



# Technical Data Sheet

## 3M™ Scotch-Weld™ Epoxy Adhesive DP100 Clear



[Product Details](#)



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### Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP100 is a two-part adhesive offering fast cure and machinability. Available in larger containers as 3M™ Scotch-Weld™ Epoxy Adhesives 100 B/A or 100 NS B/A.

### Product Features

- Easy mixing
- High Flow
- Fast Cure
- Meets UL 94 HB

### Technical Information Note

The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

### Typical Uncured Physical Properties

Attribute Name	Value
Color	Clear <sup>1</sup>
Mix Ratio by Weight (B:A)	1:0.98
Mix Ratio by Volume (B:A)	1:1

<sup>1</sup> Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.

Attribute Name	Test Method	Temperature	Value
Base Resin			Epoxy
Base Net Weight			9.5 — 9.9 lb/gal
Accelerator Net Weight			9.2 — 9.6 lb/gal
Base Viscosity	3M C1d	27 °C (80 °F)	8,000-15,000 cP <sup>1</sup>
Accelerator Viscosity	3M C1d	27 °C (80 °F)	9,000-16,000 cP <sup>1</sup>

<sup>1</sup> Procedure involves Brookfield RVF, #6 spindle, 20 rpm. Measurement taken after 1 minute.

### Typical Mixed Physical Properties

#### Rate of Strength Buildup

Substrate: Etched Aluminum

Temperature: 22 °C (72 °F)

Test Method: ASTM D1002, ISO 4587

Dwell Time	Value
10 min	0 lb/in <sup>2</sup> <sup>1</sup>
20 min	400 lb/in <sup>2</sup> <sup>1</sup>

<sup>1</sup> 1in wide 1/2in overlap shear specimens. 2 panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum bonded and cut 1in wide samples after 24hr. 7mil bondline. Jaw Separation 0.1in/min

Attribute Name	Test Method	Temperature	Value
Open Time			5 min <sup>1</sup>
Worklife, 10g mixed	3M C548	22 °C (72 °F)	5 min <sup>2</sup>

Attribute Name	Test Method	Temperature	Value
Set Time (min)		22 °C (72 °F)	15 — 20 min <sup>3</sup>

- <sup>1</sup> Max time allowed after applying adhesive to a substrate before bond must be closed and fixed. Cure times approximate and depend on adhesive temperature. Hotmelts: The approx. bonding range of a 1/8" bead of molten adhesive on a non-metallic surface.
- <sup>2</sup> Procedure involves periodically measuring a 10 gram mixed mass for spreading and wetting properties. This time approximates the usable worklife in an EPX applicator nozzle.
- <sup>3</sup> Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

## Typical Physical Properties

Attribute Name	Value
Cured Color	Clear

## Typical Cured Characteristics

Temperature: 22 °C (72 °F)

Attribute Name	Test Method	Value
Compression Strength	ASTM D695	8,400 lb/in <sup>2</sup>
Shore D Hardness	ASTM D2240	82 <sup>1</sup>

- <sup>1</sup> Tensile and Elongation. Samples were 51 mm (2") dumbbells with 3 mm (0.125") neck and 0.8 mm (0.03" sample thickness. Separation rate was 51 mm/min (2"/min)

## Typical Performance Characteristics

### Overlap Shear Strength

Temperature: 22 °C (72 °F)

Dwell Time: 7 d

Test Method: ASTM D1002, ISO 4587

Substrate	Surface Prep	Value
Aluminum	MEK/Abrade/MEK	950 lb/in <sup>2</sup> <sup>1</sup>
Cold Rolled Steel	MEK/Abrade/MEK	1,000 lb/in <sup>2</sup> <sup>1</sup>
Stainless Steel	MEK/Abrade/MEK	750 lb/in <sup>2</sup> <sup>2</sup>
Galvanized Steel	MEK/Abrade/MEK	900 lb/in <sup>2</sup> <sup>2</sup>
Copper	MEK/Abrade/MEK	950 lb/in <sup>2</sup> <sup>2</sup>
Brass	MEK/Abrade/MEK	700 lb/in <sup>2</sup> <sup>2</sup>
ABS	IPA Wipe/Abrade/IPA Wipe	490 lb/in <sup>2</sup> <sup>2</sup>
Polycarbonate (PC)	IPA Wipe/Abrade/IPA Wipe	250 lb/in <sup>2</sup> <sup>2</sup>
Acrylic (PMMA)	IPA Wipe/Abrade/IPA Wipe	100 lb/in <sup>2</sup> <sup>2</sup>
Fiber-Reinforced Plastic	IPA Wipe/Abrade/IPA Wipe	950 lb/in <sup>2</sup> <sup>2</sup>
Polyvinyl chloride (PVC)	IPA Wipe/Abrade/IPA Wipe	330 lb/in <sup>2</sup> <sup>2</sup>

