



SILVER CONDUCTIVE EPOXY ADHESIVE

8330-PART A

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: Silver Conductive Epoxy Adhesive: Moderate Cure / Extreme Conductivity

SDS Code: 8330-Part A

Related Part # 8330-19G, 8330-50ML, 8330-200ML

Recommended Use and Restriction on Use

Use: Silver filled electrically conductive adhesive for cold soldering or circuit continuity repairs

Uses Advised Against: Not available

Details of Manufacturer or Importer

Manufacturer

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

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

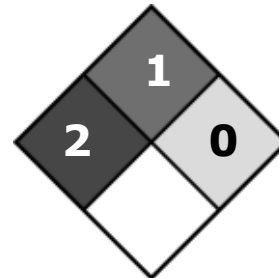
SILVER CONDUCTIVE EPOXY ADHESIVE
8330-PART A
Section 2: Hazard(s) Identification
Classification of the Chemical Material
GHS Categories

Criteria		Category	Signal Word	Pictograms
Germ Cell Mutagenicity		2	Warning	Health
Sensitization	Skin sensitizer	1	Warning	Exclamation
Environmental Hazard	Acute Aqua. Tox.	1	Warning	Environmental
Environmental Hazard	Chronic Aqua. Tox.	1	Warning	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.

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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SILVER CONDUCTIVE EPOXY ADHESIVE
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Label Elements

Signal Word	WARNING
Pictograms	Hazard Statements
	H317: May cause an allergic skin reaction
	H341: Suspected of causing genetic defects
	H411: Toxic to aquatic life with long lasting effects
Prevention	Precautionary Statements
P201 + P202	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing fumes/vapors/mist
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing.
P273	Avoid release to the environment.
Response	Precautionary Statements
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.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P391	Collect spillage.

Continued on the next page

**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART A***Continued...*

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

Argyria Warning: Long term exposure to silver containing compounds may lead to Argyria, which is an irreversible blue-grey discoloration of the skin.

Prolonged and repeated exposure to uncured epoxy resins may cause dermatitis or eczemas.

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	% Weight
7440-22-4	silver (flakes < 1 mm)	60-100%
28768-32-3	4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline]	10-30%
17557-23-2	neopentyl glycol diglycidyl ether	1-5%

Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code: Precautionary Statement</i>
IF ON SKIN	P302 + P352, P362 + P364, P333 + P313
Immediate Symptoms	<i>mild irritation, redness, rash</i>
Response	Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention.
IF SWALLOWED	P301 + P330 + P331, P308 + P313
Immediate Symptoms	<i>Irritation</i>
Response	Rinse mouth. Do not induce vomiting. IF exposed or concerned: Get medical advice/attention.

Continued on the next page

**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART A***Continued...*

IF IN EYES	P305 + P351 + P338, P333 + P313
Immediate Symptoms	<i>Redness, mild irritation</i>
Response	Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
IF INHALED	P304 + P340, P308 + P313 (unlikely route of exposure due to low volatility)
Immediate Symptoms	<i>cough, irritation of the respiratory track, sore throat, asthma</i>
Response	Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Get medical advice/attention.

Section 5: Fire-Fighting Measures

Auto-ignition Temperature	Not established	Flash Point	>127 °C [>261 °F]	LFL [LEL]	Not available
				UFL [UEL]	Not available

In case of fire	P370 + P378
Extinguishing Media	Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish. Use water spray to cool containers.
Specific Hazards	Not flammable or combustible, but will burn if involved in a fire. Produces irritating smoke and toxic fumes in fires.
Combustion Products	Produces carbon oxides (CO, CO ₂), toxic fumes, smoke
Fire-Fighter	Wear self-contained breathing apparatus for fire fighting

a) The closed cup flash point values are based on the neopentyl glycol diglycidyl ether component.

b) LFL = Lower Flammability [or Explosion] Limit (in volume %);
UFL = Upper Flammability [or Explosion] Limit (in volume %)



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Section 6: Accidental Release Measures

Personal Protection	Use personal protection recommended in Section 8.
Precautions for Response	Avoid breathing the fumes/vapors. Keep away from extreme heat or open flames.
Environmental Precautions	Avoid releasing to the environment. Prevent spill from entering drains and waterways. Do not flush to sewer.
Containment Methods	None required—this product is not readily flowable
Cleaning Methods	Collect spill in a sealable container. Wipe residue with a 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.
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. Contaminated work clothing should not be allowed out of the workplace. Take off contaminated clothing and wash it before reuse.
Handling	Avoid breathing dust/fumes/mist/vapors. Wear protective gloves/eye protection. Wash hands thoroughly after handling. Collect spillage.
Storage	Store locked up.

