

3M Scotch-Grip™ Industrial Mastic 4289-NF

Technical Data

February, 1997

(Supersedes July 1, 1992)

Product Description Scotch-Grip™ 4289-NF Industrial Mastic is a high strength industrial mastic adhesive/sealant.

- Features**
- Water-dispersed, high strength mastic adhesive/sealant.
 - Bonds Styrofoam® foam and bead board without cavitating.
 - Good adhesion to most materials including wood, concrete, drywall, masonry, steel and aluminum.
 - Freeze-thaw stable.
 - Non-sag on vertical surfaces.
 - Permits weld-through.

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.):	200,000 - 350,000 cps.
Brookfield Viscometer:	RVF #7 Sp. @ 10 rpm @ 80°F
Solids:	68-73% by weight
Base:	Synthetic Elastomer
Color:	Black
Net Weight (approx.):	10.1 - 10.4 lbs./gal.
Flash Point:	None
Solvent:	Water

Typical Adhesive Performance Characteristics

Flatwise Tensile Strength: Gemco hangers (2 in. x 2 in. perforated clips) bonded to substrate 1/16-1/8 in. glueline; separation rate 2 in./minute. Bonds made and aged @ 70°F (21.1°C), 50% R.H. except where noted. All bonds tested @ 75°F.)

Bonds Aged For:	Fir Plywood	Cold Rolled Steel	Aluminum	Galvanized Steel	Plaster Board
24 hrs.	62 lbs.	53 lbs.	–	–	–
48 hrs.	102 lbs.	69 lbs.	–	–	–
7 days	202 lbs.*	87 lbs.	108 lbs.	77 lbs.	42 lbs.*
3 days @ 160°F (71.1°C)	151 lbs.*	94 lbs.	197 lbs.	75 lbs.	48 lbs.*

*Substrate Fails

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Typical Adhesive Performance Characteristics (continued)

Heat Resistance: Samples (2 in. x 2 in. Gemco hangers to plywood) dried 3 days @ 160°F (71.1°C) will hold a 10-lb. weight @ 200°F (93.3°C) for at least 24 hours.

Green Strength: Plywood (2 in. x 2 in.) was bonded and subjected to a dead load tensile stress @ 70°F (21.1°C), 50% R.H. Immediately after bonding, the adhesive will hold 1-lb. After 24 hours, it will hold at least 10 lbs.

Shear Strength Buildup: Plywood to plywood overlap shear bonds were made using 4289-NF Industrial Mastic. They were tested at 2 in./minute @ 70°F (21.1°C), 50%/R.H.

30 Minutes	1 Hour	2 Hours	4 Hours	8 Hours	16 Hours	24 Hours	7 Days
0	3 psi	5 psi	8 psi	17 psi	75 psi	63 psi	165 psi

Shear Strength Heat Resistance: OLS bonds aged 1 week at 75°F (23.9°C) plus 24 hours at 160°F (71.1°C) pulled at 2 in./minute separation speed.

Test Temperature	Fir to Fir	CRS to CRS
75°F (23.9°C)	276 psi	73 psi
160°F (71.1°C)	51 psi	22 psi
200°F (93.3°C)	26 psi	16 psi

Typical Sealer Performance Characteristics

Adhesion (Peel): Strength values were obtained using canvas bonded to various substrates. Bonds were dried at 75°F (23.9°C) for 1 week plus 24 hours at 160°F (71.1°C). Results include initial and after 7 days water soak at 75°F (23.9°C). They were tested 180° peel on an Instron with a 2 in./minute test speed. Results:

Substrate	Initial Value (piw)	Failure Mode	*7 Day Water Soak (piw)	Failure Mode
Glass	6.5	Adhesive to Canvas	2.5	Adhesive to Substrate
Alclad Aluminum	7.3	Adhesive to Canvas	2.3	Adhesive to Substrate
Bare Aluminum	6.7	Adhesive to Canvas	2.5	Adhesive to Substrate
Camper Aluminum (Primed)	6.5	Adhesive to Canvas	3.0	Adhesive to Substrate
Cold Rolled Steel (CRS)	6.5	Adhesive to Canvas	0.0	Adhesive to Substrate
Enamel Painted Steel	7.5	Adhesive to Canvas	2.3	Adhesive to Substrate
Galvanized Steel	7.5	Adhesive to Canvas	2.5	Adhesive to Substrate
Stainless Steel	7.5	Adhesive to Canvas	0.0	Adhesive to Substrate
F.R.P.	6.3	Adhesive to Canvas	2.3	Adhesive to Substrate

*Tested Wet

4289-NF Industrial Mastic should not be used in an environment of constant water soak. The adhesive/sealant, however will withstand occasional wetting and high humidity.

