



Designation: D4933 – 16 (Reapproved 2021)

Standard Guide for Moisture Conditioning of Wood and Wood-Based Materials¹

This standard is issued under the fixed designation D4933; 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 guide covers standard procedures for conditioning and equilibrating wood and wood-based materials to constant moisture content. The procedures apply to solid wood, wood-based fiber and particulate materials and panels, and wood products containing adhesives. They are intended for use in research and development activities, testing laboratories, quality control, and for all other classes of producers and users. This guide includes background material on the importance of moisture content control, important definitions and technical data, possible types of apparatus, procedures, and the importance of conditioning time. Users should recognize that the necessary degree of precision and bias varies with the intentions of the users. Some research and testing, for example, might require very close control of moisture content, whereas control in an industrial storage facility might not require such close control. This guide offers procedures that include these different requirements.

1.2 The values stated in SI units are to be regarded as standard. The values of temperature in degrees Fahrenheit given in **Table X1.2** are mathematical conversions that are provided for information only and are not considered standard.

1.3 The following safety hazards caveat pertains only to the procedure section, Section 6, of this guide. *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.*

1.4 *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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*²

D9 Terminology Relating to Wood and Wood-Based Products

D4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials

E104 Practice for Maintaining Constant Relative Humidity by Means of Aqueous Solutions

2.2 *ISO Standard:*

ISO 554 Atmospheres for Conditioning and/or Testing—Specifications³

3. Terminology

3.1 *Definitions:*

3.1.1 The following terms are defined in accordance with Terminology **D9**.

3.1.2 *equilibrium moisture content, n*—moisture content at which wood neither gains nor loses moisture to the surrounding air.

3.1.2.1 *Discussion*—Equilibrium moisture content (EMC) generally connotes a moisture content at which a nominal species of solid wood will equilibrate. “Nominal” is used in the sense of a “hypothetical average” rather than an actual species. At constant EMC environmental conditions, however, various wood-based materials can reach different levels of EMC. It is more appropriate, therefore, to refer to conditioning at specified relative humidity (RH) and temperature conditions than to a particular EMC. Recommendations for conditioning are given in ISO 554. Nominal values for equilibrium moisture content (EMC) are given in **Appendix X1**. Caution must be used in calculating or using these values since they represent a

¹ This guide is under the jurisdiction of ASTM Committee **D07** on Wood and is the direct responsibility of Subcommittee **D07.01** on Fundamental Test Methods and Properties.

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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.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.