



Panel Bonding Adhesive

08115 • 38315 • 58115

Technical Data

June 2021

| 3M Part Numbers | 3M Part Descriptor |
|-----------------|--------------------------------------|
| 08115 | 3M™ Panel Bonding Adhesive – 200 ml |
| 38315 | 3M™ Panel Bonding Adhesive – 47.3 ml |
| 58115 | 3M™ Panel Bonding Adhesive – 450 ml |

Product Description

3M™ Panel Bonding Adhesive is intended for use in outer body, non-structural panel attachment applications, including applications where panels are used in conjunction with welding and/or riveting. Industry professionals appreciate the performance benefits that 3M™ Panel Bonding Adhesive provides, including the continuous bond, load distribution, ease of use that drives more consistent results, corrosion protection, and excellent adhesion to a wide variety of substrates. 3M™ Panel Bonding Adhesive is a two-part epoxy adhesive which provides a long open-time or work-time but can be rapidly cured with heat once the panel has been positioned and clamped into its proper position (see: Rate of Strength Buildup at Various Temperatures chart below). 3M™ Panel Bonding Adhesive also contains 10 mil glass beads to help users control bond line thickness and to prevent excessive squeeze out.

There are of course many factors and variables that can affect an individual repair, so the technician and repair facility need to evaluate each specific application and repair process, including relevant vehicle, part and OEM guidelines, and determine what is appropriate for that repair.

Features

- 3M™ Epoxy Technology
- Corrosion Inhibiting
- Heat Cure on Demand
- Bonds Steel, Aluminum, SMC, FRP
- Contains Glass Beads to Control Bond Line Thickness

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Product Uses

3M™ Panel Bonding Adhesive is intended for use in outer body, non-structural panel attachment applications, including applications where panels are attached in conjunction with welding and/or riveting.

There are of course many factors and variables that can affect an individual repair, so the technician and repair facility need to evaluate each specific application and repair process, including relevant vehicle, part and OEM guidelines, and determine what is appropriate for that repair. Examples of where Panel Bonding Adhesive may be used in conjunction with other traditional joining methods in a repair scenario, subject to OEM recommendations, can include door skins, roof skins, quarter panels and box sides.

This product is not intended to be used for structural parts, such as pillars, rockers, strut/shock towers, frame rails, or frame members unless specifically recommended by the vehicle manufacturer and used in the manner specified in the OEM repair manual and procedures. If doubt exists as to whether a particular component is structural, consider it structural.

Initial Physical Properties

The accuracy or completeness of the following product information is considered reliable but is not guaranteed and is subject to change without notice.

| | | |
|----------------------------|---|----------------|
| Container Options | PN 08115: 200 ml Duo Syringe Cartridge PN 38315: 47.3 ml Duo Syringe Cartridge PN 58115: 450 ml DMS Duo Syringe Cartridge | |
| Base | Epoxy | Amine |
| Density lbs/Gallon (Appx.) | 8.0 | 10.0 |
| Color | Black | Butterscotch |
| Solids Content (Appx.) | 100% | 100% |
| Consistency | Viscous Liquid | Viscous Liquid |
| Mix Ratio by Weight | 172 Parts | 100 Parts |
| Mix Ratio by Volume | 200 Parts | 100 Parts |

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Performance Specifications The values shown below are for ambient air temperature and substrate temperature at 73°F (23°C).

| | | |
|-------------------|--------------------|-------------------|
| <u>Work Time:</u> | <u>Clamp Time:</u> | <u>Cure Time:</u> |
| 90 minutes | 4 hours | 24 hours |

Overlap Shear Adhesion to Various Substrates

Typical overlap shear strength of bonds with 10 to 12 mil bond lines are reported below as pounds per square inch (psi). All materials except aluminum, E-Coat, and two-part epoxy primed steel, were abraded with a 50-grit coated abrasive and solvent wiped with 3M™ General Purpose Adhesive Cleaner, PN08984. Aluminum samples were abraded with a Scotch-Brite™ Rivet Cleaning Disc, PN 07410 and solvent wiped. E-Coat samples were solvent wiped. No extra surface preparation was performed on the epoxy primed steel. The bonds were allowed to cure for 7 days at 73°F and then tested on a Sintech tester at a joint separation rate of 0.5 inches (12.7 mm) per minute.

