

February, 2019

# 3M™ Scotch-Weld™ Epoxy Adhesive DP460 Off White

## Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP460 Off-White is a high performance, two-part epoxy adhesive offering outstanding shear and peel adhesion, and very high levels of durability.

## Product Features

- High shear strength
- 60 minute work life
- Easy mixing
- High peel strength
- 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

Property	Values	Test Condition
Base Color	White	
Accelerator Color	Amber	
Base Viscosity	20,000 - 50,000 cP	Room Temperature
Accelerator Viscosity	8,000 - 14,000 cP	Room Temperature
Base Resin	Epoxy	
Accelerator Resin	Amine	
Base Net Weight	9.3 to 9.7 lb/gal	
Accelerator Net Weight	8.8 to 9.2 lb/gal	
Mix Ratio by Volume (B:A)	2:1	
Mix Ratio by Weight (B:A)	2:0.96	

Typical Mixed Physical Properties

Property	Values	Test Condition
Worklife, 20g mixed	60 min	Room Temperature
Worklife, 10g mixed	75 min	Room Temperature
Worklife, 5g mixed	90 min	Room Temperature

Rate of Strength Buildup (OLS)	Dwell/Cure Time
400 lb/in²	5hr @ Room Temperature
1000 lb/in²	6 hr @ Room Temperature
3500 lb/in²	7 hr @ Room Temperature
4000/60 lb/in²	24 hr @ Room Temperature
<50 lb/in²	30 min @ 120°F(49°C)
1300 lb/in²	60 min @ 120°F(49°C)
4300/60 lb/in²	90 min @ 120°F(49°C)
4400/60 lb/in²	2 hr @ 120°F(49°C)
4800/60 lb/in²	3 hr @ 120°F(49°C)
3000/60 lb/in²	30 min @ 160°F(71°C)

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Typical Mixed Physical Properties (continued)

Rate of Strength Buildup (OLS)	Dwell/Cure Time
4500/60 lb/in²	60 min @ 160°F(71°C)
4800 lb/in²	2 hr @ 160°F(71°C)

Property: Rate of Strength Buildup (OLS)  
Method: ASTM D1002  
Test Condition : Room Temperature  
Substrate: Aluminum  
Substrate Notes: 7mil bondline  
notes: The average bondline temperature during the cure time will be somewhat lower than the oven temperature. The value in the denominator is the expected minimum 73°F (23°C) T-peel strength (piw) measured after the indicated cure cycle. NOTE: The data in this Technical Data Sheet were generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer’s directions. Thorough hand-mixing will afford comparable results.

Typical Cured Characteristics

Property	Values	Test Condition	Method
Color	Off-White	Cured	
Shore D Hardness	75 to 80	Room Temperature	ASTM D2240

Typical Performance Characteristics

Overlap Shear Strength	Test Condition	Substrate	Dwell/Cure Time	Surface Preparation	Failure mode
4500 lb/in²	-67°F(-55°C)	Aluminum			
4500 lb/in²	Room Temperature	Aluminum			
700 lb/in²	180°F(82°C)	Aluminum	15 min @ 180°F(82°C)		
1000 lb/in²	180°F(82°C)	Aluminum	30 min @ 180°F(82°C)		
1400 lb/in²	180°F(82°C)	Aluminum	60 min @ 180°F(82°C)		
2500 lb/in²	180°F(82°C)	Aluminum	4hr @ 180°F(82°C)		
220 lb/in²	250°F(121°C)	Aluminum	15 min @ 250°F(121°C)		
4500 lb/in²	Room Temperature	Etched Aluminum			
3200 lb/in²	Room Temperature	Aluminum		Oakite degreased	
3500 lb/in²	Room Temperature	Aluminum		MEK/Abrade/MEK	
3500 lb/in²	Room Temperature	Cold Rolled Steel		Oakite degreased	
2800 lb/in²	Room Temperature	Cold Rolled Steel		MEK/Abrade/MEK	
4000 lb/in²	Room Temperature	Copper		MEK/Abrade/MEK	
4000 lb/in²	Room Temperature	Brass		CDA 260	
4200 lb/in²	Room Temperature	Brass		Cartridge	
4000 lb/in²	Room Temperature	Stainless Steel		MEK/Abrade/MEK	

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## Typical Performance Characteristics (continued)

