February, 2019

3M™ Scotch-Weld™ Epoxy Adhesive DP100 Clear

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

Property	Values	Notes	Method	Test Condition
Color	Clear	Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.		
Base Viscosity	8,000-15,000 cP	Procedure involves Brookfield RVF, #6 spindle, 20 rpm. Measurement taken after 1 minute.	3M C1d	80°F(27°C)
Accelerator Viscosity	9,000-16,000 cP	Procedure involves Brookfield RVF, #6 spindle, 20 rpm. Measurement taken after 1 minute.	3M C1d	80°F(27°C)
Base Resin	Epoxy			
Base Net Weight	9.5 to 9.9 lb/gal			
Accelerator Net Weight	9.2 to 9.6 lb/gal			
Mix Ratio by Volume (B:A)	1:1			
Mix Ratio by Weight (B:A)	1:0.98			

Typical Mixed Physical Properties

Property	Values	Method	Test Condition	Notes	Substrate	Attribute Modifier	Dwell/Cure Time	Dwell Time Units	Temp C	Temp F	Substrate Notes
Worklife, 10g mixed	5 min	3M C548	Room Temperature	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.							
Time to Handling Strength	15 to 20 min	3M C3179	Room Temperature	Time to handling strength taken to be that required to achieve a 50 psi overlap shear (OLS) strength using aluminum substrates.	Aluminum						

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Typical Mixed Physical Properties (continued)

Property	Values	Method	Test Condition	Notes	Substrate	Attribute Modifier	Dwell/Cure Time	Dwell Time Units	Temp C	Temp F	Substrate Notes
Time to Full Cure	24 to 48 h		Room Temperature	The cure time is defined as that time required for the adhesive to achieve a minimum of 80% of the ultimate strength as measured by aluminum-aluminum OLS.							
Rate of Strength Buildup	400 lb/in²	ASTM D1002		Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024 T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in., other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in.	Aluminum	Overlap Shear Strength	20	min	22C	72F	7mil bondline
Rate of Strength Buildup	0 lb/in²	ASTM D1002		Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024 T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in., other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in.	Aluminum	Overlap Shear Strength	10	min	22C	72F	7mil bondline

Typical Physical Properties

Color: Translucent

Conditions
Attribute Modifier: Cured

Typical Cured Characteristics

Property	Values	Method	Dwell/Cure Time	Notes	Test Condition
Shore D Hardness	82	ASTM D2240	60 min @ Room Temperature		
Weight Loss by Thermal Gravimetric Analysis (TGA)	585°F(307°C)	ASTM E1131		Weight loss by Thermal Gravimetric Analysis reported as that temperature at which 5% weight loss occurs by TGA in air at 5°C (9°F) rise per minute.	
Compression Strength	8400 lb/in²	ASTM D695			Room Temperature

Typical Performance Characteristics

Overlap Shear Strength	Substrate	Substrate Notes	Surface Preparation	Notes
950 lb/in²	Aluminum	0.005-0.008in bondline	MEK/Abrade/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
1000 lb/in²	Cold Rolled Steel	0.005-0.008in bondline	MEK/Abrade/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Substrate Notes	Surface Preparation	Notes
950 lb/in²	Copper	0.005-0.008in bondline	MEK/Abrade/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
700 lb/in²	Brass	0.005-0.008in bondline	MEK/Abrade/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
750 lb/in²	Stainless Steel	0.005-0.008in bondline	MEK/Abrade/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
490 lb/in²	ABS	0.005-0.008in bondline	IPA Wipe/Abrade/IPA Wipe	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Substrate Notes	Surface Preparation	Notes
330 lb/in²	Polyvinyl chloride (PVC)	0.005-0.008in bondline	IPA Wipe/Abrade/IPA Wipe	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
250 lb/in²	Polycarbonate (PC)	0.005-0.008in bondline	IPA Wipe/Abrade/IPA Wipe	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
100 lb/in²	Acrylic (PMMA)	0.005-0.008in bondline		Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
950 lb/in²	Fiber-Reinforced Plastic	0.005-0.008in bondline	IPA Wipe/Abrade/IPA Wipe	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Substrate Notes	Surface Preparation	Notes
900 lb/in²	Galvanized Steel		MEK/Abrade/MEK	½" overlap; 0.010" bond line thickness; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; substrates used were 1/16" thick metals and 1/8" thick plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure mixed: AF/CF