*all adhesion values in psi

| Substrate | -40°F | 73°F | 180°F |
|--|---------|---------|---------|
| 0.057" Steel to 0.057" Steel | 4003(C) | 3935(C) | |
| 0.036" Steel to 0.036" Steel | 3309(C) | 2904(C) | 1259(A) |
| 0.035" E-Coat Primed Steel to 0.035" E-Coat Primed Steel | | 3514(S) | |
| 0.036" Galvanized Steel to 0.036" Galvanized Steel | | 3008(C) | |
| Two-Part Epoxy Primed 0.036" Steel to Two-Part Epoxy Primed 0.036" Steel | | 2183 | |
| 0.062" Aluminum 6111 to 0.062" Aluminum 6111 | | 3144(C) | |
| 0.063" Aluminum 5754 to 0.063" Aluminum 5754 | | 2152(A) | |
| 0.057" Steel to 0.062" Aluminum 6111 | | 3795(C) | |
| Fiberglass Reinforced Plastic (FRP) to FRP | | 1283(S) | |
| Sheet Molded Compound (SMC) to SMC | | 785(S) | |
| Acrylonitrile Butadiene Styrene (ABS) to ABS | | 942(S) | |

(S) = Substrate Failure

(A) = Adhesive Failure

(C) = Cohesive Failure

Adhesion to Steel at Varying Bond Line Thickness

*all adhesion values in psi

| Bond line Thickness | 0.036" thick steel | 0.057" thick steel |
|---------------------|--------------------|--------------------|
| 10 mils | 2690 | 3935 |
| 20 mils | 2638 | 3863 |
| 30 mils | 2653 | 3693 |
| 40 mils | 2601 | 3510 |
| 50 mils | 2432 | 3268 |

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Performance Specifications Cont.

Rate of Strength Buildup at Various Temperatures (0.057" Steel)

*all adhesion values in psi

| Cure Time | Cure Temperature | | | | |
|-----------|------------------|------|-------|-------|-------|
| | 50°F | 73°F | 100°F | 150°F | 200°F |
| 10 min | | | | 262 | 3061 |
| 20 min | | | 22 | 1562 | 3707 |
| 40 min | | | 32 | 3316 | 3786 |
| 1 hr | | | 172 | 3569 | |
| 2 hr | | | 1382 | 3833 | |
| 4 hr | | 78 | 2836 | | |
| 5 hr | | 569 | | | |
| 6 hr | | 865 | | | |
| 8 hr | 24 | 1756 | | | |
| 16 hr | 592 | 2920 | | | |
| 1 day | 1413 | 3273 | | | |
| 7 days | 2774 | 3935 | | | |

Corrosion Resistance:

| Test Method | Test Result |
|-----------------------------|-------------|
| SAE J 2334 revision 2003-12 | PASS |

Accessories

47.3mL Duo-Pak Syringe Format (PN 38315)

PN08190 3M™ Performance Manual Applicator

Mixing Nozzles:

PN38191 3M™ Static Mixing Nozzle – 12 nozzles per bag, 6 bags per case

PN38193 3M™ Static Mixing Nozzle – 50 nozzles per bag, 6 bags per case

200mL Duo-Pak Syringe Format (PN 08115)

Applicators:

PN08117 3M™ Manual Applicator

PN09930 3M™ Pneumatic Applicator

Mixing Nozzles:

PN08193 3M™ Static Mixing Nozzle – 6 nozzles per bag, 6 bags per case

PN08194 3M™ Static Mixing Nozzle – 50 nozzles per box, 6 boxes per case

450mL DMS Cartridge Format (PN 58115)

PN05846 3M™ DMS Applicator, Pneumatic

Mixing Nozzles:

PN55847 3M™ Dynamic Mixing Nozzle – 50 nozzles per box, 6 boxes per case

PN58207 3M™ Nozzle Extension – 12 nozzle extensions per bag

See the Instructions provided with each applicator for proper set-up and use.

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Storage and Handling

Store at temperatures between 65°F and 80°F (18° C to 27°C). Store away from excessive heat, cold and out of direct sunlight. When stored at the recommended temperature in original, unopened containers, this product has a shelf life of 24 months from the date of manufacture.

Rotate stock on a “first-in / first-out” basis.

After use, leave the mix nozzle in place to seal the cartridge.

3M Static Mix Nozzles:

- ONLY use 3M Static Mix Nozzles with 3M adhesive cartridges.
- Keep static mix nozzles stored in their original container away from dust, debris and other contaminants.

Directions for Use

There are of course many factors and variables that can affect an individual repair, so the technician and repair facility need to evaluate each specific application and repair process, including relevant vehicle, part and OEM guidelines, and determine what is appropriate for that repair. See Product Use Section.