SILVER CONDUCTIVE EPOXY ADHESIVE
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Section 8: Exposure Controls/Personal Protection
Routes of Entry

Eyes and skin

Substances with Occupational Exposure Limit Values

Chemical Name	Country or Vendor	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
silver	ACGIH	0.1 mg/m ³	Not established
(metal dust, mist)	U.S.A. OSHA PEL	0.01 mg/m ³	Not established
(metal)	Canada AB	0.1 mg/m ³	Not established
(Ag and its compounds)	Canada BC	0.01 mg/m ³	0.03 mg/m ³
(metal, dust, fumes)	Canada ON	0.1 mg/m ³	Not established
	Canada QC	3 mg/m ³	Not established

Note: The ACGIH¹, OSHA, and Canadian provinces exposure limits were consulted. Limits from by RTECS database² of the Canadian Centre for Occupational Health and Safety (CCOHS) a data from suppliers' SDS were also consulted.

Engineering Controls
Ventilation

General ventilation is adequate for normal use; keep airborne exposure as low as possible.

RECOMMENDATION: If the product is heated, use of local exhaust or full mask with organic vapor cartridge/independent air supply.

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 butyl rubber, neoprene, or other chemically resistant gloves.

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Respiratory Protection If exposed to high levels of fumes/dust/mist/vapors, wear respirator such as a half-mask respirator with organic vapor cartridge.

If exposed to the product in extreme heat or combustion conditions, wear a NIOSH approved self-contained breathing apparatus (SCBA) or supplied air respirator.

RECOMMENDATION: Consult your local safety supply store to ensure your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in section 3 of this SDS. Ensure that the respirator is fitted to the employee by a professional.

General Hygiene Considerations

Wash hands with water and soap after use.

Section 9: Physical and Chemical Properties

Physical State	Solid, paste	Lower Flammability Limit	Not available
Appearance	Silver grey	Upper Flammability Limit	Not available
Odor	Not available	Vapor Pressure @25 °C	Not available
Odor Threshold	Not available	Vapor Density	Not available
pH	Not available	Specific Gravity @20 °C	3.56
Freezing/Melting Point	Not available	Solubility in Water	Insoluble
Boiling Point	Not available	Partition Coefficient	Not applicable
Flash Point ^{a)}	≥127 °C [>261 °F]	Auto-ignition Temperature	Not available
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability (solid, gas)	Not available	Viscosity @40 °C	>>20.5 mm ² /s

a) The closed cup flash point values are based on the neopentyl glycol diglycidyl ether component.

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

Reactivity	Reacts with amines.
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Incompatible substances
Incompatibilities	Strong oxidizing agents, strong acids, strong bases, acetylene, ammonia, strong hydrogen peroxides
Polymerization	Will not occur
Decomposition	For thermal decomposition, see combustion products in Section 5

Section 11: Toxicological Information**Routes of Exposure**

Eyes, ingestion, and skin

Symptoms Summary

Eyes	May causes redness, mild eye irritation.
Skin	May cause mild skin irritation, redness, or rash.
Inhalation	May cause cough, irritation of the respiratory track, sore throat, or asthma.
Ingestion	It may cause irritation. (Also see inhalation symptoms.)
Chronic	Prolonged and repeated exposure may lead to skin sensitization.

