



# Scotch-Weld™

## Low-Odour Acrylic Adhesive DP810

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### Product Data Sheet

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Updated : February 2000

Supersedes : January 1999

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#### Product Description

3M Scotch-Weld Low-Odour Acrylic Adhesive DP-810 is a two-part, 1:1 mix ratio, toughened structural adhesive with significantly less odour than most acrylic adhesives.

DP-810 has excellent shear and peel strength along with good impact resistance and durability. DP-810 quickly bonds most metals, ceramics, rubbers, plastics and wood with minimal surface preparation.

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#### Features

- Tough, durable bonds.
- Minimal surface prep
- 10 minute time to handling strength
- Bonds Stainless Steel
- Low-Odour Acrylic Adhesive
- 10 minute worklife
- 1:1 mix ratio
- Excellent shear and peel strength

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#### Physical Properties

Not for specification purposes

	BASE	ACCELERATOR
<b>Base</b>	Acrylic	Acrylic
<b>Specific Gravity</b>	1.07	1.07
<b>Viscosity (cps)<sup>1</sup> @ 23°C (73°F)</b>	20,000	20,000
<b>Colour</b>	Green	White
<b>Work Life in Mixing Nozzle<sup>2</sup> @ 23°C (73°F)</b>	8 minutes	
<b>Time to Handling Strength (0.35 MPa Shear Strength @ 23°C (73°F)</b>	10 minutes	
<b>Applied Open Time (3mm bead)<sup>2</sup> @ 23°C (73°F)</b>	10 minutes	
<b>Mix Ratio</b>	By Volume 1:1 By Weight 1:1	
<b>Shelf Life</b>	6 months from date of despatch by 3M when stored in the original carton at 4°C or below.	

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### Typical Cured Physical Properties

Not for specification purposes

<b>Colour</b>	Green	
<b>Shore D Hardness</b>	78	
<b>Full Cure Time : Bondline @ 23°C (73°F)</b>	6 hours	
<b>Accelerated Cure : Bondline temperature of 66°C (150°F)</b>	10 minutes	

### Typical Adhesive Performance Characteristics

Not for specification purposes

#### Overlap Shear<sup>3</sup> to Various Substrates

	OLS (psi)	MPa
Aluminium-120 grit abraded	4400	31.3
Aluminium-etched	4200	29.9
Aluminium-etched/oily	3700	26.3
Aluminium-MEK wiped	3600	25.6
Stainless Steel-oily	3500	24.9
Cold Rolled Steel (CRS)-oily	3100	22.0
CRS-MEK wiped	3100	22.0
Galvanised Steel	3500	24.9
FR-4 Glass Epoxy	3800	27.0
Fibre Reinforced Plastic	1650	11.7
ABS	600	4.2
PVC	1000	7.1
Polycarbonate	850	6.0
Acrylic	1100	7.8
Fir Wood	1600	11.4

#### Overlap Shear<sup>3</sup> CRS/CRS Tested after 7 days Immersion

Immersion	OLS (psi)	MPa
Control (no immersion)	3100	22.0
Toluene	2750	19.6
Machine Oil	3100	22.0
IPA (Isopropyl Alcohol)	2600	18.5
Gasoline	2850	20.3
1,1,1-Trichloroethane	2850	20.3
10% HCL	2800	19.9
MEK (Methyl Ethyl Ketone)	550	3.9
Acetone	NR*	NR*
* Not Recommended for Immersion in this solvent (NR)		

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**Overlap Shear<sup>3</sup> FR-4/FR-4 Tested after Environmental Exposure**

Environment	OLS (psi)	MPa
Control (RT Ageing)	3800	27.0
120°C (248°F) for 2 weeks	3800	27.0
90°C (194°F)/90%RH for 2 weeks	2100	14.9
Tap Water @ 23°C (73°F) for 1 week	3700	26.3

**Overlap Shear<sup>3</sup> CRS/CRS Tested after Environmental Exposure**

Environment	OLS (psi)	MPa
Control (RT Ageing)	3100	22.0
120°C (248°F) for 2 weeks	900	6.4
90°C (194°F)/90%RH for 2 weeks	300	2.1
Tap Water @ 23°C (73°F) for 1 week	2900	20.6

**Overlap Shear<sup>3</sup> Etched Aluminium at Various Temperatures**

Test Temperature	OLS (psi)	MPa
-55°C (-67°F)	1200	8.5
23°C (73°F)	4200	29.9
83°C (180°F)	500	3.5
93°C (200°F)	300	2.1

**Overlap Shear<sup>3</sup> Heat/Humidity Aged Oily Surfaces**

Test Temperature	OLS (psi)	MPa
Etched Aluminium (Oily) 49°C (120°F)/100%RH/4 wks	2250	16.0
Stainless Steel 49°C (120°F)/100%RH/4 wks	2500	17.8
Etched Aluminium (Oily) 93°C /100%RH/2 wks	1250	8.9
CRS (Oily) 49°C (120°F)/100%RH/2 wks	1450	10.3

