

3M

Fastbond™

Contact Adhesive 2000-NF with Spray Activator #1

Technical Data

January, 2008

Product Description

3M™ Fastbond™ Contact Adhesive 2000-NF with Spray Activator #1 is a water-dispersed, high solid, activated adhesive which provides immediate bonding capabilities and handling strength without forced drying equipment for most applications.

Features

- Immediate bonding without heat.
- Immediate handling strength.
- Bonds flexible polyurethane and latex foams, plastic laminate, wood, plywood, particle board, fabrics, fiber, aluminum, galvanized steel and many plastics.
- Post-formable and heat resistant.
- Co-sprayed with plural component, external mix spray systems – no premixing, no limited pot life.
- Available in blue, light orange or neutral color.
- Not recommended for bonding bare steel surfaces (unless force dried and protected from moisture). Primed or painted steel surfaces must be thoroughly tested for corrosion and compatibility with Fastbond contact adhesive 2000-NF with spray activator #1 before use.
- Designed to be applied between two substrates. Application to substrates that results in direct exposure of the adhesive to light may result in eventual discoloration of the exposed adhesive. Direct exposure can be controlled by proper spray application. Adhesive may soak through very thin fabrics.
- **Certified to GREENGUARD® Product Emission Standard For Children and Schools^(SM) for low emitting interior building materials:**
 - Addresses or Contributes to LEED™ EQ Credit 4.1: Low Emitting Materials: Adhesive and Sealants
 - Addresses or Contributes to LEED™ EQ Credit 4.3: Low Emitting Materials: Flooring Materials
 - Addresses or Contributes to LEED™ EQ Credit 4.4: Low Emitting Materials: Composite Wood and Agrifiber Products
 - Addresses or Contributes to LEED™ EQ Credit 4.5: Low Emitting Materials: Furniture and Furnishings
 - Addresses or Contributes to LEED™ EQ Credit 4.6: Low Emitting Materials: Ceiling and Wall Systems



Special Note

When bonding wood veneers, success is dependent on many variables such as environmental conditions, bonding process, type of base material, type of veneer, adhesive type and top coat finishing systems to name a few. For unbacked wood veneers, water based contact adhesives are not recommended. It is the user's responsibility to thoroughly test any adhesive for its suitability in bonding wood veneers. It is also recommended to follow the veneer manufacturers recommendation and industry guidelines.

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Typical Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| | 3M™ Fastbond™ Contact Adhesive 2000-NF | 3M™ Fastbond™ Spray Activator #1 |
|--|--|---|
| Viscosity (approx.) | 200-750 cps | Water thin |
| Brookfield Viscometer | RVF #2 sp. @ 20 rpm @ 80°F (27°C) | |
| Solids (by weight) | 47-51% | 15-19% |
| Base | Polychloroprene | Inorganic Salt |
| Color(s) | Blue, Light Orange or Neutral | Clear |
| Net Weight | 8.9-9.3 lbs./gal. | 9.4-9.8 lbs./gal. |
| Flash Point (Setaflash® closed cup tester) | None | None |
| Coverage @ 3 gms./ft.² dry weight | 690 ft. ² /gal. (including activator) | Included in adhesive |
| Application Method | Co-Spray | Co-Spray |
| Co-Spray Ratio | 15 parts | 1 part |
| pH | 10-11 | 4.4-5.4 |

Application Equipment Suggestions

Note: Appropriate application equipment can enhance adhesive performance. We suggest the following application equipment for the user's evaluation in light of the user's particular purpose and method of application.

Air Atomizing Spray Equipment:

When hand spraying, plural component (co-spray) applicators are used. These applicators spray activator and adhesive through separate fluid nozzles with mixing occurring outside the spray applicator.

For automatic spray systems, separate spray applicators are used for the activator and adhesive, with the applicators aimed so the spray patterns converge and mix together before reaching the substrate.

Note: Premixing of the adhesive and activator prior to spraying is NOT possible and makes the adhesive unusable.

| Hand Held Spray Applicators | Air Cap | Fluid Nozzle | Atomizing Air Pressure | Approximate Air Requirement |
|--------------------------------|---------|-----------------|------------------------|-----------------------------|
| Binks Mach 1PC H.V.L.P. | 91 PC | 94F (.055") | 15-30 psi | 6 scfm @ 15 psi |
| Graco Optimizer 2K H.V.L.P. | 188-754 | 185-702 (.055") | 25-35 psi | 6 scfm @ 15 psi |
| Mattson Cross-Fire H.V.L.P. | 81270 | 82017 (.050") | 15-30 psi | 6 scfm @ 15 psi |
| DeVilbiss Pro Bond 2K | 28L | FF (.055") | 25-35 psi | 6 scfm @ 15 psi |

