THERMALLY CONDUCTIVE EPOXY **832TC-PART A**

Safety Data Sheet

Section 1: Product and Company Identification

Product Identifier and Other Means of Identification

Product Name: Thermally Conductive Epoxy: Encapsulating and Potting Compound

SDS Code: 832TC–Part A

Related Part #: 832TC-450ML, 832TC-2L, 832TC-8L, 832TC-40L

Recommended Use and Restriction on Use

Use: Thermally conductive epoxy resin for use with hardeners to pot devices or encapsulate components

Uses Advised Against: Not applicable

Details of Manufacturer or Importer

Manufacturer

MG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADA

☎ 1-800-340-0772
FAX 1-800-340-0773
E-MAIL: support@mgchemicals.com
WEB www.mgchemicals.com

MG Chemicals (Head Office)
9347-193 Street
Surrey, British Columbia V4N 4E7
CANADA

☎ 1-905-331-1396
FAX 1-905-331-2682
E-MAIL: info@mgchemicals.com

E-MAIL (Competent Person): sds@mgchemicals.com

Emergency Phone Number

For hazardous material incidents ONLY—leaks, spills, fires, exposures or accidents
USA or CANADA: Call CHEMTREC ☎: ***1-800-424-9300***

For emergencies involving dangerous goods; Collect 24/7
CANADA: Call CANUTEC ☎: ***1-613-996-6666*** or ****666*** on cellular phones

Section 2: Hazards Identification

Classification of Hazardous Chemical

WHMIS Classification

D2A – Very Toxic (Reproductive toxicant; Carcinogenicity IARC: 2B), D2B – Toxic Material (Skin/Eye Irritation; Skin Sensitization in Humans)

GHS Categories

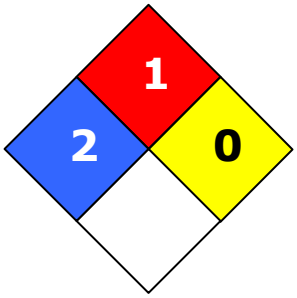
Criteria		Category	Signal Word	Pictograms
Reproductive Toxicity		1	Danger	
Eye Irritation		2A	Warning	
Skin Irritation		2	Warning	
Sensitization	Skin Sensitizer	1	Warning	
Environmental Hazard	Chronic Aqua. Tox.	2	Warning	
Environmental Hazard	Acute Aqua. Tox.	2	—	

Other Classifications

HMIS® RATING

HEALTH:	**2**
FLAMMABILITY:	**1**
PHYSICAL HAZARD:	**0**
PERSONAL PROTECTION:	

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:
0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

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Label Elements

Signal Word	**DANGER**
Pictograms	**Hazard Statements**
	H360: May damage fertility or the unborn child
	H319: Causes serious eye irritation H317: May cause allergic skin reaction H315: Causes skin irritation
	H411: Toxic to aquatic life with long lasting effects
	Precautionary Statements
Prevention	P102: Keep out of reach of children. P201 + P202: Obtain special instructions before use. Do not handle until all safety precautions have been understood. P261: Avoid breathing dust/vapors/spray/mist. P264: Wash thoroughly after handling. P280: Wear protective gloves/eye protection.
Response	P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P302 + P352 + P362 + P364: IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. P337 + P313: In rash occurs or skin or eye irritation persists: Get medical advice/attention. P308 + P313: If exposed or concerned: Get medical advice/attention.
Storage	P405: Store locked up.
Disposal	P391: Collect spillage. P501: Dispose of contents/container in accordance to local/regional/national/international regulations.

Other Hazards

Not applicable

Section 3: Hazardous Ingredients

CAS #	Chemical Name	Wt%
28064-14-4	phenyl glycidyl ether/ formaldehyde copolymer	45–55%
1313-59-3	aluminum oxide	45–55%
64741-65-7	naphtha, petroleum, heavy alkylate	0.5–1.5%
1333-86-4	carbon black	0.1–0.5%
872-50-4	1-methyl-2-pyrrolidone	0.1–0.2%

Section 4: First Aid Measures

Exposure Condition	*GHS Code: Precautionary Statement*
IF IN EYES	P305
Symptoms	Immediate: *irritation, redness, pain*
Response	P351: Rinse cautiously with water for several minutes. P338: Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists	P313: Get medical attention.
IF ON SKIN	P302
Symptoms	Immediate: *irritation, redness, dry skin*; Delayed: *rash*
Response	P352: Wash with plenty of water. P362+ P364 + P272: Take off contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace.
If skin irritation/rash occurs, or concerned	P313: Get medical advice/attention.
IF INHALED	P304 (*Not a likely route of exposure under normal use*)
Symptoms	Immediate: *cough, respiratory system irritation*
Response	P340: Remove person to fresh air (out of the contaminated zone) and keep comfortable for breathing.
If exposed or concerned	P313: Get medical advice/attention.
IF SWALLOWED	P301 (*Not a likely route of exposure under normal use*)
Symptoms	Immediate: *irritation, nausea, vomitting*
Response	P330: Rinse mouth. P331: Do NOT induce vomiting.
If exposed or concerned	P313: Get medical advice/attention.

