Kit Revision Date: 25 January 2021

8330 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

Part	*Product Name*	*Product Use*
A	8330-A	Electrically conductive epoxy adhesive resin part for use with hardeners
B	8330-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.

8330-A **(PART A)**

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Identifier: 8330-A

Other Means of Identification: Silver Conductive Epoxy Adhesive

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

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

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

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

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

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

Emergency Phone Number

For hazardous material incidents ONLY (leaks, spills, fires, exposures or accidents)
USA or CANADA—Call 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 service
CANADA—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

Signal Word	**WARNING**
Pictograms	**Hazard Statements**
	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
Prevention	**Precautionary Statements**
P102	Keep out of reach of children.
P261	Avoid breathing fumes and vapors.
P280	Wear protective gloves and eye protection.
P272	Contaminated work clothing should not be allowed out of the workplace.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.

Section continued on the next page

Continued…

Response	Precautionary Statements
P302 + P352	IF ON SKIN: Wash with plenty of water.
P333 + P313	If skin irritation or rash occurs: Get medical advice or 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 or attention.
P391	Collect spillage.
Disposal	**Precautionary Statements**
P501	Dispose of contents and container in accordance to local, regional, national, and international regulations.

Hazards Not Otherwise Classified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Argyria	Long term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin.	Not Applicable	Not Applicable

Section 3: Composition/Information on Ingredients

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

Section 4: First-Aid Measures

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

Section 5: Fire-Fighting Measures

Extinguishing Media	In case of fire: Use extinguishing media suitable for surrounding materials.
Specific Hazards	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.
Combustion Products	Produces carbon oxides (CO, CO_2), and toxic metal fumes.
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	See personal protection recommendations in Section 8.
Precautions for Response	Avoid breathing fumes or vapors. Remove or keep away all sources of extreme heat or open flames.
Environmental Precautions	Avoid releasing to the environment. Prevent spill from entering drains and waterways.
Containment Methods	No containment method required—this product is not readily flowable
Cleaning Methods	Collect paste in a sealable, chemical-resistant container. Wipe off residues with paper towels and place the used towels in the waste container.Use soap and water to remove the last traces of residue.
Disposal Methods	Dispose of spill waste according to Section 13.

Section 7: Handling and Storage

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

Section 8: Exposure Controls/Personal Protection

Substances with Occupational Exposure Limit Values

Chemical Name	Country	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	0.1 mg/m^3	Not established

Note: The ACGIH[1], OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS[2] 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

Respiratory Protection If exposed to fumes or dust above the exposure limit, wear a suitable respirator meeting local, regional and 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

Physical State	Solid	**Lower Flammability Limit**	Not available
Appearance	Silver grey, paste	**Upper Flammability Limit**	Not available
Odor	Slight	**Vapor Pressure @20 °C**	Not available
Odor Threshold	Not available	**Vapor Density**	Not available
pH	Not available	**Relative Density @25 °C**	3.4
Freezing/Melting Point	Not available	**Solubility in Water**	Insoluble
Initial Boiling Point	Not available	**Partition Coefficient n-octanol/water**	Not available
Flash Point [a)]	150 °C [302 °F]	**Auto-ignition Temperature**	Not available
Evaporation Rate	Not available	**Decomposition Temperature**	Not available
Flammability	Non Flammable	**Viscosity @40 °C**	>20.5 mm^2/s

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

Section 10: Stability and Reactivity

Reactivity	Reacts exothermically with amines.
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Avoid ignition sources, open flames, and incompatible substances. Do not use in a way that aerosolizes the product.
Incompatibilities	Avoid strong oxidizing agents, strong acids, strong bases
Polymerization	Will not occur
Decomposition	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

Eyes	May cause redness and mild irritation.
Skin	May cause skin redness, mild irritation, dry skin, or allergic contact dermatitis.
Inhalation	May cause cough, respiratory irritation, sore throat, or asthma.
Ingestion	Low toxicity: It may cause abdominal discomfort, nausea, vomiting.
Chronic	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)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
silver	≥2 000 mg/kg Rat	≥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 [a)]	2 150 mg/kg Rabbit [a)]	Not available

Note: Toxicity data from the RTECS[2] and ECHA database were consulted. The data from supplier SDS were also consulted.
a) According to supplier safety data sheet.

