English
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Technical Data Sheet

3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 Black

Product Description

3M™Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 (or 3M™ Scotch- Weld™ Epoxy Potting Compound/Adhesive 270 B/A) is a two-part, low viscosity epoxy resin system designed primarily for potting, sealing, and encapsulation of many electronic components and is available in clear or black. Scotch-Weld epoxy potting compound/adhesive DP270 is noncorrosive to copper and offers good thermal shock resistance and excellent retention of electrical insulation properties under high humidity conditions.
3M™ Scotch-Weld™ epoxy potting compound/adhesive DP270 has a work life of approximately 70 minutes, a tack-free time of about 3 hours and is fully cured after 48 hours at 73°F (23°C). This product produces no exotherm in 5-10 gram masses and a very slight exotherm in larger masses.
3M™ Scotch-Weld™ epoxy potting compound/adhesive DP270 is ideal for the potting and encapsulation of many heat sensitive or delicate components such as glass diodes and sensors as well as for transformers, coils, chokes, relays, etc. It is available in the convenient 3M™ EPX™ Applicator System for multi-station usage and in bulk containers for larger volume applications.
Available in bulk containers as Scotch-Weld epoxy potting compound/adhesive 270 B/A.

Product Features

- Good Thermal Shock Resistance
- Excellent Electrical Properties
- Meets UL 94 HB (File No. E61941)
- Noncorrosive to Copper
- Long Worklife
- Negligible Exotherm

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 Mixed Physical Properties

Property	Values	Additional Information
Open Time	60 min	View

Notes: POR=Pop Off Rubber

Worklife	60 to 70 min	View

Temp C: 23C
Temp F: 73F

Time to Handling Strength	3 hr	View

Temp C: 23C
Temp F: 73F

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

Tack Free Time	3 hr

Time to Full Cure	48 hr	View

Temp C: 23C
Temp F: 73F

Notes: 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.

Cure Shrinkage	0.08 %

Typical Physical Properties

Property	Values	Additional Information
Color	Black	View

Test Name: Cured

UL Listing	94 HB (File No. E61941)

Typical Uncured Physical Properties

Property	Values	Additional Information
Base Color	Black	
Accelerator Color	Amber	
Base Viscosity	7000 to 16000 cP	View

Temp C: 23C
Temp F: 72F

Accelerator Viscosity	6000 to 12000 cP	View

Temp C: 23C
Temp F: 72F

Base Resin	Epoxy
Accelerator Resin	Amine
Mix Ratio by Volume (B:A)	1:1
Mix Ratio by Weight (B:A)	1:0.85

Typical Cured Characteristics

Property	Values	Additional Information
Shore D Hardness	83	View
Test Method: ASTM D2240 Temp C: 23C Temp F: 73F		
Weight Loss by Thermal Gravimetric Analysis (TGA)	1 %	View
Temp C: 122C Temp F: 252F		
Weight Loss by Thermal Gravimetric Analysis (TGA)	5 %	View
Temp C: 175C Temp F: 347F		
Weight Loss by Thermal Gravimetric Analysis (TGA)	10 %	View
Temp C: 210C Temp F: 410F		
Thermal Shock Resistance	Pass 5 Cycles without cracking	View
Test Method: 3M C3174		
Compression Strength	8100 lb/in²	View
Test Method: ASTM D695 Notes: 3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 and 270 B/A can be used for, potting, encapsulation, and adhesive applications.		

Typical Performance Characteristics

Property	Values	Additional Information
Solvent Resistance Acetone 1hr	B	View
Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Acetone 1hr Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.		
Solvent Resistance Acetone 1month	C	View
Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Acetone 1mo Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.		
Solvent Resistance Isopropyl Alcohol 1hr	A	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Isopropyl Alcohol 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Isopropyl Alcohol 1month	B	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Isopropyl Alcohol 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TF 1hr	A	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TF 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TF 1month	A	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TF 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TMC 1hr	B	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TMC 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TMC 1month	C	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TMC 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance 1, 1, 1 - Trichloroethane 1hour	A	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + 1, 1, 1 - Trichloroethane 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance 1, 1, 1 - Trichloroethane 1month	C	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + 1, 1, 1 - Trichloroethane 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance RMA Flux 1hr	A	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + RMA Flux 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance RMA Flux 1month	B	View

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + RMA Flux 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Overlap Shear Strength 7day FR-4 to FR-4	1750 to 1800 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Environmental Condition: 50%RH
Substrate: FR-4
Surface Preparation: MEK wipe

Notes: 3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 and 270 B/A can be used for, potting, encapsulation, and adhesive applications. The following shows typical shear and peel values determined on several common substrates. 0.005-0.008in bondline

Overlap Shear Strength 7day Copper	1700 to 1750 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Environmental Condition: 50%RH
Substrate: Copper
Surface Preparation: MEK wipe

Notes: 3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 and 270 B/A can be used for, potting, encapsulation, and adhesive applications. The following shows typical shear and peel values determined on several common substrates. 0.005-0.008in bondline

T-Peel Adhesion 23C Aluminum to Etched Aluminum	<2 lb/in width	View

Test Method: ASTM D1876

Test Name: T-Peel Adhesion
Temp C: 23C
Temp F: 73F
Substrate: Aluminum to Etched Aluminum

Notes: 3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 and 270 B/A can be used for, potting, encapsulation, and adhesive applications.

