

3M™ Scotch-Weld™ Epoxy Adhesive EC-2792 B/A

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive EC-2792 B/A is a high performance, two-part epoxy adhesive offering outstanding shear and peel adhesion, and very high levels of durability.

Features

- High shear strength
- High peel strength
- 60 minute worklife
- Outstanding environmental performance
- Easy mixing
- Non sag

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.

Product		3M™ Scotch-Weld™ Epoxy Adhesive EC-2792 B/A
Viscosity (approx) @ 73°F (23°C)	Base Accelerator	150,000 - 275,000 cps 8,000 - 14,000 cps
Base Resin	Base Accelerator	Epoxy Amine
Color	Base Accelerator	White Amber
Net Weight Lbs./Gallon	Base Accelerator	9.3 - 9.7 8.8 - 9.2
Worklife, @ 73°F (23°C)	20 grams mixed	60 minutes



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Typical Cured Physical Properties

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Mixed Color	Off-White
Shore D Hardness (ASTM D 2240)	78 - 84
Thermal Conductivity	0.104
Dielectric Strength (ASTM D 149)	727 volts/mil

Typical Adhesive Performance Characteristics

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 were obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with the 3M™ Scotch-Weld™ Epoxy Adhesive EC-2792 B/A when applied to properly prepared substrates, cured, and tested according to the specifications indicated. This data was generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough manual mixing should afford comparable results.

Rate of Strength Build-Up

Aluminum, Overlap Shear (7 mil Bondline) (ASTM D 1002-72)

Bonds Tested at 73°F (23°C)

Scotch-Weld EC-2792 B/A Adhesive

Time in Oven	Cure Temperature		
	73°F (23°C)	120°F ¹ (49°C)	160°F ¹ (71°C)
15 min.	—	—	4860
30	—	10	5250
60	—	2800	5300
2 hr.	1	5050	5470
4	46	5400	5320
6	970	5570	5140
24	4500	—	5210

¹This represents the oven temperature to which the bonds were subjected for the prescribed time. The average bondline temperature during the cure time will be somewhat lower than the oven temperature.

Substrates and Testing

A. Overlap Shear (ASTM D 1002)

Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made using two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 inch wide samples after 24 hours. The thickness of the bondline was 0.005-0.008 in. All strengths were measured at 73°F (23°C) except where noted. The separation rate of the testing jaws was 0.1 in. per minute for metals.

B. Bell Peel (ASTM D 3167)

Bell peel strengths were measured on 1/2 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. The bonds are made with 0.064 in. bonded to 0.025 in. thick adherends.

C. Cure Cycle

With the exception of Rate of Strength Build-Up Tests, all bonds, were cured 7 days at 73°F (23°C) at 50% RH before testing or subjected to further conditioning or environmental aging.

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Typical Adhesive Performance Characteristics (continued)

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

Aluminum, Overlap Shear, at Temperature (PSI)

3M™ Scotch-Weld™ Epoxy Adhesive EC-2792 B/A	
-67°F (-55°C)	4900
73°F (23°C)	5600*
180°F (82°C) (15 minutes) ¹	1360
(30 minutes) ¹	1810
250°F (121°C) (15 minutes) ¹	420

*Based on the average of 6 lots of production release testing.

¹Represents time in test chamber oven before test.

Aluminum, Bell Peel (PIW), at Temperature (ASTM D 3167)

Scotch-Weld EC-2792 B/A Adhesive	
73°F (23°C)	60*

*Based on the average of 6 lots of production release testing.

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. However, the amount of surface preparation necessary depends on the required bond strength and the environmental aging resistance desired by user. The following cleaning methods are suggested for these common surfaces:

Aluminum (Chemical Etch)

Phosphoric acid anodize (3M Test Method C-2780), Chromic acid anodize with or without a chromate seal (3M Test Methods C-2801 or C-2782) are preferred for maximum joint durability in moist environments. Optimized FPL Etch has also demonstrated improved durability performance.