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SILVER CONDUCTIVE EPOXY ADHESIVE
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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
4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline]	Not Established	Not Established	Not Established	Not Established
neopentyl glycol diglycidyl ether	2 000 mg/kg Rat ^{a)}	2 150 mg/kg Rabbit ^{a)}	Not established	Not established

Note: Toxicity data from the RTECS database accessed through the Canadian Centre for Occupational Health and Safety (CCOHS)² were consulted. The data from supplier (M)SDS were also consulted.

a) Estimate provided by supplier

Other Toxicological Effects

Skin corrosion/irritation	Moderate skin irritant.
Serious eye damage/irritation	Serious to moderate eye irritant
Respiratory and skin sensitization (allergic reactions)	The epoxy resin components (CAS# 28768-32-3-6 and 17556-232) may cause skin sensitization in humans
Carcinogenicity (risk of cancer)	None of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP
Mutagenicity (risk of heritable genetic effects)	In vitro and in vivo studies for 4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline] show positive results for mutagenicity.
Reproductive Toxicity (risk to sex functions)	Classification criteria are not met.
Teratogenicity (risk of fetus malformation)	Classification criteria are not met.
STOT-single exposure	Classification criteria are not met.
STOT-repeated exposure	Classification criteria are not met.
Aspiration hazard	Classification criteria are not met: the mixture does not contains Class 1 aspiration toxicant and its viscosity is >20.5 mm ² /s at 40 °C

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****Section 12: Ecological Information**

The IMDG Code criteria and the raw-material (M)SDS 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 resin mixtures with CAS# 25068-38-6 and average molecular weight of less than 700 are generally classified as chronic category 2 marine pollutant due to LC50 96 h of >1 mg/L but ≤10 mg/L.

Contains silver particles less than a 1 mm in size but >100 nm (larger than nanoparticles), which are category 1 marine pollutant in ionic form. While very sparingly soluble in water in its massive form, weight of evidence suggests that small particles are more readily dissolved yielding to classifiable toxic levels.

Acute Ecotoxicity

Category 1

GHS Code: Hazard Statement

H400: Very toxic to aquatic life

Chronic Ecotoxicity

Category 1

GHS Code: Hazard Statement

H410: Very toxic to aquatic life with long lasting effect

Avoid release to the environment. Collect spillage.

Persistence and Biodegradability

The content is not readily biodegradable.

Bioaccumulative Potential

Not available

Mobility in Soil

Not available

Other Effects

Not available

Section 13: Disposal Considerations

Dispose of contents in accordance with all local, provincial, state, and federal regulations.

SILVER CONDUCTIVE EPOXY ADHESIVE
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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 5 kg and under

Limited Quantity



Sizes greater than 5 kg

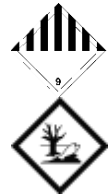
UN number: UN3077

Shipping Name: ENVIRONMENTALLY
 HAZARDOUS SUBSTANCE, SOLID, N.O.S.
 (silver particles <1 mm; 4,4'-methylenebis
 [N,N-bis(2-oxiranylmethyl) aniline])

Class: 9

Packing Group: III

Marine Pollutant: Yes


Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 30 g and under

Excepted Quantity

Document as class

E1

Refer to Package

Mark 2.6.7.1 in **IATA**
 for further instruction



Sizes greater than 30 g up to 30 kg

Limited Quantity

UN number: UN3077

Shipping Name: ENVIRONMENTALLY
 HAZARDOUS SUBSTANCE, SOLID, N.O.S.
 (silver particles <1 mm; 4,4'-methylenebis
 [N,N-bis(2-oxiranylmethyl) aniline])

Class: 9

Packing Group: III

Marine Pollutant: Yes



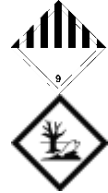
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SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART A****Sea****Refer to IMDG regulations.**

Sizes 5 kg and under

Limited Quantity

Sizes greater than 5 kg

UN number: UN3077**Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (silver particles <1 mm; 4,4'-methylenebis [N,N-bis(2-oxiranylmethyl) aniline])**Class:** 9**Packing Group:** III**Marine Pollutant:** Yes

Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.

Section 15: Regulatory Information**Canada****WHMIS Classification**

D2B – Toxic (Skin Irritant, Skin Sensitizer)

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.

Continued on the next page



SILVER CONDUCTIVE EPOXY ADHESIVE

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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; reportable quantity = 1000 lb), 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 in California.

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.

Section 16: Other Information

SDS Prepared by

Michel Hachey

Date of Revision

23 September 2014

Supersedes

16 January 2013

Reason for Changes: Changers to formulation and and reevaluation in accordance to HCS 2012 criteria.

