

## Black Rigid Urethane

### Description

8810 is a black, tough, two-part polyurethane potting compound. It has a low mixed viscosity and excellent moisture resistance. In addition, it adheres strongly to a wide variety of substrates, including metals, composites, glass, ceramics, and many plastics.

8810 offers exceptional physical protection, and is designed for potting and encapsulating intricate electronic components and cable jointing boxes.

### Features and Benefits

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

### Usage Parameters

Properties	Value
Working life @22 °C [72 °F]	45 min
Shelf life	1 y
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	1 h
Full cure @80 °C [176 °F]	45 min

## Temperature Ranges

Properties	Value
Constant service temperature	-50 to 120 °C [-58 to 248 °F]
Maximum intermittent temperature <sup>a)</sup>	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 <sup>a)</sup>
Color	Visual	Black
Density @25 °C [77 °F]	ASTM D 1475	1.15 g/mL
Hardness	Shore D Durometer	80D
Tensile strength	ASTM D 638	10 N/mm <sup>2</sup> [1 500 lb/in <sup>2</sup> ]
Compressive strength	ASTM D 695	250 N/mm <sup>2</sup> [36 700 lb/in <sup>2</sup> ]
Lap shear strength (aluminum)	ASTM D 1002	7.5 N/mm <sup>2</sup> [1 100 lb/in <sup>2</sup> ]
Lap shear strength (copper)	ASTM D 1002	4.2 N/mm <sup>2</sup> [610 lb/in <sup>2</sup> ]
Lap shear strength (brass)	ASTM D 1002	5.4 N/mm <sup>2</sup> [790 lb/in <sup>2</sup> ]

*Note: Specifications are for samples cured at 65 °C for 3 h and conditioned at ambient temperature and humidity.*

**a)** N/mm<sup>2</sup> = mPa; lb/in<sup>2</sup> = psi

## Cured Properties

Electrical Properties	Method	Value
Breakdown voltage @3.175 mm [1/8"]	Reference fit <sup>a)</sup>	50 900 V [50.9 kV]
Dielectric strength @3.175 mm [1/8"]	Reference fit <sup>a)</sup>	407 V/mil [16.0 kV/mm]
Volume resistivity	ASTM D 257	1.9 x 10 <sup>13</sup> Ω·cm
Volume conductivity	ASTM D 257	5.3 x 10 <sup>-14</sup> 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 <sub>g</sub> )	ASTM E 831	44 °C [111 °F]
CTE <sup>b)</sup> prior T <sub>g</sub> after T <sub>g</sub>	ASTM E 831 ASTM E 831	83 ppm/°C [181 ppm/°F] 210 ppm/°C [410 ppm/°F]
Thermal conductivity @25 °C [77 °F]	ASTM E 1461 92	0.25 W/(m·K)
Thermal diffusivity @25 °C [77 °F]	ASTM E 1461 92	0.13 mm <sup>2</sup> /s
Specific heat capacity @25 °C [77 °F]	ASTM E 1269 01	1.73 J/(g·K)

*Note: Specifications are for samples cured at 65 °C for 3 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 × 10<sup>-6</sup> = unit/unit/°C × 10<sup>-6</sup>

## Uncured Properties

Physical Properties	Mixture (A:B)
Color	Black
Viscosity @25 °C [77 °F]	320 cP [0.32 Pa·s] <sup>a)</sup>
Density	1.10 g/mL
Mix ratio by volume	2:1
Mix ratio by weight	1.7:1

a) Brookfield viscometer at 60 rpm with spindle LV S62

Physical Properties	Part A	Part B
Color	Black	Amber
Viscosity @25 °C [77 °F]	320 cP [0.32 Pa·s] <sup>b)</sup>	220 cP [0.22 Pa·s] <sup>c)</sup>
Density	1.10 g/mL	1.24 g/mL
Odor	Sweet	Musty

b) Brookfield viscometer at 60 rpm with spindle LV S62

c) Brookfield viscometer at 100 rpm with spindle LV S62

## Compatibility

**Adhesion**—As seen in the substrate adhesion table, 8810 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 8810 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 1 h.  
—OR—
- Put in oven at 80 °C [176 °F] for 45 min.

## Packaging and Supporting Products

Cat. No.	Packaging	Net Weight	Net Volume	Packaged Weight
8810-375ML	2 Bottle kit	428 g [15.1 oz]	375 mL [12.6 fl oz]	TBD
8810-2.55L	3 Can kit	2.91 kg [6.43 lb]	2.55 L [2.69 qt]	TBD
8810-60L	3 Pail kit	68.6 kg [151.3 lb]	60 L [1.58 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](http://www.mgchemicals.com).

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