



Designation: D7032 – 21

Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite and Plastic Lumber Deck Boards, Stair Treads, Guards, and Handrails¹

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1. Scope

1.1 This specification covers procedures to establish a performance rating for wood-plastic composite and plastic lumber for use as exterior deck boards, stair treads, guards, and handrails. The purpose of this specification is to establish a basis for code recognition of these products or systems in exterior applications.

NOTE 1—While wood-plastic composites contain wood or other cellulosic materials, the presence of wood or other cellulosic materials in plastic lumber is not required by this specification. Due to non-wood materials in wood-plastic composites and plastic lumber the structural, physical, fire, and other attributes may not be similar to those of wood.

NOTE 2—The products addressed in this standard are considered combustible. No fire response characteristic is required in this specification except for flame spread index as determined in accordance with Test Method E84.

1.1.1 The plastic component of wood-plastic composites and plastic lumber covered by this specification shall consist primarily of thermoplastics.

1.2 Deck boards, stair treads, guards, and handrails covered by this specification are permitted to be of any code compliant shape and thickness (solid or non-solid).

1.3 Wood-plastic composites and plastic lumber are produced in a broad range of fiber and/or resin formulations. It is recognized that the performance requirements in this specification are valid for any material or combination of materials used as deck boards, stair treads, guards, or handrails.

1.4 Details of manufacturing processes are beyond the scope of this specification.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

¹ This specification is under the jurisdiction of ASTM Committee D07 on Wood and is the direct responsibility of Subcommittee D07.02 on Lumber and Engineered Wood Products.

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1.6 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.

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1.8 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

- D9 Terminology Relating to Wood and Wood-Based Products
- D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D883 Terminology Relating to Plastics
- D1037 Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
- D1413 Test Method for Wood Preservatives by Laboratory Soil-Block Cultures (Withdrawn 2016)³
- D1554 Terminology Relating to Wood-Base Fiber and Particle Panel Materials
- D1761 Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials
- D1929 Test Method for Determining Ignition Temperature of Plastics
- D1972 Practice for Generic Marking of Plastic Products (Withdrawn 2014)³
- D2017 Test Method of Accelerated Laboratory Test of Natural Decay Resistance of Woods (Withdrawn 2014)³
- D2047 Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
- D2394 Test Methods for Simulated Service Testing of Wood and Wood-Based Finish Flooring
- D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications
- D2915 Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products
- D3345 Test Method for Laboratory Evaluation of Solid Wood for Resistance to Termites
- D4000 Classification System for Specifying Plastic Materials
- D4092 Terminology for Plastics: Dynamic Mechanical Properties
- D4761 Test Methods for Mechanical Properties of Lumber and Wood-Based Structural Materials
- D5764 Test Method for Evaluating Dowel-Bearing Strength of Wood and Wood-Based Products
- D6109 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products
- D6662 Specification for Polyolefin-Based Plastic Lumber Decking Boards
- E84 Test Method for Surface Burning Characteristics of Building Materials
- E1354 Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- F1679 Test Method for Using a Variable Incidence Tribometer (VIT) (Withdrawn 2006)³

G154 Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

2.2 Other References:

- AWPA Standard E1 Standard Method for Laboratory Evaluation for Determination of Resistance to Subterranean Termites⁴
- AWPA Standard E10 Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Cultures⁴
- 2009 International Building Code International Code Council, Inc.⁵
- 2009 International Residential Code International Code Council, Inc.⁵

3. Terminology

3.1 *Definitions*—Terminology used to describe WPCs are defined in Terminologies D9, D883, D1554, and D4092, Practice D1972, and Classification D4000.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *center-point load*—a flexure test where the load comes in contact with the test specimen at a location that is ½ the test span.

3.2.2 *guard*—a building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

3.2.3 *handrail*—a rail intended for grasping by the hand for guidance or support.

3.2.4 *plastic lumber*—a manufactured product made primarily from plastic materials (filled or unfilled), typically used as a building material, which is usually rectangular in cross-section.

3.2.5 *quarter-point loading*—a flexure test where the load comes in contact with the test specimen at two locations, each of which is located at ¼ the span from the specimen load support.

3.2.5.1 *Discussion*—For example, quarter-point loading for a test specimen on a 24-in. (610-mm) span would have two equal loads contact the test specimen each located 6 in. in from the test specimen load support. The distance between the two points of load would be 12 in. (305 mm).

3.2.6 *span rating*—an index number that identifies the test span used in all structural load testing, which is the maximum center-to-center support spacing for the specified end use, and allowable design capacity, in pounds per square foot (lbf/ft² (kN/m²)), determined in accordance with this specification.

3.2.6.1 *Discussion*—For example, a deck span rating of 1¹/₁₀₀ recognizes the deck board for installation perpendicular to the floor joists spaced a maximum of 16 in. (406 mm) on center, and for supporting the load combinations required by the applicable code, which in this case cannot exceed 100 lbf/ft² (4.79 kN/m²).

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 The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American Wood-Preservers' Association (AWPA), P.O. Box 361784, Birmingham, AL 35236-1784, <http://www.awpa.com>.

⁵ Available from International Code Council (ICC), 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041-3401, <http://www.intlcode.org>.