



Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood- Base Materials¹

This standard is issued under the fixed designation D 4442; 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 Department of Defense.

1. Scope

1.1 These test methods cover the determination of the moisture content (MC) of solid wood, veneer, and other wood-base materials, including those that contain adhesives and chemical additives. The test methods below describe primary (A) and secondary (B through D) procedures to measure moisture content:

Method A—Primary Oven-Drying Method
Method B—Secondary Oven-Drying Method
Method C—Distillation (Secondary) Method
Method D—Other Secondary Methods.

1.2 The primary oven-drying method (Method A) is intended as the sole primary method. It is structured for research purposes where the highest accuracy or degree of precision is needed.

1.3 The secondary methods (B through D) are intended for special purposes or under circumstances where the primary procedure is not desired or justified. In these procedures, moisture content values cannot be reported with an accuracy greater than integer percentage values. However, a greater level of accuracy may be reported if the appropriate primary procedures are used.

1.4 Distillation (secondary) method is intended for use with materials that have been chemically treated or impregnated such that the oven-drying procedures introduce greater error than desired in the results.

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

2. Referenced Documents

2.1 *ASTM Standards:*²

D 9 Terminology Relating to Wood and Wood-Based Products

D 4933 Guide for Moisture Conditioning of Wood and Wood-Based Materials

3. Terminology

3.1 *Definition:*

3.1.1 *moisture content*—the amount of water contained in the wood, usually expressed as a percentage of the mass of the oven-dry wood (in accordance with Terminology **D 9**).

3.1.1.1 *Discussion*—The moisture content of wood or other wood-based materials can be expressed on either as a percentage of oven-dry mass of the sample (oven-dry basis) or as a percentage of initial mass (wet basis). The methods described in this standard refer to the oven-dry basis. Because oven-dry mass is used, moisture content values may exceed 100 %. The term moisture content when used with wood-based materials can be misleading since untreated wood frequently contains varying amounts of volatile compounds (extractives which are evaporated when determining moisture content). Definition of the moisture content of wood is further complicated when determined by a thermal method because of thermal degradation, which causes the final moisture-free mass to decrease from small but continuous losses.

4. Significance and Use

4.1 Moisture content is one of the most important variables affecting the properties of wood and wood-base materials. The procedures in these test methods are structured to permit the full range of use from fundamental research to industrial processing. Method A is designed for obtaining the most precise values of moisture content consistent with the needs of

¹ These test methods are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.01 on Fundamental Test Methods and Properties.

Current edition approved Nov. 15, 2007. Published December 2007. Originally approved in 1984. Last previous edition approved in 2003 as D 4442 – 92 (2003).

These test methods replace, in part, Test Methods D 2016, for Moisture Content of Wood, discontinued 1989.

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.

