

SILVER CONDUCTIVE EPOXY ADHESIVE

8330-PART A

Material Safety Data Sheet

Section 1: Product and Company Identification

Product Name: Silver Conductive Epoxy Adhesive: Moderate Cure / Extreme Conductivity**MSDS Code:** 8330-Part A**Related Part #:** 8330-19G, 8330-640G**Use:** Silver filled electrically conductive adhesive for repairing traces on circuit boards, cold soldering, and bonding**Emergency Contact:** CANUTECH ☎: 1-613-996-6666, Collect 24/7**Manufacturer:** MG Chemicals (Head Office), 9347-193 Street, Surrey, B.C., V4N 4E7**Technical Contacts:** ☎ 1-800-201-8822 FAX 1-800-708-9888**E-MAIL:** support@mgchemicals.com **WEB** www.mgchemicals.com

Section 2: Hazards Identification

WHMIS Classification



D2B - Toxic Material (Skin/Eye Irritation; Skin sensitization in humans)

GHS Pictograms



Signal Word

WARNING

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GHS Categories

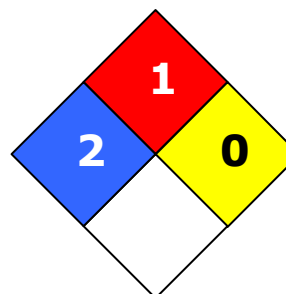
Criteria		Category	Signal Word	Symbol
Eye Irritation		2	Warning	Exclamation
Skin Irritation		2	Warning	Exclamation
Sensitization	Skin sensitizer	1	Warning	Exclamation
Environmental Hazard	Acute Aqua. Tox.	1	Warning	Environmental
Environmental Hazard	Chronic Aqua. Tox.	1	Warning	Environmental

a) Base on mixture acute toxicity estimate (ATE)

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)

Physical Hazards

GHS Code: Hazard Statement

none

Health Hazards

GHS Code: Hazard Statement

H319: Causes serious eye irritation

H315: May cause skin irritation

H317: May cause allergic skin reaction

Environmental Hazards

GHS Code: Hazard Statement

H400: Very toxic to aquatic life

H410: Very toxic to aquatic life with long lasting effects

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- Eyes** Causes moderate to severe eye irritation if splashed in eyes. The adhesive contains mechanically abrasive particles. 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.* May cause nose, throat and lung irritation.
- Ingestion** *Not a likely route of exposure.* No acute toxicity effect known. May cause irritation. May cause allergic reactions.
- Chronic** Prolonged and repeated exposure to the uncured epoxy resins used may cause dermatitis and sensitization.
- Long term accumulation of silver can lead to Argyria, which is an irreversible blue-grey discoloration of the skin.

Section 3: Hazardous Ingredients

CAS #	Chemical Name	Wt%	ACGIH TWA	OSHA PEL	STEL
7440-22-4	silver	60-100%	0.1 mg/m ³	0.01 mg/m ³	Not Established
25068-38-6	bisphenol-A-(epichlorhydrin), reaction products	20-30%	Not Established	Not Established	Not Established
68609-97-2	oxirane, mono[(C12-14-alkyloxy)methyl] derivatives	1-5%	Not Established	Not Established	Not Established

Note: Limits from by RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS). Data from suppliers' MSDS were also consulted.

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Section 4: First Aid Measures

<i>Exposure Condition</i>	<i>GHS Code: Precautionary Statement</i>
IF IN EYES	P305
Symptoms	Immediate: <i>irritation, redness, pain, blurred vision</i>
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: <i>irritation, pain, redness;</i> Delayed: <i>dry skin, rash</i>
Response	P362+ P364 + P272: Take off contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace. P352: Wash with plenty of water.
If skin irritation or rash persists	P313: Get medical attention.
IF INHALED	P304 (<i>Not a likely route of exposure under normal use</i>)
Symptoms	Immediate: <i>irritation</i>
Response	P340: Remove person to fresh air (out of the contaminated zone) and keep comfortable for breathing.
If feeling unwell	P312: Call a POISON CENTRE/doctor
IF SWALLOWED	P301 (<i>Not a likely route of exposure under normal use</i>)
Symptoms	Immediate: <i>irritation</i>
Response	P330: Rinse mouth. P331: Do NOT induce vomiting.
If feeling unwell	P312: Call a POISON CENTRE/doctor

Note: GHS codes and corresponding precaution statements are used when available.

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****Section 5: Fire Fighting Measures**

Autoignition Temperature	≥315 °C [599 °F]	Flash Point ^{a)}	>150 °C [>302 °F]	LFL [LEL] ^{b)}	Not established
		UFL [UEL]			

In case of fire P370

Response	P378: Use dry chemical, carbon dioxide, or chemical foam to extinguish. Use water spray to cool containers. COUNTER INDICATION: Do NOT use water jet, which may cause violent frothing that could intensify and propagate the fire.
Combustion Products	Produces CO, CO ₂ , toxic fumes, and smoke.
Fire-Fighter	Wear self-contained breathing apparatus for fire fighting
General Information	Toxic metal fumes may be released in fire. In presence of strong oxidizers and air, the silver metal powder may lead to an explosion.

Note: The GHS codes and the GHS precaution statements are used. The format is
GHS Codes: Statements.

a) Closed cup value for the Bis-A resin component.

