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Technical Data Sheet

3M™ Scotch-Weld™ Epoxy Adhesive DP190 Translucent

Product Details

Regulatory Info/SDS

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP190 Translucent is a 1:1 mix ratio similar to 3M™ Scotch-Weld™ Epoxy Adhesive 2216 B/A Translucent but faster curing.

Product Features

- 90 minute worklife
- Excellent shear and peel strength
- Flexible
- 1:1 mix ratio
- Translucent

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	Test Method	Temperature	Value
Mix Ratio by Volume (B:A)			1:1
Color			Translucent [1]
Base Resin			Epoxy
Base Color			Clear
Mix Ratio by Weight (B:A)			1.15:1
Accelerator Color			Amber
Accelerator Resin			Amine
Accelerator Viscosity		27 °C (80 °F)	7000 — 15000 cP [2]
Base Net Weight			1.11 — 1.16 g/cm³ (9.3 — 9.7 lb/gal)
Accelerator Net Weight			0.98 — 1.03 g/cm³ (8.2 — 8.6 lb/gal)
Base Viscosity	3M C1d	27 °C (80 °F)	2000 - 8000 cP [3]

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

[2] Viscosity measured using Brookfield RTV, spindle #7, 20 RPM

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

Typical Mixed Physical Properties

Attribute Name	Temperature	Value
Open Time		90 min [1]
Time to Handling Strength	23 °C (73 °F)	5 h

[1] Max time allowed after applying adhesive to a substrate before bond must be closed and fixed. Cure times approximate and depend on adhesive temperature. Hotmelts: The approx. bonding range of a 3.2 mm (1/8 in) bead of molten adhesive on a non-metallic surface.

Typical Physical Properties

Attribute Name	Value
Cured Color	Translucent

Typical Cured Characteristics

Temperature: 23 °C (73 °F)

Attribute Name	Test Method	Value
Shore D Hardness	ASTM D2240	61

Typical Performance Characteristics

Overlap Shear Strength

Temperature: 23 °C (73 °F)
Test Method: ASTM D1002, ISO 4587

Dwell Time	Substrate	Surface Prep	Value
7 d	Polycarbonate (PC)	IPA Wipe	929 (MM) lb/in² [1]
7 d	Acrylic (PMMA)	IPA Wipe	492 (AF) lb/in² [1]
24 h	Aluminum	Etched	2041 lb/in² [1]
7 d	FRP (Epoxy)	Acetone/Abrade/Acetone	2659 (AF/SF) lb/in² [1]
7 d	CRS	Acetone/Abrade/Acetone	1010 (MM) lb/in² [1]
7 d	FRP (Polyester)	Acetone/Abrade/Acetone	1341 (MM/SF) lb/in² [1]
7 d	ABS	IPA Wipe	343 (AF) lb/in² [1]
7 d	Polyvinyl chloride (PVC)	IPA Wipe/Abrade/IPA Wipe	462 (AF) lb/in² [1]

[1] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.13-0.20 mm (5-8 mil)
Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber
Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3-1.6 mm (50-64 mil), rubber and plastic 3.2 mm (125 mil)
Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

Substrate: Aluminum
Surface Prep: Etched
Temperature: 23 °C (73 °F)
Test Condition: 23 °C

Attribute Name	Test Method	Value
Bell Peel	ASTM D3167	70 lb/in width [1]

[1] Floating roller peel; adhesives allowed to cure for 24 hours @RT; 25 mm (1 in) wide samples;
Samples pulled at 15 mm/min (6 in/min)
Cohesive (CF), Adesive (AF) and Substrate (SF) Failure

Test Method: ASTM D638, ISO 527

Attribute Name	Temperature	Test Condition	Value
Modulus			1,376 lb/in²
Elongation	23 °C (73 °F)	10 mm/min	339 % [1]

[1] Type IV dogbone

Substrate: Aluminum
Test Condition: Pendulum Impact

Attribute Name	Test Method	Value
Impact Shear Strength	ASTM D950	12.4 J [1]

[1] 21.7J Hammer

Overlap Shear Strength

Substrate: Aluminum
Surface Prep: Sandblasted
Temperature: 23 °C (73 °F)
Dwell Time: 7 d
Test Method: ASTM D1002, ISO 4587

Test Condition	Value
49 °C (120 °F)	217 (MM) lb/in² [1]
82 °C (180 °F)	107 (MM) lb/in² [1]
200 °C (392°F)	89 (MM) lb/in² [1]
-40 °F	2097 (MM) lb/in² [1]

[1] Overlap shear (OLS) strengths were measured on 25 mm wide x 13 mm overlap (1 x 0.5 in) specimens on 25 x 102 x 1.5 mm (1 x 4 x 0.06 in) substrates.
Jaw separation 2.5 mm/min (0.1 in/min). 0.25 mm (10 mil) bondline.