3M™ EPX™ Pneumatic Applicator Delivery Rates

Property	Values	Additional Information
Pneumatic Applicator Delivery Rates	38.2 g/min	View

Notes: Tests were run at a temperature of 70°F ± 2°F (21°C ± 1°C) and at maximum applicator pressure.

Pneumatic Applicator Delivery Rates	148.8 g/min	View

Notes: Tests were run at a temperature of 70°F ± 2°F (21°C ± 1°C) and at maximum applicator pressure.

Pneumatic Applicator Delivery Rates	68.6 g/min	View

Notes: 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	Additional Information
Glass Transition Temperature (Tg)	49 °C	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		
Glass Transition Temperature (Tg)	120 °F	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		
Glass Transition Temperature (Tg)	43 °C	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		
Glass Transition Temperature (Tg)	109 °F	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		
Insulation Resistance	3 x 10^13 Ω	View
Notes: 0.8 mm/0.8 mm comb pattern on FR-4, 60°C/96% R.H./100 volts d.c.		
Insulation Resistance	2 x 10^11 Ω	View
Notes: 0.8 mm/0.8 mm comb pattern on FR-4, 60°C/96% R.H./100 volts d.c.		
Dielectric Constant 1KHz	3.5	View
Test Method: ASTM D150 Temp C: 23C Temp F: 72F		
Dissipation Factor 1KHz	0.018	View
Test Method: ASTM D150 Temp C: 23C Temp F: 72F		
Thermal Conductivity	4.25 x 10^-4 Cal/s/cm/°C	View
Test Method: C177 Temp F: 110F Notes: Thermal conductivity determined using C-matic Instrument using 2 in. diameter samples.		
Thermal Conductivity	0.178 W/m/K	View
Test Method: C177 Temp F: 110F Notes: Thermal conductivity determined using C-matic Instrument using 2 in. diameter samples.		
Thermal Conductivity	0.103 (btu-ft)/(h-ft²-°F)	

View		

Test Method: C177

Temp F: 110F

Notes: Thermal conductivity determined using C-matic Instrument using 2 in. diameter samples.

Volume Resistivity	4.1 x 10^14 Ω-cm	View

Test Method: ASTM D257

Temp C: 23C
Temp F: 73F

Coefficient of Thermal Expansion	80 x 10^-6 m/m/°C
Coefficient of Thermal Expansion	180 x 10^-6 m/m/°C
Additional Electrical Properties	

Storage and Shelf Life

Store product at 60-80°F (16-27°C) for maximum storage life.
These products when stored in original, unopened container have a shelf life of 18 months from date of manufacture.

Industry Specifications

UL 94 HB (File E61941)

Bottom Matter

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Handling/Application Information

Application Equipment

These products may be applied by spatula, trowel or flow equipment.

Two part mixing/proportioning/dispensing equipment is available for intermittent or production line use. These systems are ideal because of their variable shot size and flow rate characteristics and are adaptable to most applications.

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 directly 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. These products consist of two parts.

Mixing

For Duo-Pak Cartridges

3M™ Scotch-Weld™ epoxy potting compound/adhesive DP270 Clear and Black are supplied in a dual syringe plastic duo-pak cartridge as part of the 3M™ EPX™ Applicator systems. 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 applicator mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of material and mix thoroughly to obtain a uniform color.

For Bulk Containers

Mix thoroughly by weight or volume in the proportions specified in the typical uncured properties section to obtain a uniform color.

3. For maximum bond strength apply product evenly to both surfaces to be joined.

4. Application to the substrates should be made within 70 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 firm. Heat up to 200°F (93°C) will speed curing.

6. The following times and temperatures will result in a full cure of these products.

23°C (73°F) 48 Hours

50°C (122°F) 4 Hours

80°C (176°F) 60 Minutes

100°C (212°F) 30 Minutes

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 ketone type solvents*.

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

Adhesion Coverage: 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 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 150°F ± 10°F (66°C ± 5°C).

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 to the glass surfaces to be bonded and allow the primer to dry 60 minutes before bonding.

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

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/p/d/b5005321029/
Safety Data Sheet SDS	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP270 Black

Family Group

Link Tags:

DP270 Clear · DP270 Black

Products	Shore D Hardness	Color	Worklife
DP270 Clear	83	N/A	N/A
DP270 Black	83	Black	60 to 70 min

ISO Statement

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

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 or (651) 737-6501.

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