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English-US

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Technical Data Sheet

3M™ Scotch-Weld™ Epoxy Adhesive DP100FR

Product Details

Regulatory Info/SDS

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR is a two-part flame retardant (self-extinguishing) version of Scotch-Weld DP100. It meets the UL94 V-O Burn Test requirements and has a work life of 4-8 minutes after mixing. It is ideal for many applications requiring a self-extinguishing structural epoxy adhesive system.

Product Features

- Fast Cure
- Cream Color
- Easy Mixing
- Meets UL 94 V-O (File No. E61941)
- Passes 14 CFR 25.853 (60 Sec. Vertical Burn Test: As listed in code Federal Regulations, FAA, DOT Regulations 25.853 paragraph a.)
- Does not contain brominated or antimony-based flame retardants.

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	Cream [1]
Mix Ratio by Volume (B:A)	1:1
Mix Ratio by Weight (B:A)	1:0.95

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

Attribute Name	Temperature	Value
Base Resin		Epoxy
Base Net Weight		1.27 — 1.32 g/cm³ (10.6 — 11.0 lb/gal)
Accelerator Net Weight		1.21 — 1.26 g/cm³ (10.1 — 10.5 lb/gal)
Base Viscosity	23 °C (73 °F)	45,000-90,000 cP [1]
Accelerator Viscosity	23 °C (73 °F)	40,000-120,000 cP [1]

[1] Brookfield RVF #7 spindle at 20 rpm.

Typical Mixed Physical Properties

Rate of Strength Buildup

Substrate: Etched Aluminum
Temperature: 23 °C (73 °F)
Test Method: ASTM D1002, ISO 4587

Dwell Time	Value
5 min	0 MPa (0 lb/in²) [1]
10 min	3.1 MPa (450 lb/in²) [2]
20 min	8.6 MPa (1250 lb/in²) [2]

Dwell Time	Value
4 h	11 MPa (1650 lb/in²) [1]
24 h	15 MPa (2200 lb/in²) [1]

[1] 25 mm (1 in) wide 12.7 mm (0.5 in) overlap specimens with 25 mm x 102 mm (1 in x 4 in) substrates. 13 - 20 µm (0.005-0.008 in) bondline.
Jaw separation 2.5 mm/min (0.1 in/min)
Substrate thickness 1.3 - 1.6 mm (0.05-0.064 in)
Cohesive (CF), Adhesive (AF), Substrate (SF) Failure

[2] 25 mm wide 12.7 mm (1 in, 0.5 in) overlap shear specimens. 2 panels 1.6 mm (0.063 in) thick, 100 x 180 mm (4 x 7 in) of 2024T-3 clad aluminum bonded and cut 25 mm (1 in) wide samples after 24hr. 0.18 mm (7mil) bondline. Jaw Separation 2.5 mm/min (0.1 in/min)

Attribute Name	Temperature	Value
Open Time		6 min [1]
Worklife, 20g mixed	23 °C (73 °F)	4 — 8 min [2]
Set Time (min)	23 °C (73 °F)	10 — 20 min [3]

[1] 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 3.2 mm (1/8 in) bead of molten adhesive on a non-metallic surface.

[2] Approximate time during which a 20 g quantity of mixed resin at 73 °F (23 °C) will adequately wet out on a substrate.

[3] Minimum time required to achieve 0.3 MPa (50 psi) of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

Typical Physical Properties

Attribute Name	Value
Cured Color	Cream

Typical Cured Characteristics

Temperature: 23 °C (73 °F)

Attribute Name	Test Method	Value
Modulus		4500 MPa (650000 lb/in²) [1]
Shore D Hardness	ASTM D2240	87

[1] Determined using DMA.

Typical Performance Characteristics

Overlap Shear Strength

Surface Prep: MEK/Abrade/MEK
Temperature: 23 °C (73 °F)
Dwell Time: 7 d
Test Method: ASTM D1002, ISO 4587

Substrate	Value
Aluminum	7 MPa (1050 lb/in²) [1]
Cold Rolled Steel	8 MPa (1100 lb/in²) [1]

[1] 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)

Substrate: Etched 2024 T3 Aluminum
Temperature: 23 °C (73 °F)
Dwell Time: 7 d

Attribute Name	Test Method	Value
T-Peel Adhesion	ASTM D1876	4 N/cm (2 lb/in) [1]

[1] Data from 3M™ EPX™ Applicator System equipped with an EPX static mixer, to manufacturer's directions. Thorough manual mixing should afford comparable results.
T-Peel with 25 mm (1 in) bonds. Separation 254 mm/min (10in/min). 0.8 mm (0.032 in) thick substrate, 0.43 - 0.51 mm (17 - 20 mil) bondline

Electrical and Thermal Properties

Test Condition: Mid-Point

Attribute Name	Value
Glass Transition Temperature (Tg)	61 °C (142 °F) [1]

[1] Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 20 °C (68 °F) per minute. Second heat values given.

Handling/Application Information

Directions for Use

For high 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 necessary depends on the required bond strength and the environmental aging resistance desired by user. For specific surface preparations on some common substrates, see the section on surface preparation.

3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR is supplied in a dual syringe plastic duo-pak cartridge as part of the 3M™ 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 simultaneous mixing of Part A and Part B is desired, attach the EPX mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive.

When mixing Part A and Part B manually, the components must be mixed in the ratio indicated in the Physical Uncured Properties section. Thorough mixing of the two components is required to obtain optimum properties.

Two-part mixing/proportioning/dispensing equipment is available for intermittent or production line use. These systems are ideal for line use because of their variable shot size and flow rate characteristics and are adaptable to most applications.

Surface Preparation

For high 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 necessary depends on the required bond strength and the environmental aging resistance desired by user.

The following cleaning methods are suggested for these common surfaces:

Steel:
1. Wipe free of dust with oil-free solvent such as acetone, isopropyl or alcohol solvents.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with solvent to remove loose particles.
*When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer's precautions and directions for use.

Aluminum:
1. Alkaline Degrease: Oakite 164 solution (9-11 oz./gallon water) at 190°F (88°C) ± 10°F (-13°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water.
2. Acid Etch: Place panels in the following solution for 10 minutes at 150°F (66°C) ± 5°F (-15°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
Note: Read and follow component suppliers environmental, health and safety recommendations prior to preparing this etch solution.
3. Rinse: Rinse panels in clean running tap water.
4. Dry: Air dry 15 minutes; force dry 10 minutes at 190°F (88°C) ± 10°F (5°C).

Plastics/Rubber
1. Wipe with isopropyl alcohol.*

2. Abrade using fine grit abrasives.
3. Wipe with isopropyl alcohol.*

Glass
1. Solvent wipe surface using acetone or methyl ethyl ketone (MEK).*
2. Apply a thin coating (0.0001 in. or less) of primer such as 3M™ Scotch-Weld™ Structural Adhesive Primer EC-3901 to the glass surfaces to be bonded and allow the primer to dry before bonding.
*When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer's precautions and directions for use.

Industry Specifications

UL 94 V-O (File E61941)
14 CFR 25.853

Storage and Shelf Life

Store under normal conditions of 16° to 27°C (60° to 80°F) and 40 to 60% relative humidity in the original, unopened packaging, out of direct sunlight. Lower temperatures cause increased viscosity of a temporary nature. For best performance, use this product within 24 months from date of manufacture.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577

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.

Information

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ISO Statement

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

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