

ASTM Standards

From the Wood Adhesives Experts



Franklin's products meet and many times exceed applicable ASTM standards. The standards that most commonly impact our wood markets for exterior uses are described below as well as the test methods used to show passage. Please contact us if you need additional information about any standards impacting wood markets we serve. We are happy to help.



ASTM D-5572-99

Standard Specification for Adhesives Used for Finger Joints in Non-Structural Lumber Products

There are two classifications for this standard. One classification is for dry use, and the other is wet use. The classification we are outlining in this document is for wet use nonstructural adhesives capable of producing sufficient strength and durability for the bonded parts to be used in service conditions in which the equilibrium moisture content can exceed 16 percent.

ASTM D-5572-99

This test is appropriate for finger jointed exterior millwork including windows, doors, fascia boards and similar types of wood trim. There are two testing preparations; flexure and tension.

The test specimens are exposed and tested under four conditions:

- Dry - under ambient conditions.
- Boil – four hour boil, dry 20 hours at 145 degrees Fahrenheit, repeat boil, cool one hour and test wet.
- Vacuum-Pressure – place in vacuum pressure chamber, immerse in water, maintain vacuum for 30 minutes, release vacuum and apply pressure application for 30 minutes and test wet.
- Elevated Temperature - conditioned at 220 degrees Fahrenheit for six hours and tested hot.

- ASTM D-5572-99 Wet Use Finger Joint / Flexures – The test specimen is typically 3/4" x 3/4" x 24"L. It is placed in a test fixture that supports a span of 18 inches with the finger joint in the center. The specimen is loaded at six inches and 12 inches and pushed downward until the joint fails. This is a "two-point" load. It measures the strength of the joint until rupture.
- ASTM D-5572-99 Wet Use Finger Joint / Tension - The test specimen has a cross section 1/4" x 3/4" that is pulled apart in tension. The tension test measures the force required to pull the joint apart. The part is also measured for wood failure.

The passing values for both strength and wood failure are dependent on both the wood species and conditioning of the specimen prior to testing. You must pass both flexures and tension for a passing test.

ASTM D-5751-99

Standard Specification for Adhesives Used for Laminated Joints in Non-Structural Lumber Products

This test is applicable for exterior millwork that is face or edge glued rather than finger jointed. The wet use conditioning is the same as ASTM D-5572-99, but the test pieces are laminate joints.



The laminated bonds are cut into block shear specimens 2" width and 1 3/4" in length. Laminated bonds are tested in shear by compression loading. The strength required to break the block as well as the percentage of wood failure is recorded.

The passing values for both strength and wood failure are dependent on both the wood species and conditioning of the specimen prior to testing.

ASTM D-5751-99

All tests are conducted under all four conditions:

Dry - under ambient conditions.

Boil - four hour boil, dry 20 hours at 145 degrees Fahrenheit, repeat boil, cool one hour and test wet.

Vacuum-Pressure - place in vacuum pressure chamber, immerse in water, maintain vacuum for 30 minutes, release vacuum and apply pressure application for 30 minutes and test wet.

Elevated Temperature - conditioned at 220 degrees Fahrenheit for six hours and tested hot.



ASTM D-4317

Standard Specification for Polyvinyl Acetate Based Emulsion Adhesives (PVA)

In addition to the above standards specific to laminated and finger joint parts for exterior millwork; there is also an ASTM standard specific to polyvinyl acetate based adhesives. This specification describes the general exposure conditions for which each class will perform satisfactorily; it does not describe the end use products for which each class of adhesives is accepted. Within this standard are also references to additional ASTM test methods, including ASTM D-905 and ASTM D-906.



- *ASTM D-905 is for strength properties of adhesive bonds in shear by compression loading.*
- *ASTM D-906 is for strength properties of adhesives in plywood type constructions in shear by tension loading.*

The certification classifies adhesives at three performance levels in accordance with water resistance Type 1 and Type 2. We will outline the Type 1 and Type 2 levels in this document.

TYPE 1

Type 1, Wet Use – An adhesive passing Type 1 test requirements and having high water-resistance, capable of producing sufficient adhesive-joint strength and durability to make the bonded product serviceable under conditions in which the equilibrium moisture content of the wood may be 16 percent to 21 percent for short periods of time and where the temperature may reach levels as high as 160 degrees Fahrenheit during service. This adhesive will withstand most outdoor conditions, such as repeated soakings. It is not, however, suitable for marine conditions where immersion would be continual. Type 1 is water-resistant, but not waterproof.

- *Block Shear tested in compression at 160 degrees Fahrenheit.*
- *Plywood Shear tested at 75 degrees and 160 degrees Fahrenheit after 6 hours.*
- *Plywood shears are boiled for four hours, dried for 20 hours, boiled for four more hours, cooled and tested wet.*
- *Plywood shears are subjected to 48-hour soaks at 75 degrees Fahrenheit.*

All specimens are tested until failure and wood failure is recorded. Each condition has specific test requirements for passing results.

TYPE 2

Type 2, Intermediate Use – An adhesive passing Type 2 test requirements and having good water resistance, capable of producing sufficient adhesive-joint strength and durability to make the bonded products serviceable under interior or protected conditions in which there will be occasional intermittent exposure to wet conditions or high humidity, where the temperature may reach levels as high as 71 degrees Celsius during service.

The same testing is used as in the Type 1 method described above except there are no boiled specimens. All specimens are tested until failure and wood failure is recorded. Each condition has specific test requirements for passing results.

Technical Leadership

With over 70 years of combined hands-on experience, our technical support team is one of the most recognized and respected in the industry. We welcome your calls and encourage you to contact us if you have any questions or concerns regarding any industry standards.

*For additional information, visit our website for **24/7** online support at www.FranklinAdhesivesandPolymers.com.*

1.800.877.4583

The information in this brochure was provided by ASTM International as well as Franklin's adhesive experts.

ASTM International. (2003). Annual Book of ASTM Standards 2003. West Conshohocken, PA: American Society for Testing and Materials.



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