



Designation: D2842 – 19

Standard Test Method for Water Absorption of Rigid Cellular Plastics¹

This standard is issued under the fixed designation D2842; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers the determination of the water absorption of rigid cellular plastics by measuring the change in buoyant force resulting from immersion under a 5.1-cm (2-in.) head of water for the specified immersion period of 96 h.

1.2 This test method describes two procedures that shall be used to measure the change in buoyant force. Procedure A shall be used for materials that either experience rapid water absorption or that show an increase in volume during the exposure period, or both. Materials that do not exhibit either of these characteristics shall be evaluated by Procedure B.

1.3 For specific applications, immersion periods varying from the normal 96-h test requirement shall be agreed upon between the manufacturer and the purchaser.

1.4 The values stated in SI units are to be regarded as 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.*

NOTE 1—This test method is equivalent to ISO 2896.

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

D883 Terminology Relating to Plastics

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Materials - Plastics and Elastomers.

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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.

D3576 Test Method for Cell Size of Rigid Cellular Plastics
D4968 Practice for Annual Review of Test Methods and Specifications for Plastics

E96 Test Methods for Water Vapor Transmission of Materials

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E456 Terminology Relating to Quality and Statistics

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

E2935 Practice for Conducting Equivalence Testing in Laboratory Applications

2.2 ISO Standard:

ISO 2896 Cellular Plastics, Rigid—Determination of Water Absorption³

3. Terminology

3.1 *Definitions*—Terms used in this standard are defined in accordance with Terminology D883, unless otherwise specified.

3.2 For terms relating to precision and bias and associated issues, the terms used in this standard are defined in accordance with Terminology E456.

4. Summary of Test Method

4.1 The buoyant force of an object less dense than water is equal to the weight of water it displaces when submerged, less the dry weight of the object. Water absorbed into the object lowers the buoyant force by increasing the weight of the sample. By knowing the volume and initial dry weight of the sample, the initial buoyant force can be calculated or the initial buoyant force can be determined by direct measurement. The final buoyant force at the end of the immersion period is measured with an underwater weighing assembly. The difference between the initial and final buoyant force is the weight of the water absorbed per unit of specimen volume.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

*A Summary of Changes section appears at the end of this standard