



Scotch-Weld™

Core Reinforcement Adhesive

EC-3903

Technical Data

June, 2002

Introduction

3M™ Scotch-Weld™ Core Reinforcement Adhesive EC-3903 is a liquid adhesive designed for use in bonding and reinforcing crushed honeycomb core and is suggested for use with 3M™ Scotch-Weld™ Structural Adhesive Films AF 126 or AF 126-2. Specific data has been obtained with these adhesives and can be found under the product performance sections of their respective data sheets.

Product Description

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

Color:	Green
Base:	Resin-elastomer
Solvent:	Organic solvents
Net Weight:	8.0 lbs./gallon
Flash Point:	45°F (7°C)
Viscosity:	100-300 cps (Brookfield RVF, No. 1 spindle, 20 rpm, 75°F [24°C])
Solids Controls:	45% ± 3% (1-2 gram sample dried 1/2 hour at 250°F (121°C))

Product Application

Proper adhesive application is as important as proper bond design and adhesive choice to obtain maximum joint properties. Improper adhesive application techniques can result in partial or complete failure of an assembly.

Scotch-Weld EC-3903 performance data (reported under Product Performance sections) was developed using the following suggested procedures. Variations from these procedures should be fully evaluated to insure bond properties sufficient to meet the requirements of your particular assembly.

Surface Preparation: A thoroughly cleaned, dry, grease-free surface is essential for maximum performance. Cleaning methods which will produce a break-free water film on metal surfaces are generally satisfactory. Surface preparations should be fully evaluated with the adhesive, especially if resistance to specific environments are anticipated.

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Product Application (continued)

Suggested Cleaning Procedures for Aluminum

1. Vapor Degrease – Perchloroethylene condensing vapors for 5-10 minutes.
2. Alkaline Degrease – Oakite 164 solution 9-11 oz./gallon of 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 ± 5°F (66 ± 2°C).

Caution: Use adequate respiratory, eye and skin protection when using etch solution.

Sodium Dichromate (Na ₂ Cr ₂ O ₇ ·2H ₂ O)	4.1 - 4.9 oz./gallon
Sulfuric Acid, 66° Be	38.5 - 41.5 oz./gallon
2024T-3 aluminum (dissolved)	0.2 oz./gallon minimum
Tap Water as needed to balance	

4. Rinse – Rinse panels in clear, running water.
5. Dry – Air dry 15 minutes; followed by a force dry 10 minutes at 150 ± 10°F (66 ± 5°C).
6. It is advisable to coat the freshly cleaned surfaces with adhesive within 4 hours after surface preparation.

Suggested Cleaning Procedure for Aluminum Honeycomb Core

1. Soak in clean Aliphatic Naphtha (to conform to TT-N-95A) for five minutes at room temperature. Dry 10 minutes at 150°F ± 10°F (66°C ± 5°C).
2. Optional – Immerse in etching solution for two (2) minutes at 150°F ± 5°F (66°C ± 2°C). Rinse, air dry and force dry in similar manner to skin panels.

Primer Application: Care should be taken to avoid contaminating adhesive and cleaned aluminum by any substance which will hinder wetting action of the primer or film. 3M™ Scotch-Weld™ Core Reinforcement Adhesive EC-3903 should be agitated prior to application.

Scotch-Weld EC-3903 has been applied successfully by pour coating* in honeycomb core priming applications. The following dry cycle is suggested:

Air Dry: 30 minutes at 75°F ± 10°F (24°C ± 5°C)

Force Dry: 30 minutes at 150°F ± 5°F (66°C ± 2°C)

*Viscosity can be adjusted by dilution with a 60/40 blend of toluene/ethyl alcohol.

Cleanup: *Excess primer and equipment may be cleaned prior to curing with a 60/40 blend of toluene/ethyl alcohol.

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

Cure Cycle: The following cure cycle is suggested:

Temperature:	250°F ± 10°F (121°C ± 5°C)
Time:	60 minutes
Pressure:	50 psi
Bond Line Temperature Rise Rate:	4-12°F/minute

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Product Performance

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

The following product performance data has been obtained in the 3M laboratory under the conditions specified. General application methods and bonding procedures are described. Since there is no satisfactory reproducible test for a crushed core application, data on 3M™ Scotch-Weld™ Core Reinforcement Adhesive EC-3903 has been developed on overlap shear bonds to serve as a guide of strength properties over a wide temperature range.

Aluminum to Aluminum Overlap Bonds

The following data shows typical values obtained with Scotch-Weld EC-3903 in aluminum overlap bonds. All properties were measured on 1" x 1/2" overlap specimens cut from .063" thick 4" x 7" bonded panels of 2024T-3 clad aluminum which were cleaned as indicated above. Scotch-Weld EC-3903 was coated to a 3 mil dry thickness on both faces of the aluminum overlap shear panels, dried 30 minutes at 75°F (24°C) plus 30 minutes at 150°F (66°C), layed up in a 1/2 inch overlap bond and cured either 60 minutes at 250°F (121°C) or 90 minutes at 225°F (107°C) under 50 psi with a 6-8°F/minute bond line temperature rise.

Test Temperature	Typical Values	
	60 Minutes 250°F (121°C) Cure	90 Minutes 225°F (107°C) Cure
-67°F (-55°C)	4000 psi	4000 psi
75°F (24°C)	4700 psi	4300 psi
180°F (82°C)	4500 psi	4300 psi
250°F (121°C)	1000 psi	1000 psi

Storage

Store Scotch-Weld EC-3903 at 40°F (4°C) or lower for optimum storage life. Scotch-Weld EC-3903 should be permitted to thoroughly warm to room temperature before opening in order to prevent moisture condensation on the adhesive surface. Rotate stock on a “first in – first out” basis. Upon request your 3M sales representative will be pleased to advise you of the shelf life of this produce under the storage conditions in your plant.

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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 (800) 235-2376. Our fax number is (417) 869-5219. Address correspondence to: 3M Aerospace Central, 3211 E. Chestnut Expressway, Springfield, MO 65802.

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ISO 9002

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