Continued on the next page

**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART A****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
NOELR	No observable effect loading ratio
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
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*
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Surrey, British Columbia, Canada
V4N 4E7

Disclaimer This material safety data sheet is provided as an information resource only. *M.G. Chemicals, Ltd.* believes the information contained herein is accurate and compiled from reliable sources. It is the responsibility of the user to query and verify any information seeming suspect where doubt on the validity may exist. The buyer assumes all responsibility of using and handling the product in accordance with local, regional, national, and international regulations.

**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART B**

Safety Data Sheet

Section 1: Identification**Product Identifier and Other Means of Identification**

Product Name: Silver Conductive Epoxy Adhesive: Moderate Cure / Extreme Conductivity

SDS Code: 8330-Part B

Related Part # 8330-19G, 8330-50ML, 8330-200ML

Recommended Use and Restriction on Use

Use: Silver filled electrically conductive adhesive for cold soldering and circuit repair

Uses Advised Against: Not available

Details of Manufacturer or Importer**Manufacturer**

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

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

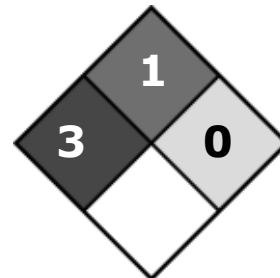
SILVER CONDUCTIVE EPOXY ADHESIVE
8330-PART B
Section 2: Hazard(s) Identification
Classification of the Chemical Material
GHS Categories

Criteria		Category	Signal Word	Pictograms
Serious Eye Damage		1	Danger	Corrosion
Skin Corrosion		1B	Danger	Corrosion
Sensitization	Skin sensitizer	1	Warning	Exclamation
Reproductive toxicity		2	Warning	Health
Environmental Hazard	Acute Aqua. Tox.	1	Warning	Exclamation
Environmental Hazard	Chronic Aqua. Tox.	1	Warning	Exclamation

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.

Other Classifications
HMIS® RATING

HEALTH:	* 3
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)

Continued on the next page

SILVER CONDUCTIVE EPOXY ADHESIVE
8330-PART B
Label Elements

Signal Word	DANGER
Pictograms	Hazard Statements
	H314: Causes severe skin burns and eye damage
	H317: May cause an allergic skin reaction
	H361: Suspected of damaging fertility or the unborn child
	H410: Toxic to aquatic life with long lasting effects
Prevention	Precautionary Statements
P102	Keep out of reach of children.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe fumes/vapors.
P280	Wear protective gloves/eye protection/face protection.
P264	Wash hands thoroughly after handling.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.

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**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART B***Continued...*

Response	Precautionary Statements
P305 + P351 + P338, P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
P301+ P330 + P331, P310	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor.
P304 + P340, P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.
P308 + P313	If exposed or concerned: Get medical advice.
P303 + P361 + P353, P310	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor.
P363	Wash contaminated clothing 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

Argyria Warning: Long term exposure to silver containing compounds may lead to Argyria, which is an irreversible blue-grey discoloration of the skin.

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	% Weight
7440-22-4	silver	70-80%
84852-15-3	4-nonyl phenol, branched	15-30%
140-31-8	1-piperazineethanamine	3-6%
111-40-0	diethylene triamine	0.1-1%
80-05-7	4,4'-isopropylidenediphenol	0.1-0.5%

SILVER CONDUCTIVE EPOXY ADHESIVE
8330-PART B
Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code: Precautionary Statement</i>
IF IN EYES	P305 + P351 + P338, P310
Immediate Symptoms	<i>redness, severe irritation, pain, burns</i>
Response	Rinse cautiously with water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
IF ON SKIN	P303 + P361+ P353, P310, P313 +P313
Immediate Symptoms	<i>redness, rash, severe irritation, pain, burns, blistering</i>
Response	Wash with plenty of water/shower. Take off immediately all contaminated clothing. Immediately call a POISON CENTRE/doctor. If skin irritation or rash occurs: Get medical advice/attention.
IF INHALED	P304 + P340, P310, P308 + P313
Immediate Symptoms	<i>cough, severe irritation or burns of the respiratory track</i>
Response	Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTRE/doctor. IF exposed or concerned: Get medical advice/attention.
IF SWALLOWED	P301 + P330 + P331, P310, P308 + P313
Immediate Symptoms	<i>severe irritation, burns to mouth, throat, stomach</i>
Response	Rinse mouth. Do not induce vomiting. Immediately call a POISON CENTRE/doctor. IF exposed or concerned: Get medical advice/attention.

