3M Fastbond™ Pressure Sensitive Adhesives 4224-NF • Clear • Blue

Technical Data **January, 2008**

Description

3M™ Fastbond™ Pressure Sensitive Adhesive 4224-NF is a water-based, permanently pressure sensitive adhesive with excellent initial tack and good bond strength.

Features

- Good UV and plasticizer resistance.
- Excellent water resistance when dry.
- Non-flammable in the wet state.
- Adheres to most glass, paper, steel, galvanized steel, bare and clad aluminum, stainless steel, high impact styrene, PVC, ABS, polycarbonate and acrylic plastic surfaces.
- **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 4.5: Low Emitting Materials: Furniture and Furnishings

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.

Viscosity (approx.):	9,000 - 12,000 cps
Brookfield Viscometer:	RVF/RVT #6sp. @ 20 rpm @ 80°F
Solids (by wt.):	39-42%
Base:	Acrylate
Color:	Blue adhesive: wet – opaque blue dry – transparent blue Clear adhesive: wet – white dry – clear
Net weight (approx.):	8.0 - 8.4 lbs./gal.
Flash point:	None
Solvent:	Water
Coverage: (1 mil dry film) (approx.)	670 sq. ft./gal.

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Handling/Application Information

Directions for Use

1. **Surface Preparation:** Surfaces must be clean, dry and dust free. Wiping with solvent such as 3M™ Scotch-Weld™ No. 3 or methyl ethyl ketone (MEK)* will aid in removing oil and dirt. Plastic surfaces may be cleaned with isopropyl alcohol.*
2. **Application Temperature:** For best results, the temperature of the adhesive and the surfaces being bonded should be at least 65°F (18°C).
3. **Application:** Spray, brush, roll or knife coat a smooth, uniform coat of adhesive to the least porous surface. Thickness of the adhesive will depend upon the surfaces being bonded and stress requirements and should be determined by the user. Porous or rough surfaces generally require more adhesive than smooth surfaces.
4. **Drying Time:** This will depend on the adhesive film thickness and drying temperature and should be determined by the user. Infrared heat may be used to speed up the drying process, if necessary. Generally, when the adhesive film has changed from an opaque, milky appearance to a clear or transparent and odorless state, drying can be considered complete. In order to maintain long term pressure sensitivity, the dry adhesive film must be kept free of dust or other contaminants through the use of a protective release liner.
5. **Bonding:** Bond surfaces together using firm pressure. A 3-inch wide (maximum) rubber roller (J-roller) is recommended. For maximum bond performance, the use of a nip-roll or rotary press is preferred. Bonding while one or both surfaces are warm will also help improve bond results.
6. **Cleanup:** Liquid adhesive can be removed from tools and equipment by flushing with large amounts of water. The addition of liquid soap and warm water will aid in cleanup. Dried adhesive may be removed with a solvent such as 3M™ Scotch-Weld™ Solvent No. 3 or methyl ethyl ketone.*

***Note:** When using solvents, extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

Application Equipment Information

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.

1. **Pumping:** Use a 2:1 ratio divorced design stainless steel pump with Teflon® packings. Because these products contain water, pumping equipment should be stainless steel for maximum durability. Wetted parts of chrome or nickel should also be suitable.
2. **Spray:**

Spray Gun	Air Cap.	Fluid Tip	Air Pressure	Approx. Air Requirement	Fluid Flow
DeVilbiss JGV	30	E	10-15 PSI	5 CFM	12-24 fl. oz./min.
Binks 2001SS or No. 95	66 SD	66 SS	10-15 PSI	5 CFM	12-24 fl. oz./min.

Application/Equipment Information *(continued)*

3. **Hoses:** All material hoses should be nylon lined. Do not use PVA hoses. Do not use fluid hoses previously used with solvent based adhesive since residual solvent will cause the water dispersion to coagulate. New fluid hoses should be installed when changing from a solvent to a water-based adhesive.
4. **Brushes and Rollers:** Brushes and rollers designed for latex paints are suggested.

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Adhesive was tested in 180° (angle) peel, overlap shear, and dead load strength by first applying about a 6 mil (wet thickness) coating of adhesive to a primed polyester film. After drying, bonds were made to various substrates. Test results after 48 hrs. at 73°F (23°C) were as follows:

Substrate	Peel Strength (piw)	Overlap Shear (psi)
Glass	2.8	44
Cold Rolled Steel	4.4	48
Galvanized Steel	3.1	48
2024 T-3 Bare Aluminum	2.7	40
Clad Aluminum	2.3	45
Stainless Steel	4.2	48
High Density Polyethylene	1.5	33
Polypropylene	1.9	27
High Impact Polystyrene	2.9	47
PVC	3.4	46
ABS Plastic	3.6	44
Polycarbonate	3.3	50
Acrylic	3.0	44
Neoprene Rubber	1.6	13
EPDM Rubber	1.5	16

Dead Load Shear: The adhesive, knife coated on polyester film as above, was used to make 1 in. x 1/2 in. bonds to 2024-T3 bare aluminum. Various weights were then hung on the portion of the film extending below the bond area and the time required for the bond to fail was measured. The results were as follows:

Test Temperature	Time to Failure at a Load of:		
	2 psi	5 psi	10 psi
73°F (23°C)	24 + hrs.	24 + hrs.	6 hrs.
120°F (49°C)	24 + hrs.	2 hrs.	15 min.
160°F (71°C)	4 hrs.	11 min.	3 min.

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Storage

Store product at 60-80°F (16-27°C) for maximum storage life. Freezing will cause irreversible coagulation of product. Keep containers tightly sealed when not in use.

Shelf Life

When stored at the recommended conditions in the original, unopened containers, these products have a shelf life of 15 months.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

Product Use

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

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ISO 9001:2000

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001:2000 standards.

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