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### 180° T-Peel Strength <sup>5</sup>

Substrate	Test Temperature	Peel Strength (piw)	N/10mm
Etched Al/Etched Al	-55°C (-67°F)	2	3.5
Etched Al/Etched Al	-29°C (-20°F)	25	43.8
Etched Al/Etched Al	23°C (73°F)	30	52.6
Etched Al/Etched Al	38°C (100°F)	34	59.6
Etched Al/Etched Al	54°C (130°F)	35	61.3
Etched Al/Etched Al	65°C (150°F)	33	57.8
Etched Al/Etched Al	83°C (180°F)	25	43.8
Neoprene/CRS	23°C (73°F)	17*	29.8*
Nitrile/CRS	23°C (73°F)	22*	38.5*
Red SBR/CRS	23°C (73°F)	22*	38.5*
Black SBR/CRS	23°C (73°F)	26*	45.5*

\* rubber substrate yielded at given value

### Rate of Strength Build-up OLS<sup>3</sup>

Time from Bonding to OLS Test	OLS Strength (psi)	MPa
10 minutes	50	0.35
12 minutes	250	1.7
20 minutes	2000	14.2
1 hour	2650	18.8
2 hours	2850	20.3
4 hours	3850	27.4
8 hours	4200	29.9
24 hours	4200	29.9

### Test Methods and Footnotes :

- Viscosity obtained by Brookfield, DV-II, #7 Spindle, 20rpm at 24°C (75°F).
- Time, in minutes, for adhesive to gel at 24°C (75°F) in the specified condition.
- Overlap Shear Test  
Method : overlap shear test for adhesion determined in accordance to ASTM D1002-72, sample dimensions were 25mm x 100mm x 3mm, with a 325mm<sup>2</sup> area of overlap, bonded to themselves unless otherwise noted, allowed to cure for at least 6 hours at 24°C (75°F) before testing.
- Data were collected using a Sintech 5GL Mechanical Tester with a 2000# or 5000# lead cell.  
  
Test rate was 0.1"/minute. Strength determined at 24°C (75°F) unless otherwise noted.
- Environmental tests were conducted by immersing bonded coupons prepared in accordance to description in footnote 3.
- Peel tests (ASTM D1876-61T) on FPL etched, 0.8mm gauge aluminium, with a 0.4mm bondline thickness. Jaw separation rate 500mm/min. All bonds were allowed to cure for at least 6 hours at 24°C (75°F) before testing.

### Storage Conditions

Store Duo-Pak cartridges at 4°C (40°F) or below.

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<b>Surface Preparation</b>	Scotch-Weld Low-Odour Acrylic Adhesive DP-810 can bond oily metal, plastic and other substrates with very little surface preparation, however, for the most consistent results and environmental resistance all substrates should be clean, dry and free of paint, oxide films, dust, mould release agents and all other surface contaminants. The amount of surface preparation directly depends on the bond strength and environmental resistance desired by the user.	<p>The following cleaning methods are suggested for common surfaces.</p> <p><b>Steel and Aluminium</b></p> <ol style="list-style-type: none"> <li>1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol solvents*.</li> <li>2. Sandblast or abrade using clean fine grit abrasives (180 grit or finer).</li> <li>3. Wipe again with solvents to remove loose particles.</li> </ol>	<p><b>Plastic/Rubber</b></p> <ol style="list-style-type: none"> <li>1. Wipe with isopropyl alcohol*.</li> <li>2. Abrade using fine grit abrasives (180 grit or finer).</li> <li>3. Remove residue by wiping again with isopropyl alcohol*.</li> </ol> <p><b>Glass</b></p> <ol style="list-style-type: none"> <li>1. Solvent wipe surface using acetone.</li> <li>2. Apply a thin coating (0.0001" or less) of Scotch-Weld EC3901 Primer to the glass surfaces to be bonded and allow the primer to dry a minimum of 30 minutes at 24°C (75°F) before bonding for maximum adhesion</li> </ol>
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\* Note : When using solvents, be sure to extinguish all ignition sources and follow the manufacturer's precautions and directions for use when handling such materials.

<b>Directions for Use /Clean Up</b>	<p>Place Duo-Pak cartridge into retaining lip on applicator.</p> <p>Remove re-sealable cap.</p> <p>Attach mixing nozzle and dispense.</p>	<p>Remove mixing nozzle after use.</p> <p><b>WIPE TIP CLEAN AFTER USE AND REPLACE CAP.</b></p>	<p><b>Clean Up:</b> Excess uncured adhesive can be removed with Scotch-Grip Solvent No. 2.</p> <p><b>NOTE:</b> Solvent No. 2 is flammable and the proper safety precautions should be observed.</p>
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<b>Health &amp; Safety Information</b>	For further Health and Safety Information please contact the Toxicology Department at the Bracknell Head Office on (01344) 860678.
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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.



#### Tapes & Adhesives Group

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