



Scotch-Weld™

1838 B/A Structural Adhesive

Product Data Sheet

Updated : March 1996
Supersedes : November 1993

Product Description

1838 B/A Structural Adhesive is a two-part room temperature (24°C (75°F)) curing adhesive designed for use where extreme environmental exposure is expected.

Cures to a strong, durable bond in 24-48 hours at 24°C (75°F).

Paste viscosity which allows use on vertical or overhead surfaces with little or no tendency to flow or sag during cure.

Excellent resistance to fuel, oil and water.

Excellent retention of strength after ageing in many environments.

Physical Properties

Not for specification purposes

	(B) Base	(A) Accelerator
Base	Modified Epoxy	Polyamide
Specific Gravity	1.3	1.04
Mix Ratio	1 pt by wt. 4 pts by vol.	1 pt by wt. 5 pts by vol.
Solids Content	100%	100%
Colour	White	Green
Consistency	Heavy paste	Heavy Paste
Solvent	None	None
Flash Point	None	None
Work Life	Approx. 60 minutes.	
Shelf Life	24 months from date of despatch by 3M when stored in the original carton at 21°C (70°F) & 50 % Relative Humidity	

Performance

Characteristics

Not for specification purposes

Service Temperature Range	-57°C to 71°C (-70°F to 160°F)	
Water Resistance	Good	
Weathering Resistance	Good	
Fuel and Oil Resistance	Excellent	

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Additional Product Information

Strength of Adhesive	Test Temperature		Test Results
Test Results: Etched Aluminium Overlap Shear Strength Cure Cycle: 7 days at 24°C (75°F) 2 psi.	-55°C 24°C 82°C	-67°F 75°F 180°F	1500 psi 3000 psi 800 psi

Strength of Adhesive	Test Temperature		Test Results
Test Results: Etched Aluminium T-Peel Strength Cure Cycle: 7 days at 24°C (75°F) 2 psi.	-55°C 24°C	-67°F -75°F	2 piw 2 piw

Strength of Adhesive	Test Temperature		Test Results
Test Results: Solvent Wiped Steel Overlap Shear Strength Cure Cycle: 7 days at 24°C (75°F) 2 psi.	-55°C 24°C 82°C	-67°F 75°F 180°F	725 psi 1670 psi 160 psi

Strength of Adhesive	Test Time	Results 24°C (75°F)
Environment		
Hydrocarbon Fluid at 24°C (75°F)	7 days	2878 psi
Hydraulic Oil at 24°C (75°F)	30 days	2800 psi
JP - 4 Fuel at 24°C (75°F)	30 days	3160 psi
Air at 149°C (300°F)	8 days	3360 psi
Air at 82°C (180°F)	7 days	2600 psi
Gasoline at 24°C (75°F)	30 days	3280 psi
Gasoline at 24°C (75°F)	90 days	2940 psi
Freon	2230 days	1880 psi
Tap Water at 24°C (75°F)	30 days	3325 psi
100% Relative Humidity at 49°C (120°F)	30 days	4440 psi
	90 days	3790 psi
Salt Spray at 35°C (95°F)	30 days	3350 psi
	90 days	3975 psi
	80 days	3400 psi
	365 days	2300 psi
Cure Cycle: 7 days at 24°C (75°F) 2 psi		

Thermal Conductivity	0.169 BTU/HR/Sq. Ft. /°F/FT	
Coefficient of Thermal Expansion	69 x 10 ⁻⁶ in./in./°C Tested at 100°F, 38°C.	

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Electrical Properties	Arc Resistance		82 Seconds	
	Dielectric Strength		585 volts/mil	
	Dielectric Constant	at 23°C (73°F) at 60°C (140°F)		6.06 measured at 1.00 KC 5.14 measured at 1.00 KC
	Dissipation Factor	at 23°C (73°F) at 60°C (140°F)		0.011 measured at 1.00 KC 0.102 measured at 1.00 KC
	Surface Resistivity	at 23°C (73°F)		1.9×10^{14} ohms measured at 500 volts DC
	Volume Resistivity	at 23°C (73°F)		5.5×10^{16} ohms measured at 500 volts DC

