



Designation: D5457 – 20

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 format conversion procedure is outlined in Section 4. The test-based derivation procedure is outlined in [Annex A1](#). The reference resistance derived from this specification applies to the design of structures addressed by the load combinations in ASCE 7-16.

1.2 A commentary to this specification is provided in [Appendix X1](#).

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

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.*

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. 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 Wood 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](#)

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.