



# Scotch-Weld™

## EPX™ Epoxy Adhesive DP460

### Product Data Sheet

Updated : March 1996  
Supersedes : January 1995

|                            |                                                                                                                                                 |                                                                                                    |                                                                                                                                |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Product Description</b> | DP460 epoxy adhesive is a room temperature curing, two part epoxy adhesive supplied in 3M Duo-Pak cartridge for use with the 3M EPX Applicator. | <b>DP460 offers the following features:</b><br><br>High shear strength.<br><br>High Peel strength. | 2:1 premix strength allowing gap filling.<br><br>Outstanding environmental resistance.<br><br>Easy mixing and controlled flow. |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|

#### Physical Properties

Not for specification purposes

|                                  | BASE                                                                                                             | ACCELERATOR    |
|----------------------------------|------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Base</b>                      | Modified Epoxy                                                                                                   | Modified Amine |
| <b>Viscosity</b><br>(cP at 23°C) | 80,000                                                                                                           | 10,000         |
| <b>Specific Gravity</b>          | 1.12                                                                                                             | 1.08           |
| <b>Colour</b>                    | White                                                                                                            | Amber          |
| <b>Work Life</b>                 | 60 minutes at 23°C.                                                                                              |                |
| <b>Handling Strength</b>         | 240 - 360 minutes at 23°C                                                                                        |                |
| <b>Full Strength</b>             | 5 days (test to full performance at one week)                                                                    |                |
| <b>Shelf Life</b>                | 12 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

|                        |                                                                    |  |
|------------------------|--------------------------------------------------------------------|--|
| <b>T-Peel Strength</b> | Measured on abraded, steel (0.8mm) at 24°C.<br>43.9 N/cm (25 piw). |  |
|                        | Measured on Etched Aluminium at 23°C (60 piw).                     |  |

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### Performance Characteristics (Cont...)

Not for specification purposes

### Overlap Shear Strength

The following strength values were obtained with DP460 when tested after 7 day cure cycle at 24°C.

Substrates solvent wiped, abraded and solvent wiped prior to bonding.

|                             | MPa  | psi   |
|-----------------------------|------|-------|
| Galvanised Steel            | 13.8 | 2000  |
| Cold Rolled Steel           | 19.3 | 2800  |
| FPL Etched Aluminium        | 31.0 | 4500  |
| Copper                      | 27.6 | 4000  |
| Stainless Steel             | 27.6 | 4000  |
| Brass                       | 27.6 | 4000  |
| Acrylic                     | 2.3  | 330   |
| PVC                         | 2.4  | 350   |
| Polycarbonate               | 3.4  | 500   |
| Neoprene/Steel              | 0.8* | 120*  |
| SBR/Steel                   | 1.0* | 140*  |
| ABS                         | 4.0  | 575   |
| FRP                         | 6.9* | 1000* |
| * Denotes Substrate Failure |      |       |

### Environmental Resistance

Etched Aluminium. Overlap shear tested at 23°C.

| Environment                         | Condition                                          | Etched AL (MPa) | Galv Steel (MPa) |
|-------------------------------------|----------------------------------------------------|-----------------|------------------|
| 23°C / 50% RH                       | 30 days                                            | 35.8            | 15.2             |
| Distilled Water                     | 30 days immersion                                  | 35.2            | 15.9             |
| Water Vapour                        | 50°C / 100% RH, 30 days<br>93°C / 100% RH, 14 days | 34.5<br>21.4    | 13.1<br>10.3     |
| Antifreeze/H <sub>2</sub> O (50/50) | 82°C 30 day immersion                              | 34.5            | 13.8             |
| Isopropanol                         | 23°C 30 day immersion                              | 39.3            | 13.8             |
| Methyl Ethyl Ketone                 | 23°C 30 day immersion                              | 29.0            | 13.8             |
| Salt Spray 5%                       | 65°C 30 days                                       | 35.2            | 13.1             |

### Electrical Properties

|                                |                        |  |
|--------------------------------|------------------------|--|
| Dielectric Strength (Volts/mm) | 2.8 x 10 <sup>4</sup>  |  |
| Volume Resistivity (Ohms/cm)   | 2.4 x 10 <sup>14</sup> |  |

### Thermal Properties

|                            |                                                                              |  |
|----------------------------|------------------------------------------------------------------------------|--|
| Thermal Conductivity W/m°C | Coefficient of Thermal Expansion (cm/cm/°C)                                  |  |
| 0.180                      | - 50°C to 30°C 59 x 10 <sup>-6</sup><br>50°C to 110°C 159 x 10 <sup>-6</sup> |  |

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### Storage Conditions

Store product at 16 to 27°C for maximum storage life. High temperatures reduce normal storage life.

Rotate stock on a "first in-first out" basis.

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### Directions for Use /Clean Up

Place the cartridge into the 3M EPX Applicator and clip into position.

Remove the resealable cap.

Expel a small quantity of adhesive and ensure both components flow freely.

Attach correct mixer nozzle (this should have 20 or more elements).

Dispense the adhesive as required.

When finished either leave the nozzle in place and store, or remove the nozzle, wipe clean the tip, and replace cap.

To re-start after storage remove the old nozzle with cured adhesive and re-fit a new nozzle, or remove the cap and fit a new nozzle.

### Surface Preparation:

The degree of surface preparation depends on the bond strength required and the environment likely to be encountered by the bonded structure. For most plastics solvent wiping with 3M VHB surface cleaner, followed by abrasion with 3M Scotchbrite 7447, followed by a further solvent wipe until clean, will give good performance (except for acetal, polyethylene and polypropylene and some other low surface energy materials). This also applies to powder coat paints and other stoved paint systems.

The same surface preparation will also give good adhesion to metal surfaces. The objective is to remove loosely attached surface films such as oils, waxes, dusts, mill-scale, loose paints and all other

surface contaminants in addition to enhancing mechanical adhesion. Grit-blasting using a clean, fine grit also offers excellent adhesion on many metallic substrates.

Where humid environments are likely to be encountered by metallic substrates we recommend additional priming with 3M Scotch-Weld 3901. Alternatively, chemical conversion coating techniques combined with priming can offer the best durability.

### Clean-Up:

Excess uncured adhesive can be removed with the following solvents:

**3M VHB Surface Cleaner**  
(mild alcohol based cleaner)

**3M Scotch-Grip Solvent No2.** (Ketone blend)

**3M Industrial Cleaner**  
(Aerosol).

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## Health & Safety Information

### Precautions:

Risk of serious damage to eyes. Irritating skin: Irritation may be severe. May cause sensitisation by skin contact. May cause respiratory system irritation. Avoid contact with skin and eyes. Wear suitable gloves and eye/face protection. Use only in well ventilated areas. Take off immediately all contaminated clothing. Avoid prolonged breathing of vapours.

### First Aid:

#### Eye Contact:

Immediately flush eyes with copious amounts of water for at least 15 minutes, holding eyes open. Call a physician.

#### Skin Contact:

Wash immediately with plenty of soap and water.

For further Health and Safety Information please contact the Toxicology Department at the Bracknell Head Office on (0344) 858000.

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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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