Section continued on the next page

Other Toxicological Effects

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/irritation	Causes severe eye irritation. Contains mechanically abrasive particles.
Sensitization (allergic reactions)	The epoxy resin components (CAS# 28064-14-4 and 17557-23-2) 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)	Based on available data, the classification criteria are not met.
Reproductive Toxicity (risk to sex functions)	Based on available data, the classification criteria are not met.
Teratogenicity (risk of fetus malformation)	Based on available data, the classification criteria are not met.
STOT-single exposure	Based on available data, the classification criteria are not met.
STOT-repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Based on available data, the classification criteria are not met. There is no category 1 components, and the kinematic viscosity is >20.5 mm^2/s at 40 °C.

Section 12: Ecological Information

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

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

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.

Section 14: Transport Information

Ground

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

TDG: Sizes 5 kg and under *8330-19G, 8330-50ML, 8330-200ML* **NOT REGULATED** in TDG per Special Provisions 99	Sizes greater than 5 kg *FOR REFERENCE ONLY* **UN number:** UN3077 **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (silver flakes <1 mm; phenol, polymer with formaldehyde, glycidyl ether) **Class:** 9 **Packing Group**: III **Marine Pollutant:** Yes
CFR: Sizes 5 kg and under **NOT REGULATED** in 49 CFR per exception 171.4 (c)(2)	

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:
(2) 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.

Temperature sensitive—Keep between 5 °C and 35 °C.

Section continued on the next page

Air

Refer to ICAO-IATA regulations.	
Sizes 5 kg and under *8330-19G, 8330-50ML, 8330-200ML* **NOT REGULATED** Not Restricted, as per Special Provisions A197	Sizes over 5 kg *FOR REFERENCE ONLY* **UN number:** UN3077 **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (silver flakes <1 mm; phenol, polymer with formaldehyde, glycidyl ether) **Class:** 9 **Packing Group:** III **Marine Pollutant**: Yes
Special Provision A197: These substances when transported in single or combination packagings containing net quantity per single or inner packaging of less than 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Regulations provided the packagings meet the general provisions 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.	

Temperature sensitive—Keep between 5 °C and 35 °C.

Sea

Refer to IMDG regulations.	
Sizes 5 kg and under *8330-19G, 8330-50ML, 8330-200ML* **NOT REGULATED** per clause 2.10.2.7	Sizes over 5 kg *FOR REFERENCE ONLY* **UN number:** UN3077 **Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (silver flakes <1 mm; phenol, polymer with formaldehyde, glycidyl ether) **Class:** 9 **Packing Group:** III **Marine Pollutant**: Yes
2.10.2.7: Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provision of this Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class, all provisions of this Code relevant to any additional hazards continue to apply.	

Temperature sensitive—Keep between 5 °C and 35 °C.

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

Section 15: Regulatory Information

Canada

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

All hazardous ingredients are listed on the DSL.

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.

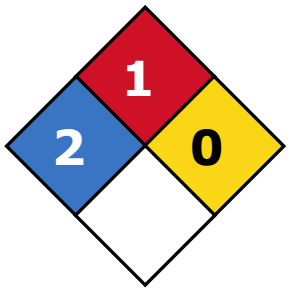
USA

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)

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.

Section continued on the next page

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	22 January 2021
Supersedes	09 March 2020

Reason for Changes: Update to transport section and other minor changes.

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®)

Section continued on the next page

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

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

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.

8330-B **(PART B)**

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Identifier: 8330–B

Other Means of Identification: Silver Conductive Epoxy Adhesive (Part B) / Adhésif Époxy d'Argent Conducteur (Partie 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

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

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

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

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

Emergency Phone Number

For hazardous material incidents ONLY (leaks, spills, fires, exposures or accidents)
USA or CANADA—Call 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 service
CANADA—Call CANUTEC collect at ***+1-613-996-6666*** or ****666*** on cellular phones

Section 2: Hazard(s) Identification

Classification of the Chemical Material

GHS Categories

Criteria		Category	Signal Word	Pictograms
Serious Eye Damage Skin Corrosion		1 1B	Danger Danger	Corrosion Corrosion
Sensitization	Skin	1	Warning	Exclamation
Reproductive Toxicity		2	Warning	Health
Hazardous to the Aquatic Environment	Acute	1	Warning	Environment
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

