3M Scotch-Weld[™] Epoxy Potting Compound/Adhesive DP270 Clear and Black

Technical Data		March, 2015	
Product Description	3M [™] Scotch-Weld [™] Epoxy Potting Com Weld [™] Epoxy Potting Compound/Adhes epoxy resin system designed primarily for many electronic components and is availa potting compound/adhesive DP270 is non thermal shock resistance and excellent ret under high humidity conditions.	pound/Adhesive DP270 (or 3M [™] Scotch- ive 270 B/A) is a two-part, low viscosity potting, sealing, and encapsulation of ble in clear or black. Scotch-Weld epoxy corrosive to copper and offers good ention of electrical insulation properties	
	3M TM Scotch-Weld TM 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 TM Scotch-Weld TM 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 TM EPX TM Applicator System for multi-station usage and in bulk containers for larger volume applications.		
	Available in bulk containers as Scotch-We 270 B/A.	eld epoxy potting compound/adhesive	
Features	Good Thermal Shock Resistance	Excellent Electrical Properties	
	• Meets UL 94 HB (File No. E61941)	Noncorrosive to Copper	
	Long Worklife	Negligible Exotherm	
Typical Uncured Properties	Note: The following technical information or typical only and should not be use	and data should be considered representative d for specification purposes.	

Color:	Clear or Black	
Base Resin:	Epoxy/amine	
Mix Ratio:	1:1 by volume (1:0.85 B:A by weight)	
Net Weight: Lbs./Gal.	Base 9.6 - 9.7 Accelerator 8.0 - 8.2	
Worklife:	60-70 minutes @ 23°C (73°F)	
Viscosity: @ 23°C (73°F)	Base7000 - 16,000 cpsAccelerator6000 - 12,000 cps	

Typical Cured Properties	Note: The following technical information and or typical only and should not be used for	data should be considered representative or specification purposes.
	Physical:	
	Color	Clear or Black
	Refractive Index @ 25°C (77°C)	Clear 1.656
	Cure Shrinkage	.08%
	Shore D Hardness (ASTM D-2240)	83
	Tack-free Time	Approx. 3 hrs. @ 23°C (73°F)
	UL Rating	94 HB (File No. E61941)
	Cure Time	48 hrs. @ 23°C (73°F)
	Thermal:	
	Weight Loss by TGA (in air)	1% @ 122°C (252°F) 5% @ 175°C (347°F) 10% @ 210°C (410°F)
	Thermal Coefficient of Expansion by TMA Below Tg	80 x 10 ⁻⁶ units/unit/°C
	Above Tg	180 x 10 ⁻⁶ units/unit/°C 60-125°C range (140-257°F)
	Glass Transition Temperature by DSC Onset Mid-Point	43°C (109°F) 49°C (120°F)
	Thermal Conductivity (@ 110°F on .250" samples) BTU - ft./ft.² - hr °F Cal./sec cm - °C Watt/m - °C	.103 .426 x 10³ .177
	Thermal Shock Resistance Potted Washer Olyphant Test 3M Test Method C-3174 +100°C (air) to -50°C (liquid)	Pass 5 Cycles without cracking
	Electrical:	
	Dielectric Constant (ASTM D-150)	3.5 @ 1 KHz @ 23°C (73°F)
	Dissipation Factor (ASTM D-150)	.018 @ 1 KHz @ 23°C (73°F)
	Dielectric Strength (ASTM D-149)	850 volts/mil
	Volume Resistivity (ASTM D-257)	4.1 x 10 ¹⁴ ohm-cm
	Insulation Resistance (.8 mm/.8 mm comb pattern on FR-4) 60°C/96% R.H./100 volts d.c.) Initial	3 x 10 ¹³ ohms
	1000 hrs.	2 x 10 ¹¹ ohms

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Additional Electrical
PropertiesNote:The following technical information and data should be considered representative or
typical only and should not be used for specification purposes.



Insulation Resistance .8 mm/.8 mm Comb Pattern 60°C (140°F)/95% RH/100 V d.c.



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Note: The following technical or typical only and sho	l information and d uld not be used for	lata should be considered representativ specification purposes.
Corrosion:		
Per ASTM D-3482 (35°C/95°F/96% R.H.//	45V d.c./15 days)	Pass - No copper corrosion
Per 3M Test Method C-708 (45°C/113°F/96% R.H. (65°C/149°F/96% R.H.	./250V d.c./5 days) ./250V d.c./4 days)	Pass - No copper corrosion Pass - No copper corrosion
Per Mil S-46163 (10 days/50% R.H./23	°C/73°F)	Pass - No aluminum, brass or steel discoloration or corrosion
Solvent Resistance:		
	1 Hour	1 Month
Acetone	B	C
Isopropyl Alcohol	A	B
Freon TF	A	Ā
Freon TMC	В	С
1,1,1-Trichloroethane	Α	С
RMA Flux	Α	В
Key: A - Unaffected B - Slight Attack C - Moderate/Ser	vere Attack	
	Note: The following technical or typical only and sho Corrosion: Per ASTM D-3482 (35°C/95°F/96% R.H./ Per 3M Test Method C-708 (45°C/113°F/96% R.H (65°C/149°F/96% R.H Per Mil S-46163 (10 days/50% R.H./23 Solvent Resistance: (Visual check after immersi Acetone Isopropyl Alcohol Freon TF Freon TMC 1,1,1-Trichloroethane RMA Flux Key: A - Unaffected B - Slight Attack C - Moderate/Se	Note: The following technical information and dor typical only and should not be used for Corrosion: Per ASTM D-3482 (35°C/95°F/96% R.H./45V d.c./15 days) Per 3M Test Method C-708 (45°C/113°F/96% R.H./250V d.c./5 days) (65°C/149°F/96% R.H./250V d.c./4 days) Per Mil S-46163 (10 days/50% R.H./23°C/73°F) Solvent Resistance: (Visual check after immersion in specified solve 1 Hour Acetone B Isopropyl Alcohol A Freon TF A Freon TMC B 1,1,1-Trichloroethane A RMA Flux A Key: A - Unaffected B - Slight Attack C - Moderate/Severe Attack

