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3M™ Scotch-Weld™ Epoxy Adhesive DP405 Black

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP405 Black is a two-part, 2:1 mix ratio, toughened epoxy structural adhesive which has a 5 minute work life and accelerated cure. It exhibits excellent shear and peel strengths along with good impact resistance and durability. It bonds extremely well to many metal and composite surfaces. It also has lower odor when compared to traditional fast cure epoxies and acrylic adhesives.

Product Features

- Excellent shear and peel strengths
- 5-minute work life
- Easy mixing
- Low odor

3M™ Scotch-Weld™ Epoxy Adhesive DP405 Black

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	Notes
Base Color	Black		
Accelerator Color	Clear		
Base Viscosity	11,000 cP	Room Temperature	Brookfield RVF #7 spindle at 20 rpm.
Accelerator Viscosity	6,500 cP	Room Temperature	Brookfield RVF #7 spindle at 20 rpm.
Base Resin	Epoxy		
Base Net Weight	Approx. 10 lb/gal		
Accelerator Net Weight	Approx. 9.2 lb/gal		
Mix Ratio by Volume (B:A)	2:1		
Mix Ratio by Weight (B:A)	2.1:1		

Typical Mixed Physical Properties

Property	Values	Test Condition	Notes
Worklife	4 min	(Nozzle Mixed) @ Room Temperature	Maximum time that adhesive can remain in a static mixing nozzle and still be expelled without undue force on the applicator.
Applied Open Time	3 min		Approximate time after application of adhesive that bonds can be made without adversely affecting wetting out of adhesive and ultimate performance levels.
Time to Handling Strength	8 to 10 min	Room Temperature	Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

Typical Mixed Physical Properties (continued)

Rate of Strength Buildup (OLS)	Dwell/Cure Time
43 lb/in²	15 min @ Room Temperature
110 lb/in²	30min @ Room Temperature
240 lb/in²	1hr @ Room Temperature
630 lb/in²	2hr @ Room Temperature
1630 lb/in²	3hr @ Room Temperature
2200 lb/in²	5hr @ Room Temperature
4410 lb/in²	6hr @ Room Temperature
4790 lb/in²	24 hr @ Room Temperature
970 lb/in²	15 min @ 120°F(49°C)
3090 lb/in²	30min @ 120°F(49°C)
4380 lb/in²	15 min @ 140°F(60°C)
5900 lb/in²	30min @ 140°F(60°C)

Property: Rate of Strength Buildup (OLS)
Method: ASTM D1002
Test Condition : Room Temperature
Substrate: Aluminum
Substrate Notes: 0.005in bondline
notes: Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

Typical Cured Characteristics

Property	Values	Notes	Method	Test Condition
Color	Black	Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.		
Shore D Hardness	75 to 80		ASTM D2240	Room Temperature

Typical Performance Characteristics

Peel Adhesion (Non-linered Side): 2860 N/cm

Conditions
Substrate: Cushioned Sleeve A
Methods
ASTM D3330 (modified)

Typical Performance Characteristics (continued)

Bell Peel	Test Condition
18 lb/in width	@ -67°F(-55°C)
40 lb/in width	Room Temperature
8 lb/in width	@ 180°F(82°C)

Property: Bell Peel
Method: ASTM D3167
Dwell/Cure Time: 7 days @ Room Temperature
Substrate: Aluminum
Substrate Notes: 0.025in thick; 0.064in bondline
notes: Bell peel strengths were measured on 1/2 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute.

Overlap Shear Strength	Substrate	Surface Preparation	Notes
2580 lb/in²	Aluminum	MEK/Abrade/MEK	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
2260 lb/in²	Cold Rolled Steel	MEK/Abrade/MEK	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
2300 lb/in²	Copper	MEK/Abrade/MEK	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Surface Preparation	Notes
2830 lb/in²	Brass	MEK/Abrade/MEK	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
2050 lb/in²	Galvanized Steel	MEK/Abrade/MEK	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
300 lb/in²	ABS		Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
370 lb/in²	Polyvinyl chloride (PVC)		Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Surface Preparation	Notes
360 lb/in²	Polycarbonate (PC)		Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
2070 lb/in²	FRP (Epoxy)		Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
1200 lb/in²	Phenolic		Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

