



Kit Revision Date: 23/09/2021

## 8330S SILVER CONDUCTIVE EPOXY ADHESIVE KIT

### MG Chemicals Multipart Product Kit

This product is a kit made up of multiple parts. Each part is an independently packaged chemical component and has independent hazard assessments.

#### **Kit Content**

<i>Part</i>	<i>Product Name</i>	<i>Product Use</i>
A	8330S-A	Electrically conductive epoxy adhesive resin part for use with hardeners
B	8330S-B	Electrically conductive epoxy adhesive hardener part for use with resins

*Safety Data Sheets for each part listed above follow this cover sheet.*

#### **Transportation Instruction**

Before offering this product kit for transport, read Section 14 for all parts listed above.

8330S-A

(PART A)

# Safety Data Sheet

## Section 1: Identification

### Product Identifier and Other Means of Identification

**Product Identifier:** 8330S-A**Other Means of Identification:** Silver Conductive Epoxy Adhesive**Related Part #** 8330S-21G, 8330S-50ML, 8330S-200ML

### Recommended Use and Restriction on Use

**Use:** Electrically conductive epoxy adhesive resin part for use with hardeners**Uses Advised Against:** Not available

### Details of Manufacturer or Importer

**Manufacturer**MG Chemicals  
1210 Corporate Drive  
Burlington, Ontario L7L 5R6  
CANADA**Supplier**Digi Key  
701 Brooks Ave  
Thief River Falls, MN 56701  
United States +1-800-340-0772**FAX** +1-800-340-0773**E-MAIL** [support@mgchemicals.com](mailto:support@mgchemicals.com)**WEB** [www.mgchemicals.com](http://www.mgchemicals.com) +1-800-344-4539**E-MAIL** (Competent Person): [sds@mgchemicals.com](mailto:sds@mgchemicals.com)

### Emergency Phone Number

**For hazardous material incidents ONLY** (leaks, spills, fires, exposures or accidents)USA or CANADA—Call Verisk 3E at **+1-866-519-4752** or **+1-760-476-3962**

(Service access code: 335388)

**For emergencies involving the transport of dangerous goods;** 24/7 serviceCANADA—Call CANUTEC collect at **+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
Sensitization	Skin	1	Warning	Exclamation
Eye Irritation		2	Warning	Exclamation
Skin Irritation		2	Warning	Exclamation
Hazardous to the Aquatic Environment	Chronic	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.

**Label Elements**

<b>Signal Word</b>	<b>WARNING</b>
<b>Pictograms</b>	<b>Hazard Statements</b>
	H317: May cause an allergic skin reaction H319: Causes serious eye irritation H315: Causes skin irritation
	H410: Very toxic to aquatic life with long lasting effects
<b>Prevention</b>	<b>Precautionary Statements</b>
P102	Keep out of reach of children.
P261	Avoid breathing fumes/vapors.
P280	Wear protective gloves/eye protection.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P264	Wash hands thoroughly after handling.

*Section continued on the next page*

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**(PART A)**
*Continued...*

<b>Response</b>	<b>Precautionary Statements</b>
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.
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.
P391	Collect spillage.
<b>Disposal</b>	<b>Precautionary Statements</b>
P501	Dispose of contents/container in accordance to local/regional/international regulations.

**Hazards Not Otherwise Classified**

<b>Other Criteria</b>	<b>Hazard Statements/Precautionary Statement</b>	<b>Signal Word</b>	<b>Pictograms</b>
Argyria	Long term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin.	None	None
Metal fume fever	When the product is exposed to very high heat such as welding or when mechanically aerosolized, this may cause harmful zinc oxide and aluminum oxide fumes.	None	None

**Section 3: Composition/Information on Ingredients**

<b>CAS #</b>	<b>Chemical Name</b>	<b>%(weight)</b>
7440-22-4	silver	78%
28064-14-4	phenol, polymer with formaldehyde, glycidyl ether	20%
17557-23-2	neopentyl glycol diglycidyl ether	2%

