



Standard Test Methods for Mechanical Properties of Lumber and Wood-Base Structural Material¹

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INTRODUCTION

Numerous evaluations of the mechanical properties of wood-based structural material have been satisfactorily conducted since the late 1920s, using Test Methods D 198. Those methods are best suited to a laboratory environment and are adaptable to a variety of products such as stress-graded lumber, sawn timber, laminated timbers, wood-plywood composite members, reinforced and prestressed timbers.

The procedures presented in these test methods have been derived from those set forth in Test Methods D 198. They are intended primarily for application to stress-graded lumber, but can be used for other wood-base structural material as well. The procedures are more flexible than those in Test Methods D 198, making testing in a nonlaboratory environment more feasible. Thus the test methods can be used on production sites for field testing and quality control, as well as in laboratories for research applications. Key differences from Test Methods D 198 are the testing speed, the deflection measuring procedures for test specimens under load, and the detail of data reporting. Furthermore, the test methods do not require that specimens be loaded to failure (Note 1).

Since these test methods allow latitude in testing procedures, the procedures used shall be fully documented in the test report. It may also be desirable to correlate the results from tests carried out according to these test methods with test results obtained through the use of a traditional procedure such as set forth in Test Methods D 198.

1. Scope

NOTE 1—A proof load may be used which will permit the determination of a specified strength percentile without testing the total sample to destruction. Designing a test program on the basis of proof loading can be complex, requiring consideration in relation to the objectives of the test program. Guidance on this matter can be found in the paper by Johnson.²

1.1 These test methods cover the determination of the mechanical properties of stress-graded lumber and other wood-base structural material.

1.2 These test methods appear in the following order:

	Section
Bending edge-wise	6-11
Bending flat-wise:	
Center point loading	12-17
Third point loading	18-23

¹ 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 & Properties.

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² “Current Statistical Methods for Estimating Lumber Properties by Proof Loading,” Johnson, R. A., *Forest Products Journal*, Vol 30, No. 1, 1980, pp. 14–22.

Axial strength in tension	24-29
Axial strength in compression	30-35

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 9 Terminology Relating to Wood³

D 198 Test Methods of Static Tests of Lumber in Structural Sizes³

D 2915 Practice for Evaluating Allowable Properties for Grades of Structural Lumber³

D 4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials³

E 4 Practices for Force Verification of Testing Machines⁴

³ *Annual Book of ASTM Standards*, Vol 04.10.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