Optimized FPL Etch Process – 3M Test Method C-2803 or ASTM D 2651

1. Alkaline degrease – Oakite® Aluminum Cleaner 164, 9-11 oz./gallon of water at 190° ± 10°F for 10 to 20 minutes. Rinse immediately in large quantities of cold running water (3M Test Method C-2802).
2. Optimized FPL Etch Solution (1 liter):

Material	Amount
Sodium Dichromate	28 to 67.3 grams
Sulfuric Acid	287.9 to 310.0 grams
2024-T3 aluminum (dissolved)	1.5 grams/liter of mixed solution
Distilled Water	700 ml plus balance of liter (see below)

Note: Review and follow safety and precautionary information provided by chemical suppliers prior to preparation of this etch solution.

To prepare 1 liter of this solution, dissolve sodium dichromate in 700 ml of distilled water. Add sulfuric acid and mix well. Add additional distilled water to fill to 1 liter. Heat mixed solution to 150 to 160°F (66 to 71°C). Dissolve 1.5 grams of 2024 bare aluminum chips per liter of mixed solution. Gentle agitation will help aluminum dissolve in about 24 hours. To FPL etch panels, place them in the above solution at 150 to 160°F (66 to 71°C) for 12 to 15 minutes.

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Surface Preparation (continued)

3. Rinse immediately in large quantities of clear running tap water.
4. Dry – Air dry approximately 15 minutes followed by force dry for 10 minutes (minimum) at 140°F (60°C) maximum .
5. If primer is to be used, it should be applied within 4 hours after surface preparation. Both surface structure and chemistry play a significant role in determining the strength and permanence of bonded structures. It is therefore advisable to bond or prime freshly primed clean surfaces as soon as possible after surface preparation in order to avoid contamination and/or mechanical damage.
Please contact your 3M sales representative for primer recommendations.

Steel or Aluminum (Mechanical Abrasion):

1. Wipe free of dust with oil-free solvent such as acetone, isopropyl alcohol or a ketone type solvent such as Methyl Ethyl Ketone (MEK).*
2. Sandblast or abrade using clean fine grit abrasives (180 grit or finer).
3. Wipe again with solvent to remove loose particles.
4. Thoroughly dry before application of adhesive.

Plastics/Rubber

1. Wipe with isopropyl alcohol.*
2. Abrade surfaces to be bonded with 180 grit sandpaper.
3. Wipe with a clean, lint-free towel with isopropyl alcohol or a ketone type solvent* such as Methyl Ethyl Ketone (MEK).*
4. Thoroughly dry before application of adhesive.

*When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer's precautions and directions for use. Use solvents in accordance with local regulations.

Product Application

3M™ Scotch-Weld™ Epoxy Adhesive EC-2792 B/A is supplied in dual syringe plastic duo-pak cartridges as part of the 3M™ EPX™ Applicator System. The duo-pak cartridges are supplied in 37 ml and 200 ml configurations. To use the 37 ml cartridge simply insert the duo-pak cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. Next, remove the duo-pak cartridge cap and expel a small amount of adhesive to be sure both sides of the duo-pak cartridge are flowing evenly and freely. If simultaneous mixing of Part A and Part B is desired, attach the EPX mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive.

With the 200 ml cartridge, the nozzle must be attached before dispensing any material to prevent unmixed adhesive from getting into the applicator cartridge holder. A small quantity of material should be discarded until uniform color, consistency of product and even flow is evident.

When mixing Part A and Part B manually, the components must be mixed in the ratio indicated in the typical uncured properties section. Complete mixing of the two components is required to obtain optimum properties.

Shelf Life and Storage Conditions

Customer shelf life is 15 months from the date of shipment when stored at 60-80°F (15-27°C) in original unopened container.

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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, please visit www.3M.com/msds or call 1-800-364-3577 or (651) 737-6501.

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 or one of the following branches:

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Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product 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. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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