**8330S-A**
**(PART A)**
**Section 4: First-Aid Measures**

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
<b>IF ON SKIN</b>	P302 + P352, P333 + P313, P362 + P364
<b>Immediate Symptoms</b>	<i>redness, irritation, allergic dermatitis, rash</i>
<b>Response</b>	Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
<b>IF IN EYES</b>	P305 + P351 + P338, P337 + P313
<b>Immediate Symptoms</b>	<i>redness, irritation</i>
<b>Response</b>	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.
<b>IF INHALED</b>	P304 + P340
<b>Immediate Symptoms</b>	<i>cough, irritation of the respiratory track, sore throat, asthma</i>
<b>Response</b>	Remove person to fresh air and keep comfortable for breathing.
<b>IF SWALLOWED</b>	P301 + P330, P331
<b>Immediate Symptoms</b>	<i>low toxicity: abdominal discomfort, nausea, vomiting</i>
<b>Response</b>	Rinse mouth. Do NOT induce vomiting.

**Section 5: Fire-Fighting Measures**

<b>Extinguishing Media</b>	In case of fire: Use extinguishing media suitable for surrounding materials.
<b>Specific Hazards</b>	Not flammable or combustible, but burns if involved in a fire. Produces irritating smoke of unknown toxicity in fires. Inhalation of silver oxide fumes may cause metal fever and irritate the respiratory tract. The flu-like symptoms of metal fever may be delayed, occurring 4 to 12 hours after exposure. Prevent fire-fighting wash from entering waterway or sewer system.
<b>Combustion Products</b>	Produces carbon oxides (CO,CO <sub>2</sub> ), and toxic metal fumes.
<b>Fire-Fighter</b>	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

**Section 6: Accidental Release Measures**

<b>Personal Protection</b>	See personal protection recommendations in Section 8.
<b>Precautions for Response</b>	Avoid breathing fumes/vapors. Remove or keep away all sources of extreme heat or open flames.
<b>Environmental Precautions</b>	Avoid releasing to the environment. Prevent spill from entering drains and waterways.
<b>Containment Methods</b>	No containment method required—this product is not readily flowable
<b>Cleaning Methods</b>	Collect liquid in a sealable, chemical-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Use soap and water to remove the last traces of residue.
<b>Disposal Methods</b>	Dispose of spill waste according to Section 13.

**Section 7: Handling and Storage**

<b>Prevention</b>	Keep out of reach of children. Avoid breathing fumes/vapors or contact with skin or eyes. Avoid release to the environment. Take off contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace.
<b>Handling</b>	Wear protective gloves/eye protection. Wash hands thoroughly after handling. Collect spillage.
<b>Storage</b>	Not available

**Section 8: Exposure Controls/Personal Protection**
**Substances with Occupational Exposure Limit Values**

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

*Note:* The ACGIH<sup>1</sup>, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS<sup>2</sup> database and data 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.

**Engineering Controls**
**Ventilation**

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

The silver flakes are inextricably bound to the adhesive mixture; therefore they are not available as airborne hazards under normal use. Ensure adequate ventilation if the product is mechanically aerosolized.

**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, latex, neoprene, or other chemically resistant gloves.

For incidental contacts, use nitrile or other chemically resistant gloves.

*Section continued on the next page*

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**(PART A)**

**Respiratory Protection** If exposed to fumes or dust above the exposure limit, wear a suitable respirator meeting local/regional/national guidelines.

If the product is heated or the worker has a known allergic reaction, consider using a full mask with organic vapor cartridge or with an independent air supply.

**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**

<b>Physical State</b>	Solid	<b>Lower Flammability Limit</b>	Not available
<b>Appearance</b>	Silver grey, paste	<b>Upper Flammability Limit</b>	Not available
<b>Odor</b>	Slight	<b>Vapor Pressure @20 °C</b>	Not available
<b>Odor Threshold</b>	Not available	<b>Vapor Density</b>	Not available
<b>pH</b>	Not available	<b>Relative Density @25 °C</b>	3.54
<b>Freezing/Melting Point</b>	Not available	<b>Solubility in Water</b>	Insoluble
<b>Initial Boiling Point</b>	Not available	<b>Partition Coefficient n-octanol/water</b>	Not available
<b>Flash Point</b> <sup>a)</sup>	127 °C [261 °F]	<b>Auto-ignition Temperature</b>	Not available
<b>Evaporation Rate</b>	Not available	<b>Decomposition Temperature</b>	Not available
<b>Flammability</b>	Not available	<b>Viscosity @40 °C</b>	>20.5 mm <sup>2</sup> /s

a) The closed cup flash point values are based on the phenol, polymer with formaldehyde, glycidyl ether resin component.

