

# 3M™ Scotch-Weld™ Structural Adhesive

## EC-9356 B/A FST

### Technical Data Sheet

#### Introduction

3M™ Scotch-Weld™ EC-9356 B/A FST is a two-part, room temperature curing epoxy paste adhesive. It is designed for bonding typical aircraft interior materials, including metals and honeycomb panels. Typical operations are honeycomb panel bonding, ditch and pot, cut and fold, mortise and tenon joints, insert bonding, or metal to honeycomb bonding. Designed for interior applications and formulated without halogens and antimony, EC-9356 B/A FST meets the latest flammability, smoke density, and toxic gas emission requirements as listed in FAR/JAR25.853 and ABD0031.

Key advantages are:

- Thixotropic, non-sag paste adhesive for ease of use.
- Fast curing composition enabling increased manufacturing productivity.
- Designed to meet the latest FST requirements according to FAR/JAR/CS 25.853(a) App F, part I(a)(1)(ii) and ABD0031.
- Qualified to aircraft interior specifications.
- Low exothermic reaction.

#### Product Characteristics

NOTE: All technical data and information in this data sheet should be considered representative or typical only and should not be used for specification purposes.

General Properties	Part B	Part A
Colour	Pink (Light brown to pink)	White (Off-White to Beige)
Base	Epoxy	Modified Amine
Density	1.4 g/cm <sup>3</sup> [8,3 lbs/gal]	1.4 g/cm <sup>3</sup> [8,3 lbs/gal]
Viscosity	250 Pas	70 Pas
Mix Ratio by Volume	100	50
Consistency	Thixotropic, non-sag paste	
Colour (mixed)	Light Mauve	
Work life <sup>(a)(b)</sup>	20 Minutes at 23 ± 2 °C	
Handling Strength <sup>(c)</sup>	120 minutes at 23 ± 2 °C	
Full Cure cycle	2 days at 23 °C	

a) Time frame from mixing of both components until fixation.

b) Typical work life when using a static mixer. NOTE: Work life varies by mixing quantity and temperatures. Do not mix more than 50g in concentrated shape.

c) Time to reach ~ 2 MPa overlap shear strength.

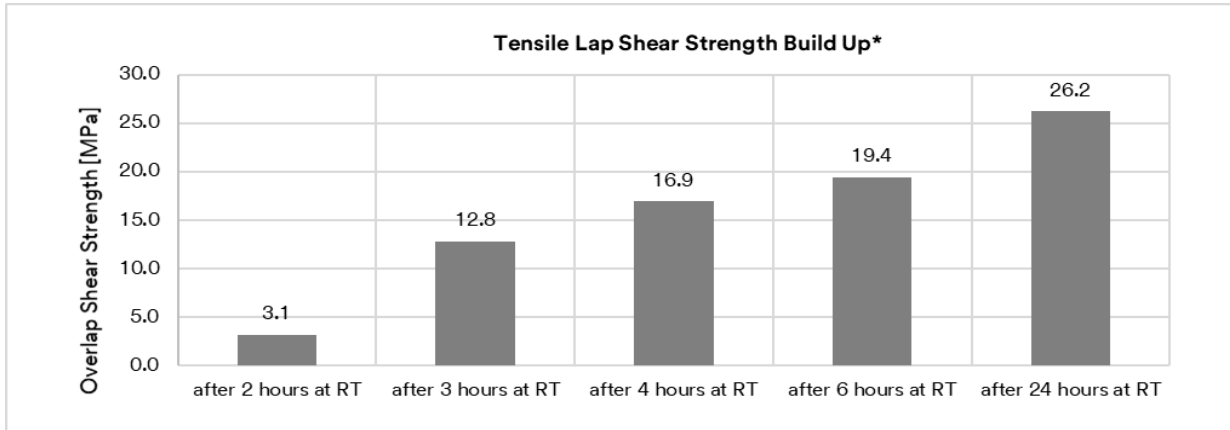
#### Product Performance

The following product performance data was obtained from samples cured for 7 days at room temperature (23 °C +/- 2 °C), unless otherwise stated. The surface preparation of the aluminium substrates is described in the "Instructions for use" section on page 3.

Mechanical properties	Test temperature	Result	Test method
Overlap shear strength (a) (b)	-55 °C (- 67 °F)	22 MPa (3100 PSI)	EN 2243-1
	-15 °C (5 °F)	26 MPa (3700 PSI)	EN 2243-1
	23 °C (75 °F)	25 MPa (3600 PSI)	EN 2243-1
	55 °C (130 °F)	12 MPa (1700 PSI)	EN 2243-1
	85 °C (185 °F)	6 MPa (850 PSI)	EN 2243-1
Overlap shear strength (a) (b) 2h @ 65 °C curing cycle	23 °C (75 °F)	25 MPa (3600 PSI)	EN 2243-1
Floating roller peel strength (a) (b)	23 °C (75 °F)	105 N / 25 mm (23 PIW)	EN 2243-2

(a) Test substrates: clad aluminium 2024 T3

(b) Surface preparation: PSA – see “Instructions for use” on page 3.



\*Tested according to ISO 4587

## Ageing properties

Overlap shear strength was measured after exposure to different media and environments to determine the ageing resistance of 3M™ Scotch-Weld™ Structural Adhesive EC-9356 B/A FST. The curing cycle for all samples was 7 days at room temperature (23 °C +/- 2 °C).