Section 5: Fire Fighting Measures

Auto-ignition Temperature	Not Established	**Flash Point** [a)]	>190 °C [>374 °F]	**LFL [LEL]** [b)] **UFL [UEL]**	Not Established

In case of fire	P370
Response	P378: Use dry chemical, carbon dioxide, or chemical foam to extinguish. Use water spray to cool containers.
Combustion Products	Produces CO, CO_2, aluminum oxides, nitrogen oxides (NOx), and phenolic molecules.
Fire-Fighter	Wear self-contained breathing apparatus for fire fighting.
General Information	Do not use halocarbon extinguishers. Prevent fire-fighting wash from entering waterway or sewer system.

a) Supplier value for the component with the lowest know flash point
b) LFL = Lower Flammability [or Explosion] Limit (in volume %);
UFL = Upper Flammability [or Explosion] Limit (in volume %)

Section 6: Accidental Release Measures

Personal Protection: See Section 8. Avoid breathing the mist/vapors.

Containment Remove all sources of ignition.

Cleaning Collect liquid in a sealable, solvent-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wipe up further residue with paper towel wetted with alcohol (or other suitable organic solvent) and place dirty towels in container. Wash spill area with soap and water to remove the last traces of residue.

RECOMMENDATION: Use a plastic container.

Disposal Dispose of spill waste according to Section 13.

Section 7: Handling and Storage

Prevention

P201 + P202: Obtain special instructions before use. Do not handle until all safety precautions have been understood.

P261 + P271 + P284: Avoid breathing fume/vapors. Use only outdoors or in well ventilated area. In cases of inadequate ventilation wear respiratory protection.

P262: Do not get in eye, on skin, or on clothing.

P261: Avoid breathing dust/vapors/spray/mist.

P270: Do not eat, drink, or smoke when using this product.

RECOMMENDATION: Protect from high heat. Do NOT process in a fashion that causes mist or fumes.

Handling

P280: Wear protective gloves/clothing/eye protection.

RECOMMENDATION: Wear neoprene, butyl rubber, nitrile or other impervious gloves with breakthrough time greater than intended use period.

P264: Wash hands thoroughly after handling.

P391: Collect spillage.

Storage

P405: Store locked up.

RECOMMENDATION: Keep in a dry and clean area, away from incompatible substances.

Section 8: Exposure Controls/Personal Protection

Routes of Entry

Eyes, ingestion, inhalation, and skin

Substances with Occupational Exposure Limit Values

Chemical Name	Country	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
Alumina [a)]	ACGIH	1 mg/m^3	—
	U.S.A. OSHA PEL	15 mg/m^3	—
	Canada AB	10 mg/m^3	—
	Canada BC	1 mg/m^3	—
	Canada ON	1 mg/m^3	—
	Canada QC	10 mg/m^3	—
Carbon black [a)]	ACGIH	3.5 mg/m^3	—
	U.S.A. OSHA PEL	3.5 mg/m^3	—
	Canada AB	3.5 mg/m^3	—
	Canada BC	3 mg/m^3	—
	Canada ON	3.5 mg/m^3	—
	Canada QC	3.5 mg/m^3	—
1-Methyl-2-pyrrolidone	ACGIH	—	—
	Canada ON	400 mg/m^3	—

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH[2], OSHA, and Canadian provinces exposure limits were consulted. Limits from by RTECS database[1] of the Canadian Centre for Occupational Health and Safety (CCOHS) a data from suppliers' SDS were also consulted. Short term exposure limits (STEL) are usually for 15 min and long term permissible exposure limits (PEL) for 8 h.

a) Respirable airborne particles

Engineering Controls

Ventilation

Keep airborne concentrations below exposure limits. Because carbon black is bound to the liquid mixture; the airborne hazard is present only if the conditions of use could result in aerosolization or misting.

RECOMMENDATION: If the product is heated at high temperatures or worker is allergic, consider using a full mask with organic vapor cartridges.

