in 9.1.

5. Significance and Use

5.1 Some insulation materials contain moisture, which will affect the thermal and other physical properties of the insulation.

6. Apparatus

6.1 *Air-circulating Oven.*

6.2 *Scale* (accurate to within 0.0011 lb (0.5 g).

7. Sampling and Test Specimen Preparation

7.1 *Test Specimen*—The test specimen shall be of a size that can be conveniently tested in a drying oven but not less than 72 cubic inches in volume such as 6 by 6 by 2 in. thick (150 by 150 by 51 mm).

8. Procedure

8.1 Four test specimens shall be tested. Cut or prepare the four specimens to meet the size requirements of 7.1.

8.2 Measure and record the specimens weight (W_i) immediately after the specimens are prepared to size. The specimens shall be weighed to the nearest 0.0011 lb (0.5 g).

8.3 Place the specimens in an air-circulating oven at a temperature specified in the material specification or at a temperature no higher than $230 \pm 10^\circ\text{F}$ ($110 \pm 6^\circ\text{C}$) for a minimum of 2 h. Cool the specimens to room temperature in a desiccator and measure their weight. Repeat the process until successive weights agree to within 0.2 % of the specimen weight obtained in the latest weighing. Record these weights as moisture free weight (W_{MF}).

NOTE 1—When testing an insulation that contains multiple ingredients and one or more ingredients will dehydrate between the material specification upper temperature limit or above, the oven temperature can be

lowered. The oven temperature will be adjusted based on the chemical the dehydrates at the lowest temperature.

9. Calculation

9.1 Calculate the moisture content as follows:

$$M = 100 \left[\frac{(W_I - W_{MF})}{W_{MF}} \right] \quad (1)$$

9.2 The value reported shall be the numerical average of the calculated moisture content of the four specimens rounded to the nearest 0.1 percent.

10. Report

10.1 Report the following information:

10.1.1 Complete sample identification including trade name, manufacturer, lot number and date of production, when known,

10.1.2 Date and time of test initiation,

10.1.3 Date and time of all weight determinations along with the weights,

10.1.4 Actual temperature used to dry the sample,

10.1.5 Time to reach steady dry weight, and

10.1.6 Report the results of all the specimens tested for each sample and the numerical average calculated in 9.2.

11. Precision and Bias

11.1 Precision and bias have not yet been determined but are being investigated. A precision and bias statement will be included when the proper data have been obtained and analyzed.

12. Keywords

12.1 inorganic insulation; insulation; moisture content; organic insulation; water; weight

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