| Automatic Spray Applicators | Air Cap | Fluid Nozzle | Atomizing Air Pressure | Approximate Air Requirement |
|--|---------|--------------|------------------------|-----------------------------|
| Binks Mach 1PC H.V.L.P. | 91 PC | 94F (.055") | 15-30 psi | 6 scfm @ 15 psi |
| Binks Mach 1A H.V.L.P. (Adhesive) | 91 P | 94F (.055") | 15-30 psi | 11 scfm @ 30 psi |
| Binks Mach 1A H.V.L.P. (Activator) | 91 P | 90F (.030") | 15-30 psi | 11 scfm @ 30 psi |
| Binks 21, 61, 95A (Adhesive) | 66SD-3 | 65SS (.059") | 15-30 psi | 6 scfm @ 15 psi |
| Binks 21, 61, 95A (Activator) | 66S | 63SS (.028") | 10-15 psi | 3.4 scfm @ 30 psi |
| DeVilbiss AGX (Adhesive) | 30 | FF (.055") | 15-30 psi | 6 scfm @ 20 psi |
| DeVilbiss AGX (Activator) | 30 | G (.028") | 10-15 psi | 6 scfm @ 20 psi |
| DeVilbiss AGXV H.V.L.P. (Adhesive) | 33A | FF (.055") | 15-30 psi | 12 scfm @ 30 psi |
| DeVilbiss AGXV H.V.L.P. (Activator) | 33A | G (.028") | 10-15 psi | 6 scfm @ 20 psi |

TO MEASURE FLUID FLOW

Hand Held Applicators: Pressurize adhesive source only. Direct adhesive fluid nozzle into a measuring device. Pull trigger and flow material into measuring device for 60 seconds. Increase or decrease fluid source pressure to obtain desired fluid flow. The fluid flow of the activator should be adjusted to 15 to 1 ratio when co-sprayed. The measurement can be done by either weight or volume.

Automatic Applicators: Pressurize adhesive fluid source only. Activate trigger and flow adhesive into measuring device for 60 seconds. Increase or decrease fluid pressure to obtain desired fluid flow. When adhesive fluid flow is correctly adjusted repeat the process with the activator spray applicator, setting fluid flow to one-fifteenth of the adhesive fluid flow. The measurement can be done by either weight or volume.

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Application Equipment Suggestions (*continued*)

Material Supply:

Pressure Pots

Adhesive and Activator: For best results, use stainless steel pressure pots. Non-stainless pressure pots may be used if used with plastic liner and the dip tube and fittings are changed to plastic or stainless steel.

Pumps

Adhesive: Use a 1 inch plastic bodied, double diaphragm pump with Teflon® diaphragms and ball checks. It is suggested that all diaphragm pumps are short stroked by the manufacturer before use. Do not use piston type reciprocating pumps, or diaphragm pumps smaller than 1 inch. When using diaphragm pumps the use of a bag type fluid filter is recommended on the output of the pump. A filter such as the Graco Model 12 part number 915-518 with a 300 micron filter bag part number 521-264 or equivalent is suggested.

Fluid regulators cannot be used with this adhesive. Fluid pressure is controlled by the pump pressure.

Activator: A 1:1 or 2:1 pogo or piston type reciprocating pump is suggested. All pump parts in contact with activator must be plastic or stainless steel.

Diaphragm pumps and fluid regulators can be used (stainless steel or plastic on all wetted components).

Hoses

All fluid hoses should be nylon or polyethylene lined. Hose fittings should be stainless steel or plastic.

Note: Do not use fluid lines that have previously been used with solvent whether flammable or nonflammable.

Handling/Application Information

When using 3M™ Fastbond™ Contact Adhesive 2000-NF with Spray Activator #1, it is required that at least one of each pair of substrates to be bonded be porous or water permeable.

Surface Preparation

Surfaces must be clean, dry and dust free.

Spray Mix Ratio of Activator to Adhesive

It is recommended that Fastbond contact adhesive 2000-NF be spray mixed with spray activator #1 at a ratio of 15 parts adhesive to 1 part activator (by weight or volume). When activated, slight adhesive transfer should occur when adhesive film is touched immediately after spraying.

Application

Use a plural nozzle, external mix spray applicator to mix adhesive with activator to achieve proper mix of Fastbond contact adhesive 2000-NF with spray activator #1. (Refer to Application Equipment Suggestions above for additional information about spray equipment.) Spray apply a uniform coat of mixed adhesive to both surfaces. (See coverage section.) One coat should usually be sufficient for both surfaces. Be sure to overlap the spray pattern slightly with each pass of the spray applicator to ensure complete activation of adhesive and uniform coverage.

A uniform dull film indicates sufficient mixture of Fastbond contact adhesive 2000-NF with spray activator #1.

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Handling/Application Information *(continued)*

Coverage

Approximately 690 sq. ft./gal. sufficient to apply 345 sq. ft. of bonded surface on most substrates such as decorative laminate and particle board. Optimum performance is obtained using 2.5-3.5 grams/sq. ft. dry adhesive on each surface.

