

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

**Typical Performance Characteristics**  
Not for specification purposes

**Overlap Shear Strength (MPa)**

**Test method EN 2243-1**

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 :

- 7 days at  $23 \pm 2^\circ\text{C}$  under a pressure of 100 kPa the first 24 hours
- 24 hours at  $23 \pm 2^\circ\text{C}$  under a pressure of 100 kPa followed by a 60 min post cure at  $80 \pm 3^\circ\text{C}$
- 120 min at  $65 \pm 3^\circ\text{C}$  under a pressure of 100 kPa.

150  $\mu\text{m}$  diameter glass beads were used to control glue line thickness

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

Table denotes typical results obtained on 1.6 mm thick optimised FPL etched 2024 T3 bare aluminium after curing for 7 days at  $23^\circ\text{C}$ . 150  $\mu\text{m}$  glass beads were used to control the glue line thickness. Testing was conducted at  $23 \pm 2^\circ\text{C}$  after ageing for 750 hours

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

\* Denotes no corrosion under the glue line

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

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  $23^\circ\text{C}$ . 150  $\mu\text{m}$  glass beads were used to control the glue line thickness.

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

### Thermal properties

The glass transition temperature ( $T_g$ ) was determined using Perkin/Elmer DSC7 analyser with a heating rate of  $10^\circ\text{C}/\text{min}$ . 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 °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°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