

### Description

832B *potting and encapsulating compound* is a black, general purpose, hard, two-part epoxy that offers extreme environmental, mechanical and physical protection for printed circuit boards and electronic assemblies.

Due to its low mixed viscosity, 832B can easily penetrate small gaps and cavities. It also provides excellent electrical insulation and protects components from static discharges, vibration, abrasion, thermal shock, environmental humidity, salt water, fungus, and many harsh chemicals.

This epoxy has a convenient 2:1 volume mix ratio, making it compatible with most dispensing equipment. 832B can be cured at room temperature or higher.

### Benefits and Features

- **Convenient 2A:1B volume mix ratio**
- **Low mixed viscosity of 3 300 cP**
- **Extremely high compressive and tensile strength**
- **Excellent adhesion to a wide variety of substrates including metals, composites, glass, ceramics, and many plastics**
- **Excellent electrical insulating characteristics**
- **Broad service temperature range -40 to 140 °C (-40 to 284 °F)**
- **Extreme resistance to water and humidity (allows for submersion where needed)**
- **Solvent-free**

### Usage Parameters

| <i>Properties</i>                         | <i>Value</i> |
|-------------------------------------------|--------------|
| Working Time @22 °C [72 °F] <sup>a)</sup> | 1 h          |
| Shelf Life                                | ≥3 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       |
| Full Cure @100 °C [212 °F]                | 35 min       |

a) Working time and full cure assumes room temperature and 100 g. A 10 °C increase can decrease the working time by half.

### Temperature Ranges

| <i>Properties</i>                              | <i>Value</i>                     |
|------------------------------------------------|----------------------------------|
| Constant Service Temperature                   | -40 to 140 °C<br>[-40 to 284 °F] |
| Maximum Intermittent Temperature <sup>b)</sup> | 175 °C<br>[347 °F]               |
| Storage Temperature of Unmixed Parts           | 16 to 27 °C<br>[60 to 80 °F]     |

b) Temperature that components can withstand for short periods without sustaining damage.

### Principal Components

| Name                               | CAS Number |
|------------------------------------|------------|
| Part A: Bis-A Epoxide Resin        | 25068-38-6 |
| Alkyl Glycidyl Ether Epoxide Resin | 68609-97-2 |
| Part B: Curing Polyamide           | 68082-29-1 |
| Curing Aliphatic amine             | 112-24-3   |

### Properties of Cured 832B

| <i>Physical Properties</i>           | <i>Method</i>               | <i>Value</i> <sup>a)</sup>                         |
|--------------------------------------|-----------------------------|----------------------------------------------------|
| Color                                | Visual                      | Black                                              |
| Density @26 °C [79 °F]               | ASTM D 792                  | 1.11 g/cm <sup>3</sup>                             |
| Hardness                             | Shore D Durometer           | 80D                                                |
| Tensile Strength                     | ASTM D 638                  | 56.9 N/mm <sup>2</sup> [8 250 lb/in <sup>2</sup> ] |
| Elongation                           | ASTM D 638                  | 3.3%                                               |
| Lap Shear Strength (SS 304)          | ASTM D 1002                 | 4.2 N/mm <sup>2</sup> [606 lb/in <sup>2</sup> ]    |
| Izod Impact @0.259"                  | ASTM D 256                  | 0.932 kJ/m <sup>2</sup> [0.443 ft·lb/in]           |
| Compressive Strength                 | ASTM D 695                  | 155 N/mm <sup>2</sup> [22 400 lb/in <sup>2</sup> ] |
| Flexural Strength                    | ASTM D 790                  | 114 N/mm <sup>2</sup> [16 500 lb/in <sup>2</sup> ] |
| <i>Electrical Properties</i>         | <i>Method</i>               | <i>Value</i>                                       |
| Breakdown Voltage @2.79 mm           | ASTM D 149                  | 51.9 kV                                            |
| Dielectric Strength @2.79 mm         | ASTM D 149                  | 472 V/mil [18.6 kV/mm]                             |
| Breakdown Voltage @3.175 mm [1/8"]   | Reference fit <sup>b)</sup> | 55.3 kV                                            |
| Dielectric Strength @3.175 mm [1/8"] | Reference fit <sup>b)</sup> | 442 V/mil [17.4 kV/mm]                             |
| Volume Resistivity @0.95"            | ASTM D 257                  | 5.3 x 10 <sup>12</sup> Ω·cm                        |
| Comparative Tracking Index           | ASTM D 3628                 | Not established                                    |
| Dielectric Dissipation & Constant    | ASTM D 150-98               | <i>dissipation, D</i> <i>constant, k'</i>          |
| @1 kHz                               | ASTM D 150-98               | 0.008            2.95                              |
| @10 kHz                              | ASTM D 150-98               | 0.013            2.89                              |
| @100 kHz                             | ASTM D 150-98               | 0.018            2.83                              |
| @1 MHz                               | ASTM D 150-98               | 0.017            2.77                              |

Note: Specifications are for epoxy samples cured at 65 °C for 1 hour, with additional curing time at room temperature for optimal results. For most tests, samples were conditioned at 23 °C and 50% RH.