- <sup>1</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber. Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)
- <sup>2</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.13-0.20 mm (5-8 mil) Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber. Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3-1.6 mm (50-64 mil), rubber and plastic 3.2 mm (125 mil) Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

## T-Peel Adhesion

Temperature: 22 °C (72 °F)

Dwell Time: 7 d

Test Method: ASTM D1876

Substrate	Surface Prep	Value
Aluminum		2 lb/in width <sup>1</sup>
Cold Rolled Steel	MEK/Abrade/MEK	2 lb/in width <sup>1</sup>

<sup>1</sup> 0.032in thick, 5 - 8 mil bondline  
T-peel strengths with 1 in wide bonds. Jaw separation rate @ 20 in/min.

## Typical Environmental Performance

### Solvent Resistance

Environmental Condition	Value
24hr @ RT + 2hr @ 71°C (160°F) + Isopropyl Alcohol 1hr	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Acetone 1hr	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + 1, 1, 1 - Trichloroethane 1hr	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Freon TF 1hr	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Freon TMC 1hr	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + RMA Flux 1hr	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Isopropyl Alcohol 1mo	B <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Acetone 1mo	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + 1, 1, 1 - Trichloroethane 1mo	B <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Freon TF 1mo	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + Freon TMC 1mo	A <sup>1</sup>
24hr @ RT + 2hr @ 71°C (160°F) + RMA Flux 1mo	A <sup>1</sup>

<sup>1</sup> Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control.

A: Unaffected, no color or texture change

B: Slight attack, slight swelling of surface.

C: Moderate/severe attack, extreme swelling of surface.

## Electrical and Thermal Properties

Attribute Name	Test Condition	Value
Glass Transition Temperature (T <sub>g</sub> )	Mid-Point	33 °C (91 °F) <sup>1</sup>
Coefficient of Thermal Expansion	-40°C ~ 20°C	60 x 10 <sup>-6</sup> m/m/°C <sup>2</sup>
Coefficient of Thermal Expansion	60°C ~ 120°C	209 x 10 <sup>-6</sup> m/m/°C <sup>2</sup>

<sup>1</sup> Glass Transition Temperature (T<sub>g</sub>) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.

<sup>2</sup> CTE determined using TMA Analyzer using a heating rate of 10°C per minute. Second heat values given.

Temperature: 22 °C (72 °F)

Attribute Name	Test Method	Value
Volume Resistivity	ASTM D257	3.5 x 10 <sup>12</sup> Ω-cm

## **Handling/Application Information**

### **Directions for Use**

1. For optimum strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation directly depends on the required bond strength and the environmental aging resistance desired by user. For specific surface preparations on common substrates, see the following section on Surface Preparation.

2. Use gloves to minimize skin contact with adhesive.

3. These products consist of two parts.

#### **Mixing and Applying**

For Duo-Pak Cartridges - 48.5 ml

3M™ Scotch-Weld™ DP100 and DP100 NS Adhesives are supplied in a dual syringe plastic Duo-Pak cartridge as part of the 3M™ Scotch-Weld™ EPX™ Applicator system. To use, simply insert the Duo-Pak cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. Next, remove the Duo-Pak cartridge cap and expel a small amount of adhesive to be sure both sides of the Duo-Pak cartridge are flowing evenly and freely. If mixing of Part A and Part B is desired, attach the EPX mixing nozzle to the Duo-Pak cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of adhesive and mix thoroughly. Mix approximately 15 seconds after uniform color is obtained.

