

Black Flexible Urethane

Description

8800 is a black, flexible, two-part polyurethane potting compound. It has a low mixed viscosity and maintains excellent flexibility at low temperatures. In addition, it adheres strongly to a wide variety of substrates, including metals, composites, glass, ceramics, and many plastics.

8800 is a cost-effective flexible potting option that provides exceptional physical protection and creates minimum stress on circuit boards and surface-mounted devices. It offers superior moisture resistance and is an ideal choice for harsh environment applications, especially salt water exposure and marine applications.

Features and Benefits

- *2:1 mix ratio*
- *5-7 minute working time*
- *24 hour cure at room temperature*
- *Constant service temperature of -50 to 120 °C (-58 to 248 °F)*
- *Excellent dielectric properties*

Usage Parameters

Properties	Value
Working life @22 °C [72 °F]	5–7 min
Shelf life	1.5 y
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	30 min
Full cure @80 °C [176 °F]	25 min

Temperature Ranges

Properties	Value
Constant service temperature	-50 to 120 °C [-58 to 248 °F]
Maximum intermittent temperature ^{a)}	130 °C [266 °F]
Storage temperature	16 to 30 °C [61 to 86 °F]

a) Temperature that can be withstood for short periods without sustaining damage.

Cured Properties

Physical Properties	Method	Value ^{a)}
Color	Visual	Black
Density @25 °C [77 °F]	ASTM D 1475	1.14 g/mL
Hardness	Shore A Durometer	74A
Tensile strength	ASTM D 638	4.5 N/mm ² [660 lb/in ²]
Young's Modulus	ASTM D 638	5.2 N/mm ² [760 lb/in ²]
Lap shear strength (stainless steel)	ASTM D 1002	4.4 N/mm ² [640 lb/in ²]
Lap shear strength (aluminum)	ASTM D 1002	3.1 N/mm ² [450 lb/in ²]
Lap shear strength (copper)	ASTM D 1002	5.2 N/mm ² [760 lb/in ²]
Lap shear strength (brass)	ASTM D 1002	3.8 N/mm ² [550 lb/in ²]
Lap shear strength (ABS)	ASTM D 1002	2.4 N/mm ² [350 lb/in ²]
Lap shear strength (polycarbonate)	ASTM D 1002	2.4 N/mm ² [350 lb/in ²]

Note: Specifications are for samples cured at 65 °C for 1 h and conditioned at ambient temperature and humidity.

a) N/mm² = mPa; lb/in² = psi

Cured Properties

Electrical Properties	Method	Value
Breakdown voltage @3.175 mm [1/8"]	Reference fit ^{a)}	46 200 V [46.2 kV]
Dielectric strength @3.175 mm [1/8"]	Reference fit ^{a)}	370 V/mil [14.6 kV/mm]
Resistivity	ASTM D 257	$8.4 \times 10^{12} \Omega \cdot \text{cm}$
Conductivity	ASTM D 257	$1.2 \times 10^{-13} \text{ S/cm}$
Dielectric dissipation, D @1 MHz	ASTM D 150-11	TBD
Dielectric constant, k' @1 MHz	ASTM D 150-11	TBD
Thermal Properties	Method	Value
Glass transition temperature (T_g)	ASTM E 831	11 °C [52 °F]
CTE ^{b)} prior T_g after T_g	ASTM E 831 ASTM E 831	86 ppm/°C [186 ppm/°F] 221 ppm/°C [430 ppm/°F]
Thermal conductivity @25 °C [77 °F]	ASTM E 1461 92	0.32 W/(m·K)
Thermal diffusivity @25 °C [77 °F]	ASTM E 1461 92	0.10 mm ² /s
Specific heat capacity @25 °C [77 °F]	ASTM E 1269 01	2.73 J/(g·K)

Note: Specifications are for samples cured at 65 °C for 1 h and conditioned at ambient temperature and humidity.

