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3M™ Scotch-Weld™ Epoxy Adhesive DP100FR

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

Property	Values	Notes	Test Condition
Color	Cream	Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.	
Base Viscosity	45,000-90,000 cP	Brookfield RVF #7 spindle at 20 rpm.	Room Temperature
Accelerator Viscosity	40,000-120,000 cP	Brookfield RVF #7 spindle at 20 rpm.	Room Temperature
Base Resin	Epoxy		
Base Net Weight	10.6 to 11.0 lb/gal		
Accelerator Net Weight	10.1 to 10.5 lb/gal		
Mix Ratio by Volume (B:A)	1:1		
Mix Ratio by Weight (B:A)	1:0.95		

Typical Mixed Physical Properties

Property	Values	Test Condition	Notes
Worklife, 20g mixed	4 to 8 min	Room Temperature	Approximate time during which a 20 gram quantity of mixed resin at 73°F (23°C) will adequately wet out on a substrate.
Time to Handling Strength	10 to 20 min	Room Temperature	Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.
Time to Full Cure	24 to 48 h		Time to develop maximum overlap shear properties.

Typical Mixed Physical Properties (continued)

Rate of Strength Buildup (OLS)	Dwell/Cure Time
0 lb/in²	5 min @ Room Temperature
450 lb/in²	10 min @ Room Temperature
1250 lb/in²	20 min @ Room Temperature
1650 lb/in²	4 hr @ Room Temperature
2200 lb/in²	24 hr @ Room Temperature

Property: Rate of Strength Buildup (OLS)
Method: ASTM D1002
Test Condition : Room Temperature
Substrate: Aluminum
Substrate Notes: 0.032in thick; 7mil bondline
notes: The following product performance data were obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with the 3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR when applied to properly prepared substrates, cured, and tested according to the specifications indicated. This data was generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough manual mixing should afford comparable results. T-Peel strengths were measured on 1" wide bonds. The testing jaw separation rate was 10 inches per minute.

Typical Cured Characteristics

Property	Values	Notes	Method	Test Condition
Modulus	650,000 lb/in²	Determined using DMA.		
Color	Cream	Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.		
Shore D Hardness	87		ASTM D2240	Room Temperature

Electrical and Thermal Properties

Property	Values		Notes
Glass Transition Temperature (Tg) by DSC	61 °C	142 °F	Determined using DSC and heating rate of 68°F (20°C) per minute.

Typical Performance Characteristics

Overlap Shear Strength	Substrate	Surface Preparation
2200 lb/in²	Etched Aluminum	
1050 lb/in²	Aluminum	MEK/Abrade/MEK
1100 lb/in²	Cold Rolled Steel	MEK/Abrade/MEK
420 lb/in²	ABS	
240 lb/in²	Polyvinyl chloride (PVC)	

Table continued on next page

Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Surface Preparation
200 lb/in²	Polycarbonate (PC)	
145 lb/in²	Acrylic (PMMA)	
600 lb/in²	Fiberglass Reinforced Plastic	

Property: Overlap Shear Strength
Method: ASTM D1002
Test Condition : Room Temperature
Substrate Notes: 0.005-0.008in bondline
notes: The following product performance data were obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with the 3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR when applied to properly prepared substrates, cured, and tested according to the specifications indicated. This data was generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough manual mixing should afford comparable results. Overlap shear (OLS) strengths were measured on 1" wide 1/2" overlap specimens. These bonds were made individually using 1" x 4" pieces of substrate except for aluminum. Two panels 0.063" thick, 4" x 7" of 2024 T-3 clad aluminum were bonded and cut into 1" wide samples after 24 hours. The separation rate of the testing jaws was 0.1" per minute for metals, 2" per minute for plastics. The thickness of the substrates were: metals, 0.060"; plastics, 0.125".

Environmental Resistance (OLS)	Environmental Condition
2200 lb/in²	30 days at Room Tempterature
2100 lb/in²	Tap Water, 30 days @ Room Tempterature
2700 lb/in²	Salt Spray (30 days) Room Tempterature

Property: Environmental Resistance (OLS)
Method: ASTM D1002
Test Condition : Room Temperature
Substrate Notes: 0.005-0.008in bondline
notes: The following product performance data were obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with the 3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR when applied to properly prepared substrates, cured, and tested according to the specifications indicated. This data was generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough manual mixing should afford comparable results. Overlap shear (OLS) strengths were measured on 1" wide 1/2" overlap specimens. These bonds were made individually using 1" x 4" pieces of substrate except for aluminum. Two panels 0.063" thick, 4" x 7" of 2024 T-3 clad aluminum were bonded and cut into 1" wide samples after 24 hours. The separation rate of the testing jaws was 0.1" per minute for metals, 2" per minute for plastics. The thickness of the substrates were: metals, 0.060"; plastics, 0.125".

Overlap Shear Strength (at Temperature)	Test Condition
1250 lb/in²	@ -67°F(-53°C)
2200 lb/in²	Room Temperature
800 lb/in²	15 min @ 180°F(82°C)

Property: Overlap Shear Strength (at Temperature)
Method: ASTM D1002
Substrate Notes: 0.005-0.008in bondline
notes: The following product performance data were obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with the 3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR when applied to properly prepared substrates, cured, and tested according to the specifications indicated. This data was generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough manual mixing should afford comparable results. Overlap shear (OLS) strengths were measured on 1" wide 1/2" overlap specimens. These bonds were made individually using 1" x 4" pieces of substrate except for aluminum. Two panels 0.063" thick, 4" x 7" of 2024 T-3 clad aluminum were bonded and cut into 1" wide samples after 24 hours. The separation rate of the testing jaws was 0.1" per minute for metals, 2" per minute for plastics. The thickness of the substrates were: metals, 0.060"; plastics, 0.125".

Typical Performance Characteristics (continued)

90° T-Peel Adhesion: 2 lb/in width

Conditions
Dwell/Cure Time: 7 days @ Room Temperature
Test Condition : Room Temperature
Substrate: Etched 2024 T3 Aluminum
Substrate Notes: 0.032in thick; 17-20 mil bond line
Methods
ASTM D1876
Additional Information
notes: The following product performance data were obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with the 3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR when applied to properly prepared substrates, cured, and tested according to the specifications indicated. This data was generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough manual mixing should afford comparable results.
T-Peel strengths were measured on 1" wide bonds. The testing jaw separation rate was 10 inches per minute.

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.

Handling/Application Information (continued)

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.

Storage and Shelf Life

Store product at 60-80°F (16-27°C) for maximum storage life. Higher temperatures reduce normal storage life. Lower temperatures may cause increased viscosity of a temporary nature. Rotate stock on a "first in-first out" basis.
When stored in the original, unopened container at the storage conditions suggested, 3M™ Scotch-Weld™ Epoxy Adhesive DP100 FR has a shelf life of 24 months from the date of manufacture.

Industry Specifications

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

Trademarks

References

1. 3m.com Product Page
   Url: http://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Scotch-Weld-Epoxy-Adhesive-DP100FR?N=5002385+3293241729&rt=rud
2. Safety Data Sheet
   Url: https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP100FR

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

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 or (651) 737-6501.

Technical Information

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