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Technical Data Sheet

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

Product Details

Regulatory Info/SDS

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP100 Plus Clear is a flexible, fast setting, two-part, 1:1 mix ratio mercaptan-cured epoxy adhesive. It is unique among fast setting mercaptan cure epoxies in that it combines high shear strength with good peel performance properties. Scotch-Weld epoxy adhesive DP100 Plus Clear is clear when cured. Available in bulk containers as 3M™ Scotch-Weld™ Epoxy Adhesive DP100 Plus B/A Clear.

Product Features

- 2-5 minute worklife
- High shear and peel strength
- Flexible
- 1:1 mix ratio
- Recognized as meeting 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 [1]
Mix Ratio by Volume (B:A)	1:1

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

Attribute Name	Test Method	Temperature	Value
Base Color			Clear
Accelerator Color			Clear
Base Resin			Epoxy
Accelerator Resin			Mercaptan
Base Net Weight			9.65 — 9.9 lb/gal
Accelerator Net Weight			9.4 — 9.8 lb/gal
Base Density			9.4 — 9.8 lb/gal
Accelerator Density			9.65 — 9.9 lb/gal
Base Viscosity	3M C1d	27 °C (80 °F)	4000 — 11000 cP [1]
Accelerator Viscosity	3M C1d	27 °C (80 °F)	7000 — 13000 cP [1]

[1] Procedure involves Brookfield RVF, #7 spindle, 20 rpm. Measurement taken after 1 minute rotation.

Typical Mixed Physical Properties

Attribute Name	Test Method	Temperature	Value
Viscosity			9,662 cP
Worklife, 20g mixed	3M C3180	22 °C (72 °F)	2 - 5 min [1]
Set Time (min)		22 °C (72 °F)	15 min [2]
Time to Structural Strength		23 °C (73 °F)	5 h [3]

[1] Procedure involves periodically measuring a 20 gram mixed mass for self leveling and wetting properties. This time will also approximate the usable worklife in an 3M™ EPX™ Applicator mixing nozzle.

[2] Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

[3] Minimum time required to achieve 1000 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

Typical Cured Characteristics

Dwell Time: 7 d

Attribute Name	Test Method	Temperature	Value
Young's Modulus	ASTM D638, ISO 527	23 °C (73 °F)	10.413 MPa (1510 lb/in²) [1]
Shore D Hardness	ASTM D2240	23 °C (73 °F)	64
Poisson's Ratio	ASTM D638, ISO 527		0.39 [1]
Peak Stress	ASTM D638, ISO 527	23 °C (73 °F)	5.04 MPa (731 lb/in²) [2]
Elongation at Break	ASTM D638, ISO 527		68 % [2]

[1] Tested in accordance with ASTM D638 test method, Type IV dogbone. Jaw separation 5 mm/min at a strain range between 0.1 and 1.0%. Sample removed from a dry condition and tested after equilibriation at 25°C / 50%RH for 40 hrs.

[2] Tested in accordance with ASTM D638 test method, Type IV dogbone. Jaw separation 100 mm/min. Sample removed from a dry condition and tested after equilibriation at 25°C / 50%RH for 40 hrs.

Typical Performance Characteristics

Overlap Shear Strength

Temperature: 22 °C (72 °F)
Dwell Time: 7 d
Test Method: ASTM D1002, ISO 4587

Test Condition	Substrate	Surface Prep	Value
	Aluminum	Sandblasted	1,638 lb/in² [1]
	CRS	Acetone/Abrade/Acetone	1,125 lb/in² [1]
	ABS	IPA Wipe	203 lb/in² [1]
	Polycarbonate (PC)	IPA Wipe	395 lb/in² [1]
	Acrylic (PMMA)	IPA Wipe	241 lb/in² [1]
	FRP (Epoxy)	Acetone/Abrade/Acetone	1,049 lb/in² [1]
	FRP (Polyester)	Acetone/Abrade/Acetone	466 lb/in² [1]
-40°F	Aluminum	Sandblasted	1,116 lb/in² [2]
120°F	Aluminum	Sandblasted	214 lb/in² [2]
180°F	Aluminum	Sandblasted	160 lb/in² [2]
392°F	Aluminum	Sandblasted	110 lb/in² [2]

[1] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") x 1.5 mm (0.06") substrates.
Separation Rate 13 mm/min (0.05 in/min). 0.25 mm (10 mil) bondline.
Cohesive (CF), Adhesive (AF), Mixed Mode (MM), and Substrate (SF) Failure.

