

# 3M™ Scotch-Weld™ Epoxy Adhesive EC-2815 B/A FR

## Product Description

3M™ Scotch-Weld™ Epoxy Adhesive EC-2815 B/A FR is a two-component epoxy adhesive with cure at room temperature or with additional heat to form a tough, impact-resistant bond. It has excellent adhesion to many metal, composite, and plastic substrates. The cured material meets the 14 CFR 25.853 (a) before and subsequent to environmental conditioning.

Scotch-Weld EC-2815 B/A FR Adhesive is a non-sag, white adhesive that is designed for structural bonding of metal and composite structures and insert bonding.

## Key Features

- 100% solids
- White adhesive
- Meets the flammability requirements of 14 CFR 25.853 (a)
- Easy mixing
- Thixotropic properties for ease of application
- Excellent sag resistance
- High shear strength
- Outstanding environmental resistance
- 60 minute worklife
- Does not contain any Reach SVHCs and is RoHS compliant



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## General Applications

3M™ Scotch-Weld™ Epoxy Adhesive EC-2815 B/A FR is designed for honeycomb sandwich constructions typically found in aircraft interiors such as galley structures, luggage bins, partition walls, lavatory structures, crew rest compartments, seating structures, ceiling panels, closets, stowage compartments, sidewall panels, cargo bay panels, bar units, coatrooms and passenger doors.

## Typical Physical Properties

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

Scotch-Weld EC-2815 B/A FR Adhesive		
	Part B	Part A
<b>Chemistry</b>	Epoxy	Amine
<b>Color</b>	White	Gray
<b>Typical Uncured Density</b>	1.4 ± 0.1 g/cc (11.7 ± 0.8 lb/gal)	1.2 ± 0.1 g/cc (10.0 ± 0.8 lb/gal)
<b>Mix Ratio by Weight</b>	100	40
<b>Mix Ratio by Volume</b>	100	50
<b>Solids</b>	100%	100%
<b>Cured Density</b>	1.3 ± 0.1 g/cc (10.8 ± 0.8 lb/gal)	
<b>Work Life at 72 ± 3°F</b>	over 60 minutes	
<b>Full Cure</b>	24 h @ 75°F (24°C) 1 h @ 180°F (82°C)	
<b>Consistency</b>	thixotropic paste	
<b>Application by Method</b>	cartridge dispensable / manual mix	
<b>Volatile Loss on Cure</b>	less than 0.1%	

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## Typical Product Performance

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

### Aluminum to Aluminum Bonds

#### A. Overlap Shear

The following data shows typical values obtained with 3M™ Scotch-Weld™ Epoxy Adhesive EC-2815 B/A FR in aluminum overlap shear bonds. All specimens were 2024-T3 bare aluminum panels which had been FPL etched and phosphoric acid anodized. If applicable, the panels were primed with 3M™ Scotch-Weld™ Structural Adhesive Primer EW-5000. Bonds were cured for 16 hours at 70°F - 80°F (21°C - 27°C) under 2 psi (13.8 kPa) pressure and then post cured for 1 hour at 180°F (82°C) with no additional pressure. Sample preparation and testing was conducted per ASTM D1002-10.

Primer	Test Temperature		Result (psi)	Result (MPa)
3M™ Scotch-Weld™ Structural Adhesive Primer EW-5000	-45°F	-43°C	3700	25.5
	75°F	24°C	5000	34.5
	160°F	71°C	3400	23.4
	180°F	82°C	1900	13.1
No Primer	75°F	24°C	5000	34.5
	160°F	71°C	3400	23.4

#### B. Conditioned Overlap Shear

The following data shows typical values obtained with Scotch-Weld EC-2815 B/A FR Adhesive in aluminum overlap shear bonds. All specimens were 2024-T3 bare aluminum panels which had been FPL etched and phosphoric acid anodized.

If applicable, the panels were primed with Scotch-Weld EW-5000 Primer. Bonds were cured for 16 hours at 70°F - 80°F (21°C - 27°C) under 2 psi (13.8 kPa) pressure and then post cured for 1 hour at 180°F (82°C) with no additional pressure. Sample preparation and testing was conducted per ASTM D1002-10. Bonds were tested after 14 days exposure at 160°F (71°C) and 95% relative humidity.

Primer	Exposure Conditions	Test Temperature		Result (psi)	Result (MPa)
3M™ Scotch-Weld™ Structural Adhesive Primer EW-5000	14 days at 160°F (71°C) and 95% relative humidity	75°F	24°C	4650	32.1
		160°F	71°C	3600	24.8

#### C. Floating Roller Peel

The following data shows typical values obtained with Scotch-Weld EC-2815 B/A FR Adhesive in floating roller peel bonds. All specimens 2024-T3 bare aluminum panels which had been FPL etched and phosphoric acid anodized. If applicable, the panels were primed with Scotch-Weld EW-5000 Primer. Bonds were cured for 16 hours at 70°F - 80°F (21°C - 27°C) under 2 psi (13.8 kPa) pressure and then post cured for 1 hour at 180°F (82°C) with no additional pressure. Sample preparation and testing was conducted per ASTM D3167-10.