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**(PART A)**
**Section 10: Stability and Reactivity**

<b>Reactivity</b>	Reacts exothermically with amines.
<b>Chemical Stability</b>	Chemically stable at normal temperatures and pressures
<b>Conditions to Avoid</b>	Avoid ignition sources, open flames, and incompatible substances. Do not use in a way that aerosolizes the product.
<b>Incompatibilities</b>	Avoid strong oxidizing agents, strong acids, strong bases
<b>Polymerization</b>	Will not occur
<b>Decomposition</b>	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

**Section 11: Toxicological Information**
**Summary of Effects and Symptoms by Routes of Exposure**

<b>Eyes</b>	May cause redness and mild irritation.
<b>Skin</b>	May cause skin redness, mild irritation, dry skin, or allergic contact dermatitis.
<b>Inhalation</b>	May cause cough, respiratory irritation, sore throat, or asthma.
<b>Ingestion</b>	Low toxicity: It may cause abdominal discomfort, nausea, vomiting (see inhalation symptoms).
<b>Chronic</b>	Prolonged and repeated exposure may lead to skin sensitization. Prolonged and repeated ingestion or inhalation of silver may yield to an irreversible blue-grey discoloration of the skin.

**Acute Toxicity (Lethal Exposure Concentrations)**

<b>Chemical Name</b>	<b>LD50 oral</b>	<b>LD50 dermal</b>	<b>LC50 inhalation</b>
silver	>5 g/kg Guinea Pig	≥2 000 mg/kg Rabbit	5.16 mg/L Rat 4 h (dust)
phenol, polymer with formaldehyde, glycidyl ether	Not available	Not available	Not available
neopentyl glycol diglycidyl ether	2 000 mg/kg Rat <sup>a)</sup>	2 150 mg/kg Rabbit <sup>a)</sup>	Not available

*Note:* Toxicity data from the RTECS<sup>2</sup> and ECHA database were consulted. The data from supplier SDS were also consulted.

*Section continued on the next page*

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**8330S-A****(PART A)****Other Toxicological Effects**

<b>Skin corrosion/irritation</b>	Causes skin irritation.
<b>Serious eye damage/irritation</b>	Causes severe eye irritation. Contains mechanically abrasive particles.
<b>Sensitization</b> (allergic reactions)	The epoxy resin components (CAS# 28064-14-4 and 17557-23-2) may cause skin sensitization in humans.
<b>Carcinogenicity</b> (risk of cancer)	None of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP.
<b>Mutagenicity</b> (risk of heritable genetic effects)	Based on available data, the classification criteria are not met.
<b>Reproductive Toxicity</b> (risk to sex functions)	Based on available data, the classification criteria are not met.
<b>Teratogenicity</b> (risk of fetus malformation)	Based on available data, the classification criteria are not met.
<b>STOT-single exposure</b>	Based on available data, the classification criteria are not met.
<b>STOT-repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met. There is no category 1 components, and the kinematic viscosity is >20.5 mm <sup>2</sup> /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.

Contains silver particles of less than a 1 mm but more than 100 nm (larger than nanoparticles), which release ionic silver levels that is very toxic to the environment. While massive silver is insoluble in water, its powders is considered sufficiently soluble to give rise to an ecological hazard by EU regulators. The classification that follows takes into account to chronic aqueous toxicity of category 1 (M = 10 for silver) of the EU.

In Europe, similar epoxy resin with CAS# 28064-14-4 is generally classified as chronic category 2 marine pollutant due to LC50 96 h of >1 mg/L but ≤10 mg/L.

Based on available data, neopentyl glycol diglycidyl ether is not classified as environmental hazard according to GHS criteria.

*Section continued on the next page*

**8330S-A****(PART A)****Acute Ecotoxicity**

Category 1

Very toxic to aquatic life

**Chronic Ecotoxicity**

Category 1

Very toxic to aquatic life with long lasting effects

Avoid release to the environment. Collect spillage.

