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3M™ Scotch-Weld™ Structural Adhesive Primer EC-3917

Technical Data Sheet

Introduction

3M™ Scotch-Weld™ Structural Adhesive Primer EC-3917 is a primer for 3M™ Scotch-Weld™ epoxy based film adhesives. EC-3917 primer contains a corrosion inhibiting pigment. Priming with EC-3917 offers the following advantages:

Advantages

- Complete wetting of the adhesive to the adherends
- Improves durability of bonded joint
- Preserves surface preparation until ready to bond
- Can be brushed or sprayed
- Can be used as a corrosion resistant coating

Description

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

Color:	Yellow – green
Base:	Synthetic Resin
Net Weight:	7.2 lbs./gallon (0.9 Kg/liter) [approximate]
Solids Content:	12.0 ± 1%
Flash Point:	20°F (6.7°C) [Closed Cup]

Note: EC-3917 primer must be thoroughly agitated prior to use.

Product Performance

All data reported in this section is typical data obtained on EC-3917 primed aluminum surfaces. Prior to priming, the metal was etched as described in the surface preparation section. Where noted, the etch was followed by chromic acid anodization. After primer application and dry, the bonds were assembled and cured for 60 minutes at 250°F [121°C] for the 3M™ Scotch-Weld™ Film Adhesive AF 126 series and AF 163-2 series. A 4-5°F/minute (2.2-2.8°C/minute) rise rate to temperature and 45-50 psi (3.1-3.4 bar) pressure was used. Parts were cooled to below 200°F (93°C) before the pressure was removed.

Product Performance *(continued)*

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

1. Metal to Metal – Overlap Shear

All properties were measured on 1" wide, 1/2" overlap specimens cut from 0.063" thick 4" x 7" bonded panels of 2024-T3 alclad aluminum.

Note: AF 163-2K (.06 wt.) tests were conducted on unsealed chromic acid anodized panels.

Test Temperature	3M Adhesives AF 126-2 (.06 wt.)		AF 147 (.075 wt.)		AF 143-2 (.10 wt.)		AF 163-2K (.06 wt.)	
-67°F (-55°C)	3000 psi	20.7 MPa	3500 psi	24.1 MPa	2600 psi	17.9 MPa	6000 psi	41.3 MPa
75°F (24°C)	4000 psi	27.6 MPa	4500 psi	31.0 MPa	3250 psi	22.4 MPa	5800 psi	40.0 MPa
250°F (121°C)	700 psi	4.8	3500 psi	24.1 MPa	2700 psi	18.6 MPa	1500 psi	10.3
300°F (149°C)	not tested	MPa not tested	2200 psi	15.2 MPa	2700 psi	18.6 MPa	not tested	MPa not tested

2. Metal to Metal – T-Peel

T-Peel strength was measured on 1" wide specimen cut from unsealed, chromic acid anodized, 8" x 8" x .020" bonded panels of 2024-T3 alclad aluminum.

Test Temperature	3M Adhesives AF 126-2 (.06 wt.)		AF 147 (.075 wt.)		AF 143-2 (.10 wt.)	
-67°F (-55°C)	25 piw	111.2 N/25mm	25 piw	111.2 N/25mm	30 piw	133.4 N/25mm
75°F (24°C)	30 piw	133.4 N/25mm	30 piw	133.4 N/25mm	45 piw	200.2 N/25mm
180°F (82°C)	25 piw	111.2 N/25mm	25 piw	111.2 N/25mm	35 piw	155.7 N/25mm

3. Metal to Metal Floating Roller Peel

Peel strength was measured on 1" wide specimens cut from a 3" x 8" x .063" 2024-T3 bare aluminum panel bonded to a 3" x 10" x .025" 2024-T3 bare panel. Tests were conducted per ASTM D-3167.

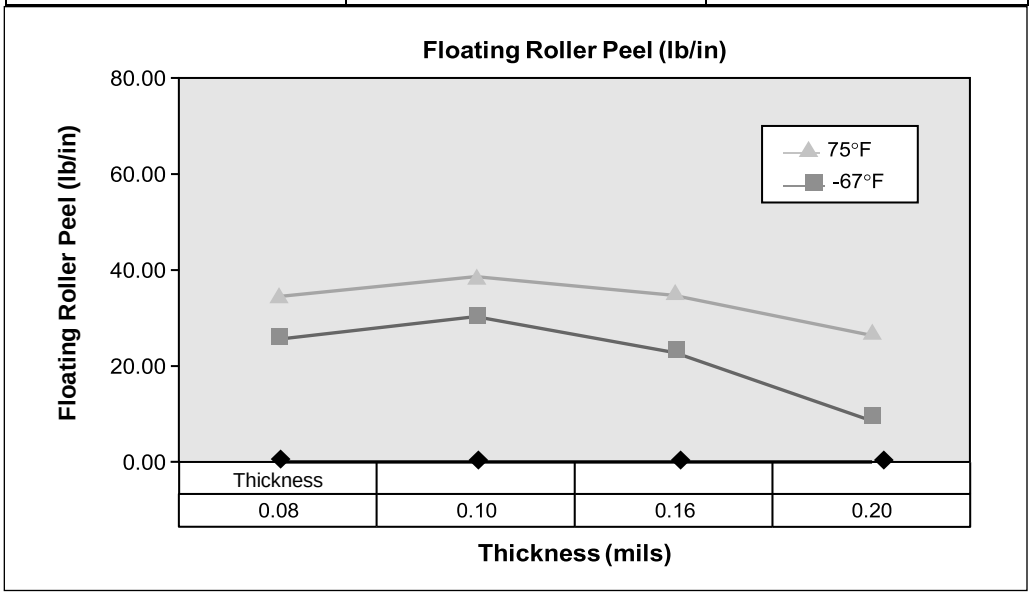
Test Temperature	3M Adhesives AF 126-2 (.06 wt.)		AF 147 (.075 wt.)		AF 143-2 (.10 wt.)	
75°F (24°C)	50 piw	222.4 N/25mm	30 piw	133.4 N/25mm	6 piw	26.7 N/25mm