Typical Adhesive Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Although 3MTM Scotch-WeldTM Epoxy Potting Compound/Adhesive DP270 and 270 B/A can be used for many potting and encapsulation applications, they can also be used as adhesives. The following shows typical shear and peel values determined on several common substrates:

Overlap Shear Adhesion (ASTM D-1002-72)

Curing 7 days		onditions °F (23°C)
Alum./Alum. (etched)	@-67°F (-55°C) @73°F (23°C) @180°F (82°C)	1200-1250 psi 2450-2500 psi 300-350 psi
FR-4/FR-4 (MEK Wiped)	@73°F (23°C)	1750-1800 psi
Copper/Copper (MEK Wiped)	@73°F (23°C)	1700-1750 psi

90° T-Peel Adhesion (ASTM D-1876-61T)

Alum./Alum. (etched)	@73°F (23°C)	< 2 piw
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Compression Strength (ASTM D-695-68T)

Scotch-Weld epoxy potting compound/adhesive DP270 Clear and Black	@73°F (23°C)	8100 psi

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3MTM EPXTM Pneumatic Applicator Delivery Rates

200 ml Applicator – Maximum Pressure 58 psi

Adhesive*	6mm Nozzle gms/minute	10mm Nozzle gms/minute
3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 Black	38.2	148.8

50 ml Applicator – Maximum Pressure 50 psi

Adhesive*	1/4 in. Nozzle gms/minute
3M™ Scotch-Weld™ Epoxy Potting Compound/Adhesive DP270 Clear	75.6
Scotch-Weld epoxy potting compound/adhesive DP270 Black	68.6

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

Handling/Curing Information

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

3MTM Scotch-WeldTM epoxy potting compound/adhesive DP270 Clear and Black are supplied in a dual syringe plastic duo-pak cartridge as part of the 3MTM EPXTM 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.

Handling/Curing Information (<i>continued</i>)	 For maximum bond strength apply product evenly to both surfaces to be joined. Application to the substrates should be made within 70 minutes. Larger quantities and/or higher temperatures will reduce this working time. 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. The following times and temperatures will result in a full cure of these products. 			
				Application and Equipment Suggestions
 Keep parts from moving during cure. Contact pressure necessary. Maximum shear strength is obtained with a 3-5 mil bond line. 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 sq. ft./gallon	
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.				
now rate characteristics and are adaptable to most applications.				

Surface Preparation	For high strength structural bonds, paint, or and all other surface contaminants must b amount of surface preparation directly dep environmental aging resistance desired by	oxide films, oils, dust, mold release agents be completely removed. However, the pends on the required bond strength and the y user.	
	The following cleaning methods are sugg	ested for common surfaces:	
	Steel		
	1. Wipe free of dust with oil-free solvent solvents.*	such as acetone, isopropyl or alcohol	
	2. Sandblast or abrade using clean fine grit abrasives.		
	3. Wipe again with solvent to remove loo	ose particles.	
	4. If a primer is used, it should be applied	d within 4 hours after surface preparation.	
	Aluminum		
	 Alkaline Degrease: Oakite 164 solution (88°C ± 5°C) for 10-20 minutes. Rinse running water. 	n (9-11 oz./gallon water) at $190^{\circ}F \pm 10^{\circ}F$ e immediately in large quantities of cold	
	2. Acid Etch: Place panels in the followin $(66^{\circ}C \pm 2^{\circ}C)$.	ng solution for 10 minutes at $150^{\circ}F \pm 5^{\circ}F$	
	Sodium Dichromate Sulfuric Acid, 66°Be 2024-T3 aluminum (dissolved) Tap water as needed to balance	4.1 - 4.9 oz./gallon 38.5 - 41.5 oz./gallon 0.2 oz./gallon minimum	
	3. Rinse: Rinse panels in clear running ta	np water.	
	4. Dry: Air dry 15 minutes; force dry 10	minutes at $150^{\circ}F \pm 10^{\circ}F$ ($66^{\circ}C \pm 5^{\circ}C$).	
	5. If primer is to be used, it should be appreparation.	plied within 4 hours after surface	
	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.*	
	 Apply a thin coating (0.0001 in. or less EC3901 to the glass surfaces to be bond before bonding. 	s) of 3M [™] Scotch-Weld [™] Metal Primer ded and allow the primer to dry 60 minutes	

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

Storage	Store product at 60-80°F (16-27°C) for maximum storage life.		
Shelf Life	These products when stored in original, unopened container have a shelf life of two years for bulk containers and 15 months in duo-pak containers.		
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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3M Center, Building 225-3S-06 St. Paul, MN 55144-1000 800-362-3550 • 877-369-2923 (Fax) www.3M.com/structuraladhesives

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ООО "ЛайфЭлектроникс"

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Тел: +7 (812) 336 43 04 (многоканальный) Email: org@lifeelectronics.ru

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