

3M™ Scotch-Weld™ EC-7272 B/A

Two Part Liquid Shim Technical Data Sheet

Product Description

3M™ Scotch-Weld™ EC-7272 B/A is a two-part, epoxy based, room temperature curing adhesive designed for shimming applications. It combines excellent toughness and high compressive strength over a wide temperature range.

Key Features

- Fast curing at ambient temperature (can be accelerated by mild heat)
- Good gap filling properties
- Excellent adhesion and compression properties
- Extrudable from cartridges or bulk material
- Thixotropic
- Low exothermicity

Product Characterization

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

Properties	Part B	Part A	Test method
Chemical base	Modified epoxy	Modified amine	
Colour	Dark blue	Yellow	
Consistency	Paste	Paste	
Volatile content	< 0.1 %	0.4 %	ISO 3251
Density	1.18 g/cm ³	1.16 g/cm ³	EN 542
Mix ratio by volume	100	50	
Viscosity at 23 °C	850 Pa·s	100 Pa·s	ISO 2555
Viscosity in mixed state at 23 °C		60 Pa·s	AITM 3-0004
Work life (50 g of mixed material, 23 °C)		ca. 30 min	
Colour in mixed state		Greenish blue	
Available packaging		200 ml duo-pack cartridge	

Product Performance

The following product performance data were obtained after 7 days curing at room temperature, if not stated otherwise. For overlap shear strength, approximately 1 wt.% of glass beads (thickness 90 – 150 µm) was added to the mixed adhesive in order to control the bond line thickness.

Properties	Test temperature	Result	Test method
Overlap shear strength clad Al 2024 T3, thickness 1.6 mm, optimized FPL ^(a) surface treatment, test speed 1 mm/min	-55 °C	16 MPa	EN 2243-1
	23 °C	23 MPa	EN 2243-1
	80 °C	21 MPa	EN 2243-1
	120 °C	16 MPa	EN 2243-1
Overlap shear strength As above, cure cycle: 1 h at 70 °C	23 °C	26 MPa	EN 2243-1
	80 °C	25 MPa	EN 2243-1
Compression strength Specimen size 12.7 x 12.7 x 25.4 mm ³ , test speed 0.5 mm/min	-55 °C	149 MPa	ISO 604
	23 °C	79 MPa	ISO 604
	80 °C	44 MPa	ISO 604
	100 °C	33 MPa	ISO 604
	120 °C	20 MPa	ISO 604
Compression modulus Cylindric specimens diameter: 12.7 mm, height 36.8 mm test speed 1.27 mm/min	-55 °C	2647 MPa	ISO 604
	23 °C	2403 MPa	ISO 604
	80 °C	1400 MPa	ISO 604
	100 °C	1220 MPa	ISO 604
	120 °C	716 MPa	ISO 604

^(a) for optimized FPL etching process see "Instructions for use" below

Shore D

Shore D hardness was determined according to ISO 868 in two conditions:

Condition 1: 23 °C ± 2 °C, 50 % ± 5 % relative humidity

Condition 2: 30 °C ± 2 °C, 50 % ± 5 % relative humidity

Test	Curing time	Condition 1	Condition 2	Test method
Shore D 50 g of mixed material Disc of 70 mm diameter and 10 mm height	1 h	-	81	ISO 868
	2 h	75	84	ISO 868
	4 h	82	88	ISO 868
	6 h	83	88	ISO 868
	12 h	86	-	ISO 868

Aging Properties

Specimens were cured 7 days at room temperature and exposed to different media and environments. Overlap shear strength, compression strength and modulus were measured to determine the ageing resistance of 3M™ Scotch-Weld™ EC-7272 B/A.

Mechanical properties	Ageing condition	Test temperature	Result	Test method
Overlap shear strength clad Al 2024 T3, thickness 1.6 mm, optimized FPL ^(a) surface treatment, test speed 1 mm/min	(initial)	23 °C	23 MPa	EN 2243-1
	168 h, 120 °C	23 °C	20 MPa	EN 2243-1
	(initial)	120 °C	16 MPa	EN 2243-1
	1000 h water, 70 °C	120 °C	14 MPa	EN 2243-1
	1000 h hydraulic fluid, 70 °C	120 °C	16 MPa	EN 2243-1
	1000 h water/hydraulic fluid, 50 °C	120 °C	12 MPa	EN 2243-1
	1000 h fuel, 23 °C	120 °C	14 MPa	EN 2243-1
	1000 h organic solvent (MEK), 23 °C	120 °C	15 MPa	EN 2243-1
	1000 h coolant (Dowcal N), 23 °C	120 °C	17 MPa	EN 2243-1