- a)** To allow comparison between products, the dielectric strength was recalculated with the Tautscher equation fitted to 5 experimental values and extrapolated to a standard thickness of 1/8" (3.175 mm).
b) Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C $\times 10^{-6}$ = unit/unit/°C $\times 10^{-6}$

Uncured Properties

Physical Properties	Mixture (A:B)
Color	Black
Mix ratio by volume	2:1
Mix ratio by weight	7:4

Physical Properties	Part A	Part B
Color	Black	Amber
Viscosity @25 °C [77 °F]	300 cP [0.30 Pa·s] ^{a)}	640 cP [0.64 Pa·s] ^{b)}
Density	1.07 g/mL	1.22 g/mL
Odor	Mild	None

a) Brookfield viscometer at 60 rpm with spindle LV S62

b) Brookfield viscometer at 30 rpm with spindle LV S62

Compatibility

Adhesion—As seen in the substrate adhesion table, 8800 adheres to most plastics and metals used to house printed circuit assemblies; however, it is not compatible with contaminants like water, oil, or greasy flux residues that may affect adhesion. If contamination is present, first clean the surface to be coated with MG Chemicals 824 Isopropyl Alcohol.

Storage

Store between 24 to 30 °C [75 to 85 °F] in a dry area, away from sunlight.

Minimize the time that the container is kept opened and purge with nitrogen before closing if the material is not used up at once.

Health and Safety

Please see the 8800 Safety Data Sheet (SDS) parts A and B for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Substrate Adhesion (In Decreasing Order)

Physical Properties	Adhesion
Copper	Stronger
Steel	
Aluminum	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Acrylic	
Polycarbonate	Weaker
Polypropylene	Does not bond
Teflon™	Does not bond

Application Instructions

For best results, follow the procedure below.

Manual mixing:

1. (Optional) Pre-heat part A to improve surface quality.
2. Scrape settled material free from the bottom and sides of the part A container; stir the contents until homogenous.
3. Measure 2 part by volume of the pre-stirred part A, and pour into the mixing container. Ensure all contents are transferred by scraping the container.
4. Measure 1 part by volume of the part B, and pour into the mixing container. Ensure all contents are transferred by scraping the container.
5. Thoroughly mix parts A and B together.
6. (Optional) Put in a vacuum chamber at 25 inHg.
7. Pour the mixture into a container holding the components to be protected.
8. Blanket both parts with nitrogen if the material is not used up to prevent moisture.
9. Close the part A and B containers tightly between uses.

Attention!

Mixing >500 g at a time decreases working life and can lead to a flash cure. Limit the size of hand-mixed batches. For large production volumes, contact MG Chemicals Technical Support for assistance.

Cure Instructions

Room temperature cure:

- Let cure at room temperature for 24 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 30 min.
—OR—
- Put in oven at 80 °C [176 °F] for 25 min.

Packaging and Supporting Products

Cat. No.	Packaging	Net Weight	Net Volume	Packaged Weight
8800-375ML	2 Bottle kit	418 g [14.7 oz]	375 mL [12.6 fl oz]	TBD
8800-2.55L	3 Can kit	2.84 kg [6.28 lb]	2.55 L [2.69 qt]	TBD
8800-10.8L	3 Can kit	12 kg [26.6 lb]	10.8 L [2.85 gal]	TBD
8800-60L	3 Pail kit	67 kg [147 lb]	60 L [15.8 gal]	TBD

TBD=To be determined

Technical Support

Please contact us regarding any questions, suggestions for improvements, or problems with this product. Application notes, instructions and FAQs are located at www.mgchemicals.com.

Email: support@mgchemicals.com

Phone: +(1) 800-340-0772 (Canada, Mexico & USA)

+(1) 905-331-1396 (International)

+(44) 1663 362888 (UK & Europe)

Fax: +(1) 905-331-2862 or +(1) 800-340-0773

Mailing address: Manufacturing & Support
1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6

Head Office
9347-193rd Street
Surrey, British Columbia, Canada
V4N 4E7

Disclaimer

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9