



Designation: C1918 – 21

Standard Test Method for Water Retention of Rigid Thermal Insulation Materials after Immersion and Exposure to Drying Conditions¹

This standard is issued under the fixed designation C1918; 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 determines the amount of water retained (excluding surface water) by flat specimens of rigid thermal insulations after immersion and exposure to drying 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 potentially 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 partial immersion, water vapor transmission, internal condensation, freeze-thaw cycling, or a combination of these effects requires different test procedures.

1.3 This test method does not address or attempt to quantify the drainage characteristics of materials.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems has the potential to result in non-conformance with the standard.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C168 Terminology Relating to Thermal Insulation

C303 Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation

C578 Specification for Rigid, Cellular Polystyrene Thermal Insulation

3. Terminology

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

4. Summary of Test Method

4.1 Test specimens are immersed in water for 24 h and subsequently exposed to drying conditions for minimum of 24 h. Water absorption is determined after the immersion period and water retention is determined after the exposure to drying period.

5. Significance and Use

5.1 This test method provides a means of measuring the water retention of flat specimens of rigid thermal insulation as a result of immersion in water and exposure to drying conditions.

6. Apparatus

6.1 *Temperature-Controlled Room or Chamber*, suitable for maintaining temperature within $\pm 2^{\circ}\text{C}$ ($\pm 4^{\circ}\text{F}$).

6.2 *Temperature and Humidity-Controlled Room or Chamber*, suitable for maintaining temperature within $\pm 2^{\circ}\text{C}$ ($\pm 4^{\circ}\text{F}$) and relative humidity within $\pm 5\%$.

6.3 *Caliper, Dial Gage, or Micrometer*, suitable for measuring specimen dimensions to within 0.1 %.

6.4 *Balance*, suitable for measuring specimen weight to within 0.1 %.

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.

Current edition approved Dec. 1, 2021. Published January 2022. DOI: 10.1520/C1918-21.

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.