^(a) for optimized FPL etching process see "Instructions for use" below

Mechanical properties	Ageing condition	Test temperature	Result	Test method
Compression strength Specimen size 12.7 x 12.7 x 25.4 mm ³ , test speed 0.5 mm/min	70 °C / 85 % r. h.	-55 °C	151 MPa	ISO 604
	70 °C / 85 % r. h.	23 °C	72 MPa	ISO 604
	70 °C / 85 % r. h.	100 °C	-	ISO 604
	70 °C / 85 % r. h.	120 °C	10 MPa	ISO 604
Compression modulus Cylindric specimens diameter: 12.7 mm, height 36.8 mm test speed 1.27 mm/min	70 °C / 85 % r. h.	-55 °C	2359 MPa	ISO 604
	70 °C / 85 % r. h.	23 °C	1743 MPa	ISO 604
	70 °C / 85 % r. h.	100 °C	-	ISO 604
	70 °C / 85 % r. h.	120 °C	144 MPa	ISO 604

Handling, Application, Storage

Note: This processing information is general or summary in nature and not intended to replace user's careful consideration of the unique circumstances involved in its use of 3M products.

Precautionary Information

Refer to product label and Safety Data Sheet (SDS) for health and safety information before using this product. For SDS visit our website https://www.3m.com/3M/en_US/company-us/SDS-search/.

Surface Preparation

For optimum adhesion, a thoroughly cleaned, dry, grease-free surface is essential. The strength and durability of a bonded joint depends on proper treatment of the surface to be bonded. Cleaning methods which will produce a continuous water film on metal surfaces are generally satisfactory. Optimum processing temperature for substrates and adhesives is around room temperature (23 °C). At the very least, joint surfaces should be cleaned with a good proprietary degreasing agent and abraded mechanically, e. g. with Scotch-Brite™ Hand Pad 7447. Abrading should be followed by a second degreasing treatment, e. g. with 3M™ 08984 Adhesive Cleaner. The results given in this data sheet were determined using an optimized FPL etching process:

- 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 H₂SO₄; 7.5 wt.% of Na₂Cr₂O₇ · 2 H₂O; 65 wt.% of demineralized water; 0.5 g/l aluminium; 1.5 g/l CuSO₄ · 5 H₂O.
- 5) Rinse in tap water.
- 6) Dry 15 minutes at 23 ± 2 °C.
- 7) Dry 10 minutes at 70 ± 2 °C.

Caution: *Use adequate respiratory, eye and skin protection when using etch solutions.*

A structural adhesive primer may be used to further improve the corrosion resistance of a bonded metal joint.

Application

This product consists of two parts. Unless cartridges or other mixing devices with static mixers are used, mix part B and part A in a separate container just prior to application in the specified proportions. Mix both components thoroughly until a uniform color is obtained.

Note: Mix ratio deviations can have significant influence on material performance. When using a new static mixer, purge the first milliliters until a uniform color is obtained.

Important: Be careful when mixing larger quantities, because exothermic reaction may occur. Dual cartridge applications provide maximum accuracy and easy handling. Apply mixed material to substrates before end of work life.

Note: Work life depends on temperature and to some extent on mixed quantity and the shape of the container. When used for adhesive bonding, the substrates should be assembled immediately after the adhesive has been applied, in order to obtain optimum mechanical performance. A fixation of the joint and a uniform contact pressure throughout the bond area during cure will ensure optimum performance. Maximum shear strength is obtained with 0.10 – 0.20 mm bond line thickness.

Suggested Cure Cycle

Larger quantities and/or higher temperatures will reduce the work life. Join the surfaces coated with mixed material and let it cure according to mentioned cure cycles. Avoid moving of parts until handling strength is reached. The following times and pressures will result in a full cure:

- 7 days at 23 ± 2 °C
- 1 h at 70 °C ± 2 °C

Storage

Store the product at room temperature. Shelf life is 6 months from date of shipment in the original unopened containers. Refer to SDS for safe handling and storage information.

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 were manufactured under a 3M Quality Management System registered to the AS9100 standard

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