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

Auto-ignition Temperature	Not established	Flash Point ^{a)}	>93 °C [>200 °F]	LFL [LEL] ^{b)}	Not available
				UFL [UEL]	

In case of fire	P370 + P378
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Extinguishing Media Use dry chemical, carbon dioxide, or chemical foam to extinguish. Use water spray to cool containers.

COUNTER INDICATION: Avoid use of water jet as extinguishing media. Material can form a very toxic aqueous solution with water. If possible, prevent run-off from entering drains and waterways.

Specific Hazards Not flammable or combustible, but will burn if involved in a fire. Produces irritating smoke and toxic smoke in fires.

Combustion Products Produces carbon oxides (CO, CO₂), nitrogen oxides (NO_x), amines, toxic fumes, and smoke.

Fire-Fighter Wear self-contained breathing apparatus for fire fighting

a) Setaflashed closed cup for hardener components

b) LFL = Lower Flammability [or Explosion] Limit (in volume %);

UFL = Upper Flammability [or Explosion] Limit (in volume %)

Section 6: Accidental Release Measures

Personal Protection Use personal protection recommended in Section 8.

Precautions for Response Do not breathe fumes/vapors. Keep away from extreme heat or open flames.

Environmental Precautions Avoid releasing to the environment. Prevent spill from entering drains and waterways. Do not flush to sewer.

Containment Methods None required—this product is not readily flowable

Cleaning Methods Collect liquid in a sealable container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wipe remaining residue with a 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, stainless steel, or carbon steel container. Avoid containers with copper, aluminum, zinc, or galvanized surfaces since the waste mater can slowly oxidize them.

Disposal Methods Dispose spill waste according to Section 13.

**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART B****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.

Contaminated work clothing should not be allowed out of the workplace. Take off contaminated clothing and wash it before reuse.

Protect from heat. Do not process in a way that causes mist or fumes.

Do not breathe fumes/vapors.

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

Handling

Wear protective gloves/eye protection.

Wash hands thoroughly after handling.

Collect spillage.

Storage

Keep container tightly closed.

Store locked up.

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

Eyes, skin, ingestion, inhalation

Substances with Occupational Exposure Limit Values

Chemical Name	Country or Vendor	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
silver (metal dust, mist) (metal) (Ag and its compounds) (metal, dust, fumes)	ACGIH	0.1 mg/m ³	Not established
	U.S.A. OSHA PEL	0.01 mg/m ³	Not established
	Canada AB	0.1 mg/m ³	Not established
	Canada BC	0.01 mg/m ³	0.03 mg/m ³
	Canada ON	0.1 mg/m ³	Not established
	Canada QC	3 mg/m ³	Not established

Continued on the next page

**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART B***Continued...*

Chemical Name	Country or Vendor	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
diethylene triamine	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	1 ppm ^{a)} , Not established 1 ppm ^{a)} 1 ppm ^{a), b)} 1 ppm ^{a)} 1 ppm ^{a)}	Not established Not established Not established Not established Not established Not established

Note: The ACGIH¹, OSHA, and Canadian provinces exposure limits were consulted. Limits from by RTECS database² of the Canadian Centre for Occupational Health and Safety (CCOHS) a data from suppliers' SDS were also consulted.

a) Danger of cutaneous absorption

b) Skin sensitizer

Engineering Controls**Ventilation**

General ventilation is adequate for normal use; keep airborne exposure as low as possible.

Recommendation: If the product is heated, use of local exhaust or full mask with organic vapor cartridge/independent air supply.

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 butyl rubber, neoprene, or other chemically resistant gloves.

Respiratory Protection

If exposed to the product in extreme heat or combustion conditions, wear a NIOSH approved self-contained breathing apparatus (SCBA) or supplied air respirator.

