



Designation: D2395 – 17 (Reapproved 2022)

# Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials<sup>1</sup>

This standard is issued under the fixed designation D2395; 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 ( $\epsilon$ ) 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 These test methods cover the determination of the density and specific gravity (relative density) of wood and wood-based materials to generally desired degrees of accuracy and for specimens of different sizes, shapes, and moisture content conditions. The test method title is indicative of the procedures used or the specific area of use.

|                                         | Section |
|-----------------------------------------|---------|
| Test Method A—Volume by Measurement     | 8       |
| Test Method B—Volume by Water Immersion | 9       |
| Test Method C—Flotation Tube            | 10      |
| Test Method D—Forstner Bit              | 11      |
| Test Method E—Increment Core            | 12      |
| Test Method F—Chips                     | 13      |
| Test Method G—Full-Size Members         | 14      |

1.2 *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.*

1.3 *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:<sup>2</sup>

- D9 Terminology Relating to Wood and Wood-Based Products
- D2555 Practice for Establishing Clear Wood Strength Values

<sup>1</sup> 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 Aug. 1, 2022. Published September 2022. Originally approved in 1965. Last previous edition approved in 2017 as D2395 – 17. DOI: 10.1520/D2395-17R22.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

D5456 Specification for Evaluation of Structural Composite Lumber Products

D7438 Practice for Field Calibration and Application of Hand-Held Moisture Meters

E1547 Terminology Relating to Industrial and Specialty Chemicals

### 2.2 Other Standards:

CAN/CSA O86 Engineering Design in Wood<sup>3</sup>

ANSI/AWC National Design Specification for Wood Construction<sup>4</sup>

## 3. Terminology

### 3.1 Definitions:

3.1.1 For definitions of terms used in this standard, refer to Terminology D9.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *density*,  $\rho$  [ $\text{kg/m}^3$ ,  $\text{g/cm}^3$  or  $\text{lb/ft}^3$ ],  $n$ —mass of a unit volume of a specimen at specified moisture content.

NOTE 1—The moisture content is specified for both mass and volume. For further discussion, see Appendix X3.

3.2.1.1 *density at moisture content M*—density based on the mass of a specimen including moisture and its volume at the same moisture content.

NOTE 2—The mass and volume at 12 % moisture content are frequently used.

3.2.1.2 *density, basic or conventional*,  $\rho_b$ —density based on the oven-dry mass of a specimen and its green volume.

3.2.1.3 *density, oven-dry or in the absolute dry condition*,  $\rho_o$ —density based on the oven-dry mass of a specimen and its oven-dry volume.

3.2.2 *green volume*,  $n$ —volume of wood specimen before any shrinkage occurs due to drying to moisture content below the fiber saturation point (about 30 %).

<sup>3</sup> Available from CSA Group, 5060 Spectrum Way, Mississauga, ON L4W 5N6, Canada, <http://www.csa.ca>.

<sup>4</sup> Available from American Wood Council (AWC) 222 Catotcin Circle, SE, Suite 201 Leesburg, VA 20175, [www.awc.org](http://www.awc.org).