Note: Coverage will vary depending on the porosity of substrates and strength of adhesive bond desired. For decorative laminate to particle board, optimum performance is obtained at 2.5-3.5 grams of dry adhesive per square foot applied to each surface. Depending on the user's performance requirements, less adhesive is suggested if fabrics, foams, etc. are to be bonded. In all cases, user's evaluation will be required to determine the optimum coverage levels.

Activation Time

With proper mixing of adhesive and activator and depending on ambient conditions, adhesive activates sufficiently to make bonds within 5-15 seconds after application. Depending on ambient conditions and substrates, bonds should be made within (2) hours. While bonds may be made immediately, the optimum initial strength will be obtained by allowing the adhesive to dry the same amount of time as the previous adhesive (solvent) type.

Assembly

For foam bonding and foam fabrication, pressure may be applied to the bond by manual or mechanical methods. Bond adhesive coated surfaces with sufficient pressure to assure good contact across adhesive bond line. For decorative laminates, spacers such as dowels or strips of laminate may be used to help prevent premature adhesive/adhesive contact and bonding prior to positioning. Slide out the spacers and apply uniform pressure working toward the edges. A 3 inch roller used with maximum body pressure should be used to help ensure adequate contact and bonding especially on the edges. Bonded assemblies may be machined, trimmed, etc. immediately after bonding. The use of a pinch roll is preferred for optimum performance.

Cleanup

Work Surface: If adhesive has not activated, clean surfaces with water or with a small amount of liquid detergent followed with a cleaner such as 3M™ Citrus Base Cleaner or equivalent. Dried, activated adhesive may be cleaned with a combination of cleaner and mechanical systems such as wire brushing.

Spray Equipment: Flush adhesive portion of spray equipment with cold water containing a small amount of detergent* followed by a flush with clean water. The activator portion of spray equipment should be flushed with clean water (no detergent).

***Cleaning Solution:** One pint of detergent to five gallons of water.

Typical Adhesive Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Overlap Shear Strength (ASTM D 1002)

1/8 inch birch to 1/8 inch birch. Adhesive co-spray applied and bonded immediately with nip roll pressure. Bonds tested after aging 3 weeks @ 75°F (24°C) and 50% R.H. at a separation rate of 0.2 in./min.

| Test Temp. | Value (psi) |
|---------------|-------------|
| -30°F (-37°C) | 1000 |
| 75°F (24°C) | 350 |
| 180°F (82°C) | 50 |
| 200°F (93°C) | 40 |
| 225°F (107°C) | 30 |

Overlap Shear Rate of Strength Build-Up (ASTM D 1002)

1/8 inch birch to 1/8 inch birch. Adhesive co-spray applied and bonded immediately with nip roll pressure. Bonds aged at 77°F (25°C)/50% R.H. and 90°F (32°C)/90% R.H. for indicated time and then tested at a separation rate of 0.2 in./min. at 75°F (24°C).

| Time | Value (psi) | Value (psi) |
|----------|---------------------------|---------------------------|
| | 77°F (25°C)/50% R.H. Aged | 90°F (32°C)/90% R.H. Aged |
| 1 min. | 55 | 55 |
| 15 min. | 75 | 75 |
| 30 min. | 130 | 160 |
| 60 min. | 160 | 180 |
| 90 min. | 165 | 190 |
| 2 hours | 170 | 190 |
| 4 hours | 230 | 215 |
| 8 hours | 260 | 255 |
| 24 hours | 290 | 315 |
| 3 days | 320 | 340 |
| 7 days | 350 | 350 |
| 14 days | 350 | 350 |
| 21 days | 350 | 350 |

Flatwise Tensile Strength (ASTM C 297)

High pressure laminate to particle board. Adhesive co-sprayed applied and bonded immediately with nip roll pressure. Bonds aged for 3 weeks @ 75°F (24°C)/50% R.H. and then tested at a separation rate of 0.05 in./min.

| Test Temp. | Value (psi) |
|---------------|-------------|
| 75°F (24°C) | 84 |
| 180°F (82°C) | 25 |
| 200°F (93°C) | 25 |
| 225°F (107°C) | 25 |

Foam to Foam Heat Resistance

A pinch bond (knife edge) of 4 inch thick urethane foam (1.2 lb./ft.³) was made co-spraying adhesive and bonding immediately with hand pressure. The bond was then immediately placed in a 160°F (91°C) oven for 3 months.

- Test Result
- No opening or separation of pinch bond.
 - No degradation or hardening of adhesive bondline.

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| | |
|------------------------------------|--|
| Storage | Best storage temperature is 60-80°F (16-27°C). Higher temperatures reduce normal storage life. Lower temperatures cause increased viscosity of a temporary nature. This water-dispersed adhesive will become unusable with prolonged storage below 40°F (4°C). Rotate stock on a “first in, first out” basis. Protect from freezing. |
| Shelf Life | When stored at the recommended temperature in the original, unopened container, these products have a shelf life of 15 months from date of shipment. |
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Industrial Adhesives and Tapes Division

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