

Technical data sheet



Product: EC-9300

Manufacturer: 3M DEUTSCHLAND GMBH

Product group: KLEBSTOFF

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3M SCOTCH-WELD EC-9300 B/A FST

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Tewipack Uhl GmbH
Industriestraße 15
D-75382 Althengstett

Telephone:
+49(0)7051/9297-0
Fax:
+49(0)7051/9297-99

E-Mail:
info@tewipack.de
Website:
www.tewipack.de

Managing director:
Alexander Uhl,
Michael Uhl
HRB 330424
Amtsgericht
Stuttgart

Bank details:
Sparkasse
Sindelfingen
Pforzheim
Calw
BLZ 666 500
85
Konto 17 787

Commerzbank
Sindelfingen
BLZ 603 400 71
Konto 8 001 166

Vereinigte
Volksbank AG
Böblingen
BLZ 603 900 00
Konto 80 089
003

Postbank
Stuttgart
BLZ 600 100
70
Konto 146
294 708

3M™ Scotch-Weld™ EC-9300 B/A FST

Two Part Structural Adhesive

Product Description

3M™ Scotch-Weld™ EC-9300 B/A FST (fire smoke toxicity) is a two part structural, room temperature curing epoxy adhesive. It is designed for bonding aircraft interior materials, including metals and honeycomb panels. Based on a halogen and antimony free FST system, this adhesive is used for bonding of interior structures to meet flammability, smoke density and toxicity as well as heat release requirements according to FAR/JAR 25.853 and ABD0031. Typical applications are honeycomb panel bonding, ditch and pot (cut and fold), insert bonding, or metal to honeycomb bonding.

Key Features

- Two part, low viscosity, non-sag epoxy adhesive
- Excellent chemical and ageing resistance
- Meets FST requirements of FAR/JAR 25.853 and ABD0031
- Curable at room temperature, can be accelerated by mild heat
- Available in cartridges or as bulk material



Product Characterization

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	Brown	Off-white
Base	Epoxy	Modified amine
Consistency	Thixotropic paste	Thixotropic paste
Density	1.22 g/cm ³	1.17 g/cm ³
Viscosity	190 Pas	15 Pas
Mix ratio by volume	100	50
Cure cycle	2 hours at 65 °C or 7 days at 23 °C	
Work life ^(a) at 23 ± 2 °C	5 hours	
Available packaging sizes	Cartridges and pails	

^(a) Time, while the adhesive can be applied properly to an aluminium surface; 45 g of mixed adhesive

Product Performance

The following product performance data was obtained from samples cured for 2 hours at 65 °C, unless otherwise stated. The surface preparation of the aluminium substrates is described in the “Instructions for use” section on page 3. To control the bond line thickness, ca. 1 wt.% of glass beads, 90 – 150 µm diameter, were added to the adhesive.

Mechanical properties	Test temperature	Result	Test method
Overlap shear strength ^{(a) (b)}	-55 °C	24 MPa	EN 2243-1
	-15 °C	28 MPa	EN 2243-1
	23 °C	29 MPa	EN 2243-1
	55 °C	19 MPa	EN 2243-1
	80 °C	11 MPa	EN 2243-1
Overlap shear strength ^{(a) (b)} (7 d RT curing)	23 °C	27 MPa	EN 2243-1
Floating roller peel strength ^{(a) (b)}	23 °C	102 N / 25 mm	EN 2243-2

^(a) Test substrates: clad aluminium 2024 T3

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

Ageing properties

Overlap shear strength was measured after exposure to different media and environments to determine the ageing resistance of 3M™ Scotch-Weld™ EC-9300 B/A FST. The curing cycle for all samples was 2 hours at 65 °C.