Mechanical properties	Exposure time	Medium and temperature	Result
Overlap shear strength acc. EN 2243-1, after ageing, measured at 23 ± 2 °C	1000 hours	70 °C / 85 % relative humidity	19 MPa (2700 PSI)
	1000 hours	Dry heat 105°C	28 MPa (4000 PSI)
	168 hours	Demineralized Water	26 MPa (3700 PSI)
	24 hours	Coca Cola	26 MPa (3700 PSI)
	1 hour	MEK	24 MPa (3500 PSI)

## Flammability, Smoke Density and Toxic Gas Emission

FST properties have been measured in a standalone mode. Pure adhesive has been cured and tested in the dimensions specified.

Fire properties		Requirements	Results
Flammability - 12s vertical Bunsen burner FAR/JAR/CS 25.853(a), App. F Part. I §(a)(1)(ii) Specimen size: 6,35 x 76 x 305 mm <sup>3</sup> [ 0,25" x 3" x 12" ]	Flame extinguishing time	≤ 15 s	0 s
	Burn length	≤ 203 mm (8 inch)	21 mm (0,8 inch)
	Drip flame time	≤ 3 s	0 s
Flammability - 60 s vertical Bunsen burner FAR/JAR/CS 25.853(a), App. F Part. I §(a)(1)(i) Specimen size: 6,35 x 76 x 305 mm <sup>3</sup> [ 0,25" x 3" x 12" ]	Flame extinguishing time	≤ 15 s	0 s
	Burn length	≤ 152 mm (6 inch)	68 mm (2,7 inch)
	Drip flame time	≤ 3 s	0 s
Smoke density - flaming mode FAR/JAR/CS 25.853, App. F part V & AITM 2.0007 Specimen size: 6,35 x 76 x 305 mm <sup>3</sup> [ 0,25" x 3" x 3" ]	DS <sub>max</sub> <sup>(a)</sup> in 4 min	≤ 200	100
Toxic gas emission Airbus ABD0031 & AITM 3.0005 Specimen size: 6,35 x 76 x 305 mm <sup>3</sup> [ 0,25" x 3" x 3" ]	HCN	≤ 150 ppm	53 ppm
	HF	≤ 100 ppm	0 ppm
	HCl	≤ 150 ppm	0 ppm
	SO <sub>2</sub> + H <sub>2</sub> S	≤ 100 ppm	5 ppm
	NO <sub>x</sub>	≤ 100 ppm	24 ppm

<sup>(a)</sup> DS<sub>max</sub>: maximum optical smoke density

## Handling

Refer to product label and Material Safety Data Sheet (MSDS) for health and safety information before using this product. For MSDS visit our website [www.3m.com/sds](http://www.3m.com/sds)

## Surface Preparation

A thoroughly cleaned, dry, grease-free surface is essential for maximum performance. Cleaning methods which will produce a continuous water film on a metal surface are generally satisfactory. In addition, the surfaces should be abraded mechanically, e.g. with 3M Scotch-Brite™ 7447. However, the necessary amount of surface preparation depends on the user's required bond strength and environmental ageing resistance.

NOTE: The results given in this data sheet were determined using a phosphoric sulfuric anodizing (PSA) process: CAUTION: *Use adequate respiratory, eye and skin protection when using chemical etching solutions.*

## Application

Mix the two parts B (Base) and A (Accelerator) manually or by static mixer in the proportions specified on the product. NOTE: Mix ratio deviations above  $\pm 5\%$  may have a significant influence on material performance. Mix manually approximately 15 seconds after a uniform colour is obtained.

When using a cartridge, start pressing out a small amount of material, until a regular flow of both parts is obtained. Then mount static mixer. NOTE: The work life differs with pot size and temperature. Larger quantities and higher temperatures lead to faster reaction times. CAUTION: Heat is generated during cure. Do not mix more than 50g in concentrated shape. For maximum bond strength apply the product evenly to both surfaces to be joined.

Optimum processing temperatures for adhesive and substrate are between 20 – 25 °C. The adhesive can be applied manually, e.g. by a spatula, or semi- to full automatic via static mixer. Maximum strength is obtained with 0.10 – 0.25 mm bond line thickness. For bond line thickness control 1% wt of glass beads 90 – 150 µm have been added to the formulation.

## Cleaning

Excess uncured adhesive can be cleaned with ketone type solvents. After cure, the adhesive can be removed mechanically only. NOTE: When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and instructions for use.

## Curing

Join and fix the substrates coated with adhesive and cure the material according to cure cycles previously mentioned. Avoid moving of parts until handling strength is reached. Contact pressure is necessary. The following times and temperatures will result in a full cure:

- 2 days at  $23 \pm 2$  °C
- 1 hours at  $65 \pm 2$  °C

## Storage

Store the product at room temperature. Shelf life is minimum 6 months from date of shipment in the original unopened containers. The specific expiry date is mentioned on the product label.

## Available packaging sizes and Dispensing Equipment

This product is available in cartridges. 50ml cartridges are best to use with 3M™ Scotch-Weld™ EPX Manual Dispenser II and the 3M™ Scotch-Weld™ EPX Mixing Nozzle Square Green 2:1.

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