Description

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

832C is specifically designed for applications where visual inspection is required. Due to its low mixed viscosity, it 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. 832C can be cured at room temperature or higher.

Benefits and Features

- **Translucent amber color (allows for visual inspection)**
- **Convenient 2A:1B volume mix ratio**
- **Low mixed viscosity of 2 700 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

Properties	*Value*
Working Time [a)]	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

Properties	*Value*
Constant Service Temperature	-40 to 140 °C [-40 to 284 °F]
Maximum Intermittent Temperature [b)]	175 °C [347 °F]
Storage Temperature of Unmixed Parts	16 to 27 °C [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 832C

Physical Properties	*Method*	*Value* [a]	
Color	Visual	Translucent	
Density @26 °C [79 °F]	ASTM D 792	1.12 g/mL	
Hardness	Shore D Durometer	84D	
Tensile Strength	ASTM D 638	56 N/mm^2	[8 100 lb/in^2]
Elongation	ASTM D 638	6.4%	
Lap Shear Strength (SS 304)	ASTM D 1002	4.4 N/mm^2	[640 lb/in^2]
Izod Impact @0.214"	ASTM D 256	1.47 kJ/m^2	[0.700 ft·lb/in]
Compressive Strength	ASTM D 695	182 N/mm^2	[26 500 lb/in^2]
Flexural Strength	ASTM D 790	38 N/mm^2	[5 500 lb/in^2]

Electrical Properties	*Method*	*Value*
Breakdown Voltage @0.114”	ASTM D 149	48.5 kV @ avg. of 2.90 mm
Dielectric Strength	ASTM D 149	425 V/mil [16.7 kV/mm]
Breakdown Voltage @1/8”	Reference fit [b]	50.7 kV
Dielectric Strength	Reference fit [b]	406 V/mil [15.7 kV/mm]
Volume Resistivity	ASTM D 257	1.22 x 10^{16} Ω·cm
Surface Resistivity [c]	ASTM D 257	5.50 x 10^{15} Ω

Thermal Properties	*Method*	*Value*
Glass Transition Temperature (T_g)	ASTM D 3418	35 °C [95 °F]
Coefficient of Thermal Expansion (CTE) [e]	ASTM E 831	
Before Tg	ASTM E 831	77 ppm/°C
After Tg	ASTM E 831	195 ppm/°C
Thermal Conductivity @25 °C [77 °F]	ASTM E 1461	0.28 W/(m·K)
@50 °C [122 °F]	ASTM E 1461	0.29 W/(m·K)
@100 °C [212 °F]	ASTM E 1461	0.31 W/(m·K)
Heat Deflection Temperature (HDT) [f]	ASTM D 648	44 °C [111 °F]

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^2 = mPa; lb/in^2 = 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).

c) The surface (sheet) resistivity unit is commonly referred to as “Ohm per square.”

e) Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C × 10^{-6} = unit/unit/°C × 10^{-6}

f) HDT under 1820 kPa [264 lb/in^2] load

Properties of Uncured 832C

Physical Properties	*Mixture*
Color	Translucent, Amber Tint
Viscosity @20 °C [73 °F]	2 700 cP [2.7 Pa·s] [a)]
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)	100%

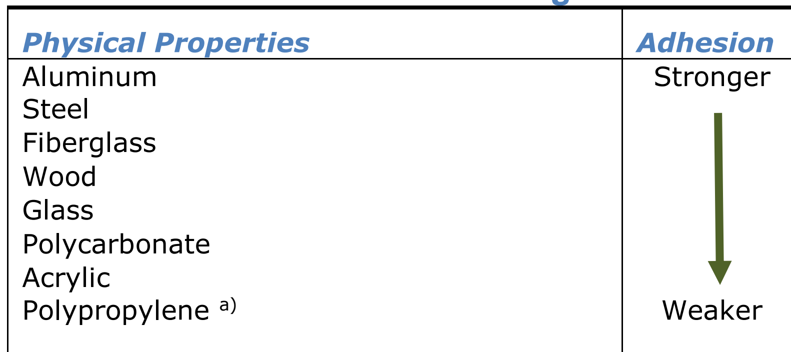
Physical Properties	*Part A*	*Part B*
Color	Translucent, Amber Tint	Clear, Amber Tint
Viscosity @24°C [73 °F]	1 900 cP [1.9 Pa·s] [a)]	5 800 cP [5.8 Pa·s] [a)]
Density	1.13 g/mL	0.963 g/mL
Flash Point	>150 °C [>302 °F]	>122 °C [>252 °F]
Odor	Mild	Musty

a) Brookfield viscometer at 50 RPM with spindle LV4

Compatibility

Adhesion—As seen in the substrate adhesion table, 832C epoxy 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, which may affect adhesion. In case of contamination, first clean the surface to be coated with MG Chemicals 824 Isopropyl Alcohol.

Substrate Adhesion in Decreasing Order



Physical Properties	*Adhesion*
Aluminum	Stronger
Steel	
Fiberglass	
Wood	
Glass	
Polycarbonate	
Acrylic	
Polypropylene [a)]	Weaker

a) Does not bond to polypropylene

Chemical Resistance—The chemical solvent resistance table presents the percent weight change over the indicated period. The results show low water absorption and a high chemical resistance to water and most ionic species. Softening and swelling occurs for aggressive organic solvents.

Chemical Solvent Resistance

Physical Properties	***Weight Change 3 days***	***Weight Change 45 days***
Water	<0.0 %	<1%
Hydrochloric Acid	<0.0 %	<1%
Isopropyl alcohol	0.3%	<1%
Mineral spirits	0.3 %	0.3 %
Xylene	2 %	9 %
Ethyl Lactate	3 %	7 %
Iso hexanes	5 %	8%
Acetone	7 %	destroyed

Storage

Store between 16 and 27 °C [60 and 80 °F] in a dry area, away from sunlight. Prolonged storage, or storage at or near freezing temperatures, can result in crystallization.

If crystallization occurs, reconstitute the component to its original state by temporarily warming it to between 50 and 60 °C [122 and 140 °F]. To ensure full homogeneity, stir the warm component thoroughly, reincorporating all settled material, then re-secure container lid and let cool before use.

Health and Safety

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

Application Instructions

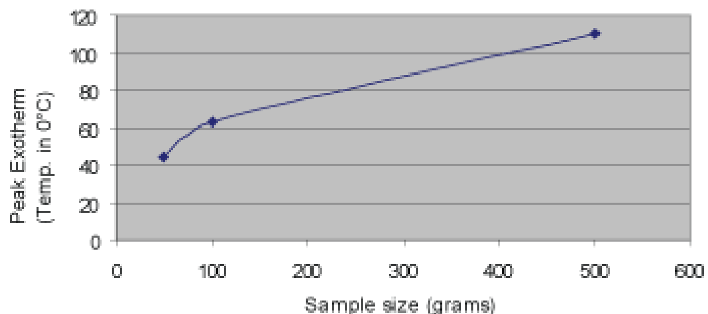
For best results, follow the procedure below.

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 mintues.
  –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

Cat. No.	Packaging	Net Volume		Net Weight		Packaged Weight	
832C-375ML	Bottle	375 mL	12.7 fl oz	402 g	12.9 oz	0.6 kg	1.3 lb
832C-450ML	Cartridge	450 mL	25.3 fl oz	483 g	15.5 oz	0.7 kg	1.6 lb
832C-3L	Can	2.55 L	5.39 pt	2.73 kg	6.0 lb	3.6 kg	8.0 lb
832C-60L	Pail	60 L	16 gal	64.3 kg	142 lb	65 kg	150 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.

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