



# 3M™ Scotch-Weld™ Epoxy Adhesive

## EC-3542 B/A FR

### Technical Data Sheet



#### Product Description

3M™ Scotch-Weld™ Epoxy Adhesive EC-3542 B/A FR is a two-component epoxy adhesive with cure at room temperature or with additional heat to form a tough bond. It has excellent adhesion to many metal, composite, and plastic substrates. The cured material meets the flammability requirements of 14 CFR 25.853 (a) before and after environmental conditioning.

Scotch-Weld EC-3542 B/A FR Adhesive is a non-sag, light gray adhesive that is designed for bonding of metal and composite structures and insert bonding.

#### Key Features

- 100% solids
- Light gray colored adhesive
- Meets the flammability requirements of 14 CFR 25.853 (a)
- Easy mixing
- Thixotropic properties for ease of application
- Excellent sag resistance
- Medium shear strength
- Outstanding environmental resistance
- 30 minute work life
- Typical Cured Density of 0.71 g/cc (5.9 lbs/gal)

#### General Applications

3M™ Scotch-Weld™ Epoxy Adhesive EC-3542 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.

	Part B	Part A
Chemistry	Epoxy	Amine
Color	White	Gray
Typical Uncured Density	0.67 ± 0.04 g/cc (5.6 ± 0.3 lbs/gal)	0.68 ± 0.05 g/cc (5.7 ± 0.4 lbs/gal)
Mix Ratio by Weight	100	52
Mix Ratio by Volume	100	50
Solids	100%	100%
Cured Density	0.71 ± 0.03 g/cc (5.9 ± 0.3 lbs/gal)	
Work Life at 72 ± 3°F	Approximately 30 Minutes	
Full Cure	3 Hours @ 75°F (24°C) 5 Hours @ 125°F (52°C) 7 Days @ 75°F (24°C)	
Consistency	Thixotropic Paste	
Application by Method	Cartridge Dispensable / Bulk Dispensable	
Volatile Loss on Cure	Less than 0.1%	

### 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

##### Overlap Shear

The following data shows typical values obtained with 3M™ Scotch-Weld™ Epoxy Adhesive EC-3542 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. Bonds were cured as described in the table under 2 psi (13.8 kPa) with no additional pressure. Sample preparation and testing was conducted per ASTM D1002-10.

No Primer	Test Temperature	Result (psi)	Result (MPa)
3 Hours @ RT & 5 Hours @ 125°F	75°F (24°C)	2036	14
7 Days at RT	75°F (24°C)	1927	13.3

##### 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.).

Test Temperature	Peak Stress		Modulus	
	(psi)	(MPa)	(ksi)	(MPa)
-65°F (24°C)	13812	95	---	---
75 °F (24°C)	7200	50	207	1427
180°F (24°C)	1680	11.5	---	---

### Insert Pull/Pluck Test

The Tensile testing was completed per SAE R-422. 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: 3 hours at 75 °F (24°C), 5 hours at 125°F (52°C). The sample is tested to determine the peak force required to dislodge the insert from the panel.

Force	
(lbs)	(N)
403	1792

### Insert Torque Test

The Torque testing was completed per SAE R-422. 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.