**Biodegradability**

Not readily biodegradable

**Bioaccumulation**

Not available

**Other Effects**

Not available

**Section 13: Disposal Information**

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

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**(PART A)**

**Section 14: Transport Information**

**Ground**

**Refer to TDG regulations** (Canadian Transportation of Dangerous Goods regulations); **USA DOT 49 CFR** (Parts 100 to 185) **Regulations.**

<p>Sizes under 450 kg <b>NOT REGULATED</b> in TDG per Special Provisions 99</p>	<p><i>FOR REFERENCE ONLY</i> <b>UN number:</b> UN3077 <b>Shipping Name:</b> ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (silver flakes &lt;1 mm; phenol, polymer with formaldehyde, glycidyl ether)</p>
<p>Sizes 5 kg and under  <b>NOT REGULATED</b> in 49 CFR per exception 171.4 (c)(2)</p>	<p><b>Class:</b> 9 <b>Packing Group:</b> III <b>Marine Pollutant:</b> Yes</p>

**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.

**171.4 (c) Exceptions:** 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 of 5 kg or less for solids, are not subject to any other requirements of this subchapter provided the packagings meet the general requirements in §§ 173.24 and 173.24a. This exception does not apply to marine pollutants that are a hazardous waste or a hazardous substance. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class, all provisions of this subchapter relevant to any additional hazards continue to apply.

*Section continued on the next page*

**8330S-A****(PART A)****Air****Refer to ICAO-IATA regulations.**

Sizes 5 kg and under: Cat. No. 8330S-15G, 8330S-50ML, 8330S-200ML

**NOT REGULATED**

Not Restricted, as per Special Provisions A197

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.

**Sea****Refer to IMDG regulations.**

Sizes 5 kg and under: Cat. No. 8330S-21G, 8330S-50ML, 8330S-200ML

**NOT REGULATED**

per 2.10.2.7

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 trained and certified 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.

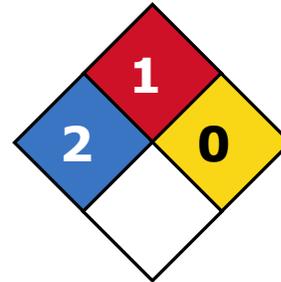
**Hazardous Products Act (R.S.C., 1985, c. H-3)**

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

*Section continued on the next page*

**8330S-A****(PART A)****USA****Other Classifications****HMIS® RATING**

<b>HEALTH:</b>	<b>*</b>	<b>2</b>
<b>FLAMMABILITY:</b>		<b>1</b>
<b>PHYSICAL HAZARD:</b>		<b>0</b>
<b>PERSONAL PROTECTION:</b>		

**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 contains silver (CAS# 7440-22-4; reportable quantity = 1 000 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, USA).

This product does not contain any listed substances in California.

**Europe****RoHS** (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP 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** MG Chemical's Regulatory Department**Date of Review** 23 September 2021**Supersedes** Not applicable**Reason for Changes:** First release.**Reference**

1) ACGIH 2017 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 (2017).

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)
ECHA	European Chemicals Agency
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

*Section continued on the next page*

**8330S-A****(PART A)**

**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](http://www.mgchemicals.com).

Email: [support@mgchemicals.com](mailto: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

**Disclaimer** This 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.

8330S-B

**(PART B)**

# Safety Data Sheet

## Section 1: Identification

### Product Identifier and Other Means of Identification

**Product Identifier:** 8330S-B**Other Means of Identification:** Silver Conductive Epoxy Adhesive**Related Part #** 8330S-21G, 8330S-50ML, 8330S-200ML

### Recommended Use and Restriction on Use

**Use:** Silver filled electrically conductive adhesive epoxy hardener for use with resins**Uses Advised Against:** Not available

### Details of Manufacturer or Importer

**Manufacturer**MG Chemicals  
1210 Corporate Drive  
Burlington, Ontario L7L 5R6  
CANADA**Supplier**Digi Key  
701 Brooks Ave  
Thief River Falls, MN 56701  
United States +1-800-340-0772**FAX** +1-800-340-0773**E-MAIL** [support@mgchemicals.com](mailto:support@mgchemicals.com)**WEB** [www.mgchemicals.com](http://www.mgchemicals.com) +1-800-344-4539**E-MAIL** (Competent Person): [sds@mgchemicals.com](mailto:sds@mgchemicals.com)

