



# DUAL-MIX™

## WE'VE BEEN RIVET BONDING ALUMINUM & STEEL FOR OVER A DECADE

### SOLUTION 1

#### 39747 MULTI-PURPOSE PANEL ADHESIVE

7 oz. Cartridge



A two-component epoxy for panel bonding any combination of steel, aluminum, SMC and fiberglass.

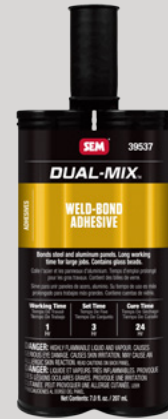
- Long working time
- Superior impact and peel strength
- Excellent corrosion resistance
- Glass beads for consistent bond line thickness

**Working Time:** 90 min  
**Set Time:** 4 hr  
**Cure Time:** 24 hr  
**Heat Cure Time:** 1 hr  
**Resin Base:** Epoxy

### SOLUTION 2

#### 39537 WELD-BOND ADHESIVE

7 oz. Cartridge



A non-sag, two-component acrylic adhesive system formulated to bond metal surfaces without the use of an external primer.

- Long working time
- Superior impact and peel strength
- Glass beads for consistent bond line thickness

**Working Time:** 1 hr  
**Set Time:** 3 hr  
**Cure Time:** 24 hr  
**Heat Cure Time:** 1 hr  
**Resin Base:** Acrylic



### DUAL-MIX FOREVER WARRANTY

COVERS PARTS & LABOR FOR LIFE  
AS IT HAS FOR OVER 25 YEARS



# RIVET BONDING PROCEDURE FOR ALUMINUM & STEEL SUBSTRATES

## TECHNICAL BULLETIN



Check local VOC regulations to ensure compliance of all products in your area.

**Rivet Bonding for Aluminum and Steel Substrates is a process that uses a combination of automotive structural rivets and adhesive to join two pieces of metal of similar or dissimilar composition.**

Stringent increases in CAFE (Corporate Average Fuel Economy) standards at the manufacturing level have become the driving force behind automobile makers' willingness to develop new steel and aluminum alloys for their vehicles. These high-strength, light-weight alloys have helped OEMs significantly lessen the weight of the vehicles, providing better fuel economy, while increasing safety for its passengers in the process. These new alloys have created challenges to repair facilities, such as whether the part could be welded with traditional methods or welded at all. The combination of rivets and SEM adhesives is a perfect fit for applications where welding is prohibited and provides outstanding strength and corrosion protection on substrates of similar or dissimilar composition.

SEM Products approves the use of two adhesives for use in rivet bonding procedures. Both products are covered under the **Dual-Mix Forever Warranty** for rivet bonding procedures.

## PRODUCTS APPROVED

Part	Product Name
39747	Multi-Purpose Panel Adhesive
39537	Weld-Bond Adhesive

**Multi-Purpose Panel Adhesive** and **Weld-Bond Adhesive** incorporate glass beads in the adhesive to control bondline thickness. Bondline thickness is a crucial component of rivet bonding procedures for the control of corrosion, such as galvanic corrosion between dissimilar metals.

SEM recommends full, non-structural panel replacements. However, there may be instances where an OEM recommends the use of rivets and adhesives to perform structural repairs. The procedure included within this document is to be used as a guideline for full, non-structural panel replacements and for structural replacements only if the manufacturer recommends it. Consulting VIN-specific repair procedures should always be the first step in the repair process.

## HANDLING

Special precautions must be taken when working with combinations of aluminum and steel to prevent corrosion.

1. Work areas and tools for aluminum and steel repair should be kept separate to avoid cross contamination of substrates.
2. Tools to be used for multiple substrates should be cleaned thoroughly between uses and inspected regularly.
3. Use proper air ventilation and curtains to control airborne particles.
4. Always use filtered, clean air from the compressor.



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## PREPARATION

1. Remove spot-welds by drilling with a spot-weld cutter; remove rivets by drilling or grinding.
2. Remove damaged panel and straighten bent flanges with a hammer and dolly.
3. Clean surfaces to be bonded with **SEM Solve** or **Zero VOC Surface Cleaner** per directions.
4. Grind mating flanges with a 36 grit grinding disc at low speed to maintain grinding marks, removing any adhesive or protective coating, such as paint, e-coat or galvanized coating.  
**Note:** Some manufacturers may recommend leaving the OEM e-coat on the surface of the new replacement panel. If this is the case, omit grinding with 36 grit in step 4 and instead, scuff with a red scuff pad.
5. Blow off and re-clean surfaces with **SEM Solve** or **Zero VOC Surface Cleaner** if necessary. Always use lint-free towels when cleaning surfaces to avoid lint and particle contamination.
6. Bonding surfaces should be clean, dry, and free of contamination. Dry-fit all panels before applying adhesive to ensure proper alignment and clearance.
7. While dry-fitting the panel, drill holes for replacement rivets or mark the location of self-piercing rivets per manufacturer instructions.