[2] Overlap shear (OLS) strengths were measured on 1in wide 1/2in overlap specimens on 1in x 4in x .060in substrates.
Jaw separation 0.1 in/min. 10 mil bondline.

Substrate: Aluminum
Surface Prep: Sandblasted
Temperature: 23 °C (72 °F)
Dwell Time: 7 d

Attribute Name	Test Method	Value
Bell Peel	DIN EN 1464	6.59 N/cm (3.76 lb/in width)

Attribute Name	Value

Attribute Name	Value
Additional Test notes	The following product performance data was obtained in the 3M laboratory under the conditions specified. The following data show typical results obtained with 3M™ Scotch-Weld™ Epoxy Adhesive DP100 Plus Clear 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 hand mixing should afford comparable results.

Typical Environmental Performance

Overlap Shear Strength

Substrate: Aluminum
Surface Prep: Sandblasted
Temperature: 23 °C (72 °F)
Dwell Time: 7 d
Test Method: ASTM D1002, ISO 4587

Environmental Condition	Value
85°C + 85%RH: 500 hrs	840 lb/in² [1]
Salt water (5% wt in water): 500 hrs	1,976 lb/in² [1]
Diesel Fuel: 500 hrs	2,124 lb/in² [1]
Gasoline: 500 hrs	1,757 lb/in² [1]
Water: 500 hrs	1,663 lb/in² [1]
49°C + 80%RH on PVC	660 lb/in² [1]

[1] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") x 1.5 mm (0.06") substrates. Separation Rate 13 mm/min (0.05 in/min). 0.25 mm (10 mil) bondline. Cohesive (CF), Adhesive (AF), Mixed Mode (MM), and Substrate (SF) Failure.

Electrical and Thermal Properties

Temperature: 40 °C (104 °F)

Attribute Name	Test Method	Value
Thermal Conductivity	ASTM E1530	0.198 W/m/K

Handling/Application Information

Directions for Use

1. 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 depends on the required bond strength and the environmental aging resistance desired by user. For specific surface preparations on common substrates, see the section on surface preparation.
2. Use gloves to minimize skin contact. Do not use solvents for cleaning hands.
3. Mixing
For Duo-Pak Cartridges
3M™ Scotch-Weld™ Epoxy Adhesive DP100 Plus Clear 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 ensure both sides of the duo-pak cartridge are flowing evenly and freely. If automatic mixing of Part A and Part B is desired, attach the EPX applicator 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 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 3 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), in order to speed curing. These products will cure in 48 hours @ 75°F (24°C).
7. Keep parts from moving during cure. Contact pressure necessary. Maximum shear strength is obtained with a 3-5 mil bond line.
8. Excess uncured adhesive can be cleaned up with methyl ethyl ketone (MEK).*
Adhesive Coverage:A 0.005 in thick bond line will yield a coverage of 320 sqft/gallon.
*Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer's precautions and directions for use.

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 directly depends on the required bond strength and the environmental aging resistance desired by user.
The following cleaning methods are suggested for 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.
4. If a primer is used, it should be applied within 4 hours after surface preparation.

Aluminum:
1. Alkaline Degrease: Oakite 164 solution (9-11 oz./gallon water) at 190°F ± 10°F (88°C ± 5°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 ± 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
3. Rinse: Rinse panels in clear running tap water.
4. Dry: Air dry 15 minutes; force dry 10 minutes at 190°F ± 10°F (88°C ± 5°C).
5. If primer is to be used, it should be applied within 4 hours after surface preparation.

Note: Read and follow component supplier's environmental health and safety information prior to preparing this etch solution.
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 MEK.*

*__Note:__When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer's precautions and directions for use.

Application Equipment

For small or intermittent applications, the 3M™ EPX™ Applicator is a convenient method of application.

For larger applications, these products 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.

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

Information

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Product Selection and Use

Intended Use: 3M™ Scotch-Weld ™ Epoxy Adhesive DP100 Plus Clear is intended for bonding of metals, glass, ceramics, mica, high and medium surface plastics, and some low surface energy surfaces, when
used in accordance with the guidance provided by 3M in this Technical Data Sheet and other product instructions. Since there are many factors that can affect a product's use, the customer remains responsible for determining whether the 3M product is suitable and appropriate for the customer's specific application and system, including customer conducting an appropriate risk assessment and evaluating the 3M product in customer's application and system.

Restricted Use: 3M advises against the use of this 3M product in any application other than the stated intended use(s), since other applications have not been evaluated by 3M and may result in an unsafe or unintended condition.

ISO Statement

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

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