Primer	Test Temperature		Result (piw)	Result (N/25mm)
3M™ Scotch-Weld™ Structural Adhesive Primer EW-5000	75°F	24°C	33	147

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## Typical 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.

### D. Tensile and Elongation

The following data shows typical values obtained with 3M™ Scotch-Weld™ Epoxy Adhesive EC-2815 B/A FR for tensile and elongation testing. Specimens were cured for 16 hours at 70°F - 80°F (21°C - 27°C) and then post cured for 1 hour at 180°F (82°C). Sample preparation and testing was conducted per ASTM D638-10, Type I.

Modulus		Tensile Strength		Elongation at Break (%)
(ksi)	(MPa)	(psi)	(MPa)	
481	3316	8200	56.5	3.4

### E. Cured Compression

The compression testing was completed per ASTM D695-10. Specimens were machined to 0.50" ± 0.05" x 0.50" ± 0.05" x 1.00" ± 0.05" (13 mm ± 1.3 x 13 mm ± 1.3 x 25 mm ± 1.3) (width x length x height) from a larger homogeneous block of cured adhesive. Specimen Cure: 16 hours at 75°F (24°C), 1 hour at 180°F (82°C). Specimen Test Speed: 0.5 inch/min. (13 mm/min.).

Peak Load		Peak Stress		Modulus	
(lbf)	(N)	(psi)	(MPa)	(ksi)	(MPa)
2240	9964	9550	65.8	248	1710

### F. Insert Pull/Pluck Test

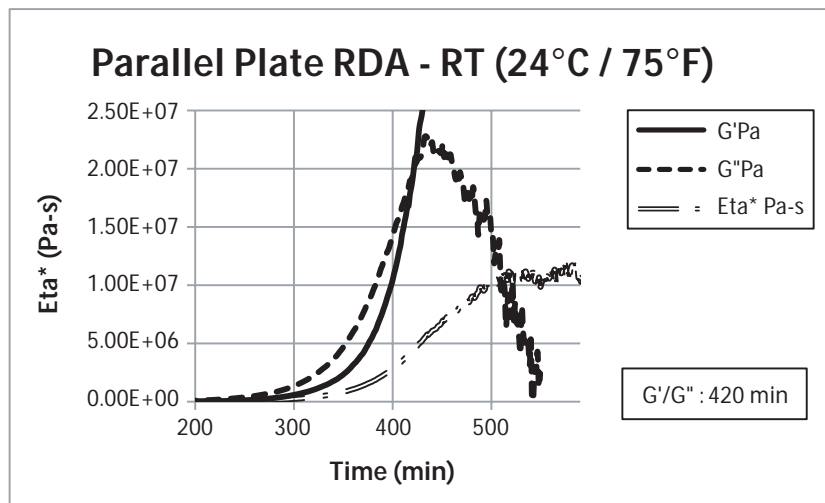
The compression testing was completed per MIL-HDBK-17-1E. Specimen are nominally 0.5" x 3" x 3" (13 mm x 76 mm x 76 mm) honeycomb panel. A 0.5" (13 mm) hole is bored into the panel on center in to which an insert fastener is placed. Adhesive is injected into the fastener and fills the space between the fastener and the honeycomb cells exposed in the boring process. Specimen Cure: 48 hours at 75 °F (24°C), 1 hour at 120°F (49°C). The sample is tested to determine the peak force required to dislodge the insert from the panel.

Force	
(lbs)	(N)
360	1601

### G. Parallel Plate RDA

Test Equipment: Rheometric Dynamic Analyzer (RDA)

1 Hz frequency, isothermal, 25 mm parallel plates, 1% initial strain, strain adjustment 100%.



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## Typical 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.

### H. Flammability and OSU Heat Release

Flammability (60 second vertical, stand alone)

Specimen: 12" x 3" x 0.25" / 305 mm x 76 mm x 6.4 mm adhesive plaque

Flammability (12 second vertical, stand alone)

Specimen: 12" x 3" x 0.25" / 305 mm x 76 mm x 6.4 mm adhesive plaque

Flammability (60 second vertical, tested in construction)

Specimen: 10" x 8" x 0.5" / 254 mm x 203 mm x 13 mm composite/honeycomb panel with 10" x 0.5" x 0.5" / 254 mm x 13 mm x 13 mm cured adhesive

Conditioned Flammability (60 second vertical, stand alone)

Specimen: 12" x 3" x 0.25" / 305 mm x 76 mm x 6.4 mm adhesive plaque, 14 days at 160°F (71°C) and 95% relative humidity