### Emergency Phone Number

**For hazardous material incidents ONLY** (leaks, spills, fires, exposures or accidents)USA or CANADA—Call Verisk 3E at **+1-866-519-4752** or **+1-760-476-3962**

(Service access code: 335388)

**For emergencies involving the transport of dangerous goods;** 24/7 serviceCANADA—Call CANUTEC collect at **+1-613-996-6666** or **\*666** on cellular phones

**8330S-B**
**(PART B)**
**Section 2: Hazard(s) Identification**
**Classification of the Chemical Material**
**GHS Categories**

Criteria		Category	Signal Word	Pictograms
Eye Damage		1	Danger	Corrosion
Sensitization	Skin	1	Warning	Exclamation
Skin Irritant		2	Warning	Exclamation
Hazardous to the Aquatic Environment	Chronic	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.

**Label Elements**

<b>Signal Word</b>	<b>DANGER</b>
<b>Pictograms</b>	<b>Hazard Statements</b>
	H318: Causes serious eye damage
	H317: May cause an allergic skin reaction H315: Causes skin irritation
	H410: Very toxic to aquatic life with long lasting effects

*Section continued on the next page*

**8330S-B**
**(PART B)**
*Continued ...*

<b>Prevention</b>	<b>Precautionary Statements</b>
P102	Keep out of reach of children.
P261	Avoid breathing fumes/vapors.
P280	Wear protective gloves/eye 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.
<b>Response</b>	<b>Precautionary Statements</b>
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/doctor.
P302 + P352, P362 + P364	IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before reuse.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P391	Collect spillage.
<b>Disposal</b>	<b>Precautionary Statements</b>
P501	Dispose of contents/container in accordance to local/regional/international regulations.

**Hazards Not Otherwise Classified**

<b>Other Criteria</b>	<b>Hazard Statements/Precautionary Statement</b>	<b>Signal Word</b>	<b>Pictograms</b>
Argyria	Long term ingestion or inhalation of silver can lead to an irreversible blue-grey discoloration of the skin.	None	None

**Section 3: Composition/Information on Ingredients**

CAS #	Chemical Name	%(weight)
7440-22-4	silver	60-100%
68541-13-9	9,12-octadecadienoic acid-based polyamidoamine	7-13%
68082-29-1	fatty acid-polyethylamine polymer	5-10%
4246-51-9	3,3'-(oxybis(2,1-ethane-diyloxy))bis-1-propanamine	1-5%
112-24-3	triethylenetetramine	0.5-1.5%

**Section 4: First-Aid Measures**

<i>Exposure Condition</i>	<i>GHS Code: Precautionary Statement</i>
<b>IF IN EYES</b>	P305 + P351 + P338, P310
<b>Immediate Symptoms</b>	<i>redness, severe irritation, pain, burns</i>
<b>Response</b>	Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  Immediately call a POISON CENTER/doctor.
<b>IF ON SKIN</b>	P302 + P352, P362 + P364, P333 + P313
<b>Immediate Symptoms</b>	<i>redness, severe irritation, rash (allergic contact dermatitis)</i>
<b>Response</b>	Wash with plenty of water. Take off contaminated clothing and wash it before reuse.  If skin irritation or rash occurs: Get medical advice/attention.
<b>IF INHALED</b>	P304 + P340
<b>Immediate Symptoms</b>	<i>low toxicity: cough, irritation of the respiratory track</i>
<b>Response</b>	Remove person to fresh air and keep comfortable for breathing.
<b>IF SWALLOWED</b>	P301 + P330 + P331
<b>Immediate Symptoms</b>	<i>low toxicity: no symptoms known or expected</i>
<b>Response</b>	Rinse mouth. Do not induce vomiting.

*Section continued on the next page*

**8330S-B****(PART B)****Advice to Physicians**

In case of exposure to nitrogen oxides (NO<sub>x</sub>) combustion products or triethylenetetramine vapors during a fire, the symptoms may be delayed. For significant exposures, the exposed person should be kept under medical surveillance for 48 hours.