Product Performance *(continued)*

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

EC-3917 with 3M™ Scotch-Weld™ Structural Adhesive Film AF 191M (.035 wt.)
Floating Roller Peel (ASTM D-3167) at -67°F (-55°C) and 75°F (24°C) versus Primer Thickness

Primer Thickness	(lb/in)	(lb/in)
(mil)	-67°F (-55°C)	RT
0.08	26	37
0.10	31	39
0.16	23	36
0.20	9	28



4. Resistance to Environmental Exposure

When used as a primer, EC-3917 resists attack by salt spray, humidity, and aircraft test fluids.

Given below is typical data obtained on AF 126-3 (.06 wt.) on EC-3917 primed aluminum prepared as in section 1. Metal to Metal – Overlap Shear. The overlap shear and environmental exposure tests were conducted according to MMM-A-132.

Test – 75°F (24°C) overlap shear	AF 126-3 (.06 wt.)/EC-3917	
Unexposed control	4500 psi	31.0 MPa
After 30 days at 120°F (49°C) and 95-100% Rel. Humidity	3800 psi	26.2 MPa
After 30 days exposure to Salt Water Spray	4100 psi	28.3 MPa
After 30 days immersion in Tap Water at 75°F (24°C)	4600 psi	31.7 MPa
After 7 days immersion in JP-4 Fuel at 75°F (24°C)	5020 psi	34.6 MPa
After 7 days immersion in MIL-F-5566 Anti Icing Fluid	4500 psi	31.0 MPa
After 7 days immersion in MIL-H-5606 Hydraulic Oil	5170 psi	35.6 MPa
After 7 days immersion in Type III Hydrocarbon Fluid	4980 psi	34.3 MPa

Application	Proper primer 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. EC-3917 primer will give excellent results under the following suggested procedures. Variations from these procedures should be fully evaluated to ensure bonded performance is sufficient to meet the requirements of your particular application.
Surface Preparation	Suggested Cleaning Procedures for Aluminum 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 preparation should be fully evaluated with the complimentary adhesive, especially if continuous exposure to specific environments is anticipated. For aluminum, the best performance will be achieved with surface preparation consisting of solvent degreasing, alkaline cleaning, chemical etching according to ASTM D2674 and phosphoric acid anodizing according to ASTM D3933. It is advisable to coat the freshly cleaned surfaces with EC-3917 within four (4) hours after surface preparation. Care should be taken to avoid contaminating the surfaced prepared aluminum by any substance which will hinder the wetting action of EC-3917.

Surface Preparation *(continued)*

Primer Application: EC-3917 is satisfactorily applied by brush coating to spraying. Primer must be thoroughly agitated just prior to application.

		Spray Gun
A. Spray Procedure	DeVILBISS JGA	Binks No. 62
Air Cap	30	66SD
Fluid Tip and Needle	AV-15-FX	66-365
Cup Pressure	2-4 psi (13.78-27.56 MPa)	Siphon Feed
Line Pressure	30 psi (0.207 MPa)	30 psi (0.207 MPa)
Distance from Panel	9 ± 3 in. (228.6 ± 76.2 mm)	6-9 in. (152.4-228.6 mm)
Primer Thickness	00005-00015 in. (1.27-3.81 micron)	
Primer Weight	140-420 mg/sq. ft.	

B. Primer Dry and Cure
Air dry for 30 minutes minimum at 75°F (24°C) followed by force cure for 60 minutes at 250°F (121°C).

Note: The above primer application procedures will give satisfactory performance with 3M™ Scotch-Weld™ Epoxy Adhesives. However, review the particular product technical sheet for the optimum primer application to be used with that product.

The primed surface should be protected from contamination introduced by dust, fingerprints, oil, etc.

If extended periods of storage are required, wrap the parts in unplasticized Kraft paper. If the cured, primed surface is contaminated with dust, it may be cleaned prior to bonding by wiping with clean unsized cheesecloth and ketone* type solvents.

Cleanup: Excess primer and equipment may be cleaned up, prior to curing with ketone* type solvents.

*When using solvents, extinguish all sources of ignition in the area, review and follow suppliers precautionary information prior to handling these materials.

Storage & Handling

3M Standard shelf life of EC-3917 primer is 6 months from date of shipment from 3M when stored at 0°F (-18°C) or below in its original unopened container. Avoid heat and dampness in storage. Freezer storage 0°F (-18°C) or below is recommended for EC-3917. Rotate stock on a “first in – first out” basis.

Caution: Primer should be permitted to thoroughly warm to room temperature before being used in order to prevent moisture condensation. Primer should also be thoroughly agitated prior to opening container to dispense contents.

Precautionary Information	Refer to Product Label and 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, and visit www.3m.com/3M/en_US/company-us/SDS-search/
For Additional Information	In the U.S., call toll free 1-800-235-2376, or fax 1-800-435-3082 or 651-737-2171. For U.S. Military, call 1-866-556-5714. If you are outside of the U.S., please contact your nearest 3M office.
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