



Designation: D7519 – 11

Standard Test Method for Internal Bond Strength and Thickness Swell of Cellulosic- Based Fiber and Particle Panels After Repeated Wetting¹

This standard is issued under the fixed designation D7519; 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 These test methods provide a measure of the moisture resistance of cellulosic-based fiber and particle panels (for example, medium-density fiberboard (MDF), particleboard, and hardboard). Resistance to moisture changes is measured by dimensional and internal bond changes and does not refer to decay/mold resistance or other performance aspects.

1.2 These test methods do not address structural properties or performance following moisture exposure. Panels are subjected to repeated cycles of water submersion and oven drying. After three cycles, the test specimens are tested for thickness swelling (TS) and internal bond (IB) strength.

1.3 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.

1.4 *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

[D1037 Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials](#)

[D4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials](#)

[D4933 Guide for Moisture Conditioning of Wood and Wood-Based Materials](#)

3. Significance and Use

3.1 These test methods provide a measure of the moisture resistance of cellulosic-based fiber and particle panels (for

example, medium-density fiberboard (MDF), particleboard, and hardboard). This test methodology can be used to assess the thickness swelling and bond integrity characteristics of panels engineered for interior end-use applications involving exposure to cyclic temperatures and intermittent wetting environments.

4. Apparatus

4.1 The methods and test equipment used in Test Methods [D1037](#) are used in these test methods.

5. Sampling and Test Specimens

5.1 Two samples taken from the same board measuring 6 × 6 in. (152 × 152 mm) shall be used for collection of thickness swelling (TS) data.

5.2 Three internal bond (IB) strips measuring 6 × 12 in. (152 × 305 mm) shall be cut from the same board as the TS samples.

6. Conditioning

6.1 Condition specimens to practical equilibrium at a relative humidity of $65 \pm 3\%$ and a temperature of $68 \pm 4^\circ\text{F}$ ($20 \pm 2^\circ\text{C}$). Practical equilibrium is defined as the state of time change in which, for practical purposes, the specimen is neither gaining nor losing appreciable moisture content in a 24-h period. Guide [D4933](#) provides further information on moisture equilibrium.

7. Procedure

7.1 Thickness Swell (TS)

7.1.1 After conditioning, the mass of the specimen shall be measured to an accuracy of $\pm 0.2\%$. The width, length, and thickness of the specimen shall be measured to an accuracy of $\pm 0.3\%$ to compute the volume of the specimen.

7.1.2 The thickness shall be measured at four points midway along each side 1 in. (25 mm) away from the edge and the average of these four measurements shall be recorded as the initial thickness for each specimen. The thickness shall be measured over a surface with $\frac{1}{4}$ -in. diameter on both sides of the specimen using a micrometer with $\frac{1}{4}$ -in. (6.4-mm) anvils.

7.1.3 The specimens shall be submitted to three exposure cycles according to [7.2](#). The water soak tank parameters shall

¹ This test method is under the jurisdiction of ASTM Committee [D07](#) on Wood and is the direct responsibility of Subcommittee [D07.03](#) on Panel Products.

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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.