For Duo-Pak Cartridges - 200/400 ml

**Directions for Use:** While holding cartridge in an upright position, remove insert from Duo-Pak cartridge by unscrewing plastic nut. Detach metal removal disc from insert to free plastic nut for nozzle attachment. Clear orifices if necessary. Attach mixing nozzle and secure with plastic nut. Place cartridge into EPX Applicator. Dispense a small quantity of adhesive to assure both components are dispensing equally. Apply adhesive to clean surfaces, join parts, secure until set up (20 minutes @ 75°F [24°C]). Leave nozzle attached to store. Replace nozzle after storage.

For Bulk Containers

Mix thoroughly by weight or volume in the proportions specified in the Typical Uncured Properties section. Mix approximately 15 seconds after uniform color is obtained.

4. For maximum bond strength apply adhesive evenly to both surfaces to be joined.

5. Application to the substrates should be made within 5 minutes. Larger quantities and/or higher temperatures will reduce this working time.

6. Join the adhesive coated surfaces and allow to cure at 60°F (16°C) or above until completely firm. Heat, up to 200°F (93°C), will speed curing. These products will fully cure in 24-48 hours @ 75°F (24°C).

7. Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 3-5 mil bond line.

8. Excess uncured adhesive can be cleaned up with ketone type solvents.\*

\*Note: When using solvents, extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

**Adhesive Coverage:** A 0.005 in. thick bondline will typically yield a coverage of 320 sqft/gallon.

### **Surface Preparation**

For optimum strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation directly depends on the required bond strength and the environmental aging resistance desired by the user.

**The following cleaning methods are suggested for common surfaces:**

#### **Steel:**

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol.\*

2. Sandblast or abrade using clean fine grit abrasives.

3. Wipe again with solvent to remove loose particles.

4. If a primer is used, it should be applied within 4 hours after surface preparation.

#### **Aluminum:**

1. Acid Etch: Place panels in the following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C).

Sodium Dichromate 4.1 - 4.9 oz./gallon

Sulfuric Acid, 66°Be 38.5 - 41.5 oz./gallon 2024-T3 aluminum (dissolved) 0.2 oz./gallon minimum Tap Water as needed to balance

2. Rinse: Rinse panels in clear running tap water.

3. Dry: Air dry 15 minutes and force dry 10 minutes at 150°F ± 10°F (66°C ± 5°C).

4. If primer is to be used, it should be applied within 4 hours after surface preparation.

5. Option 2: Degrease with an industrial solvent such as MEK\*; abrade with ScotchBrite™ 7447 abrasive (or sandpaper of approximately 180 grit) and wipe again with solvent\*.

Plastics/Rubber:

1. Wipe with isopropyl alcohol.\*

2. Abrade using fine grit abrasives.

3. Wipe with isopropyl alcohol.\*

\*Note: When using solvents, extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

## **Application Equipment**

For small or intermittent applications the 3M™ Scotch-Weld™ EPX™ applicator is a convenient method of application.

For larger applications these adhesives may be applied by use of flow equipment. Two-part meter/mixing/dispensing equipment is available for intermittent or production line use. These systems may be desirable because of their variable shot size and flow rate characteristics and are adaptable to many applications.

## **Industry Specifications**

UL 94 HB

## **Storage and Shelf Life**

Store under normal conditions of 16° to 27°C (60° to 80°F) in the original, unopened packaging, out of direct sunlight. For best performance, use this product within 12 months from date of manufacture.

## **Automotive Disclaimer**

### **Select Automotive Applications:**

This product is an industrial product and has not been designed or tested for use in certain automotive applications, such as automotive electric powertrain battery or high voltage applications, which may require the product to be manufactured in a IATF certified facility, meet a Ppk of 1.33 for all properties, undergo an automotive production part approval process (PPAP), or fully adhere to automotive design or quality system requirements (e.g., IATF 16949 or VDA 6.3). Customer assumes all responsibility and risk if customer chooses to use this product in these applications.

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## **ISO Statement**

This product was manufactured under a 3M quality system registered to ISO 9001 standards.

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