



Designation: D7857 – 24

Standard Test Method for Evaluating the Flexural Properties and Internal Bond Strength of Fire-Retarded Mat-Formed Wood Structural Composite Panels Exposed to Elevated Temperatures¹

This standard is issued under the fixed designation D7857; 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 test method is designed as a laboratory screening test. It is intended to establish an understanding of the respective contributions of the many wood material, fire-retardant, resin and processing variables, and their interactions, upon the mechanical properties of fire-retarded mat-formed wood structural composite (FRSC) panels as they affect flexural and internal bond (IB) performance and as they are often affected later during exposure to high temperature and humidity. Once the critical material and processing variables have been identified through these small-specimen laboratory screening tests, additional testing and evaluation shall be required to determine the effect of the treatment on the panel structural properties and the effect of exposure to high temperature on the properties of commercially produced FRSC panels. In this test method, treated structural composite panels are exposed to a temperature of 77 °C (170 °F) and at least 50 % relative humidity.

1.2 The purpose of the preliminary laboratory-based test method is to compare the flexural properties and IB strength of FRSC panels relative to untreated structural composite panels with otherwise identical manufacturing parameters. The results of tests conducted in accordance with this test method provide a reference point for estimating strength temperature relationships for preliminary purposes. They establish a starting point for subsequent full-scale testing of commercially produced FRSC panels.

1.3 This test method does not cover testing and evaluation requirements necessary for product certification and qualification or the establishment of design value adjustment factors for FRSC panels.

NOTE 1—One potentially confounding limitation of this preliminary screening test method is that it may be conducted with laboratory panels that may not necessarily represent commercial quality panels. A final

qualification program should likely be conducted using commercial quality panels and the scope of the review should include evaluation of the effects of the treatment and elevated temperature exposure on all relevant mechanical properties of the commercially produced panel.

1.4 This test method is not intended for use with structural plywood.

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

1.6 *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.*

1.7 *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
- 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
- D1165 Nomenclature of Commercial Hardwoods and Softwoods
- D2395 Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials
- D3043 Test Methods for Structural Panels in Flexure
- D5516 Test Method for Evaluating the Flexural Properties of

¹ This test method is under the jurisdiction of ASTM Committee D07 on Wood and is the direct responsibility of Subcommittee D07.07 on Fire Performance of Wood.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.