If no OEM procedures exist, 3M makes the following general repair suggestions for the technician and repair facility’s consideration:

- If outer body panels, skins or assemblies include attached structural parts, the structural parts must be welded. If doubt exists as to whether a particular component is structural, then that component should be welded.
- For those applications determined to be appropriate for the use of Panel Bonding Adhesive:
 - Non-structural door skin applications – Apply Panel Bonding Adhesive to the perimeter of the door mating flanges and re-hem the new door skin to the inner support.
 - Non-structural roof panel applications – Apply Panel Bonding Adhesive to the perimeter of the mating flange areas, and weld in areas where structural parts meet.
 - Non-structural quarter panel applications – Apply Panel Bonding Adhesive to the mating flange areas, weld the sail panel, belt line, rear vertical joints, and in areas where structural parts meet.
 - Non-structural box side applications – Apply Panel Bonding Adhesive to the mating flange areas, weld the rear vertical flange, and in areas where structural parts meet.

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Directions for Use Cont.

SURFACE PREPARATION:

1. Wash the surface with an appropriate VOC compliant product for removal of surface contaminants.
2. Remove all rust, primer and paint from the areas to be bonded or welded using a Scotch-Brite™ Clean & Strip Disc or 3M grade 50 Grinding Disc.
3. Straighten all metal, and “dry-fit” the parts.
4. Clamp the part in place and check for fit and alignment.
5. Remove the panel from the vehicle.

PRODUCT PREPARATION:

6. Place an adhesive cartridge in the proper 3M Applicator and remove the cap plug from the cartridge (see the Applicators User Manual for proper set-up and use)
 - PN 38315, 47.3 ml: Remove the cap plug from the end of the cartridge by rotating it 90 degrees and pulling. Retain for reuse if re-capping the cartridge is desired.
 - PN 08115, 200ml: Remove the threaded retaining collar and red plug from the end of the cartridge. Discard plug but save the retaining collar.
 - PN 58115, DMS: Remove the cap from the top of the cartridge.
7. Equalize the cartridge: Extrude a small amount of adhesive until both parts A and B are present at the outlet of the cartridge and attach the correct mixing nozzle.
 - PN 38315, 47.3 ml: Attach a 3M™ Mixing Nozzle, PN 38191, to the cartridge and lock in place by rotating it 90 degrees.
 - PN 08115, 200 ml: Attach a 3M™ Mixing Nozzle, PN 08194, to the cartridge and secure in place with the retaining collar.
 - PN 58115, DMS: Attach a 3M™ Mixing Nozzle, PN 55847, to the cartridge making sure it is secured by the nozzle locking tabs.
8. Equalize the Mix Nozzle: Dispense a 1 to 2-inch (25 to 50 mm) line of adhesive through the mixing nozzle and discard.
 - 3M™ Panel Bonding Adhesive has a work time of 90 minutes. For best results, adhesive should be immediately dispensed once a new mix nozzle has been equalized. If the adhesive cartridge is left unused for more than 30 minutes, install a new mix nozzle to ensure proper adhesive mixing, before continuing use.

REPAIR PROCESS:

- Areas to be Metal Inert Gas (MIG) welded should be coated with 3M™ Weld-Thru II Coating, according to the directions on the can. Adhesive should not be applied to the areas that will be MIG welded.
 - Areas to be Squeeze Type Resistance Spot Welded (STRSW) should NOT be coated with Weld-Thru coating. 3M™ Panel Bonding Adhesive should be applied to these areas and can be spot welded through before adhesive is cured.
9. Apply first adhesive bead to host panel. Use enough adhesive and a plastic spreader or acid brush to tool-out the adhesive to ensure coverage of all bare metal surfaces.
 10. Apply second adhesive bead to replacement panel. Use enough adhesive and a plastic spreader or acid brush to tool-out the adhesive to ensure coverage of all bare metal surfaces.

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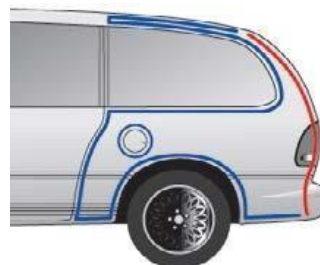
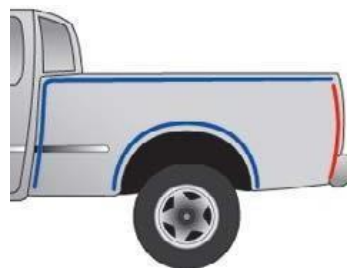
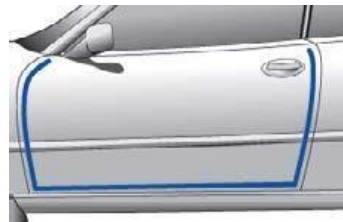
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Directions for Use Cont.

