

3M™ Scotch-Weld™ Structural Adhesive Primer EW-5005

Technical Data Sheet

Product Description

3M™ Scotch-Weld™ Structural Adhesive Primer EW-5005 is a water-based, non-chromated, structural adhesive primer.

Benefits

- Easy to use – Spray with conventional HVLP spray equipment.
- Convenient – High build rate with ability to visually check thickness
- Compatible with 3M Surface Pretreatment AC-130-2 surface preparation for adhesive bonding
- For use with a wide variety of 250 – 350°F (121 – 177°C) curing epoxy adhesive systems.

Typical Uncured Physical Properties

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	Epoxy
Vehicle	Distilled water and small amounts of co-solvents
Solids Content	20 ± 2%
Net Weight	8.7lbs/gallon (1.04 g/cc)
Storage	35 to 45°F (1 to 7°C) [DO NOT FREEZE]

Typical Cured Physical Properties

Note: The following technical information and data is based upon limited 3M testing conditions and are considered typical values and should not be used for specification purposes.

I. Key Specifications

Appearance	Glossy to Semi-glossy
Air Dry Tack	None
Pencil Hardness	>7H1
Min. Thickness to MEK Resistance:	0.10 – 0.14 mil (2.5 – 3.6μ) ¹

¹Tested according to ASTM D5402.

II. Overlap Shear Per ASTM D1002

Test Temperature	3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2K .06WT
-67°F (-55°C)	6400 psi (44 MPa)
75°F (24°C)	6000 psi (41 MPa)
180°F (82°C)	3700 psi (25 MPa)
250°F (121°C)	2000 psi (14 MPa)
300°F (121°C)	-----
350°F (177°C)	-----

AF 163-2K Adhesive Cure: 250 ± 5°F for 60 to 70 minutes at 35 ± 5 psi, 4 to 5°F/min rise rate.

Primer Cure: Minimum 30 minutes air dry followed by 60 to 70 minutes at 250°F (121°C).

Substrate: 0.063" Bare Aluminum 2024-T3

Surface Treatment: Phosphoric Acid Anodize per ASTM D3933

Crosshead Speed: 0.05"/min

III. Floating Roller Peel per ASTM D3167

Test Temperature	3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2K .06WT
75°F (24°C)	75 lbf/in
180°F (82°C)	70 lbf/in

AF 163-2K Adhesive Cure: 250 ± 5°F for 60 to 70 minutes at 35 ± 5 psi, 4 to 5°F/min rise rate.

Adhesive Cure: 250°F (121°C) for 90 minutes 50 psi (3.45 x 10⁵ Pa) – 5.8°F/min rise rate (3.2°C/min).

Primer Cure: Minimum 30 minutes air dry followed by 60 to 70 minutes at 250°F (121°C).

Substrate: Bare Aluminum 2024-T3, 0.025" peel sheet and 0.063" backer sheet.

Surface Treatment: Phosphoric Acid Anodize per ASTM D3933

Test Speed: 6"/min

Note: The following technical information and data is based upon limited 3M testing conditions and are considered typical values and should not be used for specification purposes.

IV. Metal to Metal Climbing Drum Peel per ASTM D1781

Test Temperature	AF163-2K .06WT
75°F (24°C)	80 in-lb/in

Adhesive: 3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2K .06WT
Cure: 250 ± 5°F for 60 to 70 minutes at 35 ± 5 psi, 4 to 5°F/min rise rate.
Primer Cure: Minimum 30 minutes air dry followed by 60 to 70 minutes at 250°F (121°C).
Substrate: Bare Aluminum 2024-T3, 0.020" peel sheet.
Core: 1/4 cell, 5052 alloy, 5/8" thick, 4-mil foil, non-perforated. **Surface Treatment:** Phosphoric Acid Anodize per ASTM D3933 **Test Speed:** 3"/min

VI. Honeycomb Climbing Drum Peel per ASTM D1781

Test Temperature	AF 163-2K .06WT
75°F (24°C)	20 in-lb/1-in

Adhesive: 3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2K .06WT
Cure: 250 ± 5°F for 60 to 70 minutes at 35 ± 5 psi, 4 to 5°F/min rise rate.
Primer Cure: Minimum 30 minutes air dry followed by 60 to 70 minutes at 250°F (121°C).
Substrate: Bare Aluminum 2024-T3, 0.020" peel sheet.
Core: 1/4" cell, 5052 alloy, 1/2" thick, 4-mil foil, non-perforated. **Surface Treatment:** Phosphoric Acid Anodize per ASTM D3933 **Test Speed:** 3"/min

Product Application

Note: This information is provided as a general application guideline based upon typical conditions. No two applications are identical due to differing assemblies, method of heat and pressure application, production equipment and other limitations. It is therefore suggested that experiments be run, within the actual constraints imposed, to determine optimum conditions for your specific application and to determine suitability of product for particular intended use.