RECOMMENDATION: Consult your local safety supply store to ensure your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in section 3 of this SDS, 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.

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SILVER CONDUCTIVE EPOXY ADHESIVE
8330-PART B
General Hygiene Considerations

Wash hands with water and soap after use.

Section 9: Physical and Chemical Properties

Physical State	Solid, paste	Lower Flammability Limit	Not available
Appearance	Silver grey	Upper Flammability Limit	Not available
Odor	Amine-like	Vapor Pressure @25 °C^{a)}	Not available
Odor Threshold	Not available	Vapor Density	Not available
pH	Not available	Specific Gravity @25 °C	2.92
Freezing/Melting Point	Not available	Solubility in Water	Practically insoluble
Boiling Point	Not available	Partition Coefficient	Not available
Flash Point	>93.3 °C [>200 °F]	Auto-ignition Temperature	Not available
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability (solid, gas)	Not available	Viscosity @40 °C	>>20.5 mm ² /s

a) Setaflashed closed cup for hardener components

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

Reactivity	Not available
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Incompatible substances and excessive heat
Incompatibilities	Strong oxidizing agents, acids, acetylene, hydrogen peroxides.
Polymerization	Will not occur
Decomposition	For thermal decomposition, see combustion products in Section 5

Section 11: Toxicological Information**Routes of Exposure**

Eyes, ingestion, and skin

Symptoms Summary

Eyes	Causes severe eye damage. Contains mechanically abrasive particles.
Skin	Causes skin burns.
Inhalation	Severe respiratory irritant. May be destructive to tissue of the mucous membranes, upper respiratory tract (nose, throat, lungs).
Ingestion	Severe irritant. May cause burns to mouth, throat, and stomach. (See inhalation symptoms.)
Chronic	Prolonged and repeated exposure may lead to skin sensitization.

Continued on the next page

SILVER CONDUCTIVE EPOXY ADHESIVE
8330-PART B
Lethal Exposure Concentrations

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
silver	>5 g/kg Guinea Pig	>2 000 mg/kg Rabbit	>5 000 mg/m ³ Rat
4-nonyl phenol, branched	1 300 mg/kg Rat	>3 160 mg/kg	Not established
1-piperazineethanamine	2 140 µl/kg Rat	866 mg/kg Rabbit	Not established
diethylene triamine	1 080 mg/kg Rat	1 090 mg/kg Rabbit	Not established
4,4'-isopropylidenediphenol	2 400 mg/kg Rat	3 mL/kg Rabbit	>170 mg/m ³ Rat 6 h

Note: Toxicity data from the RTECS database accessed through the Canadian Centre for Occupational Health and Safety (CCOHS)² were consulted. The data from supplier (M)SDS were also consulted.

Other Toxicological Effects

Skin corrosion/irritation	Causes skin burns.
Serious eye damage/irritation	Serious to moderate eye irritant
Respiratory and skin sensitization (allergic reactions)	Diethylene triamine, 1-piperazineethanamine, and 4,4'-isopropylidenediphenol may cause skin sensitization.
Carcinogenicity (risk of cancer)	None of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP
Mutagenicity (risk of heritable genetic effects)	No known effects
Reproductive Toxicity (risk to sex functions)	No known effects.
Teratogenicity (risk of fetus malformation)	The 4-nonyl-phenol, branched (CAS#84852-15-13) and 4,4'-isopropylidenediphenol (CAS# 80-05-7) are suspected of being a reproductive toxicants.
STOT-single exposure	Does not meet classification criteria. Diethylene triamine (CAS# 111-40-0) is a Cat 3 respiratory irritants but it is present at only 1%.
STOT-repeated exposure	No known classifiable effects. See hazards not otherwise specified Arguria warning in Section 2.
Aspiration hazard	Mixture does not contain components classified as aspiration hazards; therefore, the mixture is not an aspiration hazard.

SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART B****Section 12: Ecological Information**

The IMDG Code criteria and the raw-material (M)SDS along with supporting data for the classification of registered substances from the European Chemical Agency database (<http://echa.europa.eu>) were used.

