

3M™ Scotch-Weld™ Epoxy Adhesive EC-9370 B/A FST

Technical Data Sheet

Introduction

3M™ Scotch-Weld™ EC-9370 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 where high strength and low density are required. Typical applications include honeycomb panel bonding (ditch and pot, cut and fold, mortise and tenon joints), insert potting, and honeycomb core reinforcement.

Designed for light weighting in aircraft interior applications, EC-9370 B/A FST has met flammability, smoke density, and toxic gas emission requirements as listed in 14 CFR / CS 25.853 (a) and (d) and ABD0031.

Key advantages are:

- Lightweight epoxy adhesive with cured density below 0.7 g/cc
- Thixotropic, non-sag paste adhesive
- Designed to meet the FR/FST requirements according 14 CFR /CS 25.853 (a), Appendix F, Part I(a)(1)(ii), 14 CFR / CS 25.853 (d), Appendix F, Part V, and ABD0031, Section 7.4 (AITM 3.0005).

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	Light Mauve	Off-White/beige
Base	Epoxy	Modified Amine
Mix Ratio by Volume	100	50
Density (mixed)	≤ 0,7 g/cc	
Consistency	Thixotropic, non-sag paste	
Colour (mixed)	Off-white / pale light mauve	
Work life ^{(a) (b)}	20-30 minutes at 23 ± 2 °C	
Handling Strength ^(c)	4 hrs at RT	
Full Cure cycle	3 days at RT or 5 hours at 52 °C	

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

b) Typical work life using 75 g mix (50 g part A and 25 g part B). NOTE: Work life varies by mixing quantity and temperatures.

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

Product Performance

The surface preparation of the aluminium substrates is described in the “Instructions for use” section on page 3.

A technical report with average performance data is available upon request.

Mechanical properties	Test temperature	Result	Test method
Overlap shear strength ^(a) 3 days at RT curing cycle	23 °C (75 °F)	> 10 MPa	EN 2243-1
Compressive Strength 5h @ 52 °C curing cycle	23 °C (75 °F)	> 35 MPa	ISO 604
Compressive Strength 3 days at RT curing cycle	23 °C (75 °F)	> 35 MPa	ISO 604
Compression Modulus 5h @ 52 °C curing cycle	23 °C (75 °F)	> 1500 MPa	ISO 604
Compression Modulus 3 days at RT curing cycle	23 °C (75 °F)	> 1500 MPa	ISO 604

a) Test substrates: clad aluminium 2024 T3

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.

A technical report with average performance data is available upon request.

Fire properties		Requirements	Results
Flammability – 12 seconds vertical ^(a)	Flame extinguishing time	≤ 15 sec	PASSED
	Burn length	≤ 203 mm (8 inch)	
	Drip flame time	≤ 5 sec	
Smoke density - flaming mode ^(a)	DS _{max} ^(b) in 4 min	≤ 200	
Toxic gas emission ^(a)	HCN	≤ 150 ppm	
	HF	≤ 100 ppm	
	HCl	≤ 150 ppm	
	SO ₂	≤ 100 ppm	
	NO _x	≤ 100 ppm	

(a) Tested in accordance with 14 CFR / CS 25.853 (a), Appendix F, Part I (a)(1)(ii) 12 sec vertical burn, 14 CFR / CS 25.853 (d), Appendix F, Part V [per ASTM F814-83] Smoke Density, and Airbus ABD0031, Section 7.4 (ref. AITM 3.0005) Smoke Toxicity in a stand-alone mode. Pure material has been cured and tested in the dimension specified – specimen size: 6,35 x 76 x 305 mm [0,25" x 3" x 12"]. Installation approval is the responsibility of the design approval holder or the aircraft owner/operator.

(b) DS_{max} refers to maximum optical smoke density

Handling

Refer to product label and Safety Data Sheet (SDS) for health and safety information before using this product. For SDS visit our website 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 Scotch-Brite™ Hand Pad 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 (Hardener) thoroughly manually or by using an appropriate mixing equipment 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 color 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 the static mixer. Purge a minimum 2,5gr of mixed material before applying the product. Optimum processing temperatures for adhesive and substrate are between 20 and 25 °C. For maximum bond strength apply the product evenly to both surfaces to be joined. NOTE: The work life differs with pot size and temperature. Larger quantities and higher temperatures lead to faster reaction times. Lower temperatures will reduce the reaction speed.

CAUTION: Heat is generated during cure, especially if large quantities of the product are mixed.

The adhesive can be applied manually, e. g. by a spatula, or semi- to fully 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.

NOTE: Minor phase separation of the material may be observed. This is naturally occurring phenomenon for low density epoxy materials and does not impact mechanical performance. Please follow the mixing and application guidelines above to ensure optimum performance.

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:

- 3 days at 23 ± 2 °C
- 5 hours at 52 ± 2 °C

Storage

Store the product at room temperature. Shelf life is 12 months from date of manufacturing 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. 50 ml cartridges are best to use with 3M™ Scotch-Weld™ EPX Manual Dispenser III and the 3M™ Scotch-Weld™ EPX Mixing Nozzle Square Green 2:1.

For 200 ml, EPX Gold square static mix nozzles (08193) for the 2:1-System are recommended.

Bulk option available on request.

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.

These products are manufactured under a 3M Quality Management System registered to the AS9100 standard.

Technical Information: The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.

Product Selection and 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 and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer: Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability: Except for the limited remedy stated above, and except to the extent prohibited by 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.



Automotive and Aerospace Solutions Division
www.3m.com/aerospace

Issue date: 1/08/2024
3M and Scotch-Weld are
trademarks of 3M Company.
© 3M 2024. All rights reserved.