Designation: D3201/D3201M – 13

Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products[1]

This standard is issued under the fixed designation D3201/D3201M; 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 prescribes the procedure for determining the hygroscopicity of fire retardant treated wood products by determining the moisture content of fire-retardant-treated wood and wood-based product specimens after exposure to a test condition of 92 ± 2 % relative humidity at 81 ± 4°F [27 ± 2°C].

1.2 The text of this test method references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of this test method.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 *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]

D9 Terminology Relating to Wood and Wood-Based Products

E84 Test Method for Surface Burning Characteristics of Building Materials

E176 Terminology of Fire Standards

E2768 Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)

3. Terminology

3.1 *Definitions*—Definitions used in this practice are in accordance with Terminologies D9 and E176.

4. Significance and Use

4.1 The hygroscopic properties of wood and wood-based products treated with fire-retardant chemicals are often greater than for untreated products. This is particularly true at the higher relative humidity conditions. This higher hygroscopicity sometimes is the cause for staining, decay, poor paint adhesion, and migration and exuding of chemicals and moisture at the high humidities. Corrosion of metal fasteners sometimes also occurs.

4.2 The results obtained with this standard are important in identifying treatments with low hygroscopic properties.

4.3 Results can be useful in determining exposure limitations in service for specific treated products.

4.4 Building codes and other specifications for fire-retardant-treated wood for interior use include requirements based on this test method.

5. Apparatus

5.1 *Conditioning* chamber with air circulation and capable of being maintained at 81 ± 4°F [27 ± 2°C] and a relative humidity of 92 ± 2 %.

5.2 *Oven,* air-circulated and vented, capable of maintaining a temperature of 217 ± 4°F [103 ± 2°C].

5.3 *Weighing Scale*—A scale or balance that will weigh a specimen within an accuracy of ±0.2 %.

6. Test Specimens

6.1 A minimum of five specimens shall be selected from the untreated product/species combination that is to be tested. Solid wood specimens with identifiable sapwood shall be selected with as much sapwood as can be readily obtained from the lot of material from which it is selected.

6.2 *Specimen Size:*

6.2.1 Solid wood specimens shall be cross sections cut from solid sawn, surfaced lumber of nominal 2×6 size. The test

[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 service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.