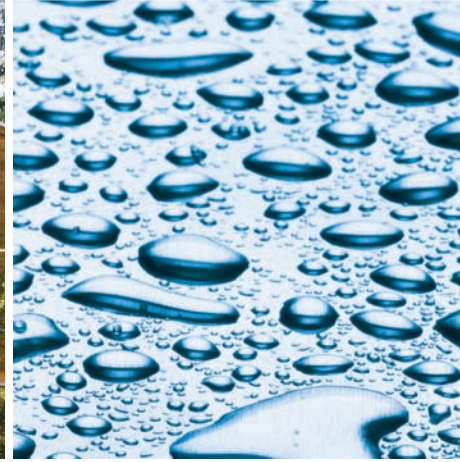


WOOD BONDING ADHESIVES

N-DURANCE™



Introducing N-DURANCE™ Cross-linking Emulsion Adhesives

Higher-Performance Wet-Use Adhesives for Wood Bonding

Over 30 years ago, National Adhesives' DURO-LOK® adhesives set the standard for high performance cross-linking emulsions adhesives for wood bonding applications.

Now, National offers a new, higher-performance line of products to address the more demanding requirements of today's manufacturers. Our N-DURANCE product line provides excellent water resistance, conforms to industry standards and demonstrates National's commitment to developing innovative solutions for our wood bonding customers.

N-DURANCE adhesives are designed to:

- adhere the toughest-to-stick imported woods and composites
- provide unprecedented water resistance and durability
- deliver all this quality at competitive market prices.

Quality, Performance and Industry Standards

The Hallmark standard mandates specific performance requirements in order for manufacturers to carry the Hallmark label on their products. ASTM standards D5572 and D5751 place additional emphasis on quality, and quality demands performance. The numbers tell the story; N-DURANCE adhesives consistently meet or exceed industry standards when catalyzed with 5% by volume of 42-2301 or 42-2306 catalyst. These products should be tested in specific applications to determine their level of performance.

ASTM D5572: Standard Specification for Adhesives Used for Finger Joints in Nonstructural Lumber Products

ASTM D5751: Standard Specification for Adhesives Used for Laminate Joints in Nonstructural Lumber Products

Hallmark: The WDMA Quality Standard

National Adhesives
A National Starch & Chemical Business

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Testing

The Hallmark Certification Program sponsored by the Window and Door Manufacturers Association (WDMA), is designed to provide builders, architects, specifiers and consumers with an easily recognizable means of identifying products that have been manufactured in accordance with the appropriate WDMA and other referenced performance standards.

Each protocol provides for dry-use (interior grade) and wet-use (exterior grade) testing. N-DURANCE adhesives are usually tested according to the wet-use protocols. This protocol calls for four exposure conditions for the specimens being tested. Each exposure condition requires 20 samples where the joint area is free from cross-grain and knots.

- **Dry**

Samples are tested to breaking without being subjected to any exposure conditions.

- **Boils**

Samples are boiled for four hours. They are then placed in an oven set to 145° F for twenty hours. This is followed by another four-hour boil cycle. They are then placed into running, room-temperature water for one hour to cool. Samples are tested to breaking while wet.

- **Elevated Temperature**

Samples are heated to 220° F for six hours. Samples are tested to breaking while hot.

- **Vacuum/Pressure**

Samples are placed into a pressure vessel and covered with room-temperature water. Air is evacuated from the sealed vessel to a vacuum of twenty-five inches of mercury for 30 minutes. The vessel is then pressurized to 75 psi for 30 minutes. Samples are tested to breaking while wet.

Additional Test Protocols

There are many other protocols, but those listed above are the most common. Additional protocols you may encounter are:

- NWWDA I.S. 1-A-97
- ASTM D4317-94
- ANSI/HPVA HP-1-1994

N-DURANCE adhesives conform to all of these standards. Additional information regarding these standards is available upon request from your National Adhesives technical solutions professional.

The path to higher performance

If you are currently having difficulties meeting Hallmark and other standards, or if you are looking for higher performance from your adhesives to raise the quality of your products, then N-DURANCE adhesives from National could lead you in the right direction. Give N-DURANCE adhesives a try – they stand apart from the rest.

N-DURANCE ADHESIVES ARE AVAILABLE IN THREE GRADES

Product	Application	Viscosity (As Supplied)	Density	pH		VOCs
				As Supplied	In Use	
42-361A	Finger Jointing	2,500 cps	9.1 lb _m /gal	4.8	2.0	28 g/liter
42-363A	Laminating	3,000 cps	9.1 lb _m /gal	4.8	2.0	< 5 g/liter
42-364A	Finger Jointing/ Edge Gluing	2,000 cps	9.1 lb _m /gal	5.0	2.0	< 1 g/liter

For additional performance data and other information, or to arrange a face-to-face meeting, just call 1-800-797-4992.



National Starch and Chemical Company

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National Starch and Chemical Company is dedicated to meeting the needs and expectations of customers without compromising its commitment to sustainability. National Starch supports sustainability through its continuous efforts to improve the safety, health and environment of the communities in which it operates. For detailed information on National Starch's sustainability program, visit www.nationalstarch.com.

The information given and the recommendations made herein are based on our research and are believed to be accurate but no guarantee of their accuracy is made. In every case we urge and recommend that purchasers, before using any product in full scale production, make their own tests to determine to their own satisfaction whether the product is of acceptable quality and is suitable for their particular purposes under their own operating conditions. No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without the authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the American Chemistry Council's Responsible Care® program.