## MIXING

It is highly recommended that adhesives be dispensed through a static mixer. Once mixed, **Multi-Purpose Panel Adhesive** or **Weld-Bond Adhesive** should achieve a uniform color. Heat build-up during and after mixing is normal.

1. Place cartridge into a **Universal Manual Applicator** or **Universal Pneumatic Applicator**.
2. Remove cartridge tip. To maintain product quality, replace after use.
3. Equalize cartridge by dispensing product until both parts flow equally.
4. Install static mixer.
5. Cut tip to desired application size.
6. Dispense 2-3 inches of test material to make certain color is uniform prior to applying to job.

## STATIC MIXERS

Part	Product Name	Container
70011	Integral Nut Square Static Mixers	6 pack
70012	Integral Nut Square Static Mixers	50 pack

## APPLICATION

1. Apply a 3/8" – 1/2" bead of product to both bonding surfaces and tool with a spreader or acid brush covering all exposed bare metal. Use enough material to completely fill the joint when parts are clamped. To assure maximum bond strength, surfaces must be mated and riveted within the adhesive's working time.



Check local VOC regulations to ensure compliance of all products in your area.

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## WORKING TIME @ 70°F (21°C)

Product	Time
Multi-Purpose Panel Adhesive	90 minutes
Weld-Bond Adhesive	60 minutes

2. Clamp panel into place.
3. Install rivets per manufacturer recommendations.
4. Clamps may be removed after rivets have been installed.
5. Wipe away excess material squeezed out during clamping / riveting process.
6. Allow 4 hours dry time for **Multi-Purpose Panel Adhesive** and 3 hours dry time for **Weld-Bond Adhesive** before sanding and top coating with a two-component primer per manufacturers recommendations.

### Note:

Temperatures below 55°F (13°C) will slow the cure; above 85°F (29°C) will accelerate cure rate. To enhance cure time, heat to 120°-140°F (49°-60°C) for 1 hour.

## DAMPENING MATERIAL

When performing rivet bonding procedures, **39357 Flexible Urethane Foam**, **39997 Rigid Urethane Foam** and **39977 Panel Vibration Control Material** can be used to replace the OEM dampening material found between the panels and the structural members. Refer to product information for proper selection.

## SEAM SEALING

Wherever a seam sealer is needed, SEM recommends using either **39377 Seam Sealer**, **39477 Beige Seam Sealer** or **40377 Heavy Bodied Black Seam Sealer**.

## DUAL-MIX FOREVER WARRANTY

When used according to directions, SEM guarantees to the purchaser that all Dual-Mix products will perform to specifications forever. This warranty covers reasonable costs for labor, loss of use of the vehicle, parts and materials only, and excludes consequential or incidental damages.



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## RELATED PRODUCTS

Part	Product Name	Container
38371	SEM Solve	Gallon
38373	SEM Solve	20 oz. Aerosol
38374	SEM Solve	Square Quart
39357	Flexible Urethane Foam	7 oz. cartridge
39377	Seam Sealer	7 oz. cartridge
39477	Beige Seam Sealer	7 oz. cartridge
39977	Panel Vibration Control Material	7 oz. cartridge
39997	Rigid Urethane Foam	7 oz. cartridge
40377	Heavy Bodied Black Seam Sealer	7 oz. cartridge
40401	Zero VOC Surface Cleaner	Gallon
40404	Zero VOC Surface Cleaner	Quart
70011	Integral Nut Square Static Mixers	6 pack
70012	Integral Nut Square Static Mixers	50 pack
70039	Universal Pneumatic Applicator	N/A
71119	Universal Manual Applicator	N/A

### Technical Consultation Service

Our Technical Staff is ready to assist you with any questions. You are invited to take advantage of our extensive experience, laboratory services and trained field service representatives. Call (800) 831-1122 for answers to your questions. Hours of operation are Monday through Thursday 8:00 am until 5:00 pm EST and on Friday 8:00 am until 4:30 pm EST.

#### Disclaimer:

The information supplied in this document is for guidance only and should not be construed as a warranty. All implied warranties are expressly disclaimed. All users of the materials are responsible for assuring that it is suitable for their needs, environment and use. All data subject to change as SEM deems appropriate.

Users should review the Safety Data Sheet (SDS) and product label for the material to determine possible health hazards, appropriate engineering controls and precautions to be observed in using the material. Copies of the SDS and product label are available upon request.