Overlap Shear Strength	Test Condition	Substrate	Dwell/Cure Time	Surface Preparation	Failure mode
2000 lb/in <sup>2</sup>	Room Temperature	Galvanized Steel		Hot Dipped, Oakite degreased	
2100 lb/in <sup>2</sup>	Room Temperature	Galvanized Steel		Electrodeposited, Oakite degreased	
300 lb/in <sup>2</sup>	Room Temperature	ABS		IPA Wipe	
575 lb/in <sup>2</sup>	Room Temperature	ABS		IPA Wipe/Abrade/IPA Wipe	
500 lb/in <sup>2</sup>	Room Temperature	Polyvinyl chloride (PVC)		IPA Wipe	
350 lb/in <sup>2</sup>	Room Temperature	Polyvinyl chloride (PVC)		IPA Wipe/Abrade/IPA Wipe	
400 lb/in <sup>2</sup>	Room Temperature	Polycarbonate (PC)		IPA Wipe	
500 lb/in <sup>2</sup>	Room Temperature	Polycarbonate (PC)		IPA Wipe/Abrade/IPA Wipe	
220 lb/in <sup>2</sup>	Room Temperature	Acrylic (PMMA)		IPA Wipe	
330 lb/in <sup>2</sup>	Room Temperature	Acrylic (PMMA)		IPA Wipe/Abrade/IPA Wipe	
450 lb/in <sup>2</sup>	Room Temperature	Polystyrene Foam		IPA Wipe	
475 lb/in <sup>2</sup>	Room Temperature	Polystyrene Foam		IPA Wipe/Abrade/IPA Wipe	SF
800 lb/in <sup>2</sup>	Room Temperature	Fiberglass Reinforced Plastic		IPA Wipe	
1000 lb/in <sup>2</sup>	Room Temperature	Fiberglass Reinforced Plastic		IPA Wipe/Abrade/IPA Wipe	SF
1400 lb/in <sup>2</sup>	Room Temperature	Phenolic		IPA Wipe	SF
1400 lb/in <sup>2</sup>	Room Temperature	Phenolic		IPA Wipe/Abrade/IPA Wipe	SF
150 lb/in <sup>2</sup>	Room Temperature	SBR to Steel		IPA Wipe	SF
140 lb/in <sup>2</sup>	Room Temperature	SBR to Steel		IPA Wipe/Abrade/IPA Wipe	SF
100 lb/in <sup>2</sup>	Room Temperature	Neoprene Rubber to Steel		IPA Wipe	
120 lb/in <sup>2</sup>	Room Temperature	Neoprene Rubber to Steel		IPA Wipe/Abrade/IPA Wipe	SF

Property: Overlap Shear Strength

Method: ASTM D1002

Substrate Notes: 0.005-0.008in bondline

notes: 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)

## Typical Performance Characteristics (continued)

T-Peel Adhesion	Test Condition	Substrate	Substrate Notes	Surface Preparation
5 to 10 lb/in width	-67°F(-55°C)	Aluminum	0.032in thick	
60 lb/in width	Room Temperature	Aluminum	0.032in thick	
3 to 5 lb/in width	180°F(82°C)	Aluminum	0.032in thick	
60 lb/in width	Room Temperature	Etched Aluminum	0.032in thick; 17 - 20 mil bondline	
50 lb/in width	Room Temperature	Etched Aluminum	0.032in thick; 5- 8 mil bondline	
40 lb/in width	Room Temperature	Cold Rolled Steel	0.032in thick; 17 - 20 mil bondline	Oakite degrease
25 lb/in width	Room Temperature	Cold Rolled Steel	0.032in thick; 17 - 20 mil bondline	MEK/Abrade/MEK

Property: T-Peel Adhesion

Method: ASTM D1876

notes: T-peel strengths were measured on 1 in. wide bonds. The testing jaw separation rate was 20 inches per minute.

Environmental Resistance (OLS)	Environmental Condition	Test Condition	Substrate	Substrate Notes	Notes
5200 lb/in <sup>2</sup>	30 days @ Room Temperature	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
5100 lb/in <sup>2</sup>	30 days immersed in Distilled Water	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.

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## Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Test Condition	Substrate	Substrate Notes	Notes
4500 lb/in <sup>2</sup>	30 days in Water Vapor @120°F (49°C)/100% RH	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
3100 lb/in <sup>2</sup>	14 days in Water Vapor @200°F (93°C)/100% RH	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
5000 lb/in <sup>2</sup>	30 days immersed in Antifreeze/H <sub>2</sub> O (50/50) @180°F (82°C)	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
5700 lb/in <sup>2</sup>	30 days immersed in Isopropyl Alcohol @ Room Temperature	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.