Property: Overlap Shear Strength
Method: ASTM D1002
Dwell/Cure Time: 7
Dwell Time Units: days
Temp C: 23C
Temp F: 73F
Environmental Condition: 52%RH

Solvent Resistance	Environmental Condition
A	Immersed in Acetone one hour
A	Immersed in Acetone one month
A	Immersed in Isopropyl Alcohol one hour
B	Immersed in Isopropyl Alcohol one month
A	Immersed in Freon TF one hour
A	Immersed in Freon TF one month
A	Immersed in Freon TMC one hour
A	Immersed in Freon TMC one month
A	Immersed In 1, 1, 1 - Trichloroethane one hour
B	Immersed In 1, 1, 1 - Trichloroethane one month
A	Immersed in RMA Flux one hour
A	Immersed in RMA Flux one month

Property: Solvent Resistance
Dwell/Cure Time: 24 hr @ Room Temperature + 2 hr @ 160°F(71°C)
notes: Solvent resistance was determined using cured samples (1/2 in. x 4 in. x 1/8 in. thickness) immersed n the test solvent for 1 hour and 1 month. After the allotted period of time, the sample was removed and visually examined for surface attack as compared to the control. Key: A - Unaffected - no change to color or surface texture. B - Slight attack - noticeable swelling of surface. C - Moderate/severe attack - extreme swelling of surface.

T-Peel Adhesion	Substrate	Substrate Notes	Surface Preparation
2 lb/in width	Aluminum	0.032in thick; 17 - 20 mil bondline	
2 lb/in width	Aluminum	0.032in thick; 5 - 8 mil bondline	
2 lb/in width	Cold Rolled Steel	0.032in thick; 17 - 20 mil bondline	MEK/Abrade/MEK

Property: T-Peel Adhesion
Method: ASTM D1876
Dwell/Cure Time: 7
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
notes: Note: The following product performance data was obtained in the 3M laboratory under the conditions specified. The following data shows typical results obtained with 3M™ Scotch-Weld™ Epoxy Adhesives DP100 and DP100 NS when applied to properly prepared substrates, and tested according to the test methods indicated. T-peel strengths were measured on 1 in. wide bonds. The testing jaw separation rate was 20 inches per minute.

Electrical and Thermal Properties

Property	Values		Test Condition	Notes	Method
Glass Transition Temperature (Tg)	33 °C	91 °F	Mid-Point	Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.	
Volume Resistivity	3.5 × 10^12 Ω-cm		Room Temperature		ASTM D257
Coefficient of Thermal Expansion	60 × 10^-6 m/m/°C		-40°C to 20°C (-38°F to 68°F)	Coefficient of thermal expansion determined using DuPont (TMA) using a heating rate of 10°C (50°F) per minute. Second heat values given.	
Coefficient of Thermal Expansion	209 × 10^-6 m/m/°C		60°C to 120°C (140°F to 248°F)	Coefficient of thermal expansion determined using DuPont (TMA) using a heating rate of 10°C (50°F) per minute. Second heat values given.	

Handling/Application Information

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.

Handling/Application Information (continued)

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 suppled 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 make 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.

Handling/Application Information (continued)

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.

Storage and Shelf Life

Store products at 60-80°F (16-27°C) for maximum storage life. Rotate on "first in-first out" basis.
When stored as recommended in original unopened container, this product has a shelf life of 24 months from date of manufacture.

Industry Specifications

UL 94 HB

Trademarks

3M, Scotch-Weld and EPX are trademarks of 3M Company.

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Scotch-Weld-Epoxy-Adhesive-DP100?N=5002385+3293242434&rt=rud
Safety Data Sheet (SDS)	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP100 Clear

Family Group

	DP100 Clear	DP100NS Translucent
Color Attribute Modifier: Cured	Translucent	Translucent
Time to Handling Strength (min) Test Condition: Room Temperature Substrate: Aluminum	15 to 20	15 to 20

ISO Statement

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

Information

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