



Scotch Weld™

Epoxy Structural Adhesive 7271 B/A

Product Data Sheet

Date: March 2011
Supersedes: January 2011

Product Description

3M™ Scotch-Weld™ Epoxy Structural Adhesive 7271 B/A is a two-part, 1:1 mix ratio. The hybrid chemistry of this epoxy/acrylate structural adhesive with a 15 minute work life, exhibits excellent shear and tensile strengths along with high temperature performance and durability. 3M™ Scotch-Weld™ Epoxy Structural Adhesive 7271 B/A contains glass beads for perfect control of minimal bond line thickness.

Key Features

- Fast curing
- Extremely non-sag
- High gap-filling
- Bonding multiple substrates (non thermoplastics)
- No irritating smell (compared to most acrylics)
- Minimal surface preparation

Typical Uncured Properties

	Base	Mixed Adhesive	Accelerator
Base resin		Epoxy/acrylate Hybrid	
Colour	Yellow	Green	Blue
Time to Handling Strength¹ [min] According to ASTM D3165		60	
Viscosity (acc. Brookfield #7)	168.000 mPa		166.000 mPa
Work Life @ (23°C)² (min) 3M internal test Method		12	
Mix Ratio - by volume		1.1	
Density (kg/l)	1.35	1.3	1.23
Full Cure Time [days] @ (23°C)		5	

¹Time to achieve approximate 1 MPa Overlap Shear Strength (OLS) when cured at 23°C.

²Nozzle mixed, approximate time during which material can remain in a mixer nozzle and still be expelled without undue force on the applicator.

Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

**Overlap Shear Performance
(according to ASTM D1002-01) overlap 12.7 x 4.25 mm**

Substrate	Condition (Pre-treatment, curing, ageing, test condition)	Performance
Aluminum (2024, cladded)	chemical etching, 5d@RT, none, 23°C	25,6 MPa
Aluminum (2024, cladded)	chemical etching, 5d@RT, none, 70°C	5.4 MPa
Aluminum (2024, cladded)	chemical etching, 5d@RT, none, -40°C	21.1 MPa

**Overlap Shear Performance
(according to DIN EN ISO 1465) 25.4 x 13 x 0.3mm overlap**

Substrate	Condition (Pre-treatment, curing, ageing, test condition)	Performance
GR - UP (LAMILUX®)	sanding, 5d@RT, none, RT	5,7 MPa
GR - EP (VETRONIT® EGS 619)	sanding, 5d@RT, none, RT	18,2 MPa
GR - EP (VETRONIT® EGS 619)	sanding, 5d@RT, none, 50°C	8,2 MPa
GR - EP (VETRONIT® EGS 619)	sanding, 5d@RT, salt water 31d@RT, RT	11,7 MPa
Aluminum (2024, cladded)	chemical etching, 5d@RT, salt water 31d@RT, RT	13 MPa
Aluminum (2024, cladded)	chemical etching, 5d@RT, Diesel 90d @RT, RT	19.3 MPa
Aluminum (2024, cladded)	chemical etching, 5d@RT, Oil 7d@70°C, RT	22,8 MPa
Aluminum (2024, cladded)	chemical etching, 5d@RT, Oil 90d@RT, RT	18.3 MPa

GRP-UP: Glass-fiber reinforced plastic based on unsaturated polyester resin
GRP-EP: Glass-fiber reinforced plastic based on epoxy resin

**Maximum load on fixture
(according to ASTM D897-2001) BigHead M1/B 38x30, sanded**

Substrate	Conditions (pre-treatment, curing, ageing, test condition)	Performance
GRP - EP (VETRONIT® EGS 619)	sanding, 5d@RT, none, RT	440 kg
Aluminum	sanding, 5d@RT, none, RT	530 kg
CFRP – substrate (vendor secret)	mild sanding, 5d@RT, none, RT	545 kg
Concrete slab (ISO 13640)	mild sanding, 5d@RT, none, RT	97 kg

**Floating Roller Peel Performance
(according to ASTM D 1002 -01)**

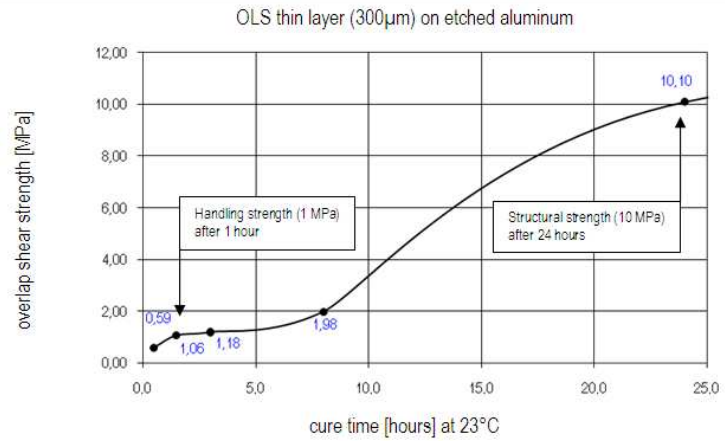
Substrate	Conditions (curing, test condition)	Performance
Aluminum (2024, cladded)	chemical etching, 5d@RT, none, RT	24.4 N/cm