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

Section continued on the next page

Continued…

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 or vapors.
P280	Wear protective gloves and 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.
Response	**Precautionary Statements**
P308 + P313	If exposed or concerned: Get medical advice.
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.
P303 + P361 + P352, P310	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with plenty of water. Immediately call a POISON CENTER or doctor.
P333 + P313	If skin irritation or rash occurs: Get medical advice or attention.
P363	Wash contaminated clothing before reuse.
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.
P391	Collect spillage.
Storage	**Precautionary Statements**
P405	Store locked up.
Disposal	**Precautionary Statements**
P501	Dispose of contents in accordance to local, regional, national and international regulations.

Section continued on the next page

Hazards Not Otherwise Classified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Argyria	Long term exposure to silver powder or compounds 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	74%
84852-15-3	4-nonyl phenol, branched	18%
140-31-8	1-piperazineethanamine	5.5%
111-40-0	diethylene triamine	1%
80-05-7	4,4'-isopropylidenediphenol	0.5%

Section 4: First-Aid Measures

Exposure Condition	*GHS Code: Precautionary Statement*
IF IN EYES	P305 + P351 + P338, P310
Immediate Symptoms	*redness, severe irritation, pain, burns*
Response	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 or doctor.
IF ON SKIN	P303 + P361 + P353, P310, P333 +P313, P308 + P313, P363
Immediate Symptoms	*redness, rash, severe irritation, pain, burns, blistering*
Response	Take off immediately all contaminated clothing. Wash with plenty of water. Immediately call a POISON CENTER or doctor. If skin irritation or rash occurs: Get medical advice or attention. If exposed or concerned: Get medical advice. Wash contaminated clothing before reuse.

Section continued on the next page

Continued…

IF INHALED	P304 + P340, P310, P308 + P313
Immediate Symptoms	*cough, severe irritation or burns of the respiratory track*
Response	Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTRE or doctor. IF exposed or concerned: Get medical advice or attention.
IF SWALLOWED	P301 + P330, P331, P310, P308 + P313
Immediate Symptoms	*severe irritation, burns to mouth, throat, stomach*
Response	Rinse mouth. Do not induce vomiting. Immediately call a POISON CENTRE or doctor. IF exposed or concerned: Get medical advice or attention.

Section 5: Fire-Fighting Measures

Extinguishing Media	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish. **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 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. Toxic to aquatic environments: Prevent fire-fighting wash from entering waterway or sewer system.
Combustion Products	Produces carbon oxides (CO, CO_2), nitrogen oxides (NO_x), amines, toxic fumes, and smoke.
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	Use personal protection recommended in Section 8.
Precautions for Response	Do not breathe fumes or vapors. Remove or keep away all sources of ignition or extreme heat.
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. Wipe remaining residue with a paper towel 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.

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. Do not breathe fumes or vapors. Avoid release to the environment.
Handling	Wear protective gloves and eye protection. Wash hands thoroughly after handling. Take off contaminated clothing and wash it before reuse. Collect spillage.
Storage	Store locked up.

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 U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	0.1 mg/m^3 0.01 mg/m^3 0.1 mg/m^3 0.01 mg/m^3 0.1 mg/m^3 3 mg/m^3	Not established Not established Not established 0.03 mg/m^3 Not established Not established
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)] (S) 1 ppm [a)] 1 ppm [a)]	Not established Not established Not established Not established Not established Not established

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

a) Danger of cutaneous absorption
S—Skin sensitizer

Engineering Controls

Ventilation

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

RECOMMENDATION: Because the silver flakes and diethylene triamine are bound in the adhesive mixture, they do not present an airborne hazard under normal use. Ensure adequate ventilation if the product is mechanically misted or aerosolized.

Section continued on the next page

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, latex, neoprene, or other chemically resistant gloves. For incidental contacts, use nitrile, latex, neoprene or other chemically resistant gloves.
Respiratory Protection	For over-exposures up to 10 x OEL of vapors, 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 that your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in Section 3. The respirator should be fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

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

a) Setaflashed closed cup for hardener components

Section 10: Stability and Reactivity

Reactivity	Reacts exothermically with epoxide groups.
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Avoid flames, excessive temperatures, and incompatible substances.
Incompatibilities	Strong oxidizing agents, strong acids, strong bases, ammonia
Polymerization	Will not occur
Decomposition	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

Eyes	Causes redness, severe irritation, pain, or severe eye damage. Contains mechanically abrasive particles.
Skin	Causes redness, severe irritation, rash, pain, or burn sensations.
Inhalation	May cough, severe irritation or burns of the respiratory track.
Ingestion	May cause severe irritation, burns to mouth, throat, and stomach.
Chronic	Prolonged and repeated exposure may lead to skin sensitization. Long term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin.