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Personal Protective Equipment

Eye protection	Wear appropriate protective eyeglasses or chemical safety goggles. **RECOMMENDATION:** Use safety glasses with lateral protection (side shields).
Skin Protection	Wear appropriate protective clothing to prevent skin contact. **RECOMMENDATION:** Use of protective gloves in butyl rubber, latex, neoprene, or other chemically resistant gloves.
Respiratory Protection	If exposed to vapors, wear respirator such as a half-mask respirator. **RECOMMENDATION:** Consult your local safety supply store to ensure your respirator has filter cartridges appropriate for the ingredients listed in section 3 of this MSDS, and that the respirator is fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

Physical State	Liquid	**Appearance**	Black
Odor	Mild aromatic	**Odor Threshold**	Not established
pH	Not available	**Specific Gravity**	1.749
Solubility in Water	Insoluble	**Freezing/Melting Point**	Not available
Flash Point [a)]	>122 °C [>252 °F]	**Vapor Pressure @ 20 °C**	Not available
Boiling Point	Not available	**Evaporation Rate**	Not available
Lower Flammability Limit	Not available	**Upper Flammability Limit**	Not available
Auto-ignition Temperature	Not available	**Decomposition Temperature**	Not available
Viscosity @25 °C	15 000 cSt	**Vapor Density**	>1 (Air = 1)
Partition Coefficient	Not established		

a) The closed cup flash point for component with the lowest reported value.

Section 10: Stability and Reactivity

Stabilities	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Excessive heat, and incompatible substances. Do not use in a way that forms a mist or aerosolize the product
Incompatibilities	Strong oxidizing agents, strong bases, strong acids, halogenated hydrocarbons
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5

Section 11: Toxicological Information

Routes of Exposure

Eyes, ingestion, inhalation, and skin

Symptoms Summary

Eyes Causes serious eye irritation. May also cause eye redness or pain.

Skin May cause mild to moderate skin irritation and allergic skin reactions.

Inhalation *Not a likely route of exposure due to low volatility.* Inhalation of vapors or mist may cause irritation to the nose, throat and lung (upper respiratory tract).

Ingestion *Not a likely route of exposure.* No acute toxicity effect known. See skin and inhalation symptoms.

Chronic Prolonged or repeated exposure to the uncured epoxy resins used may cause dermatitis and sensitization.

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation	TCLo inhalation
phenyl glycidyl ether/ formaldehyde copolymer	4 000 mg/kg Rabbit [a)]	Not available	6 000 mg/kg Rabbit [a)]	Not available
aluminum oxide	Not established	Not established	Not established	Not established
carbon black	>15 g/kg Rat	>3 g/kg Rabbit	Not available	1.6 mg/m^3 7 h Rat
1-methyl-2-pyrrolidone	3 914 mg/kg Rat	>2 000 mg/kg Rabbit	Not established	400 mg/m^3 6 h 4 w (intermit.) Rat

Note: Representative toxicity data from by RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS)[1] data from supplier MSDS were also consulted.
a) Supplier MSDS

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Skin corrosion/irritation	Skin irritant
Serious eye damage/irritation	Causes serious eye irritation.
Sensitization (allergic reactions)	The epoxy resin components (CAS# 28064-14-4) may cause skin sensitization in humans
Carcinogenicity (risk of cancer)	The carbon black [1333-86-4] is possibly carcinogenic by airborne routes of exposures. Because the carbon black is bound in a high viscosity epoxy liquid mixture, it is not expected to be available as an airborne hazard (dust, mist, or spray) under normal use. Carbon Black [1333-86-4] IARC Group 2B: Possibly carcinogenic to humans ACGIH A4: Not classified as a human carcinogen CA Prop 65: Listed as a carcinogen NTP: Not listed
Mutagenicity (risk of heritable genetic effects)	No data available
Reproductive Toxicity (risk to sex functions)	Insufficient data for classification
Teratogenicity (risk of fetus malformation)	In Europe, intension for inclusion have been declared for 1-methyl-2-pyrrolidone in the Substance of Very High Concern as a reproductive toxicant. 1-methyl-2-pyrrolidone (CAS# 872-50-4) CA Prop 65: Listed as a reproductive toxicant ACGIH: Not listed
STOT-single exposure	No data available
STOT-repeated exposure	No data available
Aspiration hazard	Viscosity at 40 °C is >>20.5 mm^2/s, thus not classified as aspiration hazard.