**Section 5: Fire-Fighting Measures**

<b>Extinguishing Media</b>	In case of fire: Use extinguishing media suitable for surrounding materials.
<b>Specific Hazards</b>	Not flammable or combustible, but burns if involved in a fire. Produces irritating and toxic fumes in fires or in contact with hot surfaces.  Inhalation of toxic smoke during fire may have delayed effects. Exposed person may need to be put under surveillance for 48 h.  Toxic for aquatic environment: Prevent fire-fighting wash from entering waterway or sewer system.
<b>Combustion Products</b>	Produces carbon oxides (CO, CO <sub>2</sub> ), ammonia, nitric acid, nitrogen oxides (NO <sub>x</sub> ), and silver metal fumes.
<b>Fire-Fighter</b>	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

**Section 6: Accidental Release Measures**

<b>Personal Protection</b>	Use personal protection recommended in Section 8.
<b>Precautions for Response</b>	Avoid breathing the fumes/vapors.
<b>Environmental Precautions</b>	Avoid releasing to the environment. Prevent spill from entering drains and waterways. Do not flush to sewer.
<b>Containment Methods</b>	None required—this product is not readily flowable.
<b>Cleaning Methods</b>	Collect spill in a sealable container. Wipe residue with a paper towel wetted with a suitable organic solvent such as alcohol or ethyl lactate, and place dirty towels in container. Use soap and water to remove the last traces of residue.  <b>RECOMMENDATION:</b> Use a plastic, stainless steel, or carbon steel container. Avoid containers with copper, aluminum, zinc, or galvanized surfaces since the waste material can slowly oxidize them.
<b>Disposal Methods</b>	Dispose spill waste according to Section 13.

**8330S-B**
**(PART B)**
**Section 7: Handling and Storage**

<b>Prevention</b>	Keep out of reach of children. Avoid breathing fumes/vapors. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment.
<b>Handling</b>	Wear protective gloves/eye protection. Take off contaminated clothing and wash it before reuse. Wash hands thoroughly after handling. Collect spillage.
<b>Storage</b>	Keep in a dry and clean area, away from incompatible substances. See incompatibles in Section 10.

**Section 8: Exposure Controls/Personal Protection**
**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 <sup>3</sup>	Not established
	U.S.A. OSHA PEL	0.01 mg/m <sup>3</sup>	Not established
	Canada AB	0.1 mg/m <sup>3</sup>	Not established
	Canada BC	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>
	Canada ON	0.1 mg/m <sup>3</sup>	Not established
	Canada QC	0.1 mg/m <sup>3</sup>	Not established
triethylenetetramine	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	Not established	Not established
	U.S.A (WEEL)	1 ppm	Not established
	Canada AB	Not established	Not established
	Canada BC	Not established	Not established
	Canada ON	0.5 mg/m <sup>3</sup> (Skin) <sup>a)</sup>	Not established
	Canada QC	Not established	Not established

*Note:* Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH<sup>1</sup>, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS<sup>2</sup> 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) Skin—can be absorbed through the skin.

*Section continued on the next page*

**8330S-B****(PART B)****Engineering Controls****Ventilation**

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

Due to low vapor pressure of the product, general ventilation should be adequate for normal use. If the product is heated at high temperatures or worker is allergic, use local ventilation and 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**

For likely contacts, use of protective butyl rubber, neoprene, or other chemically resistant gloves.

For incidental contacts, use nitrile or other chemically resistant gloves.

**Respiratory Protection**

For over-exposures up to 10 x OEL of mist/vapors/spray, wear respirator such as a half-mask respirator with organic vapor cartridges.

Above 10 x OEL, use a positive-pressure, air-supplied respirator or a self-contained breathing apparatus.

If the product is heated or worker has a known allergic reaction, consider using a full mask with organic vapor cartridge or with an independent air supply.

**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.

**General Hygiene Considerations**

Wash hands with water and soap after use.

