

# Thermally Conductive Epoxy Encapsulating & Potting Compound

## ■ 832-TC



100% solids. Formulated with undiluted Bis F resin for superior physical properties, and pigmented with high purity aluminum oxide pigment to provide excellent thermal conductivity at reasonable cost. Pigmented black for excellent thermal absorption and emission.

- Provides superior protection from impact, shock, conductivity, moisture, abuse, chemicals, and analysis
- Two part epoxy, with a 1 to 1 mixing ratio by volume.
- Two hour working time
- Suitable for large production runs
- Cures in 2 days at room temperature or one hour at 65°C.



### Specifications

Uncured Properties - Resin [Part A]		
Viscosity		41,100 cps
Specific Gravity		1.8019
Color		Black
Uncured Properties - Hardener [Part B]		
Viscosity		68,900 cps
Specific Gravity		1.5036
Color		Black
Cured Properties - PHYSICAL		Test Method
Mixed Viscosity		76,300 cps
Mixed Specific Gravity		1.6156
Volume Mix Ratio (resin:hardener)		1:1
Working time (100g)		120 min.
Cure Time (100g, room temp.)		48 hours
Heat Cure Time (100g, 65°C)		60 min.
Shore Hardness		82 Shore D
Tensile strength	ASTM-D-638-02A	2734 psi
Elongation	ASTM-D-638-02A	1.87 %
Compressive Strength	ASTM-D-695-02A	4,088 psi
Flexural Strength	ASTM-D-790-03	5,352 psi
Cantilever Beam (IZOD) Impact	ASTM-D-256-02 E1	0.80 ft lb ft / in
Shear Strength	ASTM-E-831-03	3.224 psi
Cured Properties - TEMPERATURE		Test Method
Constant Service Temperature		90°C (194°F)
Heat Deflection Temperature	ASTM-D-648-01	35.35°C (95.6°F)
Dielectric Constant	ASTM-D-150-98	4.41
Dissipation Factor	ASTM-D-150-98	0.0113

Volume Resistivity	ASTM-D-257-99	2.58 x 10 <sup>15</sup> ohm · cm
Surface Resistivity	ASTM-D-257-99	3.16 x 10 <sup>16</sup> ohm · cm
Heat Deflection Temperature	ASTM-D-648-01	35.35°C (95.6°F)
Intermediate Service Temp.		110°C (230°F)
Thermal Conductivity		0.682 W/m*K
Thermal Diffusivity		0.38 mm <sup>2</sup> /s
Volumetric Specific Heat		1.9MJ/m <sup>3</sup> *K
Thermal Expansion	ASTM-E-831-03	148.3x10 <sup>-6</sup> mm/mm°C
<b>Chemical and Solvent Resistance</b>		<b>Change after 3 days:</b>
Hydrochloric Acid		< 0.50%
Isopropyl Alcohol		~ 0%
Ethyl Lactate		< 1 %
Acetone		< 3%
Xylene		< 2%
Iso hexanes		~ 0%
Mineral spirits		~ 0%

## Available Sizes

Catalog Number	Sizes Available	Description
Epoxy - Black, Thermally Conductive Encapsulating & Potting Compound		
832TC-450ML	450mL kit (16 oz)	Liquid
832TC-2L	2 liter kit (0.5 gal)	Liquid
832TC-40L	40 liter kit (10 gal)	Liquid

# Material Safety Data Sheet

## Section 1: Product Identification

**MSDS Code: 832TC - Part A Name: Epoxy - Thermally Conductive Encapsulating**

**Related Part Numbers: 832TC-450ML; 832TC-2L; 832TC-40L**

Use: Encapsulating and potting compound.

## Section 2: Hazardous Ingredients

CAS#	Chemical Name	Percentage by weight	ACGIH TWA	Osha PeI	Osha Stel
28064-14-4	Reaction product of epichlorohydrin and Biphenyl F	40 - 60	N/e	N/e	N/e
1344-28-1	Alumina	40 - 60	N/e	N/e	N/e

## Section 3: Hazards Identification

**WHMIS Codes:** D2B

**NFPA Ratings:** Health 1 Flammability 0 Reactivity 0

**HMIS Ratings:** Health 1 Flammability 0 Reactivity 0

**Eyes:** Causes irritation.

**Skin:** Prolonged exposure may cause skin irritation. May cause allergic reaction in some individuals.

**Inhalation:** At room temperature, exposure to vapors is unlikely due to physical properties. Higher temperatures may generate vapor levels sufficient to cause irritation.

**Ingestion:** Single dose oral toxicity is low. Amounts ingested incidental to industrial handling are not likely to cause injury; however, ingestion of large amounts may cause injury.

