



Designation: D7438 – 20

Standard Practice for Field Calibration and Application of Hand-Held Moisture Meters¹

This standard is issued under the fixed designation D7438; 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 practice applies to the measurement of moisture content of solid wood, including solid wood products containing additives, that is, chemicals or adhesives, by hand-held moisture meters under conditions of end-use.

1.1.1 This practice includes calibration, use, and interpretation of meters for conditions that relate to wood product characteristics, such as nonuniform grain and growth ring orientation, and to end-use process conditions, such as moisture gradients.

1.1.2 Meters employing differing technologies will not necessarily provide equivalent readings under the same conditions. When this practice has been applied, it is assumed that the referenced meter is acceptable unless otherwise specified. Meters shall have been calibrated by Test Methods [D4444](#).

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard

1.3 *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 Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

¹ This practice 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.

[D9 Terminology Relating to Wood and Wood-Based Products](#)

[D2915 Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products](#)

[D4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials](#)

[D4444 Test Method for Laboratory Standardization and Calibration of Hand-Held Moisture Meters](#)

[D4933 Guide for Moisture Conditioning of Wood and Wood-Based Materials](#)

[D6782 Test Methods for Standardization and Calibration of In-Line Dry Lumber Moisture Meters](#)

2.2 *Other ASTM Sources:*

[ASTM Standards on Precision and Bias for Various Applications, 1992](#)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of general terms used in this standard related to wood and wood-based products, refer to Terminology [D9](#).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *conductance meters*—moisture meters that measure predominantly ionic conductance between points of applied voltage, usually direct current.

3.2.1.1 *Discussion*—Direct-current conductance meters have been commonly referred to as “resistance-type” meters. Most commercial conductance meters are high-input impedance (about $10^{12} \Omega$), wide-range (10^4 to $10^{12} \Omega$) ohmmeters. Their scales are calibrated to read directly in moisture content (oven-dry mass basis) for a particular calibration species and at a specific reference temperature.

3.2.2 *capacitive-admittance meters*—moisture meters that transmit electromagnetic wave energy into the wood to detect the influence of moisture in the wood on these waves as an estimate of moisture content.

3.2.2.1 *Discussion*—Wave energy is most often in the radio frequency range; hand-held meters commonly are placed directly on the wood surface.

4. Significance and Use

4.1 Hand-held meters provide a rapid means of sampling moisture content of wood-based materials during and after