Storage Conditions	Store product at 16°C to 27°C (60°F to 80°F) for maximum storage life.	Higher temperatures reduce normal storage life.	Rotate stock on a "first in - first out" basis.
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Health and Safety Information	<p>Precautions: The product is irritating to the eyes and skin. May cause sensitisation by skin contact. Avoid contact with skin and eyes. Wear suitable gloves and eye/face protection. Launder contaminated clothing before use.</p>	<p>First Aid:</p> <p>Eye Contact: Rinse immediately with plenty of water and seek medical advice.</p> <p>Skin Contact: Wash with soap and water.</p>	For further Health and Safety information please contact the Toxicology Department on Bracknell (0344) 858000.
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Application Characteristics	Proper adhesive application is as important as proper bond design and adhesive choice to obtain maximum joint properties. Improper adhesive application techniques can result in partial or complete failure of an assembly.	The Scotch-Weld Adhesive 1838 B/A performance data, reported in Performance Characteristics, was developed using the following suggested procedures.	Variations from these procedures should be fully evaluated to ensure bond properties sufficient to meet the requirements of your particular assembly.
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Directions for Use

Surface Preparation:

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

Adhesive Mixing:

Mix only those amounts of adhesive which can be used within the work life of the mixture. To achieve optimum physical properties of the adhesive, mixing of the base and accelerator must be very thorough. Care should be taken not to incorporate excessive air

into the adhesive during mixing and application as entrapped air will tend to give a porous weakened bond. When weighing the components, be sure that containers are free of wax or oil. When thoroughly mixed, the adhesive should be a uniform green colour. As a final check to ensure that components are adequately mixed, spread a thin film on white paper and examine closely for streaks of base or accelerator. Temperature of the adhesive should not exceed 27°C (80°F) during mixing.

Work Life:

After mixing, the mixture remains workable for a time before it becomes too viscous to properly wet the surface to which it is applied. The work life and rate of cure are both greatly affected by temperature and to some extent by humidity; curing faster as temperature and humidity are raised. The work life of a 500g batch of the mixture is approximately 60 minutes, providing the mixture is maintained at room temperature 23°C (73°F) and stirred frequently to minimise localised temperature increases.

Directions for Use (Cont...)

Application:

Application can be made with a spatula, trowel, or flow equipment. Suitable two-part mixing and metering equipment is available. Contact your 3M Representative for assistance in selecting application equipment to suit your specific needs.

Bond Line Thickness:

Optimum performance is obtained with a 0.05 to 0.250 bond line thickness.

Coverage:

200 cc per square metre for a 0.2mm glue line thickness.

Approximate Drying or Setting Time:

85% cured in 24 hours.
(Cure can be accelerated by heat).

Application Temperature Range:

16°C - 27°C (60°F - 80°F)

Clean Up:

Excess adhesive can be cleaned up, prior to curing, with 3M Solvent No. 2.

CARE:

This solvent is flammable. When using solvents for clean up it is essential that proper safety precautions are observed.

Cure Cycle:

In general, the curing of 1838 B/A to a thermostat condition is a time-temperature relationship.

The only pressure requirement is that the parts must be held in contact and alignment during the cure cycle.

To effect a useful cure in a reasonable length of time, a minimum temperature of 4°C (40°F) is required.

The following cure cycle is suggested to obtain dense glue lines which give the strengths reported in the Test Results Section.

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Standard Room Temperature Cure	Prepare overlap shear bonds in the manner described earlier and allow to cure as follows:	Cure Temperature	Time
		4°C	7 days
		66°C	25 minutes
		121°C	2 minutes
		177°C	30 seconds
	Apply 2 psi bonding pressure uniformly to the bond line using dead weights.		
	Apply panels to cure undisturbed at a temperature of 24°C (75°F) for 24-48 hours.		
Applications	Bonding metals, plastics, glass, reinforced plastic, concrete, glass and timber.	Scotch-Weld Adhesive 1838 B/A is widely used in the electronics industry.	

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Values presented have been determined by standard test methods and are average values not to be used for specification purposes. Our recommendations on the use of our products are based on tests believed to be reliable but we would ask that you conduct your own tests to determine their suitability for your applications. This is because 3M cannot accept any responsibility or liability direct or consequential for loss or damage caused as a result of our recommendations.



Specialty Tapes & Adhesives

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