**8330S-B**
**(PART B)**
**Section 9: Physical and Chemical Properties**

<b>Physical State</b>	Solid	<b>Lower Flammability Limit</b>	Not available
<b>Appearance</b>	Silver grey, paste	<b>Upper Flammability Limit</b>	Not available
<b>Odor</b>	Amine-like	<b>Vapor Pressure @20 °C<sup>b)</sup></b>	<0.48 kPa [<3.6 mmHg]
<b>Odor Threshold</b>	Not available	<b>Vapor Density</b>	Not available
<b>pH</b>	Not available	<b>Relative Density @25 °C</b>	2.83
<b>Freezing/Melting Point</b>	Not available	<b>Solubility in Water</b>	Slightly soluble
<b>Initial Boiling Point<sup>a)</sup></b>	>221 °C [>430 °F]	<b>Partition Coefficient n-octanol/water</b>	Not available
<b>Flash Point<sup>a)</sup></b>	>93 °C [>200 °F]	<b>Auto-ignition Temperature</b>	Not available
<b>Evaporation Rate</b>	Not available	<b>Decomposition Temperature</b>	Not available
<b>Flammability</b>	Non Flammable	<b>Viscosity @25 °C</b>	>20.5 mm <sup>2</sup> /s

a) The boiling point and closed cup flash point values are based on the lowest value component: 3,3'-(oxybis(2,1-ethane-diyloxy))bis-1-propanamine.

b) Based on highest vapor pressure component

**Section 10: Stability and Reactivity**

<b>Reactivity</b>	Reacts exothermically with ketones, and epoxides. May react violently with peroxides. May slowly attack metals such as aluminum, zinc, copper, and their alloys.
<b>Chemical Stability</b>	Chemically stable at normal temperatures and pressures
<b>Conditions to Avoid</b>	Avoid excessive heat and incompatible substances.
<b>Incompatibilities</b>	Strong oxidizing agents, strong acids, peroxides
<b>Polymerization</b>	Will not occur
<b>Decomposition</b>	For thermal decomposition, see combustion products in Section 5

**Section 11: Toxicological Information**
**Summary of Effects and Symptoms by Routes of Exposure**

<b>Eyes</b>	May causes redness, severe eye irritation, pain, or corrosive eye damage.
<b>Skin</b>	<p>May cause redness, serious skin irritation, allergic contact dermatitis, and chemical burns. Triethylenetetramine can be absorbed through skin leading to toxic effects.</p> <p>When heated, hot triethylenetetramine vapors may also result in itching of the face with skin redness (erythema) and swelling (edema).</p>
<b>Inhalation</b>	Low toxicity: inhalation of vapors or mist may cause irritation to the nose, throat and lung (upper respiratory tract) and coughing.
<b>Ingestion</b>	Low toxicity: no symptoms known or expected.
<b>Chronic</b>	<p>Prolonged and repeated exposure to uncured epoxy hardener may lead to skin sensitization.</p> <p>Prolonged and repeated ingestion or inhalation of silver may yield to an irreversible blue-grey discoloration of the skin.</p>

**Lethal Exposure Concentrations**

<b>Chemical Name</b>	<b>LD50 oral</b>	<b>LD50 dermal</b>	<b>LC50 inhalation</b>
silver	>5 g/kg Guinea Pig	≥2 000 mg/kg Rabbit	5.16 mg/L Rat 4 h (dust)
9,12-octadecadienoic acid-based polyamidoamine	>2 000 mg/kg <sup>a)</sup>	Not available	Not available
fatty acid-polyethylamine polymer	>2 000 mg/kg <sup>a)</sup>	Not available	Not available
3,3'-(oxybis(2,1-ethanedioxy))bis-1-propanamine	4 310 mg/kg Rat	2 510 mg/kg Rat	Not available
triethylenetetramine	2 500 mg/kg Rat	805 mg/kg Rabbit	Not available

*Note:* Toxicity data from the RTECS<sup>2</sup> and ECHA databases were consulted. The data from supplier SDS were also consulted.

