



Designation: D7199 – 20

Standard Practice for Establishing Characteristic Values for Reinforced Glued Laminated Timber (Glulam) Beams Using Mechanics-Based Models¹

This standard is issued under the fixed designation D7199; 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 describes procedures for establishing the characteristic values for reinforced structural glued-laminated timber (glulam) beams using mechanics-based models and validated by full-scale beam tests. Glulam beams shall be manufactured in accordance with applicable provisions of ANSI A190.1.

1.2 This practice also describes a minimum set of performance-based durability test requirements for reinforced glulam beams, as specified in [Annex A1](#). Additional durability test requirements shall be considered in accordance with the specific end-use environment. [Appendix X1](#) provides an example of a mechanics-based methodology that satisfies the requirements set forth in this practice.

1.3 This practice is limited to procedures for establishing flexural properties (modulus of rupture, MOR, and modulus of elasticity, MOE) about the x-x axis of horizontally-laminated reinforced glulam beams.

1.4 The establishment of secondary properties, such as bending about the y-y axis, shear parallel to grain, tension parallel to grain, compression parallel to grain, and compression perpendicular to grain, for the reinforced glulam beams are beyond the scope of this practice.

NOTE 1—When the establishment of secondary properties is deemed necessary, testing according to other applicable methods, such as Test Methods [D143](#) and [D198](#) or analysis in accordance with Practice [D3737](#), may be considered.

1.5 Reinforced glulam beams subjected to axial loads are outside the scope of this practice.

1.6 Proper safety, serviceability, and adjustment factors including duration of load, to be used in design are outside the scope of this practice.

¹ This practice 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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1.7 Evaluation of unbonded, prestressed, and shear reinforcement is outside the scope of this practice.

1.8 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. The mechanics-based model shall be permitted to be developed using SI or inch-pound units.

1.9 *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.*

1.10 *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](#)
- [D143 Test Methods for Small Clear Specimens of Timber](#)
- [D198 Test Methods of Static Tests of Lumber in Structural Sizes](#)
- [D905 Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading](#)
- [D1990 Practice for Establishing Allowable Properties for Visually-Graded Dimension Lumber from In-Grade Tests of Full-Size Specimens](#)
- [D2559 Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions](#)

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.