Typical Environmental Performance

Overlap Shear Strength

Temperature: 23 °C (73 °F)
Dwell Time: 7 d
Test Method: ASTM D1002, ISO 4587

Environmental Condition	Substrate	Surface Prep	Value
Salt water (5% wt in water): 500 hrs	Aluminum	MEK,Sandblast,MEK	1,289 lb/in² [1]
49 °C + 80 %RH	PVC	50/50 IPA	831 lb/in² [1]
Water: 500 hrs	Aluminum	MEK,Sandblast,MEK	1,128 lb/in² [1]
200°C / 30 minutes	Cold Rolled Steel	Acetone/Abrade/Acetone	3,440 lb/in² [1]
85 °C + 85 %RH: 500 hrs	Aluminum	MEK,Sandblast,MEK	1,775 lb/in² [1]
Diesel Fuel: 500 hrs	Aluminum	MEK,Sandblast,MEK	1,458 lb/in² [1]
200°C / 30 minutes	Aluminum	MEK,Sandblast,MEK	2,542 lb/in² [1]

[1] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.13-0.20 mm (5-8 mil)
Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber
Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3-1.6 mm (50-64 mil), rubber and plastic 3.2 mm (125 mil)
Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

Electrical and Thermal Properties

Attribute Name	Test Method	Test Condition	Value
Glass Transition Temperature (Tg)			22 °C [1]
Thermal Conductivity	ASTM E1530	50 °C, 25 psi	0.16
Coefficient of Thermal Expansion		Above Tg	193.9 x 10^{-6} m/m/°C [2]
Coefficient of Thermal Expansion		Below Tg	88.7 x 10^{-6} m/m/°C [2]

[1] Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 10 °C per minute. Second heat values given.

[2] CTE determined using TMA Analyzer using a heating rate of 3 °C per minute. Second heat values given.

Handling/Application Information

Directions for Use

1. For high strength structural bonds, paints, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation necessary directly depends on the required bond strength and the environmental aging resistance desired by the user. For suggested surface preparations on common substrates, see the section on surface preparation.
2. Mixing
For Duo Pak Cartridges
3M™ Scotch-Weld™ Epoxy Adhesives DP190 Translucent 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 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.
3. For maximum bond strength, apply adhesive evenly to both surfaces to be joined.
4. Application to the substrates should be made within 75 minutes. Larger quantities and/or higher temperatures will reduce this working time.
5. 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 cure in 7 to 14 days @ 75°F (24°C).
6. Keep parts from moving during cure. Contact pressure necessary. Maximum shear strength is obtained with a 3-5 mil bond line.
7. Excess uncured adhesive can be cleaned up with ketone type solvents.*
*Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer’s precautions and directions for use.
Adhesive Coverage (typical): A 0.005 in. thick bondline will yield a coverage of 320 sqft/gallon.

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 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, 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 (87°C) ± 10°F 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 (65°C) ± 5°F.*
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 150°F (65°C) ± 10°F.
5. If primer is to be used, it should be applied within 4 hours after surface preparation.
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.*
2. Apply a thin coating (0.0001 in. or less) of 3M™ Scotch-Weld™ Metal Primer EC3901 or equivalent to the glass surfaces to be bonded and allow the primer to dry before bonding.
*Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow manufacturer’s precautions and directions for use.

Application Equipment

For smaller 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/proportioning/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.

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 24 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

Automotive Disclaimer

Select Automotive Applications:
This product is an industrial product and has not been designed or tested for use in certain automotive applications, such as automotive electric powertrain battery or high voltage applications, which may require the product to be manufactured in a IATF certified facility, meet a Ppk of 1.33 for all properties, undergo an automotive production part approval process (PPAP), or fully adhere to automotive design or quality system requirements (e.g., IATF 16949 or VDA 6.3). Customer assumes all responsibility and risk if customer chooses to use this product in these applications.

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ISO Statement

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

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