I. Surface Preparation

A thoroughly cleaned, dry, and grease-free surface is essential for maximum performance. Cleaning methods that will produce a break-free water film on metal surfaces are generally satisfactory.

For aluminum, the best performance will be achieved with surface preparation consisting of solvent degreasing, alkaline cleaning, chemical etching and phosphoric acid anodizing according to ASTM D3933.

3M™ Surface Pre-Treatment AC-130-2 may be applied to surfaces after manually deoxidizing the surface by either 1) grit blasting; 2) sanding with #180 or finer sandpaper, or 3) Scotch-Brite™ pad abrasion. The success of the bonding operation relies on the thorough de-oxidation and preparation of the metal surface. See the AC-130-2 technical data sheet for more information on application and use of AC-130-2.

II. Agitation

Thoroughly mix 3M™ Scotch-Weld™ Structural Adhesive Primer EW-5005 prior to transferring primer to the spray system. After agitation, ensure that all solids are properly dispersed including any settling on the bottom of the container. Excess shaking of the container may cause foam to form.

III. Spray Procedure

1) Equipment and Settings

Spray Equipment	Conventional HVLP spray gun ¹ , e.g. 3M™ Series 12S Spray Gun Part #68512 ² 3M™ Accuspray™ Spray Gun Model HG14, 1.4mm, #16577
Fluid and Air Nozzle	1.3 mm or less for siphon or gravity feed guns 1.0 mm or less for pressure feed guns
Atomizing Pressure	6 to 10 psi (40 to 69 kilopascal) at the air cap (gun tip) ³
Fluid Nozzle Setting	1/2 to 3/4 turn out from close position
Fan Pattern	Adjust fan pattern control to provide about 45° to 60° spray pattern
Gun Distance	6 to 12 inch (15 to 30 cm) from the panel

¹Can be either a siphon or gravity-feed gun.

²3M Series 12S Part #68512 comes with a kit that contains a 0.9mm and 1.3mm fluid nozzle tip.

For 3M™ Accuspray™ Spray Gun, set the pressure just below the purple zone at the gauge attached to the gun.

2) Spray Process

- Make sure to let the primer warm up to ambient temperature and humidity conditions before spraying, preferably 65°F (18°C) or higher, but not to exceed 90°F (33°C).
- The spray of water-based products varies with temperature and humidity conditions. To assure good spray appearance, the booth temperature should be above 70°F (21°C), and humidity should be below 50%.
- For best post-cured appearance, allow flash-off between passes. At high humidity and low temperature conditions, spray less material each pass, and allow extra passes to achieve the designated thickness.

IV. Primer Dry and Cure

Air-Dry: 30 minutes at 75 ± 5°F (24 ± 3°C), followed by:

Cure: 60 minutes at 250 ± 5°F (121 ± 3°C).

IV. Primer Thickness

Optimal thickness: 0.15 to 0.4 mil (3.8 to 10.2 μm) after cure.^{1,2}

¹Primer thickness can be measured after the primer has flashed dried, prior to bake. If thickness is measured prior to bake, about 0.02 to 0.05 mil (0.5 to 1.2 μm) shrinkage will occur after bake.

²The recommended thickness should be achieved within 2 to 3 passes (or 1 to 1.5 box coats) depending on temperature and humidity. One box coat is defined as two passes, perpendicular to each other.

Shelf Life and Storage Conditions

3M™ Scotch-Weld™ Structural Adhesive Primer EW-5005 shelf life is 12 months from the date of shipment from 3M when stored between 35° to 45°F (1° to 7°C) in the original unopened container. DO NOT FREEZE. Containers should be agitated after 6 months of storage at customer site.

Scotch-Weld EW-5005 primer should be permitted to thoroughly warm to room temperature in a sealed container before being used in order to provide its normal spray and drying characteristics.

The out time of Scotch-Weld EW-5005 primer is approximately 15 days when stored below 80°F (27°C).

3M Scotch-Weld EW-5005 primer shall be maintained between 35° to 55°F (1° to 13°C) during shipping. For shipments between 55° and 80°F (13° and 27°C), the time above 55°F (13°C) shall be subtracted from the out-time of the material. The out-time is 15 days when stored below 80°F (27°C).

Precautionary Information

Refer to Product Label and Safety Data Sheet (SDS) for health and safety information before using this product. Always wear personal protection equipment, such as half or full face piece air purifying respirator suitable for organic vapors and particulates. For additional health and safety information, please visit www.3m.com/MSDS or call 1-800-364-3577 or (651) 737-6501.

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 representative.

These products were manufactured under a 3M Quality Management System registered to the AS9100 standard

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