a) Supplier MSDS

*Section continued on the next page*

**8330S-B****(PART B)****Other Toxicological Effects**

<b>Skin corrosion/irritation</b>	Skin irritant. Total category 1 components contributions is between 2–3%, giving an overall category 2 rating.
<b>Serious eye damage/irritation</b>	Causes severe eye damage. Contains mechanically abrasive particles.
<b>Sensitization</b> (allergic reactions)	Triethylenetetramine (CAS# 112-24-3), fatty acid-polyethylamine polymer (CAS# 68082-29-1), and 3,3'-(oxybis(2,1-ethane-diyloxy))bis-1-propanamine components (CAS# 4246-51-9) may cause skin sensitization according to animal studies.
<b>Carcinogenicity</b> (risk of cancer)	None of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP
<b>Mutagenicity</b> (risk of heritable genetic effects)	Based on available data, the classification criteria are not met.
<b>Reproductive Toxicity</b> (risk to sex functions)	Based on available data, the classification criteria are not met.
<b>Teratogenicity</b> (risk of fetus malformation)	Based on available data, the classification criteria are not met.
<b>STOT-single exposure</b>	Based on available data, the classification criteria are not met.
<b>STOT-repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met. There is no category 1 components, and the kinematic viscosity is >20.5 mm <sup>2</sup> /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.

Contains silver particles of less than a 1 mm but more than 100 nm (larger than nanoparticles), which release ionic silver levels that is very toxic to the environment. While massive silver is insoluble in water, its powders is considered sufficiently soluble to give rise to an ecological hazard by EU regulators. The classification that follows takes into account to chronic aqueous toxicity of category 1 (M = 10 for silver) of the EU.

The fatty acid-polyethylamine polymer is classified as a chronic category 2 environmental toxicant.

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**8330S-B****(PART B)**

The 3,3'-(oxybis(2,1-ethane-diyloxy))bis-1-propanamine is classified as a chronic category 3 environmental toxicant.

The 9,12-octadecadienoic acid-based polyamidoamine is not classified as an ecotoxic substance.

Literature values for the triethylenetetramine (CAS# 112-24-3) suggest an acute category 3 aquatic toxicity (LC50, IC50, and EC50 values of >100 mg/L for fish and between 10 and 100 mg/L for algae).

**Acute Ecotoxicity**

Category 1

Very toxic to aquatic life

**Chronic Ecotoxicity**

Category 1

Very toxic to aquatic life with long lasting effect

Avoid release to the environment. Collect spillage.

**Biodegradability**

Not readily biodegradable

**Bioaccumulation**

Not available

**Other Effects**

Not available

**Section 13: Disposal Considerations**

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

**8330S-B**

**(PART B)**

**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 kg  
**NOT REGULATED** in TDG  
per Special Provisions 99

*FOR REFERENCE ONLY*

**UN number:** UN3077  
**Shipping Name:** ENVIRONMENTALLY  
HAZARDOUS SUBSTANCE, SOLID,  
N.O.S. (silver particles <1 mm)

Sizes 5 kg and under  
**NOT REGULATED** in 49 CFR  
per exception 171.4 (c)(2)

**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.

**Air**

**Refer to ICAO-IATA regulations.**

Sizes 5 kg and under: Cat. No. 8330S-21G, 8330S-50ML, 8330S-200ML

**NOT REGULATED**  
On the air waybill, write "Not  
Restricted, as per Special  
Provisions A197"

**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.

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**8330S-B****(PART B)****Sea****Refer to IMDG regulations.**

Sizes 5 kg and under: Cat. No. 8330S-21G, 8330S-50ML, 8330S-200ML

**NOT REGULATED**

per 2.10.2.7

**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 trained and certified 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/NDSL.

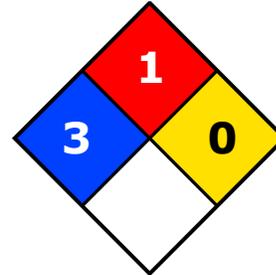
**Hazardous Products Act (R.S.C., 1985, c. H-3)**

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

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**8330S-B****(PART B)****USA****Other Classifications****HMIS<sup>®</sup> RATING**

<b>HEALTH:</b>	<b>* 3</b>
<b>FLAMMABILITY:</b>	<b>1</b>
<b>PHYSICAL HAZARD:</b>	<b>0</b>
<b>PERSONAL PROTECTION:</b>	

**NFPA<sup>®</sup> 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 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, USA).

This product does not contain any listed substances in California.

**Europe****RoHS** (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP 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** MG Chemical's Regulatory Department**Date of Revision** 23 September 2021**Supersedes** Not applicable**Reason for Changes:** First release.**Reference**

1) ACGIH 2017 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 (2017).

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](http://www.mgchemicals.com).

Email: [support@mgchemicals.com](mailto:support@mgchemicals.com)

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**8330S-B****(PART B)**

**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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