



Standard Test Method for Water Retention of Rigid Thermal Insulations Following Partial Immersion¹

This standard is issued under the fixed designation C1134; 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.

^{ε1} NOTE—Section 8.5 was editorially revised in January 2013.

1. Scope

1.1 This test method determines the amount of water retained (including surface water) by rigid block and board thermal insulations used in building construction applications after these materials have been partially immersed in liquid water for prescribed time intervals under isothermal conditions. This test method is intended to be used for the characterization of materials in the laboratory. It is not intended to simulate any particular environmental condition that may be encountered in building construction applications.

1.2 This test method does not address all the possible mechanisms of water intake and retention and related phenomena for rigid thermal insulations. It relates only to those conditions outlined in 1.1. Determination of moisture accumulation in thermal insulations due to complete immersion, water vapor transmission, internal condensation, freeze-thaw cycling, or a combination of these effects requires different test procedures.

1.3 Each partial immersion interval is followed by a brief free-drainage period. This test method does not address or attempt to quantify the drainage characteristics of materials. Therefore, results for materials with different internal structure and porosity, such as cellular materials and fibrous materials, may not be directly comparable. Also, test results for specimens of different thickness may not be directly comparable because of porosity effects. The surface characteristics of a material also affect drainage. Specimens with rough surfaces may retain more surface water than specimens with smooth surfaces, and surface treatment during specimen preparation may affect water intake and retention. Therefore, results for materials with different surface characteristics may not be directly comparable.

1.4 For most materials the size of the test specimens is small compared with the size of the products actually installed in the

field. If the surface-to-volume ratios for the test specimens and the corresponding products are different, the test results may be misleading.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *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:*

C168 Terminology Relating to Thermal Insulation²

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—Terminology **C168** applies to terms used in this test method.

3.2 *Descriptions of Terms Specific to This Standard:*

3.2.1 WR_S —short-term water retention rating, the average of the water retained following the 0.75-h and 3.00-h partial immersion intervals, kilograms per square metre (percent by volume) (for materials tested at 1.00 in. (25.4 mm) thickness). (See 4.2.)

3.2.2 WR_L —long-term water retention rating, the water retained following the 168-h partial immersion interval, kilograms per square metre (percent by volume) (for materials tested at 1.00 in. (25.4 mm) thickness). (See 4.2.)

4. Significance and Use

4.1 Materials less than or equal to 0.59 in. (15.0 mm) in thickness shall not be tested in accordance with this test

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.