Weld-through: 4289-NF Industrial Mastic can be spot-welded through using a resistance type spot welder.

Temperature Performance Range: A 1/4 inch bond of 4289-NF Industrial Mastic on bare aluminum did not fail a cold shock test at -21°F (-29.4°C), however the product loses flexibility below 32°F (0°C). 4289-NF Industrial Mastic will withstand normal paint bake cycles temperatures of 200-225°F (93.3-107.2°C).

Flame Spread Index: When tested for ASTM E-162-81A a 35 grams/sq. ft. dry wt. coverage film of 4289-NF Industrial Mastic has a flame spread index factor average value of 4.518.

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Typical Performance Characteristics (continued)

Smoke Generation: When tested per ASTM E662-83/NFPA 258 a 35 grams/sq. ft. dry wt. coverage film of 4289-NF Industrial Mastic has maximum specific optical density corrected. Dm (cor.), average value of 80.

Pressure Rupture Test: A 25 mil. film of 4289-NF Industrial Mastic will withstand 25 PSIG pressure using a Mil-S-8802 pressure rupture jig and air line pressure.

Hardness: After 3 weeks 75°F (23.9°C) 50% R.H. Shore A hardness of 53.

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.

1. **Pump:** 24:1 ratio, priming piston or shovel foot valve with an inductor type follower plate. Pumping equipment should be stainless steel for maximum durability. Wetted parts of nickel or chrome plating may also be satisfactory. Teflon® packings are recommended.
2. **Hose:** Minimum working pressure 2000 psi. All material hoses should be Nylon® lined. Do not use PVA hoses. Do not use material hoses previously used with solvent-based adhesive since residual solvent will cause the water dispersion to break. New material hoses should be installed when changing from a solvent to a water-based adhesive.
3. **Flow Gun:** High pressure with suitable tip.
4. **Reference Information:** Temperature 70°F (21.1°C), pump ratio 24:1, operating air pressure 30 psi, flow gun with 1/4 in. tip, 25 feet of 1/2 in. diameter hose, flow rate 1/3 lb. per minute.

Handling/Application Information

Directions for Use

1. **Surface Preparation:** Surface should be clean and dry. Remove all dirt, dust, oil, grease, wax, loose paint, snow, frost, etc. to help assure adhesion. Wipe away standing water.
2. **Application Temperature:** For application at low temperature, the adhesive/sealant should be brought to job sites at normal room temperature and kept warm in an insulated storage box. Surface temperatures of the materials being bonded or sealed must be 20°F (-6.7°C) or higher.
3. **Application:** Adhesive/sealant may be applied by notched trowel or in bead form with an air pressure flow gun or a manual caulking gun. To permit drying, at least one of the materials being bonded must be porous.
For bonding Styrofoam® foam or bead board to such construction surfaces as concrete or block, apply at the rate of 50-80 sq. ft. per gallon using a notched trowel. Bonding range is in excess of 30 minutes at 70°F (21.1°C) and 30% R.H. Bonding range will vary depending upon temperature and humidity. Press insulation firmly into adhesive.
One gallon of material is sufficient to apply 375 lineal feet of 1/4 in. diameter bead.
4. **Cleanup:** Adhesive/sealant may be cleaned up when wet by using soapy water. When adhesive has dried, use a solvent such as 3M™ Scotch-Grip™ Solvent No. 2.*

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

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Storage and Shelf Life

Storage:

Freeze/Thaw Stable [5 cycles at 0°F (-18°C)]

Product should be stored at temperatures above 40°F (4.4°C). Storage below 20°F (-6.7°C) will cause freezing and product will have to be completely thawed before using. Best storage temperature is between 60°F (15.6°C) and 80°F (26.7°C). Lower temperatures can cause increased viscosity of a temporary nature. After storage at lower temperatures, the contents of the adhesive container should be allowed to warm to room temperature before using. Rotate stock on a “first-in, first-out” basis.

Shelf Life:

When stored at the recommended conditions in the original, unopened container, this product has a shelf life of 15 months from date of shipment.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for Health and Safety Information before using this product.

For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550. Address correspondence to: 3M Industrial Tape and Specialties Division, 3M Center, Building 220-7E-01, St. Paul, MN 55144-1000. Our fax number is 612-733-9175. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-809-750-3000. In Mexico, phone: 5-728-2180.

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ISO 9002

This Industrial Tape and Specialties Division product was manufactured under a 3M quality system registered to ISO 9002 standards.

For Additional Product Safety and Health Information, See Material Safety Data Sheet, or call:

3M

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