

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 x 10 ¹² Ω·cm |
| Conductivity | ASTM D 257 | 1.2 x 10 ⁻¹³ 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 × 10⁻⁶ = unit/unit/°C × 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.

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