Designation: D3501 – 05a (Reapproved 2011)

Standard Test Methods for Wood-Based Structural Panels in Compression[1]

This standard is issued under the fixed designation D3501; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover the determination of the compression properties of wood-based structural panels. Wood-based structural panels in use include plywood, waferboard, oriented strand board, and composites of veneer and of wood-based layers.

1.2 *Method A, Compression Test for Small Specimens*—This method is applicable to small specimens that are uniform with respect to elastic and strength properties. Two types of compression tests are employed: one to evaluate both elastic and compressive strength properties, and the second to evaluate maximum compressive strength only.

1.3 *Method B, Compression Test for Large Specimens*—This method employs large specimens and responds well to manufacturing variables and growth characteristics that influence compression properties of structural panels.

1.3.1 This method is intended for the following:

1.3.1.1 Comparative tests of structural panels,

1.3.1.2 Evaluating the effects of moisture content on strength properties of structural panels,

1.3.1.3 Determining the strength properties of structural panels, and

1.3.1.4 Evaluating the effects of raw material and manufacturing variables on compression properties of structural panels.

1.4 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.

1.5 *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:*[2]

D2395 Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials

D4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials

3. Significance and Use

3.1 These methods determine the compressive strength of structural panels in response to stresses acting in the plane of the panel.

3.2 *Method A*—This method is applicable to structural panels of uniform properties within a panel. It is useful for evaluating plywood of clear, straight-grained veneers, and determining the effect of chemical or preservative treatments, construction, principal direction with respect to direction of stress, and other variables that are expected to uniformly influence the panel.

3.3 *Method B:*

3.3.1 The compressive properties obtained by this method are a reliable approximation of the strength of a full-size panel, and are intended for use in design.

3.3.2 The compressive properties are influenced by buckling; however, this effect can be eliminated in this test by restraining the edges of the specimens.

3.4 It is recommended that where comparisons are to be made, that the same method and specimen size be used throughout. This is because the volume of material included in a test specimen can influence the compressive strength regardless of whether the material properties are uniform throughout the sheet or vary widely due to the presence of growth or manufacturing features.

4. Control of Moisture Content

4.1 Condition structural panel samples to be tested at a specific moisture content or relative humidity to approximate

[1] These test methods are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.03 on Panel Products.

Current edition approved Nov. 1, 2011. Published November 2011. Originally approved in 1976. Last previous edition approved in 2000 as D3501 – 05a. DOI: 10.1520/D3501-05aR11.

[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.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States