**Chronic:** No information available.

## Section 4: First Aid Measure

**Eyes:** Remove contact lenses. Flush with water or saline for 20 minutes. Get medical aid if symptoms persist.

**Skin:** Wash skin with large amounts of soap and water. Get medical aid if symptoms persist.

**Inhalation:** Immediately remove from exposure to fresh air. Get medical aid if symptoms persist.

**Ingestion:** Do not induce vomiting. If conscious, give 1-2 glasses of water. Get medical aid.

## Section 5: Fire Fighting Measures

**Autoignition Temperature:** N/e **Flash Point:** 190°C **LEL / UEL:** N/e

**Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or chemical foam.

**General Information:** N/a

### Section 6: Accidental Release Measures

**Spill Procedure:** Remove all sources of ignition. Provide adequate ventilation. Wear appropriate personal protection. Sprinkle absorbent compound onto spill, then sweep into a plastic or metal container. Wipe up further residue with paper towel and place in container. Wash spill area with soap and water.

### Section 7: Handling and Storage

**Handling:** Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Do not expose container to heat or flame.

**Storage:** Keep away from sources of ignition. Store in a cool, dry, well-ventilated area, away from incompatible substances.

### Section 8: Exposure Controls

**Routes of entry:** Eyes, ingestion, inhalation, and skin.

**Ventilation:** Use adequate general or local exhaust ventilation to keep airborne concentrations below exposure limits.

**Personal Protection:** Wear appropriate protective eyeglasses or chemical safety goggles. Wear appropriate protective clothing to prevent skin contact. Use a NIOSH approved respirator when necessary.

### Section 9: Physical and Chemical Properties

<b>Physical State:</b>	Liquid	<b>Odor:</b>	Odorless	<b>Solubility:</b>	None	<b>Evaporation Rate:</b>	N/e		
<b>Boiling Point:</b>	N/e	<b>Specific Gravity:</b>	1.80	<b>Vapor Pressure:</b>	N/e	<b>Vapor Density:</b>	>1 (Air=1)	<b>pH:</b>	N/a

### Section 10: Stability and Reactivity

<b>Stability:</b>	Stable at normal temperatures and pressures.
<b>Conditions to avoid:</b>	N/a
<b>Incompatibilities:</b>	N/a
<b>Polymerization:</b>	Will not occur.
<b>Decomposition:</b>	Carbon dioxide, and carbon monoxide, phenol compounds.

### Section 11: Toxicological Information

<b>Sensitization:</b> (effects of repeated exposure)	This product is a skin sensitizer.					
<b>Carcinogenicity:</b> (risk of cancer)	No					
<b>Teratogenicity:</b> (risk of malformation in an unborn fetus)	No					
<b>Reproductive Toxicity:</b> (risk of sterility)	No					
<b>Mutagenicity:</b> (risk of heritable genetic effects)	No					
<b>Lethal Exposure Concentrations:</b>	<b>Ingestion (LD50):</b>	N/e	<b>Inhalation (LC50):</b>	N/e	<b>Skin (LD50):</b>	N/e

## Section 12: Ecological Information

**General Information:** Avoid runoff into storms and sewers, which lead into waterways. Water runoff can cause environmental damage.

**Environmental Impact Data:** (percentage by weight)

CFC: 0

HFC: 0

Cl.Solv: 0

VOC: 0

HCFC: 0

ODP: 0

## Section 13: Disposal Information

**General Information:** Dispose of in accordance with all local, provincial, state, and federal regulations. Water runoff can cause environmental damage.

## Section 14: Transportation Information

**Ground:**

Non-regulated

**Air:**

Non-regulated

**Sea:**

Non-regulated

## Section 15: Regulatory Information

**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.**

**SARA** (Superfund Amendments and Reauthorization Act of 1986, USA, 40 CFR 372.4)

None of the chemicals in this product have a reportable quantity.

**EPCRA** (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product does not contain any chemicals subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

**TSCA** (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

**CAA** (Clean Air Act, USA)

This product does not contain any class 1-ozone depletors.

This product does not contain any class 2-ozone depletors.

This product does not contain any chemicals listed as hazardous air pollutants.

## Section 15: Regulatory Information cont'd

**California Proposition 65** (Chemicals known to cause cancer or reproductive toxicity, May 1, 1997 revision, USA)

This product does not contain any chemicals listed.

**Health Canada**

Labeling and containers used in this product are listed in compliance with Consumer Chemicals and Container regulations.

**Environment Canada**

Chemicals in this product are listed on the Domestic Substances List in the Canadian Environmental Protection Act

This product does not contain any ozone depleting substances.