Scotch-Weld™
Epoxy Adhesive
2158 B/A

Technical Data **April, 2003**

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive 2158 B/A is a gray, two-part, high strength adhesive that chemically cures at room temperature. It has good adhesion to a variety of substrates including metals, many plastics, wood and concrete.

Features

- Equal mix ratio by weight or volume.
- Good adhesion to damp concrete.

Typical Uncured Properties

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

	Base	Accelerator
Physical		
Color:	White	Dark Gray
Base:	Modified Epoxy	Synthetic Resin
Net Weight: (lbs./gal.)	13.0 ± .2	12.8 ± .4
Viscosity: (Approx. cps @ 75°F [24°C])	Brookfield RVF #7 sp. @ rpm 250,000-450,000 cps	Brookfield RVF #7 sp. @ rpm 200,000-800,000 cps
Mix Ratio: by Weight	1 part	1 part
Mix Ratio: by Volume	1 part	1 part
Work Life: (Approximate time for a 100 gram quantity @ 75°F [24°C])	2 hours	

Typical Cured Properties

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

Physical

Color	Gray
Shore D Hardness ASTM D-2240	85
Time to Handling Strength at 75°F (24°C)	8-12 hours
Time to Full Cure at 75°F (24°C)	7 days

Thermal

Glass Transition Temperature	52°C
Thermal Coefficient of Expansion	53 x 10^{-6} (-50 to +30°C) in./in./°C 135 x 10^{-6} (+70 to +130°C) in./in./°C
Thermal Conductivity	.283 BTU/Hr/Ft^2/°F/Ft

Electrical

Dielectric Constant (1 khz @ 23°C)	5.6
Dissipation Factor (1 khz @ 23°C)	0.019
Dielectric Strength	980 volts/mil
Volume Resistivity	1.4 x 10^{15} ohm-cm

Handling/Curing Information

Directions For Use

1. For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. The amount of surface preparation depends on the required bond strength and the environmental aging resistance desired by user. For specific surface preparations on common substrates, see the section on surface preparation.
2. Use gloves to minimize skin contact with adhesive.
3. This product consists of two parts. Mix thoroughly by weight or volume in the proportions specified in the Uncured Properties Section. Mix approximately 15 seconds after a uniform color is obtained.
4. For maximum bond strength apply product evenly to both surfaces to be joined.
5. Application to the substrates should be made within 120 minutes. Larger quantities and/or higher temperatures will reduce this working time.
6. Join the adhesive coated surfaces and allow to cure at 60°F (16°C) or above until firm. Heat, up to 200°F (93°C), will speed curing.
7. The following times and temperatures will result in a full cure:

Cure Temperature	Time
75°F (24°C)	7 days
150°F (49°C)	120 minutes
200°F (93°C)	30 minutes

8. Keep parts from moving until handling strength is reached. Contact pressure is necessary. Maximum shear strength is obtained with a 3-5 mil bond line.
9. Excess uncured adhesive can be cleaned up with ketone type solvents.*

Adhesive coverage: A 0.005 in. thick bond line will yield a coverage of 320 sq. ft./gallon.

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

Application and Equipment Suggestions

These products may be applied by spatula, trowel or flow equipment.

Two-part mixing/proportioning/dispensing equipment is available for intermittent or production line use. These systems are ideal because of their variable shot size and flow rate characteristics and are adaptable to most applications. For more information, contact your local 3M sales representative.

Surface Preparation

For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. The amount of surface preparation depends on the required bond strength and the environmental aging resistance desired by user.

The following cleaning methods are suggested for these common surfaces:

Steel:

1. Wipe free of dust with oil-free solvent such as acetone, isopropyl or alcohol solvents.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with solvent to remove loose particles.
4. If a primer is used, it should be applied within 4 hours after surface preparation. If a primer such as 3M™ Scotch-Weld™ Structural Adhesive Primer 1945 B/A is used, apply a thin coating (0.5 mils) on the metal surfaces to be bonded, air dry for 10 minutes, then cure for 30 minutes at 180°F (82°C) prior to bonding.

Aluminum:

1. Vapor Degrease: Perchloroethylene condensing vapors for 5-10 minutes.*
2. Alkaline Degrease: Oakite 164 solution (9-11 oz./gallon water) at 190°F ± 10°F (88°C ± 5°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water.
3. Acid Etch: Place panels in the following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C).

Sodium Dichromate	4.1-4.9 oz./gallon
Sulfuric Acid, 66°Be	38.5-41.5 oz./gallon
2024-T3 aluminum (dissolved)	0.2 oz./gallon minimum
Tap Water as needed to balance	

   Note: Read and follow component supplier's environmental health and safety recommendations prior to preparation of this etch solution.

4. Rinse: Rinse panels in clear running tap water.
5. Dry: Air dry 15 minutes; force dry 10 minutes at 150°F ± 10°F (66°C ± 5°C).
6. If primer is to be used, it should be applied within 4 hours after surface preparation.

Plastics/Rubbers:

1. Wipe with isopropyl alcohol.*
2. Abrade using fine grit abrasives.
3. Wipe with isopropyl alcohol.*

Glass:

1. Solvent wipe surface using acetone or methyl ethyl ketone (MEK).*
2. Apply a thin coating (0.0001 in. or less) or primer such as 3M™ Scotch-Weld™ Structural Adhesive Primer EC-3901 to the glass surfaces to be bonded and allow the primer to dry before bonding.

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

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.

1. Overlap Shear Strength (psi) ASTM D-1002-72

Test Temp	Aluminum FPL Etch
-67°F (-55°C)	1500
75°F (24°C)	2000
180°F (82°C)	400

2. T-Peel Strength (piw) ASTM D-1876-61T

Test Temp	Aluminum FPL Etch
75°F (24°C)	3

3. Environmental Aging

Overlap Shear Strength (psi) after Environmental Aging Aluminum to Aluminum (ASTM D-1002-72).

Tap Water	30 days	2800
Air @ 300°F (149°C)	30 days	2600
Salt Spray (20% @ 95°F [35°C]	30 days	1500
Relative Humidity (100% @ 120°F [49°C])	30 days	2500

Note: All data developed using a 7 day @ 75°F (24°C), 2 psi cure.

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Storage

Store product at 60-80°F (15-27°C) for maximum storage life.

Shelf Life

3M™ Scotch-Weld™ Epoxy Adhesive 2158 B/A has a storage life of two years in unopened containers. Rotate stock on a "first in-first out" basis.

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.

For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550 or visit www.3M.com/adhesives. Address correspondence to: 3M Industrial Adhesives and Tapes Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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ISO 9002

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

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Industrial Business
Industrial Adhesives and Tapes Division
3M Center, Building 21-1W-10, 900 Bush Avenue
St. Paul, MN 55144-1000

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