



Standard Test Method for Determining Resistance to Delamination of Adhesive Bonds in Overlay-Wood Core Laminates Exposed to Heat and Water¹

This standard is issued under the fixed designation D 5824; 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 provides a procedure to determine the quality of bond between an overlay and a wood core in an adhesively bonded laminate. The quality of bond is determined by measuring the resistance to delamination of the adhesively bonded laminate when tested under specific conditions of preparation, conditioning, and testing. Such products include, but are not limited to, window and door components, such as stiles and rails, and other overlaid panels. Typical wood-based cores are finger-jointed lumber, particleboard, oriented strand board, and hardboard. Typical overlays would be veneer, high-pressure laminate, high-density polyethylene, and fiberglass-reinforced plastic.

1.2 Adhesive bond performance as measured by resistance to delamination in this test method is suitable for use in adhesive product development, manufacturing quality control, and monitoring bonding processes.

1.3 This test method does not provide guidance for determining bond line performance for plywood products.

1.4 The values stated in inch-pound units are to be regarded as 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:

D 907 Terminology of Adhesives²

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

D 5266 Practice for Estimating the Percentage of Wood Failure in Adhesive Bonded Joints²

E 6 Terminology Relating to Methods of Mechanical Testing⁴

E 41 Terminology Relating to Conditioning⁵

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁶

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁶

3. Terminology

3.1 *Definitions*—Certain terms in this test method are defined in Terminologies D 907, E 6, and E 41.

3.1.1 *delamination, n*—the separation of layers in a laminate because of failure of the adhesive, either in the adhesive itself or at the interface between the adhesive and the adherend. (See Terminology D 907.)

3.1.2 *overlay, n*—a uniform layer of material, usually in the form of a sheet, adhesively bonded to an adherend with the purpose of improving the appearance or physical properties of the laminate.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *edge, n*—in an adhesively bonded laminate, the dimension along its length [and parallel to the grain] where the overlay is bonded to the core.

3.2.2 *end, n*—in an adhesively bonded laminate, the dimension which is perpendicular to the length of the laminate where the overlay is bonded to the core.

4. Significance and Use

4.1 This test method measures quantitatively the effects of water soaking and drying, and their associated swelling and shrinking stresses on adhesive bonds in overlay-laminated assemblies.

4.2 Adhesive bond performance is based on the ability of the adhesive and adhesive bonds to resist delamination during accelerated exposure to water and heat.

4.3 Resistance to delamination when subjected to environmental factors is critical to the performance of the laminated assembly in service.

¹ This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.30 on Wood Adhesives.

Current edition approved April 10, 2003. Published April 2003. Originally approved in 1995. Last previous edition approved in 1998 as D 5824 – 98.

² Annual Book of ASTM Standards, Vol 13.06.

³ Annual Book of ASTM Standards, Vol 04.10.

⁴ Annual Book of ASTM Standards, Vol 03.01.

⁵ Annual Book of ASTM Standards, Vol 14.04.

⁶ Annual Book of ASTM Standards, Vol 14.02.