11. Apply a third bead of adhesive (1/8 inch [3 mm] diameter or more) approximately 1/4 inch [6 mm] from the inside edge of the replacement panel.
12. Install the panel into position being careful not to wipe away or scrape off adhesive from the mating flanges.
13. Properly align the panel and clamp it in place using the correct type(s), placement of, and number of clamping devices to ensure secure fixturing of the replacement panel to the host panel.
14. Tool the adhesive squeeze-out to seal all of the seams around the bonded edge(s) and to fill any gaps or voids between the panels.
15. Follow applicable OEM instructions and recommendations. See Product Use section. Weld cosmetic joints/splices as necessary or recommended by the OEM. If no OEM recommendations exist, 3M suggests welding those areas marked in Red in the accompanying diagram. Areas marked in Blue in the accompanying diagram, subject to the repair facility's confirmation, are potential bonding areas.
 - Perform STRS welding in appropriate areas while the adhesive is uncured. DO NOT attempt to MIG weld through the adhesive.
 - CAUTION: The adhesive is combustible. As with any welding operation, keep the appropriate fire extinguisher within reach, and be alert to any smoke or flame that may be present.

Red = Suggested Welding Areas, subject to OEM recommendations

Blue = Potential Adhesive Bonding Areas, subject to OEM recommendations



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Directions for Use Cont.

16. Quarter panels, interior cavities, and any welded seams **MUST** be coated with 3M™ Cavity Wax Plus.
17. Clamp Time: Clamps may be removed after four hours if temperature remains at or above 73°F. Parts will need to remain clamped longer if the temperature is below 73°F and/or if there is any tension on the part.

Adhesive Cure Requirements:

- 3M™ Panel Bonding Adhesive achieves Full Cure in 24 hours with a constant temperature of 73°F (0.057" Steel). See: Rate of Strength Buildup at Various Temperatures in the chart above.
 - 3M recommends holding vehicles repaired with Panel Bonding Adhesive in a heated area for a minimum of 24 hours with a constant temperature of 73°F or higher before returning the vehicle to service.
 - If temperatures are colder than 73°F, cure time is slower. Removing the vehicle from a heated shop to a colder storage area immediately after the application of Panel Bonding Adhesive is **NOT RECOMMENDED**.
 - The cure time may be accelerated in warmer conditions or by applying even heat with a heat gun or heat lamps. Bake time in the spray booth can be counted towards achieving Full Cure but caution should be used. The repair facility and technician need to evaluate each specific application and repair process and determine what is appropriate in order to achieve Full Cure of the Panel Bonding Adhesive before returning the vehicle into service.
18. Further repairs to the replaced part(s) can proceed once the minimum clamp time/temperature requirement is met.
 19. CLEAN-UP: Unmixed/uncured material may be cleaned from most surfaces with an appropriate VOC compliant product.

3M also recommends the replacement of all originally installed anti-flutter, sound deadening, and corrosion protection materials* such as:

- 3M™ Urethane Seam Sealer, PN 08360, PN 08361 or PN 08364
- 3M™ MSP Seam Sealer, PN 08369, PN 08370, or 08370
- 3M™ Weld-Thru II Coating, PN 05917
- 3M™ NVH Dampening Material, PN 04274
- 3M™ Sound Deadening Pad, PN 08840
- 3M™ Cavity Wax Plus, PN 08852

*Depending on the specific application, additional 3M products may be required.

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Precautionary Information

IMPORTANT NOTE: There are of course many factors and variables that can affect an individual repair, so the technician and repair facility need to evaluate each specific application and repair process, including relevant vehicle, part and OEM guidelines, and determine what is appropriate for that repair. Before using this product, please reference Product Label and/or Safety Data Sheet for Health and Safety Information. Note: Laws controlling the acceptable amounts of Volatile Organic Compounds (VOCs) vary by state, and in some cases by locality. For surface preparation and clean-up activities, consult federal, state and local regulations regarding use of products containing VOCs in your area.

Technical Information

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Product Selection & Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product in accordance with all applicable instructions and with appropriate safety equipment, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy and Limitation of Liability

3M warrants to the purchaser that 3M™ Panel Bonding Adhesive PN 08115, 58115 & 38315 will perform to 3M's performance specifications as stated in 3M's corresponding product technical data sheets for the life of the vehicle, when the 3M product is applied stored and used in accordance with 3M's Directions For Use. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, PERFORMANCE, CUSTOM OR USAGE OF TRADE. If a 3M product does not conform to this warranty, purchaser's exclusive remedy and 3M's entire liability will be the reimbursement of the cost of the parts, materials and labor needed to reattach the panel(s) plus reimbursement of the cost of a comparable rental vehicle during the repair time period, within a reasonable time after written notification of the defect and return of the defective product to 3M, if requested by 3M.

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Limitation of Liability

Except for the limited remedy stated above, and except to the extent prohibited by applicable law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.



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