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## Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Test Condition	Substrate	Substrate Notes	Notes
4200 lb/in <sup>2</sup>	30 days immersed in Methyl Ethyl Ketone @ Room Temperature	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
5100 lb/in <sup>2</sup>	30 days in Salt Spray (5%) @95°F (35°C)	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
3700 lb/in <sup>2</sup>	30 days immersed in Skydrol LD-4 @150°F (66°C)	Room Temperature	Etched Aluminum	0.005-0.008in bondline	Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet. 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.
2200 lb/in <sup>2</sup>	30 days @ Room Temperature		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2300 lb/in <sup>2</sup>	30 days immersed in Distilled Water		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.

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## Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Test Condition	Substrate	Substrate Notes	Notes
1900 lb/in <sup>2</sup>	30 days in Water Vapor @120°F (49°C)/100% RH		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
1500 lb/in <sup>2</sup>	14 days in Water Vapor @200°F (93°C)/100% RH		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2000 lb/in <sup>2</sup>	30 days immersed in Antifreeze/H <sub>2</sub> O (50/50) @180°F (82°C)		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2000 lb/in <sup>2</sup>	30 days immersed in Isopropyl Alcohol @ Room Temperature		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2000 lb/in <sup>2</sup>	30 days immersed in Methyl Ethyl Ketone @ Room Temperature		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2300 lb/in <sup>2</sup>	30 days immersed in Trichloroethane @ Room Temperature		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
1900 lb/in <sup>2</sup>	30 days in Salt Spray (5%) @95°F (35°C)		Hot Dipped Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2300 lb/in <sup>2</sup>	30 days @ Room Temperature		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.

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## Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Test Condition	Substrate	Substrate Notes	Notes
2300 lb/in <sup>2</sup>	30 days immersed in Distilled Water		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2000 lb/in <sup>2</sup>	30 days in Water Vapor @120°F (49°C)/100% RH		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
1000 lb/in <sup>2</sup>	14 days in Water Vapor @200°F (93°C)/100% RH		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
1950 lb/in <sup>2</sup>	30 days immersed in Antifreeze/H <sub>2</sub> O (50/50) @180°F (82°C)		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2200 lb/in <sup>2</sup>	30 days immersed in Isopropyl Alcohol @ Room Temperature		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2200 lb/in <sup>2</sup>	30 days immersed in Methyl Ethyl Ketone @ Room Temperature		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
2300 lb/in <sup>2</sup>	30 days immersed in Trichloroethane @ Room Temperature		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.
1500 lb/in <sup>2</sup>	30 days in Salt Spray (5%) @95°F (35°C)		Electrodeposited Galvanized Steel		Galvanized steels may afford a wide spectrum of performance due to the diversity of surfaces available. The user should test to determine specific performance. Data reported are actual values from the lots tested and may be higher than values published elsewhere in this Technical Data Sheet.

Property: Environmental Resistance (OLS)

Method: ASTM D1002

3M™ EPX™ Pneumatic Applicator Delivery Rates

Property	Values	Test Condition	Notes
Pneumatic Applicator Delivery Rates	31.1 g/min	200 ml Applicator – Maximum Pressure 58 psi. 6mm Nozzle	Tests were run at a temperature of 70°F ± 2°F (21°C ± 1°C) and at maximum applicator pressure.
Pneumatic Applicator Delivery Rates	132 g/min	200 ml Applicator – Maximum Pressure 58 psi. 10mm Nozzle	Tests were run at a temperature of 70°F ± 2°F (21°C ± 1°C) and at maximum applicator pressure.

Electrical and Thermal Properties

Property	Values	Method	Test Condition
Dielectric Strength	1100 V/mil	ASTM D149	Room Temperature
Thermal Conductivity	0.104 (btu-ft)/(h-ft²-°F)		113°F(45°C)
Volume Resistivity	2.4 × 10 <sup>14</sup> Ω-cm	ASTM D257	Room Temperature
Coefficient of Thermal Expansion	59 × 10 <sup>-6</sup> m/m/°C		Below Tg
Coefficient of Thermal Expansion	159 × 10 <sup>-6</sup> m/m/°C		Above Tg

Handling/Application Information

Directions for Use

3M™ Scotch-Weld™ Epoxy Adhesives DP460 Off-White is supplied in dual syringe plastic duo-pak cartridges as part of the 3M™ EPX™ Applicator System. The duo-pak cartridges are supplied in 50 ml, 200 ml and 400 ml configurations. To use the 50 ml cartridge 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.