Property	14 CFR 25.853 Requirements	Results			
		Flammability (60 second vertical, stand alone)	Flammability (12 second vertical, stand alone)	Flammability (60 second vertical, tested in construction)	Conditioned Flammability (60 second vertical, stand alone)
Flame Extinguishing Time (second)	≤ 15 s	≤ 2	≤ 1	≤ 2	≤ 1
Burn Length Time (inch)	≤ 6 inch / 152 mm	≤ 4 inch / 102 mm	≤ 2 inch / 51 mm	≤ 1 inch / 25 mm	≤ 1 inch / 25 mm
Drip Flame Time - if present (Y/N, second)	≤ 3 s	N, 0	N, 0	N, 0	N, 0

### Ohio State University (OSU) Heat Release

Specimen: 6" x 6" x 0.5" / 152 mm x 152 mm x 13 mm composite/honeycomb panel with 3" x 0.5" x 0.5" / 76 mm x 13 mm x 13 mm cured adhesive

Property	14 CFR 25.853 Requirements	Results
2 Min Total	65	53
Peak HR	65	61
Peak Time (s)	N/A	245
Melting (Y/N)	N/A	N
Sagging (Y/N)	N/A	N
Dripping (Y/N)	N/A	N

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## Typical Product Application

### **Aluminum 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. Optimized FPL performed per ASTM D2651-01 and phosphoric acid anodization performed per ASTM D3933-98.

### **Primer Application:**

Although 3M™ Scotch-Weld™ Epoxy Adhesive EC-2815 B/A FR gives excellent performance on unprimed surfaces, the use of 3M™ Scotch-Weld™ Structural Adhesive Primer EW-5000 corrosion inhibiting primer is suggested for maximum long-term durability and environmental resistance. See the primer data sheets for complete application instructions. These primers must be cured for one hour at 250°F prior to bonding. Review and follow MSDS prior to use.

### **Fiber Reinforced Epoxy Laminate Surface and Plastic Surface Preparation:**

Abrade surfaces to be bonded with 180 grit sandpaper or a Scotch-Brite® General Purpose Hand Pad 7447 (do not cut through resin into reinforcing fibers). Wipe with clean rag or paper towel soaked with Ketone type solvent such as methyl ethyl ketone (MEK)\*. Thoroughly dry the surface before application of the adhesive. A cleaned, dry, contamination free surface is essential for maximum performance. For repeatable results the epoxy adhesive and the surfaces should have a temperature between 68-77°F (20-25°C).

### **Mixing:**

Scotch-Weld EC-2815 B/A FR Adhesive can be mixed manually or automatically (using static mixer, minimum 12 elements). For repeatable performance keep mixing ratio in a range of  $\pm 5\%$ .

Dual Cartridge or Bamer Cartridge application provides maximum accuracy and ease of handling. Scrap the first 2 cc or until you have a uniform color when using a new static mixer. From the start of mixing the work life refer to "Handleability" on "Product Description & Properties" table above. For ease of extrudability the product should be at the temperature of 75°F (24°C) but not greater than 125°F (52°C).

### **Adhesive Cure Conditions:**

A minimum cure time of 24 hours at room temperature or 12 hours at room temperature followed with a 1 hour at 180°F post cure cycle to obtain the optimum mechanical properties of the product. Heat application accelerates the curing cycle.

### **Clean up of Epoxy Adhesive:**

Uncured epoxy adhesive can be wiped with solvent e.g. M.E.K\*. Cured material can be cleanly removed mechanically.

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

## Storage Stability

Storage Stability - Store Scotch-Weld EC-2815 B/A FR Adhesive between 44°F and 77°F (7°C and 25°C) in original unopened container. Rotate stock on "first in - first out" basis.

## Shelf Life

Standard shelf life for Scotch-Weld EC-2815 B/A FR Adhesive is 12 months from date of shipment when stored between 44°F and 77°F (7°C and 25°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](http://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:

<b>Australia</b> 61-2-949-89333 tel	<b>Austria</b> 01-86686-298 tel	<b>Brazil</b> 55 19 3838-7876 tel	<b>Canada</b> 800-410-6880 ext. 6018 tel
<b>China</b> 86-21-62753535 tel	<b>Denmark</b> 45-43-480100 tel	<b>France</b> 0810-331-300 tel	<b>Germany</b> 02131-14-2344 tel
<b>Hong Kong</b> 852-2806-6111 tel	<b>India</b> 1-800-425-3030 tel (inside country only)	<b>Italy</b> 02-7035-2177 tel	<b>Japan</b> 03-3709-8165 tel
<b>Korea</b> 02-3771-4114 tel	<b>Malaysia</b> 60 3 7806 2888 tel	<b>New Zealand</b> 64-9-477-4040 tel	<b>Netherlands</b> 31-71-5-450-272 tel
<b>Phillippines</b> 63-2-588-9100 tel	<b>Singapore</b> 65-6450-8888 tel	<b>South Africa</b> 11-922-9111 tel	<b>Spain</b> 34-91-321-6000 tel
<b>Switzerland</b> 01-724-9114 tel	<b>Thailand</b> 66-2260-8577 tel	<b>United Kingdom</b> (0) 161-237-6174 tel	

## 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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