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

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: Thermally Conductive Epoxy: Encapsulating and Potting Compound (Part A)

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

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: Hazard(s) Identification

Classification of Hazardous Chemical

GHS Categories

Criteria		Category	Signal Word	Pictograms
Reproductive Toxicity		1B	Danger	Health
Sensitization	Skin	1	Warning	Exclamation
Eye Irritation		2	Warning	Exclamation
Skin Irritation		2	Warning	Exclamation
Hazardous to the Aquatic Environment	Chronic	2	*none*	Environment

Note: The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

Label Elements

Signal Word	**DANGER**
Pictograms	**Hazard Statements**
	H360: May damage fertility or the unborn child
	H319: Causes serious eye irritation H317: May cause an allergic skin reaction H315: Causes skin irritation
	H411: Toxic to aquatic life with long lasting effects

Section continued on the next page

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Prevention	**Precautionary Statements**
P102	Keep out of reach of children.
P201 + P202	Obtain special instructions before use. Do not handle until all safety precautions have been understood.
P272	Contaminated work clothing should not be allowed out of the workplace.
P261	Avoid breathing fumes/vapors.
P264	Wash hands and exposed skin thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection.
P273	Avoid release to the environment.
Response	**Precautionary Statements**
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P302 + P352	IF ON SKIN: Wash with plenty of water.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P391	Collect spillage.
Storage	**Precautionary Statements**
P405	Store locked up.
Disposal	**Precautionary Statements**
P501	Dispose of contents/container in accordance to local/regional/international regulations.

Hazards Not Otherwise Classified

Other Criteria	**Hazard Statements/Precautionary Statement**	**Signal Word**	**Pictograms**
None	None	None	None

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
28064-14-4	phenyl glycidyl ether/ formaldehyde copolymer	48%
1344-28-1	aluminium oxide	47%
25068-38-6	bisphenol-A epoxy resin (reaction product)	2%
64741-65-7	naphtha, petroleum, heavy alkylate	1%
1333-86-4	carbon black	0.7%
68609-97-2	alkyl glycidyl ether	0.5%
872-50-4	1-methyl-2-pyrrolidone	0.1%

Section 4: First-Aid Measures

Exposure Condition	*GHS Code/Symptoms/Precautionary Statements*
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	*redness, irritation, pain*
Response	Rinse cautiously with water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
IF ON SKIN	P302 + P352, P333 + P313, P362 + P364
Immediate Symptoms	*redness, irritation, dry skin, allergic contact dermatitis*
Response	Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
IF INHALED	P304 + P340, P312, P308 + P313
Immediate Symptoms	*cough, irritation of the respiratory track*
Response	Remove person to fresh air and keep comfortable for breathing. If you feel unwell: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention.
IF SWALLOWED	P301 + P330, P331
Immediate Symptoms	*irritation*
Response	Rinse mouth. Do NOT induce vomiting.

Section 5: Fire-Fighting Measures

Extinguishing Media	Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.
Specific Hazards	Not flammable or combustible, but burns if involved in a fire. Produces irritating smoke of unknown toxicity in fires. Prevent fire-fighting wash from entering waterway or sewer system.
Combustion Products	Produces carbon oxides (CO,CO_2) and toxic fumes.
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	See personal protection recommendations in Section 8.
Precautions for Response	Avoid breathing the fumes/vapors. Remove or keep away all sources of extreme heat or open flames.
Environmental Precautions	Avoid releasing to the environment. Prevent spill from entering drains and waterways.
Containment Methods	Contain with inert and non-flammable absorbent (such as soil, sand, vermiculite).
Cleaning Methods	Collect liquid in a sealable, chemical-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wash residue with a paper towel wetted with alcohol, ethyl lactate, or another suitable organic solvent; and place dirty towels in container. Use soap and water to remove the last traces of residue.
Disposal Methods	Dispose of spill waste according to Section 13.

Section 7: Handling and Storage

Prevention	Keep out of reach of children.
	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
	Avoid breathing fumes/vapors or contact with skin or eyes.
	Avoid release to the environment.
Handling	Wear protective gloves/protective clothing/eye protection.
	Contaminated work clothing should not be allowed out of the workplace.
	Take off contaminated clothing and wash it before reuse.
	Wash hands thoroughly after handling.
	Collect spillage.
Storage	Store locked up.

Section 8: Exposure Controls/Personal Protection

Substances with Occupational Exposure Limit Values

Chemical Name	Country/Province	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
aluminum oxide [a)]	ACGIH	1 mg/m^3	Not established
	U.S.A. OSHA PEL	15 mg/m^3	Not established
	Canada AB	10 mg/m^3	Not established
	Canada BC	1 mg/m^3	Not established
	Canada ON	1 mg/m^3	Not established
	Canada QC	10 mg/m^3	Not established
naphtha, petroleum, heavy distillate	ACGIH	100 ppm (525 mg/m^3)	Not established
	U.S.A. OSHA PEL	500 ppm (2 900 mg/m^3)	Not established
	Canada AB	572 mg/m^3	Not established
	Canada BC	290 mg/m^3	580 mg/m^3
	Canada ON	100 ppm	Not established
	Canada QC	525 mg/m^3	Not established