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 available
1-piperazineethanamine	2 140 µl/kg Rat	866 mg/kg Rabbit	Not available
diethylene triamine	1 080 mg/kg Rat	1 090 mg/kg Rabbit	Not available
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[2] and ECHA databases were consulted. The data from supplier SDS were also consulted.

Section continued on the next page

Other Toxicological Effects

Skin corrosion/irritation	The 4-nonyl phenol, branched; 1-piperazineethanamine; and diethylene triamine cause skin burns.
Serious eye damage/irritation	The 4-nonyl phenol, branched; 1-piperazineethanamine; and diethylene triamine cause serious eye damage.
Respiratory and skin sensitization (allergic reactions)	The 4-nonyl phenol, branched and 4,4'-isopropyli-denediphenol may cause skin sensitization.
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)	Based on available data, the classification criteria are not met.
Reproductive Toxicity (risk to sex functions)	Based on animal studies 2-piperazin-1-ylethylamine (CAS# 140-31-8) has been shown to be a developmental toxicant if swallowed.
Teratogenicity (risk of fetus malformation)	The 4-nonyl-phenol, branched (CAS# 84852-15-13) and 4,4'-isopropyli-denediphenol (CAS# 80-05-7) are suspected of being reproductive toxicants.
STOT-single exposure	Based on available data, the classification criteria are not met.
STOT-repeated exposure	Based on available data, the classification criteria are not met. See hazards not otherwise specified Argyria warning in Section 2.
Aspiration hazard	There are no category 1 components, and the kinematic viscosity is >20.5 mm^2/s at 40 °C.

Section 12: Ecological Information

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

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 category 1 marine pollutant according to available data with a minimal 96 h LC50 of 0.135 mg/L Lepomis macrochiru.

Section continued on the next page

The 1-piperazineethanamine (CAS# 140-31-8) is a category 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).

The 4,4'-isopropylidenediphenol ingredient is a category 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).

Diethylene triamine (CAS# 111-40-0) is not classified as marine pollutant according to available data.

Acute Ecotoxicity

Category 1

Very toxic to aquatic life

Chronic Ecotoxicity

Category 1

Toxic to aquatic life with long lasting effects

Avoid release to the environment. Collect spillage.

Persistence and Biodegradability

Not available

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, regional, national, and international 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 1 kg and under
8330-19G, 8330-50ML, 8330-200ML
Limited Quantity

Sizes greater than 1 kg
FOR REFERENCE ONLY
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
(silver particles <1 mm)

Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 30 g and under
8330-19G
Excepted Quantity
Document as class **E2**

Max Net Qty/Outer Pkg = 500 g

Sizes 1 kg and under
8330-50ML, 8330-200ML
Limited Quantity

Sizes greater than 5 kg up to 15 kg
FOR REFERENCE ONLY
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
(silver particles <1 mm)

Section continued on the next page

Sea

Refer to IMDG regulations.

Sizes 1 kg and under
8330-19G, 8330-50ML, 8330-200ML
Limited Quantity

Sizes greater than 1 kg
FOR REFERENCE ONLY
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
(silver particles <1 mm)

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.

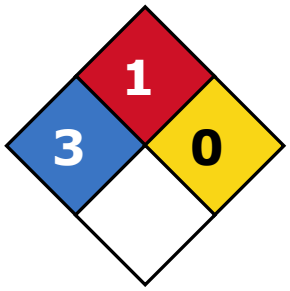
USA

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)

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 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, USA).

This product contains 4,4'-isopropylidenediphenol (CAS# 80-05-7), which is listed as a reproductive hazard.

Section continued on the next page

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 January 2021
Supersedes	21 December 2020
Reason for Changes:	Update information.

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

Section continued on the next page

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

Telephone: +1-905-331-1396

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.