Temperature Performance in Shear
 (according to ASTM D 1002 (1) and TMAE 10 (2))

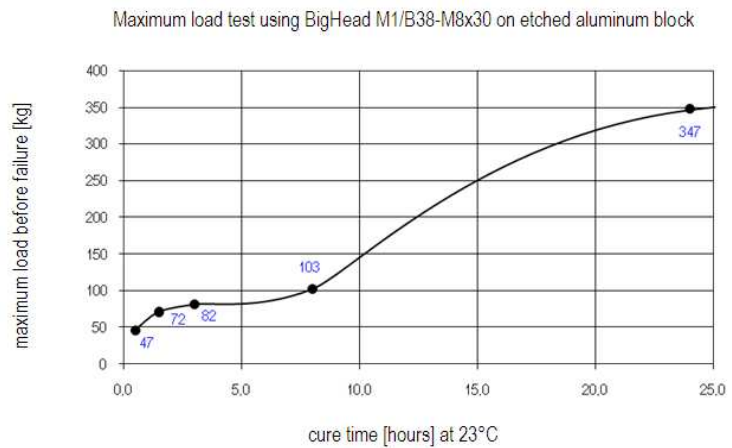
Temperature (°C)	Shear Strength (1) (MPa)	Shear Strength (2) (MPa)
-40	23.0	
80	4.70	6.10
120	3.08	3.65

Typical Cured Properties

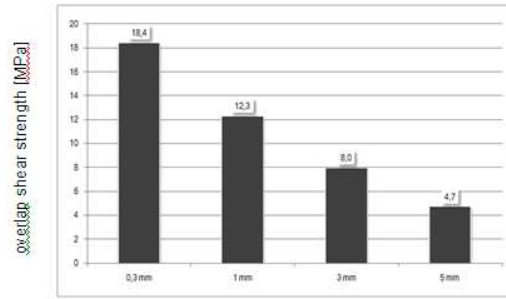
Rate of Strength Build 24h
 (According to ASTM D3165)



Rate of Strength Build 24h
 (According to ASTM D8)



**Bondline thickness influence
(according to ASTM D3165)
measured for OLS performance
97-2001)**



* All failures were cohesive in the substrate (CSF) showing delamination of upper resin layer against first layer of glass fibers.
Reduced performance values are caused by additional peel forces as a result of bending of the samples due to thick bondline preparation.

Surface Preparation

A thoroughly cleaned, dry grease-free surface is recommended for maximum performance. Cleaning methods, which will produce a breakfree water film on metal surfaces, are generally satisfactory.

- Sanding was done using 3M ScotchBrite™ General Purpose Hand Pad 7447 for metallic fixtures and 3M ScotchBrite™ Roloc Surface Conditioning Disc TR Amed (ø50.8 mm) for substrates

Chemical etching of aluminium substrates (3M company optimized FPL sulfochromic etch)

1. Degreasing with Methyl Ether Ketone
2. 10 - 20 minutes immersion in alkaline 8% Oakite164 degrease solution at 85±5°C (185±9°F)
3. Rinsing in tap water
4. Sulfochromic immersion (10 minutes) at 70±2°C (158±3°F)

Composition:

- 27.5% by weight of H₂SO₄
- 7.5% by weight of Na₂Cr₂O₇·2H₂O
- 65.0% by weight of demineralized water
- 0.5 g/litre (0.004 lbs/gal) aluminium
- 5. Rinsing in tap water
- 6. 15 minutes drying at 23±2°C (73±3°F)
- 7. 10 minutes drying at 70±2°C (158±3°F)

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

Suggested cure cycle : 5 days at 23°C for full cure

Shelf Life

When stored at the recommended conditions in original un-opened containers, Scotch-Weld™ Epoxy Structural Adhesive 7271 B/A has a shelf life of 12 months after date of manufacture.

Precautionary Information

Refer to product label and Material Safety Data Sheet for health and safety information before using the product.

For information please contact your local 3M Office.

www.3M.com

For Additional Information

To request additional product information or to arrange for sales assistance, call 0870 6080050 Address correspondence to: 3M United Kingdom PLC, 3M House, 28 Great Jackson Street, Manchester, M15 4PA

Important Notice

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