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Chemical Name	Country/Province	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
carbon black [a)]	ACGIH	3.5 mg/m^3	Not established
	U.S.A. OSHA PEL	3.5 mg/m^3	Not established
	Canada AB	3.5 mg/m^3	Not established
	Canada BC	3 mg/m^3	Not established
	Canada ON	3.5 mg/m^3	Not established
	Canada QC	3.5 mg/m^3	Not established
1-methyl-2-pyrrolidinone	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	Not established	Not established
	Canada AB	Not established	Not established
	Canada BC	Not established	Not established
	Canada ON	400 mg/m^3	Not established
	Canada QC	Not established	Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH[1], OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS[2] database and from suppliers' SDS were also consulted. Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

a) Respirable airborne particles

Engineering Controls

Ventilation

Keep airborne concentrations below the occupational exposure limits (OEL).

Because the carbon black and aluminum oxide are bound to the liquid mixture, they do not present an airborne hazard under normal use. Ensure adequate ventilation if the product is mechanically misted or aerosolized.

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Personal Protective Equipment

Eye protection	Wear appropriate protective eyeglasses or chemical safety goggles. **Recommendation:** Ensure that glasses have side shields for lateral protection.
Skin Protection	For likely contacts, use of protective butyl rubber or other chemically resistant gloves. For incidental contacts, use nitrile or other chemically resistant gloves.
Respiratory Protection	Not normally required, but if exposed to high levels of mist/vapors/fumes, wear respirator such as a half-mask respirator with organic vapor cartridge. Above 10 x OEL, use a positive-pressure, air-supplied respirator or a self-contained breathing apparatus. **RECOMMENDATION:** Consult your local safety supply store to ensure that your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in Section 3. The respirator should be 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	**Lower Flammability Limit**	Not available
Appearance	Black	**Upper Flammability Limit**	Not available
Odor	Mild aromatic	**Vapor Pressure @20 °C**	Not available
Odor Threshold	Not available	**Vapor Density**	>1 (Air = 1)
pH	Not available	**Specific Gravity @25 °C**	1.73
Freezing/Melting Point	Not available	**Solubility in Water**	Insoluble
Boiling Point	>150 °C [>302 °F]	**Partition Coefficient**	Not available
Flash Point [a)]	150 °C [302 °F]	**Auto-ignition Temperature**	Not available
Evaporation Rate	Not available	**Decomposition Temperature**	Not available
Flammability (solid, gas)	Not available	**Viscosity @25 °C**	36 000 cP

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

Section 10: Stability and Reactivity

Reactivity	Reacts exothermically with amines.
Chemical Stability	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

Skin contact, Ingestion, Inhalation, and Eye contact

Symptoms Summary

Eyes	May cause eye redness, irritation, or pain.
Skin	May cause skin redness, irritation, dry skin, or allergic contact dermatitis.
Inhalation	Inhalation of vapors or fumes may cause irritation to the nose, throat and lung (upper respiratory tract).
Ingestion	May cause irritation. Also see 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
phenyl glycidyl ether/ formaldehyde copolymer	4 000 mg/kg Rabbit [a)]	Not established	6 000 mg/kg Rabbit [a)]
aluminum oxide	Not established	Not established	Not established
bisphenol-A-(epichlorhydrin)	15 000 mg/kg Rat	23 000 mg/kg 7 h Rabbit [a)]	Not established
carbon black	>15 g/kg Rat	>3 g/kg Rabbit	Not established
alkyl glycidyl ether	19 200 mg/kg Rat [a)]	4 500 mg/kg Rat [a)]	Not established
1-methyl-2-pyrrolidone	3 914 mg/kg Rat	>2 000 mg/kg Rabbit	Not established

Note: Toxicity data from the RTECS[2] and ECHA were consulted. The data from supplier (M)SDS were also consulted.

a) Supplier MSDS

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Other Toxicological Effects

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/irritation	Causes serious eye irritation.
Sensitization (allergic reactions)	The epoxy resin components (CAS# 28064-14-4, 25068-38-6, and 68609-97-2) may cause skin sensitization in humans.
Carcinogenicity (risk of cancer)	The carbon black [1333-86-4] is possibly carcinogenic by airborne routes of exposures under WHMIS. Because the carbon black is bound in the epoxy liquid mixture, it is not 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 (airborne, as unbound particles of respirable size) NTP: Not listed
Mutagenicity (risk of heritable genetic effects)	Based on available data, the classification criteria are not met.
Reproductive Toxicity (risk to sex functions)	Based on available data, the classification criteria are not met.
Teratogenicity (risk of fetus malformation)	At large doses of >4 000 mg/kg, 1-methyl-2-pyrrolidone shows reproductive effects based on studies in rats and mice. **1-Methyl-2-pyrrolidone [CAS# 872-50-4]** CA Prop 65: Listed as a reproductive toxicant.
STOT-single exposure	Based on available data, the classification criteria are not met.
STOT-repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Based on available data, the classification criteria are not met. There is <10% components, and the kinematic viscosity is >20.5 mm^2/s at 40 °C.