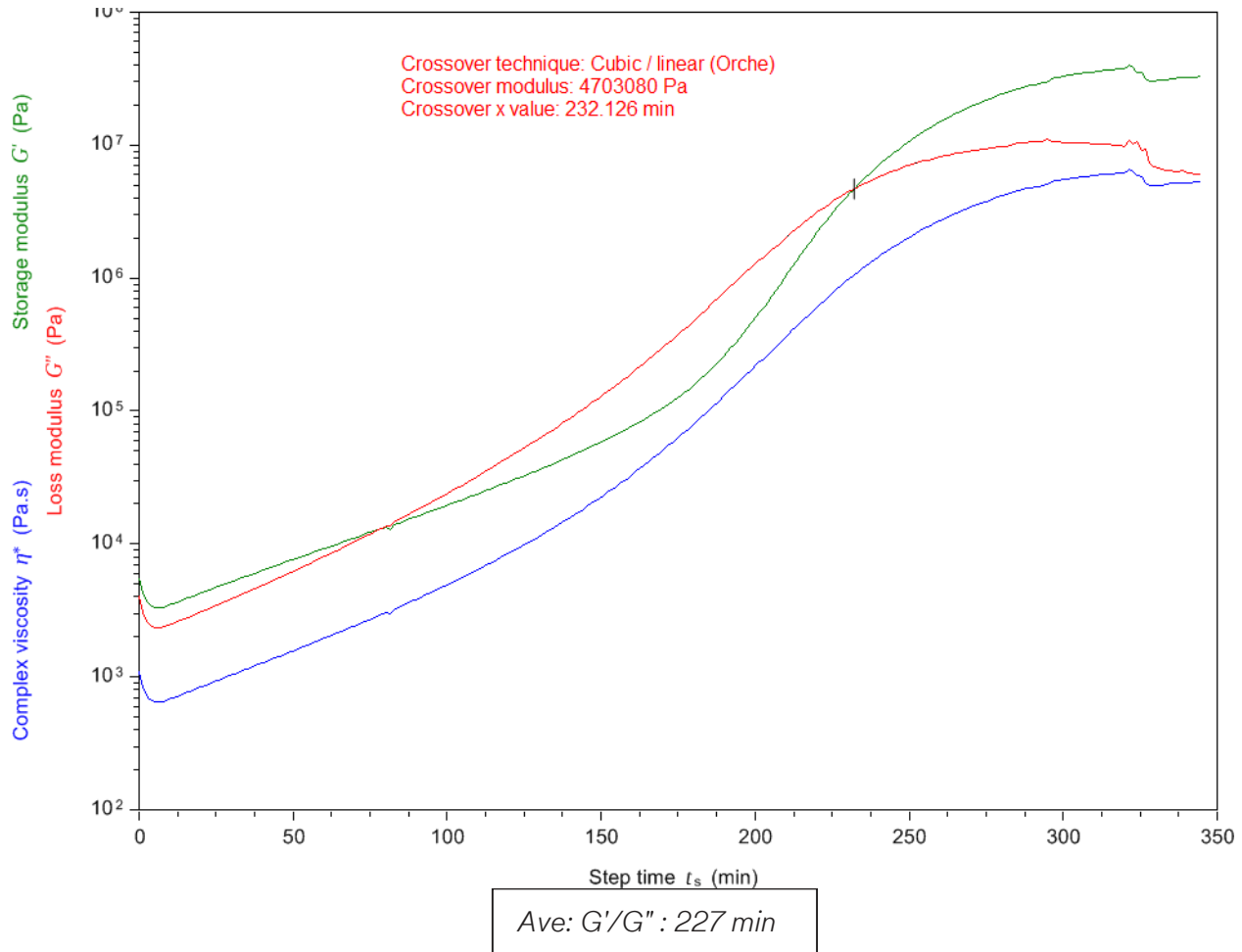
Specimen Cure: 3 hours at 75 °F (24°C), 5 hours at 125°F (52°C). The sample is tested to determine the peak force required to dislodge the insert from the panel.

Force	
(In-lb)	(N-m)
109	12.3

### Parallel Plate RDA

Test Equipment: Rheometric Dynamic Analyzer (RDA)

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



### Typical Product Performance

#### Flammability Preparation

Property	14 CFR 25.853 (a) Passing Requirements	Flammability (60 second vertical, standalone)	Flammability (12 second vertical, standalone)
Flame Extinguishing Time (Second)	≤ 15 s	≤ 2	≤ 1
Burn Length Time (Inch)	≤ 6 inch / 152 mm	≤ 3 inch / 102 mm	≤ 2 inch / 51 mm
Drip Flame Time – if present (Y/N, Second)	≤ 3 s	N, 0	N, 0

#### Flammability (60 second vertical, standalone)

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

#### Flammability (12 second vertical, standalone)

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

## 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-3542 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 SDS 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-3542 B/A FR Adhesive can be mixed automatically (using static mixer, minimum 18 elements). For repeatable performance keep mixing ratio in a range of  $\pm 5\%$ . Side by side cartridge application provides maximum accuracy and ease of handling. Scrap the first 10 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. MEK \*. 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.

### Shelf Life

Standard shelf life for Scotch-Weld EC-3542 B/A FR Adhesive is 12 months from date of shipment when stored between 40°F and 80°F (4°C and 27°C) in original unopened container.

### Precautionary Information

Refer to Product Label and Safety Data Sheet (SDS) 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.

## Authorization to Use

Ensure products meet all applicable specifications, standards, and maintenance manual requirements for the platform being worked on and validate all aircraft approvals against current technical documentation.

## 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 are manufactured under a 3M Quality Management System registered to the AS9100 standard*

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