3M Scotch-Weld™ EPX™ Epoxy Adhesive DP760

Product Data Sheet

Updated : June 2001
Supersedes : October 2000

Product Description

DP760 epoxy adhesive is a non-sag, two-part room temperature curing adhesive designed for use when high temperature resistance is required.

Physical Properties
Not for Specification Purposes

	BASE	ACCELERATOR
Base	Toughened Epoxy	Modified Amine
Colour	White	White
Specific Gravity (approx.)	1.26	0.82
Mix Ratio		
By Volume	100	50
By Weight	100	32
Viscosity	Non-sagging paste	Non-sagging paste
Worklife at 23°C (min)		
5 g	60-80	
10 g	45-60	
20 g	35-40	
Shelf Life	6 months from date of dispatch by 3M when stored in the original carton at 21 °C and 50% relative humidity.	

Typical Performance Characteristics **Overlap Shear Strength (MPa)** **Test method EN 2243-1**
Not for specification purposes

Test conditions	Cure cycle 1	Cure cycle 2	Cure cycle 3
- 55 ± 3°C	19.4 (C)	17.4 (C)	21.9 (C)
23 ± 2°C	28.2 (C)	29.1 (C)	30.4 (C)
80 ± 2°C	24.1 (C)	24.2 (C)	25.9 (C)
120 ± 2°C	16.2 (C)	16.1 (C)	15.4 (C)
150 ± 2°C	10.4 (C)	11.9 (C)	10.3 (C)
175 ± 3°C	7.6 (C)	7.3 (C)	7.5 (C)
205 ± 3°C	4.9 (C)	5.2 (C)	5.3 (C)
230 ± 3°C	2.9 (C)	3.0 (C)	3.5 (C)

Overlap shear specimens were constructed using 1.6 mm thick 2024 T3 clad aluminium with the surface prepared using the optimised FPL etch.

Typical Performance Characteristics(Cont'd) **Roller (Bell) Peel Strength (N/25mm)** **Test method EN 2243-2**

Not for specification purposes

Cure cycle 1	Cure cycle 2	Cure cycle 3
184	154	159

Roller (Bell) peel specimens were constructed using 1.6 and 0.5 mm thick 2024 T3 clad aluminium with the surface prepared using the optimised FPL etch

Cure cycles :

1. 7 days at 23 ± 2°C under a pressure of 100 kPa the first 24 hours
2. 24 hours at 23 ± 2°C under a pressure of 100 kPa followed by a 60 min post cure at 80 ± 3°C
3. 120 min at 65 ± 3°C under a pressure of 100 kPa.

150 µm diameter glass beads were used to control glue line thickness

Environmental Resistance **Overlap Shear Strength** **Test method EN 2243-1**
Not for specification purposes **(MPa)**

Table denotes typical results obtained on 1.6 mm thick optimised FPL etched 2024 T3 bare aluminium after curing for 7 days at 23 °C. 150 µm glass beads were used to control the glue line thickness. Testing was conducted at 23 ± 2°C after ageing for 750 hours

Conditions	Test results
Control (23 °C / 50% RH)	28.8 (Cohesive)
D.I. water at 23°C	29.1 (Cohesive)
150°C dry heat	21.4 (Cohesive)
JP4 fuel at 23°C	28.9 (Cohesive)
Engine oil at 23°C	27.8 (Cohesive)
Hydraulic oil at 23°C	27.2 (Cohesive)
50°C ; ≥ 95 % relative humidity	24.9 (Cohesive)
5 % salt spray at 35°C	28.1 (Cohesive)*

* Denotes no corrosion under the glue line

Long term humidity resistance **Overlap Shear Strength** **Test method EN 2243-1**
Not for specification purposes **(MPa)**

Table denotes typical results obtained on 1.6 mm thick clad and bare 2024 T3 aluminium alloy with the surface prepared by the optimized FPL etch method after curing for 7 days at 23 °C. 150 µm glass beads were used to control the glue line thickness.

Test conditions	Initial Performance		Performance after 750 h at 70°C ≥ 95 % RH	
	Clad AA	Bare AA	Clad AA	Bare AA
- 55 ± 3°C	18.8 (Cohesive)	18.6 (Cohesive)	22.9 (Cohesive)	Not tested
23 ± 2°C	28.7 (Cohesive)	28.8 (Cohesive)	24.8 (Cohesive)	19.0 (Adhesive/Cohesive)
80 ± 2°C	22.9 (Cohesive)	21.9 (Cohesive)	16.5 (Cohesive)	18.0 (Cohesive)
120 ± 2°C	16.5 (Cohesive)	14.6 (Cohesive)	8.3 (Adhesive/Cohesive)	12.8 (Cohesive)
150 ± 2°C	10.4 (Cohesive)	10.0 (Cohesive)	5.6 (Adhesive/Cohesive)	9.0 (Cohesive)
175 ± 3°C	7.9 (Superficial cohesive)	6.9 (Cohesive)	3.7 (Adhesive/Cohesive)	Not tested

Thermal properties

The glass transition temperature (Tg) was determined using Perkin/Elmer DSC7 analyser with a heating rate of 10°C/min. Second heat values given.

Mid-point : 145-150 °C

Compression strength and Young's modulus

Data generated from a cast block of material (12.5 x 12.5 x 25 mm) and curing for 24 hours at 23+/-3°C followed by a 60 minutes post-cure at 80+/-3°C. Specific gravity of the cured material was measured as 1.11 at 23 ^{o}C

Compression strength (MPa)	Young's modulus (MPa)
23 +/- 2°C : 78.8	23 +/- 2°C : 5972
80 +/- 2°C : 48.7	80 +/- 2°C : 4930
120 +/- 2°C : 36.8	120 +/- 2°C : 3633
150 +/- 3°C : 24.2	150 +/- 3°C : 2350

Additional Product Information	**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 humidity, curing faster as temperature and humidity are raised.	Once mixed, the adhesive should be used within 1 hour.
	Equipment : 3M Scotch-Weld™ DP760 is supplied in a dual syringe plastic cartridge designed to fit the EPX™ applicator system.	Contact your 3M representative for assistance in selecting application equipment to suit your specific needs.	
	Clean Up: Excess adhesive can be cleaned up prior to curing with 3M Solvent No.2.	Note: 3M Solvent No.2 is flammable. When using solvents for clean up it is	essential that the correct safety precautions are observed.
	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	
Surface Preparation	For high strength structural bonds, paint, oxide films, oils, dust and all other surface contaminants	Must be completely removed. The level of surface preparation will depend on the required	bond strength and environmental resistance required.
Storage Conditions	Rotate stock on a "first in - first out" basis. When stored at room temperature, shelf life is 6 months. 2 years shelf life applies if the	material is stored at –18^{o}C.	
Additional Information	For any additional information please contact your local 3M representative		
Health & Safety Information	For Health & Safety information, please contact the Product Responsibility Department Tel: 01344 860678		