Property: Overlap Shear Strength
Method: ASTM D1002
Dwell/Cure Time: 7 days @ Room Temperature
Test Condition : Room Temperature
Substrate Notes: 0.005in bondline

Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Notes
4610 lb/in²	Methyl Ethyl Ketone: 30 days immersion @ Room Tempterature	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
4540 lb/in²	Gasoline: 30 days immersion @ Room Tempterature	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
5030 lb/in²	Diesel Fuel: 30 days immersion @ Room Tempterature	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure
4840 lb/in²	50% Antifreeze: 30 days immersion @ Room Tempterature	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure

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Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Notes
4790 lb/in²	Room Temperature, Room Tempterature, 30 days	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
4420 lb/in²	Water Vapor, 150°F(66°C) 80% RH, 30 days	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
3820 lb/in²	Water Soak, Room Tempterature, 30 days	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
5400 lb/in²	@ 80°C (176°F) 30 days	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

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Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Notes
3900 lb/in²	Salt Spray, 38°C/5% NaCl, 14 days	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
4830 lb/in²	IPA, Room Tempterature, 30 days immersion	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
4990 lb/in²	Motor Oil, Room Tempterature, 30 days immersion	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.
5340 lb/in²	Thermal Cycle, (-30°C/23°C/100%RH/70°C), 30 days	Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

Property: Environmental Resistance (OLS)
Method: ASTM D1002
Dwell/Cure Time: 7 days @ Room Temperature
Test Condition : Room Temperature
Substrate: Etched Aluminum
Substrate Notes: 0.005in bondline

Typical Performance Characteristics (continued)

Overlap Shear Strength (at Temperature)	Test Condition
4500 lb/in²	@ -67°F(-55°C)
4500 lb/in²	Room Temperature
630 lb/in²	15 min @ 180°F(82°C) in test chamber before test
750 lb/in²	30 min @ 180°F(82°C) in test chamber before test
940 lb/in²	60 min @ 180°F(82°C) in test chamber before test
900 lb/in²	4 hr @ 180°F(82°C) in test chamber before test
400 lb/in²	15 min @ 250°F(121°C) in test chamber before test

Property: Overlap Shear Strength (at Temperature)
Method: ASTM D1002
Dwell/Cure Time: 7 days @ Room Temperature
Substrate: Aluminum
Substrate Notes: 0.005in bondline
notes: Overlap Shear strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y 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, 0.125in.; plastics, 0.125 in. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

Electrical and Thermal Properties

Property	Values	Method	Test Condition	Notes
Dielectric Constant	4.1	ASTM D150	1 KHz, Room Temperature	
Dissipation Factor	0.016	ASTM D150	1 KHz, Room Temperature	
Dielectric Strength	764 V/mil	ASTM D149	Room Temperature	
Volume Resistivity	4.4 × 10^15 Ω-cm	ASTM D257	Room Temperature	
Coefficient of Thermal Expansion	105 × 10^-6		@ 60-212°F(20-100°C)	Determined using Thermal Mechanical Analysis (TMA) and heating rate of 41°F (5°C) per minute. First heat values given.
Coefficient of Thermal Expansion	180 × 10^-6		@ 68-158°F(20-70°C)	Determined using Thermal Mechanical Analysis (TMA) and heating rate of 41°F (5°C) per minute. First heat values given.

Handling/Application Information

Directions for Use

3M™ Scotch-Weld™ Epoxy Adhesive DP405 Black is supplied in dual syringe plastic duo- pak cartridges as part of the 3M™ EPX™ Applicator System. The duo-pak cartridges are supplied in 37 ml, 200 ml and 400 ml configurations. To use the EPX cartridge system simply insert the duo-pak cartridge into the EPX applicator. 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 typical uncured properties section of this data sheet. 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.
Apply adhesive to clean, dry surfaces, joint parts and secure until adhesive sets (see rate of strength build up).

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.
*Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer’s precautions and directions for use.
D. Isopropyl Alcohol Wipe Only Surface Preparation
Wipe surface with an isopropyl alcohol soaked swab.* 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.
E. Isopropyl Alcohol/Abrade/Isopropyl Alcohol Surface Preparation
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) or refrigerate for maximum shelf life.
These products have a shelf life of 18 months from date of manufacture in original duo-pak containers at room temperature.

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-DP405?N=5002385+3293242437&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=DP405 Black

ISO Statement

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

Technical Information

The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.

Product Selection and Use

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