Section 12: Ecological Information

The ecotoxicity of the mixture was estimated by the calculation method using the summation of classified ingredients. The IMDG Code criteria and the raw-material MSDS along with supporting data for the classification of registered substances from the European Chemical Agency database (http://echa.europa.eu) were used.

In Europe, similar epoxy resins with CAS# 28064-14-4 are generally classified as category 2 marine pollutant due to LC50 96 h of >1 mg/L but ≤10 mg/L. Chronic toxic effects have been suggested.

Acute Ecotoxicity

Category 2

GHS Code: Hazard Statement

H401: Toxic to aquatic life

P273: Avoid release to the environment

P391: Collect spillage

Chronic Ecotoxicity

Category 3

GHS Code: Hazard Statement

H411: Toxic to aquatic life with long lasting effects

P273: Avoid release to the environment

P391: Collect spillage

Biodegradability

The content is not readily biodegradable.

Section 13: Disposal Information

P501: Dispose of contents in accordance with all local, regional, national, and international regulations.

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Section 14: Transport Information

Ground

Refer to TDG regulations (Canadian Transportation of Dangerous Goods regulations); **USA CFR 49 Regulations** (Parts 100 to 185). **ADR** (European Agreement Concerning the International Carriage of Dangerous Goods by Road, and **ADN** (Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways).

Sizes 5 liter and under

Limited Quantity

Note: The 832TC-450ML, 832TC-2L and 832TC-8L are composed of separate containers which meet this inner packaging limit.

All sizes greater than 5 liter

UN number: UN3082
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (Reaction product: bisphenol-F-(epichlorhydrin))
Class: 9
Packing Group: III
Marine Pollutant: Yes

Air

Refer to ICAO-IATA Dangerous Goods Regulations.

All sizes

UN number: UN3082
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (Reaction product: bisphenol-f-(epichlorhydrin))
Class: 9
Packing Group: III
Marine Pollutant: Yes
Pkg Inst: 964. ERG Code: 9L

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Sea

Refer to IMDG regulations.

Sizes 5 liter and under

Limited Quantity

Note: The 832TC-450ML, 832TC-2L and 832TC-8L are composed of separate containers which meet this inner packaging limit.

All sizes greater than 5 liter

UN number: UN3082
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (Reaction product: bisphenol-F-(epichlorhydrin))
Class: 9
Packing Group: III
Marine Pollutant: Yes
EmS#: F-A, S-F
Stowage and Segregation: Category A

Note: Component supplier SDS transportation sections and labeling were consulted. All involved staff of shipper must be appropriately trained before involvement with the transport of this product, or work under direct supervision of a trained person.

Section 15: Regulatory Information

Canada

Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)

All hazardous ingredients are listed on the DSL/NDSL.

Industry and Science Canada

MG Labels products intended for the workplace to conform to WHMIS labeling regulations. Product identification, net quantity declaration, minimum printing type size heights, and packaging of this product are in compliance.

Health Canada

Products produced by MG Chemicals intended for retail display conform to the Canadian Consumer Labeling Regulations.

USA

CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product does not contain substances that are listed as hazardous air pollutants.

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

This product does not contain substance 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.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, Sept 2, 2011 revision, USA).

This product contains carbon black (CAS# 1333-86-4; airborne, unbound particles of respirable size), which is listed as a carcinogen.

This product contains 1-methyl-2-pyrrolidone (CAS# 872-50-4) is listed as a developmental reproductive toxicant.

Europe

REACH

This product contains 1-methyl-2-pyrrolidone (CAS# 872-50-4), for which an intension of inclusion as a Substance of Very High Concern (SVHC) currently exists due to reproductive toxicity concerns.

RoHS

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, or PBDE's, and complies with European RoHS regulations.

WEEE

This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

Section 16: Other Information

MSDS Prepared by Michel Hachey

Date of Issue 18 July 2013

Supersedes 20 January 2011

Reason for Changes: Change to GHS format

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Reference

1) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

2) ACGIH *2011 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices*, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2011).

Abbreviations

ACGIH American Conference of Governmental Industrial Hygienists
GHS: Globally Harmonized System of Classification of Labeling of Chemicals
LC50 Lethal Concentration 50%
LCLo Lowest published lethal concentration
LD50 Lethal Dose 50%
N/A Not Applicable
N/E Not Estimated
PEL Permissible Exposure Limit
STEL Short-Term Exposure Limit
TCLo Lowest published toxic concentration
TWA Time Weighted Average
VOC Volatile Organic Content
WEEL Workplace Environmental Exposure Levels

Technical Queries Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.mgchemicals.com.

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