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


b) To allow comparison between products, the Tautscher equation was fitted to the experimental dielectric strengths and interpolated to a standard reference thickness of 1/8" (3.175 mm).

| <i>Thermal Properties</i>                            | <i>Method</i> | <i>Value</i>            |
|------------------------------------------------------|---------------|-------------------------|
| Glass Transition Temperature (T <sub>g</sub> )       | ASTM D 3418   | 49 °C [120 °F]          |
| Heat Deflection Temperature (HDT) <sup>c)</sup>      | ASTM D 648    | 47 °C [116 °F]          |
| Coefficient of Thermal Expansion (CTE) <sup>d)</sup> |               |                         |
| Before T <sub>g</sub>                                | ASTM E 831    | 79 ppm/°C               |
| After T <sub>g</sub>                                 | ASTM E 831    | 196 ppm/°C              |
| Thermal Conductivity @25 °C [77 °F]                  | ASTM E 1461   | 0.26 W/(m·K)            |
| @50 °C [122 °F]                                      | ASTM E 1461   | 0.26 W/(m·K)            |
| @100 °C [212 °F]                                     | ASTM E 1461   | 0.30 W/(m·K)            |
| Specific Heat @25 °C [77 °F]                         | ASTM E 1461   | 2.2 J/(g·K)             |
| Thermal Diffusivity @25 °C [77 °F]                   | ASTM E 1461   | 0.11 mm <sup>2</sup> /s |

c) HDT under 1820 kPa [264 lb/in<sup>2</sup>] load

d) Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C × 10<sup>-6</sup> = unit/unit/°C × 10<sup>-6</sup>

### Properties of Uncured 832B

| <i>Physical Properties</i> | <i>Mixture</i>                                                                       |                     |
|----------------------------|--------------------------------------------------------------------------------------|---------------------|
| Color                      | Black                                                                                |                     |
| Viscosity @20 °C [73 °F]   | 3 300 cP [3.3 Pa·s] <sup>a)</sup>                                                    |                     |
| Density                    | 1.08 g/mL                                                                            |                     |
| Mix Ratio by volume (A:B)  | 2.0:1.0                                                                              |                     |
| Mix Ratio by weight (A:B)  | 2.3:1.0                                                                              |                     |
| Solids Content (w/w)       | 99%                                                                                  |                     |
|                            |  |                     |
| <i>Physical Properties</i> | <i>Part A</i>                                                                        | <i>Part B</i>       |
| Color                      | Black                                                                                | Clear, Amber Tint   |
| Viscosity @24 °C [73 °F]   | 2 200 cP [2.2 Pa·s]                                                                  | 5 800 cP [5.8 Pa·s] |
| Density                    | 1.13 g/mL                                                                            | 0.96 g/mL           |
| Flash Point                | >150 °C [302 °F]                                                                     | >122 °C [>252 °F]   |
| Odor                       | Mild                                                                                 | Musty               |

a) Brookfield viscometer at 50 RPM with spindle #4



## Health and Safety

Please see the 832B **Safety Data Sheet** (SDS) parts A and B for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

## Application Instructions

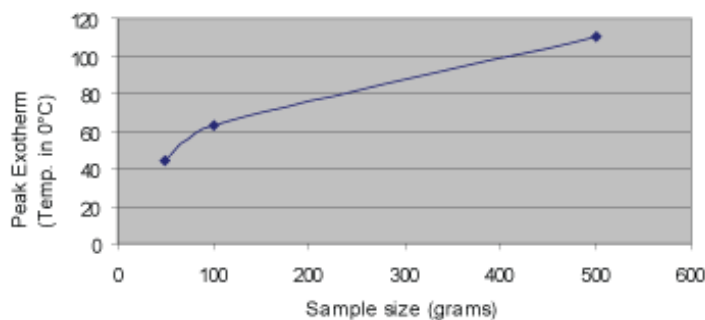
For best results, follow the procedure below.

### To prepare 2:1 (A:B) epoxy mixture:

- Scrape settled material free from the bottom and sides of **Part A** container; stir material until homogenous.
- Measure **two** parts by volume of the pre-stirred **A**, and pour into the mixing container.
- Measure **one** part by volume of the pre-stirred **B**, and pour slowly into the mixing container while stirring.
- Let sit for 15 minutes to de-air.  
—OR—  
Put in a vacuum chamber, bring to 25 inHg pressure, and wait for 2 minutes to de-air.
- If bubbles are present at the top, break them gently with the mixing paddle.
- Pour mixture into the mold or container holding the components to be encapsulated.
- Close container tightly between uses to prevent skinning.

**ATTENTION!** Mixing >500 g [0.4 L] of Part B at a time into A decreases working life and promotes flash cure. Use of epoxy mixing machines with static stirrers recommended for large volumes. Limit size of hand-mixed batches.

## Peak Exotherm Temperature



### Room temperature cure:

- Let cure at room temperature for 24 hours.

### Heat cure:

- Put in oven at 65 °C [149 °F] for 1 hour.  
-OR-
- Put in oven at 80 °C [176 °F] for 45 minutes.  
-OR-
- Put in oven at 100 °C [212 °F] for 35 minutes.

### ATTENTION!

Due to exothermic reaction, heat cure temperatures should be at least 25% below the maximum temperature the most fragile PCB component can tolerate. For larger potting blocks, reduce heat cure temperature by greater margins.

## Packaging and Supporting Products

| <i>Cat. No.</i>   | <i>Packaging</i> | <i>Net Volume</i> |            | <i>Net Weight</i> |         | <i>Packaged Weight</i> |        |
|-------------------|------------------|-------------------|------------|-------------------|---------|------------------------|--------|
| <b>832B-375ML</b> | Bottle           | 375 mL            | 12.6 fl oz | 403 g             | 0.89 lb | 0.7 kg                 | 1.5 lb |
| <b>832B-3L</b>    | Can              | 2.55 L            | 0.68 gal   | 2.74 kg           | 6.04 lb | 2.6 kg                 | 5.8 lb |
| <b>832B-12L</b>   | Pail             | 10.8 L            | 2.88 gal   | 11.6 kg           | 25.6 lb | 14 kg                  | 31 lb  |
| <b>832B-60L</b>   | Pail             | 60 L              | 16 gal     | 64.5 kg           | 142 lb  | 70 kg                  | 155 lb |

## 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).

Email: [support@mgchemicals.com](mailto: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

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