Mechanical properties	Exposure time	Medium and temperature	Result
Overlap shear strength after ageing ^{(a) (b)} EN 2243-1; measured at 23 ± 2 °C	168 h	Deionized water, 23 °C	26 MPa
	24 h	5 % NaCl in water, 23 °C	29 MPa
	168 h	Hot wet: 100 % r. h., 55 °C	21 MPa
	24 h	Dry heat, 85 °C	27 MPa
	24 h	Coca-Cola, 23 °C	27 MPa
	1 h	Methyl ethyl ketone (MEK)	29 MPa

^(a) Test substrates: clad aluminium 2024 T3

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

Flammability, Smoke Density and Toxic Gas Emission

Fire properties		Requirements	Results
Flammability (60 s vertical, stand alone) FAR/JAR/CS 25.853(a), App. F part I(a)(1)(i) Sample size: 12.5 x 12.5 x 300 mm ³	Flame extinguishing time	≤ 15 s	3 s
	Burn length	≤ 152 mm	12 mm
	Drip flame time	≤ 3 s	0 s
Flammability (60 s vertical, adhesive on aluminium) FAR/JAR/CS 25.853(a), App. F part I(a)(1)(i) Sample size: 300 x 75 x 4 mm ³ (3.2 mm thick adhesive on 0.8 mm aluminium)	Flame extinguishing time	≤ 15 s	0 s
	Burn length	≤ 152 mm	9 mm
	Drip flame time	≤ 3 s	0 s
Smoke density (flaming mode, stand alone) FAR/JAR/CS 25.853, App. F part V & AITM 2.0007 Sample size: 0.6 x 75 x 75 mm ³	DS _{max} ^(a) in 4 min	≤ 200	161
Toxic gas emission (flaming mode, stand alone) Airbus ABD0031 & AITM 3.0005 Sample size: 0.6 x 75 x 75 mm ³	CO	≤ 1000 ppm	365 ppm
	HCN	≤ 150 ppm	2 ppm
	HF	≤ 100 ppm	0 ppm
	HCl	≤ 150 ppm	0.2 ppm
	SO ₂ + H ₂ S	≤ 100 ppm	26 ppm
	NO _x	≤ 100 ppm	11 ppm

^(a) DS_{max}: maximum optical smoke density

Handling, Application, Storage

Precautionary Information

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/msds.

Instructions for use

Process step	Instruction
Surface preparation	<p>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. The results given in this data sheet were determined using an optimized FPL etching process:</p> <ol style="list-style-type: none">1) Degrease with methyl ethyl ketone.2) Immerse 10 to 20 minutes in alkaline degreasing 8 % Oakite 164 solution at 85 ± 5 °C.3) Rinse in tap water.4) Sulfochromic immersion (10 minutes) at 70 ± 2 °C: 27.5 wt.% of H_2SO_4; 7.5 wt.% of $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2 \text{H}_2\text{O}$; 65 wt.% of demineralised water; 0.5 g/l aluminium; 1.5 g/l $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$.5) Rinse in tap water.6) Dry 15 minutes at 23 ± 2 °C.7) Dry 10 minutes at 70 ± 2 °C. <p>Caution: Use adequate respiratory, eye and skin protection when using etch solutions.</p>
Application	<p>Mix the two parts B and A thoroughly manually or automatically by weight or volume in the proportions specified on the product. Mix ratio deviations above ± 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. Caution: The work life differs with pot size and temperature. Larger quantities and higher temperatures lead to faster reaction times. Heat is generated during cure. 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. Maximum strength is obtained with 0.10 – 0.25 mm bond line thickness.</p>
Curing	<p>Larger quantities and/or higher temperatures will reduce the work life. Join the surfaces coated with adhesive and cure the material according to mentioned cure cycles. Avoid moving of parts until handling strength is reached. Contact pressure is necessary. The following times and temperatures will result in a full cure:</p> <ul style="list-style-type: none">▪ 7 days at 23 ± 2 °C▪ 2 hours at 65 ± 2 °C
Cleaning	<p>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.</p>
Storage	<p>Store the product at room temperature. Shelf life is minimum 12 months from date of shipment in the original unopened containers. The specific expiry date is mentioned on the product label. Note: After several months of storage time, a slight phase separation can occur in pails of part A. This phase separation has no adverse effect on the properties of the cured adhesive, if the material is stirred for homogenization before use.</p>

Important notice: All statements, technical information and recommendations in this data sheet are based on tests 3M believes to be reliable, but the accuracy or completeness of those tests is not guaranteed. All technical data and information should be considered typical or representative only and should not be used for specification purposes. Given the variety of factors that affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product before use to determine the suitability of the 3M product for the intended use and method of application. All questions of liability relating to the 3M product are governed by the terms of the sale subject to, where applicable, the prevailing law.



Automotive and Aerospace Solutions Division

European Aerospace Laboratory

www.3m.eu/aerospace

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