With the 200 ml and 400 ml cartridges, the nozzle must be attached before dispensing any material to prevent unmixed adhesive from getting into the applicator cartridge holder. A small quantity of material should be discarded until uniform color, consistency of product and even flow is evident.

When mixing Part A and Part B manually, the components must be mixed in the ratio indicated in the typical uncured properties section. Complete 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 uses because of their variable shot size and flow rate characteristics and are adaptable to most applications.

# 3M™ Scotch-Weld™ Epoxy Adhesive DP460 Off White

## Handling/Application Information (continued)

### Surface Preparation

The following surface preparations were used for substrates described in this Technical Data Sheet.

#### A. Aluminum Etch

Optimized FPL Etch - 3M (test method C-2803)

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 (3M test method C-2802).

2. Optimized FPL Etch Solution (1 liter):

Material	Amount
Distilled Water	700 ml plus balance of liter (see below)
Sodium Dichromate	28 to 67.3 grams
Sulfuric Acid	287.9 to 310.0 grams
Aluminum Chips	1.5 grams/liter of mixed solution

To prepare 1 liter of this solution, dissolve sodium dichromate in 700 ml of distilled water. Add sulfuric acid and mix well. Add additional distilled water to fill to 1 liter.

Heat mixed solution to 66 to 71°C (150 to 160°F). Dissolve

1.5 grams of 2024 bare aluminum chips per liter of mixed solution. Gentle agitation will help aluminum dissolve in about 24 hours.

To FPL etch panels, place them in the above solution at 150 to 160°F (66 to 71°C) for 12 to 15 minutes.

Note: Review and follow precautionary information provided by chemical suppliers prior to preparation of this etch solution.

3. Rinse immediately in large quantities of clear running tap water.

4. Dry – air dry approximately 15 minutes followed by force dry at 140°F (60°C) maximum for 10 minutes (minimum).

5. Both surface structure and chemistry play a significant role in determining the strength and permanence of bonded structures. It is therefore advisable to bond or prime freshly primed clean surfaces as soon as possible after surface preparation in order to avoid contamination and/or mechanical damage. Please contact your 3M sales representative for primer recommendations.

#### B. Oakite Degrease

Oakite 164 solutions (9-11 oz./gallon of water) at 190°F ± 10°F (88°C ± 5°C) for 2 minutes. Rinse immediately in large quantities of cold running water.

#### C. MEK/Abrade/MEK

Wipe surface with a methyl ethyl ketone (MEK) soaked swab, abrade and wipe with a MEK soaked swab.\* Allow solvent to evaporate before applying adhesive.

#### D. Isopropyl Alcohol Wipe

Wipe surface with an isopropyl alcohol soaked swab.\* Allow solvent to evaporate before applying adhesive.

#### E. Isopropyl Alcohol/Abrade/Isopropyl Alcohol

Wipe surface with an isopropyl alcohol soaked swab, abrade using clean fine grit abrasives, and wipe with an isopropyl alcohol soaked swab.\* Then allow solvent to evaporate before applying adhesive.

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

## Storage and Shelf Life

Store products at 60-80°F (15-27°C) for maximum shelf life.

These products have a shelf life of 24 months from date of manufacture in original containers at room temperature.

## Industry Specifications

UL 94 HB

NFPA 130 test report details (ASTM E162, ASTM E662, BSS 7239, SMP 800-C)

## Trademarks

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

3M™ Scotch-Weld™ Epoxy Adhesive DP460 Off White

References

Property	Values
3m.com Product Page	<a href="https://www.3m.com/3M/en_US/company-us/all-3m-products/~ /3M-Scotch-Weld-Epoxy-Adhesive-DP460?N=5002385+3293241275&amp;rt=rud">https://www.3m.com/3M/en_US/company-us/all-3m-products/~ /3M-Scotch-Weld-Epoxy-Adhesive-DP460?N=5002385+3293241275&amp;rt=rud</a>
Safety Data Sheet (SDS)	<a href="https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&amp;msdsLocale=en_US&amp;co=ptn&amp;q=DP460 Off White">https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&amp;msdsLocale=en_US&amp;co=ptn&amp;q=DP460 Off White</a>

Family Group

	DP460 Off White	DP460NS
Color Test Condition: Cured	Off-White	Off-White
Shore D Hardness Test Condition: Room Temperature	75 to 80	78 to 84

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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