Contains silver particles less than a 1 mm in size but >100 nm (larger than nanoparticles), which are category 1 marine pollutant in ionic form. While very sparingly soluble in water in its massive form, weight of evidence suggests that small particles are more readily dissolved yielding to classifiable toxic levels.

The 4 nonyl phenol, branched, ingredient is a Cat 1 marine pollutant according to available data (with a minimal 96 h LC50 of 0.135 mg/L *Lepomis macrochiru*).

The 4,4'-isopropylidenediphenol ingredient is a Cat 2 marine pollutant according to available data (with minimal 96 h LC50 of 4.6 mg/L for *Pimephales promelas* (fathead minnow); 48 h EC50 of 10.2 mg/L *Daphnia Magna* (water flea); and 96 h EC50 of 2.73 for *Pseudokirchneriella subcapitata* (green algae)).

The 1-piperazineethanamine (CAS# 140-31-8) is a Cat 4 marine pollutant according to available data (with minimal 96 h LC50 of 2190 mg/L for *Pimephales promelas* (fathead minnow); 48 h EC50 of 58 mg/L *Daphnia Magna* (water flea); 72 EC50 of 465 mg/L for *Pseudokirchneriella subcapitata* (*Selenastrum capricornutum*)).

Diethylene triamine (CAS# 90-72-2) is not classified as marine pollutant according to available data.

Acute Ecotoxicity

Category 1

GHS Code: Hazard Statement

H400: Very toxic to aquatic life

Chronic Ecotoxicity

Category 1

GHS Code: Hazard Statement

H410: Very toxic to aquatic life with long lasting effect

Avoid release to the environment. Collect spillage.

Persistence and Biodegradability

Not available

Bioaccumulative Potential

Not available

Mobility in Soil

Not available

Continued on the next page

SILVER CONDUCTIVE EPOXY ADHESIVE

Other Effects

8330-PART B

Not available

Section 13: Disposal Considerations

Dispose of contents in accordance with all local, provincial, state, and federal regulations.

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 5 kg and under

Limited Quantity



Sizes greater than 5 kg

UN number: UN3263

Shipping Name:

CORROSIVE SOLID, BASIC, ORGANIC
N.O.S. (4-nonyl phenol, branched;
aminoethylpiperazine)

Class: 8

Packing Group: II

Marine Pollutant: Yes



Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 5 kg and under

Limited Quantity



Sizes greater than 5 kg up to 15 kg

UN number: UN3263

Shipping Name:

CORROSIVE SOLID, BASIC, ORGANIC
N.O.S. (4-nonyl phenol, branched;
aminoethylpiperazine)

Class: 8

Packing Group: II

Marine Pollutant: Yes



Excepted Quantity E2 ≤30 g

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SILVER CONDUCTIVE EPOXY ADHESIVE**8330-PART B****Sea****Refer to IMDG regulations.**

Sizes 1 liter and under

Limited Quantity

Sizes greater than 1 liter

UN number: UN3263**Shipping Name:**CORROSIVE SOLID, BASIC, ORGANIC
N.O.S. (4-nonyl phenol, branched;
aminoethylpiperazine)**Class:** 8**Packing Group:** II**Marine Pollutant:** Yes

Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.

Section 15: Regulatory Information**Canada****WHMIS Classification**

E – Corrosive Material;

D2A – Very Toxic Material (Reproductive Toxicity, Respiratory Sensitization)

D2B – Toxic Material (Skin Sensitization in Humans)

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.

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**SILVER CONDUCTIVE EPOXY ADHESIVE****8330-PART B****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; reportable quantity = 1000 lb), which is subject to the reporting requirements of CERCLA and section 313 of SARA Title III.

This product contains 4,4'-isopropylidenediphenol (CAS# 80-05-7), which is subject to the reporting requirements of section 313 of the SARA Title III.

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 in California.

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.

Section 16: Other Information

SDS Prepared by Michel Hachey

Date of Revision 23 September 2014

Supersedes 15 January 2014

Reason for Changes: Formulation change and reevaluation in accordance to HCS 2012 criteria.

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®)



SILVER CONDUCTIVE EPOXY ADHESIVE

8330-PART B

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Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
NOELR	No observable effect loading ratio
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
PEL	Permissible Exposure Limit
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content

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