



Standard Specification for Computing Reference Resistance of Wood-Based Materials and Structural Connections for Load and Resistance Factor Design¹

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INTRODUCTION

Load and resistance factor design (LRFD) is a structural design method that uses concepts from reliability theory and incorporates them into a procedure usable by the design community. The basic design equation requires establishing a reference resistance based on several material property parameters. A standard method for calculating the required material property input data is critical so that all wood-based structural materials can be treated equitably. This specification provides the procedures that are required for the generation of reference resistance for LRFD.

1. Scope

1.1 This specification covers procedures for computing the reference resistance of wood-based materials and structural connections for use in load and resistance factor design (LRFD). The reference resistance derived from this specification applies to the design of structures addressed by the load combinations in ASCE 7-10.

1.2 A commentary to this specification is provided in **Appendix X1**.

2. Referenced Documents

2.1 *ASTM Standards*:²

- D9** Terminology Relating to Wood and Wood-Based Products
- D143** Test Methods for Small Clear Specimens of Timber
- D198** Test Methods of Static Tests of Lumber in Structural Sizes
- D1037** Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
- D1761** Test Methods for Mechanical Fasteners in Wood
- D1990** Practice for Establishing Allowable Properties for Visually-Graded Dimension Lumber from In-Grade Tests

of Full-Size Specimens

- D2718** Test Methods for Structural Panels in Planar Shear (Rolling Shear)
 - D2719** Test Methods for Structural Panels in Shear Through-the-Thickness
 - D2915** Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products
 - D3043** Test Methods for Structural Panels in Flexure
 - D3500** Test Methods for Structural Panels in Tension
 - D3501** Test Methods for Wood-Based Structural Panels in Compression
 - D3737** Practice for Establishing Allowable Properties for Structural Glued Laminated Timber (Glulam)
 - D4761** Test Methods for Mechanical Properties of Lumber and Wood-Base Structural Material
 - D5055** Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists
 - D5456** Specification for Evaluation of Structural Composite Lumber Products
 - E105** Practice for Probability Sampling of Materials
- ### 2.2 *ASCE Standard*:³
- ASCE 7-10** Minimum Design Loads for Buildings and Other Structures

3. Terminology

3.1 *Definitions*:

3.1.1 For general definitions of terms related to wood, refer to Terminology **D9**.

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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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 The American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191.