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 and place in container. Wash spill area with soap and water to remove the last traces of residue.

RECOMMENDATION: A metal container is suggested.

Disposal Dispose of spill waste according to Section 13.

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

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

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

RECOMMENDATION: Protect from heat. Do NOT exceed 120 °C.

Handling P280: Wear protective gloves/clothing/eye protection.

P264: Wash hands thoroughly after handling.

Storage P403 + P233+ P235: Keep Container tightly closed. Store in a well-ventilated area. Keep cool: ≤40 °C.

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

Note: The GHS codes and the GHS precaution statements are used.

Section 8: Exposure Controls/Personal Protection**Routes of Entry**

Eyes, ingestion, inhalation, and skin

Engineering Controls**Ventilation**

Keep airborne concentrations below exposure limits given in Section 3.

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

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.

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Respiratory Protection If exposed to mist, 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	Odor	Mild	Odor Threshold	Not established
Appearance	Silver Beige	Specific Gravity	3.450	Freezing Point	Not established
Boiling Point^{a)}	≥150 °C [≥302 °F]	Vapor Pressure @ 20 °C	≥0.0001 hPa	Evaporation Rate	Not established
Autoignition Temperature^{b)}	≥235 °C [455 °F]	Flash Point^{a)}	>150 °C [>302 °F]	Vapor Density^{a)}	Not established
Lower Flammability Limit	Not established	Upper Flammability Limit^{c)}	Not established	Decomposition Temp.	Not available
Viscosity	Not available	Partition Coefficient	Not established	Solubility in Water	Insoluble
pH	Not available				

a) The boiling point and closed cup flash point values are based on the bisphenol-A epichlorhydrin resin.

b) The autoignition and vapor pressure values are based on oxirane, mono[(C12-14-alkyloxy)methyl] derivatives, which is the component with the lowest declared value.

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****Section 10: Stability and Reactivity**

Stabilities	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Ignition sources and incompatible substances. <i>Note:</i> Prolonged exposure to excessive heat will degrade the resin.
Incompatibilities	Strong oxidizing agents, strong acids, strong bases, ammonium nitrate, ammonia, perchlorates, phosphorus, selenium, and sulfur. <i>Note:</i> React with amines.
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5

Section 11: Toxicological Information

Skin corrosion/irritation	Skin irritant. Prolonged or repeated skin contact may cause dermatitis
Serious eye damage/irritation	Causes moderate eye irritation in rabbits (500 µL 24 h). Contains mechanically abrasive particles
Sensitization (allergic reactions)	The epoxy resin components (CAS# 25068-38-6 and 68609-97-2) may cause skin sensitization in humans
Carcinogenicity (risk of cancer)	Not classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP
Mutagenicity (risk of heritable genetic effects)	No data available
Reproductive Toxicity (risk to sex functions)	No data available
Teratogenicity (risk of fetus malformation)	No data available
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.

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Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation	TCLo inhalation
silver	>5 g/kg Guinea Pig	Not established	Not established	Not established
bisphenol-A-(epichlorhydrin) reaction products	11,400 mg/kg Rat	Not established	Not established	Not established
oxirane, mono[(C12-14-alkyloxy)methyl] derivatives	17,100 mg/kg Rat	>4,500 mg/kg Rabbit	Not established	Not established

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

Section 12: Ecological Information
Acute Ecotoxicity

Category 2

GHS Code: Hazard Statement

H400: Very toxic to aquatic life

P273: Avoid release to the environment.

P391: Collect spillage.

Chronic Ecotoxicity

H410: Very toxic to aquatic life with long lasting effects

Biodegradability

The content is not biodegradable.

VOC (EPA, WHIMS, and Europe) = 22% [759 g/L]

*VOC = *Regulated Volatile Organic Content*

Note: Silver should be recovered from the waste to reclaim its value.

Section 13: Disposal Information

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

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****Section 14: Transport Information****Ground** - all sizes less than 4 liters**Limited Quantity****Ground** - sizes greater than 4 liters

Recommend Shipper be trained and certified. Refer to TDG regulations (Canadian Transportation of Dangerous Goods regulations); **USA CFR 49 Regulations** (Parts 100 to 185).

UN number: UN3077; **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID, N.O.S. (Silver and 4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline]); **Class:** 9, **Packing Group:** III, Marine Pollutant: Yes

Air -

Shipper must be trained and certified. Refer to IATA Dangerous Goods Regulations.

UN number: UN3077; **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID, N.O.S. (Silver and 4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline]); **Class:** 9, **Packing Group:** III, Marine Pollutant: Yes

Note: The 20 gram product size falls under the E1 30g/30ml inner packaging limit and may be shipped as '**DG in Excepted Quantities**'. Refer to Package Mark 2.6.7.1 in **IATA** for further instruction. Document as Class **E1**.

Sea -

Shipper must be trained and certified. Refer to IMDG regulations.

UN number: UN3077; **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID, N.O.S. (Silver and 4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline]); **Class:** 9, **Packing Group:** III, Marine Pollutant: Yes

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****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 contains silver (CAS# 7440-22-4), which is 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 does not contain any listed substances.

Europe**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.

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****Section 16: Other Information**

MSDS Prepared by	Michel Hachey
Date of Issue	26 October 2012
Reference	All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

Abbreviations

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

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

Mailing Addresses *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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