Section 12: Ecological Information

Ecological classifications are based on the IMDG/GHS criteria in conjunction with ecotoxicological data from our suppliers, the European Chemical Agency database (http://echa.europa.eu), and other reliable sources.

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

The 1-methyl-2-pyrrolidinone ingredient is not classified as an environmental hazard according to GHS criteria with minimal LC50 96 h of >500 mg/L for Pimephales promelas (fathead minnow); EC50 24 h of ≥1 000 mg/L Daphnia pulex (water flea).

Based on available data, carbon black and alkyl glycidyl ether is not classified as environmental hazard according to GHS criteria.

Acute Ecotoxicity

See chronic ecotoxicity.

Chronic Ecotoxicity

Category 2

Toxic to aquatic life with long lasting effects

Avoid release to the environment. Collect spillage

Biodegradability

The content is not readily biodegradable.

Bioaccumulation

Not available

Section 13: Disposal Information

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 DOT 49 CFR** (Parts 100 to 185) **Regulations.**

Sizes under 450 L

Part A of all 832TC kits

NOT REGULATED in TDG per Special Provisions 99

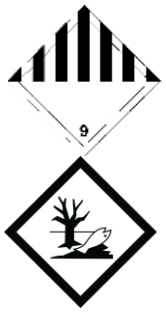
Sizes 5 L and under

Part A of 832TC-450ML, 832TC-2L, 832TC-8L kits
NOT REGULATED in 49 CFR per exception 171.4 (c)(2)

49 CFR: Sizes greater than 5 L

Part A of 832TC-40L kit

UN number: UN3082
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin))



Class: 9
Packing Group: III
Marine Pollutant: Yes

Special Provision 99 (2): These Regulations, except for Part 1 (Coming into Force, Repeal, Interpretation, General Provisions and Special Cases) and Part 2 (Classification), do not apply to the handling, offering for transport or transporting of less than 450 kg of UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., or less than 450 L of UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., on a road vehicle or a railway vehicle. The dangerous goods must be contained in one or more small means of containment designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety.

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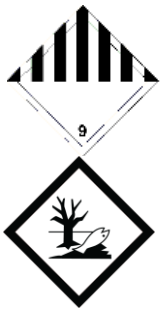
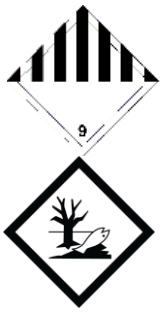
Air

Refer to ICAO-IATA Dangerous Goods Regulations.	
Sizes 5 L and under: *Part A of 832TC-450ML, 832TC-2L, 832TC-8L kits* **NOT REGULATED** On air waybill write: "Not Restricted, as per Special Provisions A197"	Sizes greater than 5 L: *Part A of 832TC-40L kit* **UN number**: UN3082 **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin)) **Class:** 9 **Packing Group**: III **Marine Pollutant:** Yes 
Special Provision A197: These substances when transported in single or combination packagings containing net quantity per single or inner packaging of less than 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Regulations provided the packagings meet the general provisions 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.	

Section continued on the next page

Sea

Refer to IMDG regulations.	
Sizes 5 L and under: *Part A of 832TC-450ML, 832TC-2L, 832TC-8L kits* **NOT REGULATED** per 2.10.2.7	Sizes greater than 5 L: *Part A of 832TC-40L kit* **UN number**: UN3082 **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin)) **Class:** 9 **Packing Group**: III **Marine Pollutant:** Yes 
2.10.2.7: Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provision of this Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class, all provisions of this Code relevant to any additional hazards continue to apply.	

Note: **Shipper must be appropriately <u>trained and certified</u> before involvement with the transport of dangerous goods.**

Section 15: Regulatory Information

Canada

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

All hazardous ingredients are listed on the DSL.

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.

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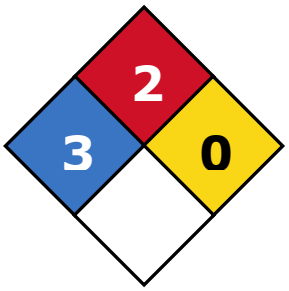
USA

Other Classifications

HMIS® RATING

HEALTH:	* 3
FLAMMABILITY:	2
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)

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 substances which are 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, June 06, 2014 revision, USA).

This product contains carbon black, but it is bound and exposures during normal conditions of uses are below the Safe Harbor Threshold.

This product contains 1-methyl-2-pyrrolidone, listed as a developmental reproductive toxicant.

Europe

RoHS (Restriction of Hazardous Substances Directive)

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

WEEE (Waste Electrical and Electronic Equipment Directive)

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

Section 16: Other Information

SDS Prepared by Michel Hachey

Date of Review 14 November 2016

Supersedes 09 August 2016

Reason for Changes: Change to California Proposition 65 statement in section 15.

Reference

1) ACGIH *2013 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 (2013).

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

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
IARC	International Agency for Research on Cancer
NOELR	No observable effect loading ratio
NTP	National Toxicology Program
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
SDS	Safety Data Sheet
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content

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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.

Email: support@mgchemicals.com

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