

SAI Global File #004008 Burlington, Ontario, Canada

# SILVER COATED COPPER CONDUCTIVE COATING

#### 843AR-AEROSOL

# Safety Data Sheet

#### Section 1: Identification

#### Product Identifier and Other Means of Identification

**Product Name:** Super Shield™ Silver Coated Copper Conductive Coating

SDS Code: 843AR-Aerosol Related Part # 843AR-340G

#### **Recommended Use and Restriction on Use**

**Use:** Electrically conductive coating and EMI/RFI shielding

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

MG Chemicals (Head Office)

9347-193 Street

Surrey, British Columbia V4N 4E7

**CANADA** 

+1-905-331-1396 +1-905-331-2682 FAX

E-MAIL info@mqchemicals.com

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

# **Emergency Phone Number**

For hazardous material incidents ONLY—leaks, spills, fires, exposures or accidents

USA or CANADA: Call CHEMTREC **☎**: +1-800-424-9300

For emergencies involving dangerous goods; Collect 24/7

CANADA: Call CANUTEC : +1-613-996-6666 or \*666 on cellular phones



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# **Section 2: Hazard(s) Identification**

# **Classification of Hazardous Chemical**

# **GHS Categories**

Criteria		Category	Signal Word	Pictograms
Flammable Aerosol		2	Warning	Flame
Gas Under Pressure		Liquefied gas	Warning	Gas cylinder
Eye Irritation		2	Warning	Exclamation
Specific Target Organ Toxicity	Single Exposure	3	Warning	Exclamation
Hazardous to the Aquatic Environment	Chronic	2	none	Environment

*Note:* The degree of severity is ranked within each hazard class from

#### **Label Elements**

Signal Word	WARNING
Pictograms	Hazard Statements
	H223: Flammable aerosol
	H280: Contains gas under pressure; may explode if heated
	H319: Causes serious eye irritation
	H336: May cause drowsiness and dizziness

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<sup>1 (</sup>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.



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Pictograms	Hazard Statements
¥2>	H411: Toxic to aquatic life with long lasting effects
Prevention	Precautionary Statements
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No smoking.
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P261	Avoid breathing mist/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/clothing/eye protection/face protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
Response	Precautionary Statements
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.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTER/doctor if you feel unwell.
P391	Collect spillage.
Storage	Precautionary Statements
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].
P403	Store in well-ventilated place.
P405	Store locked up.
Disposal	Precautionary Statements
P501	Dispose of contents/container in accordance to local/regional/international regulations.

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# **Hazards Not Otherwise Classified**

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Defats skin	Repeated exposure may cause skin dryness or cracking.	None	None
Simple Asphyxiant	May displace oxygen and cause rapid suffocation.	Warning	None

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

CAS #	Chemical Name	%(weight)
67-64-1	acetone	32%
74-98-6	propane	13%
123-86-4	n-butyl acetate	12%
616-38-6	dimethyl carbonate	12%
7440-50-8	copper	10%
75-28-5	isobutane	7%
110-43-0	heptan-2-one <sup>a)</sup>	7%
108-65-6	1-methoxy-2-propanol acetate	2%
7440-22-4	silver	1%

a) Commonly known as methyl amyl ketone (MAK)

# Section 4: First-Aid Measures

Exposure Condition	GHS Code/Symptoms/Precautionary Statements
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	redness, irritation, pain, blurred vision
Response	Rinse cautiously with water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	If eye irritation persists: Get medical advice/attention.

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IF INHALED	P304 + P340, P312
Immediate Symptoms	cough, drowsiness, dizziness, headaches, nausea, unconsciousness
Response	Remove person to fresh air and keep comfortable for breathing.
	Call a POISON CENTER/doctor if you feel unwell.
IF SWALLOWED	P301 + P330, P331
Immediate Symptoms	nausea, sore throat, abdominal pain, diarrhea, drowsiness, dizziness
Response	Rinse mouth. Do NOT induce vomiting.
IF ON SKIN	P302 + P352
Immediate Symptoms	redness, mild irritation, dry skin
Response	Wash with plenty of water.
	Take off contaminated clothing and wash it before reuse.

# Section 5: Fire-Fighting Measures

Extinguishing Media	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.	
	Use water spray to cool containers.	
Specific Hazards	Aerosols containers may erupt with force at temperatures above 50 °C [122 °F].	
	The vapors are heavier than air and may accumulate in low-lying areas. Vapors may travel long distances and ignite at an ignition source, which can cause a flashback or an explosion.	
	Prevent fire-fighting wash from entering waterway or sewer system.	
<b>Combustion Products</b>	Produces carbon oxides (CO, CO <sub>2</sub> ) and metal oxide fumes.	
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.	



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#### **Section 6: Accidental Release Measures**

**Personal Protection** See personal protection recommendations in Section 8.

Precautions for Response

Avoid breathing mist/spray/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** Not applicable

**Cleaning Methods** Collect liquid in a sealable, solvent-resistant container. Sprinkle

inert absorbent compound onto spill, then sweep into the container. Wash spill area with soap and water to remove the

last traces of residue.

**Disposal Methods** Dispose of spill waste according to Section 13.

# **Section 7: Handling and Storage**

**Prevention** Keep out of reach of children.

Keep away from heat, hot surfaces, sparks, open flames and

other ignition sources. No smoking.

Avoid breathing mist/vapors/spray. Use only outdoors or in a

well-ventilated area.

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

Do not pierce or burn, even after use.

**Handling** Do not spray on an open flame or other ignition source.

Wear protective gloves/clothing/eye protection.

Wash hands thoroughly after handling.

Avoid release to the environment. Collect spillage.

**Storage** Protect from sunlight. Do not expose to temperatures exceeding

50 °C [122 °F].

Store in well-ventilated place.

Store locked up.



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# **Section 8: Exposure Controls/Personal Protection**

# **Substances with Occupational Exposure Limit Values**

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
acetone	ACGIH	500 ppm	750 ppm
	U.S.A. OSHA PEL	1 000 ppm	Not established
	Canada AB	500 ppm	750 ppm
	Canada BC	250 ppm	500 ppm
	Canada ON	500 ppm	750 ppm
	Canada QC	750 ppm	1 000 ppm
propane	ACGIH	See footnote a)	Not established
	U.S.A. OSHA PEL	1 000 ppm	Not established
	Canada AB	1 000 ppm	Not established
	Canada BC	1 000 ppm	Not established
	Canada ON	1 000 ppm	Not established
	Canada QC	1 000 ppm	Not established
n-butyl acetate	ACGIH	150 ppm	Not established
	U.S.A. OSHA PEL	150 ppm	Not established
	Canada AB	150 ppm	200 ppm
	Canada BC	20 ppm	200 ppm
	Canada ON	150 ppm	Not established
	Canada QC	150 ppm	200 ppm
copper	ACGIH	1.0 mg/m <sup>3</sup>	Not established
(dust and mist)	U.S.A. OSHA PEL	1.0 mg/m <sup>3</sup>	Not established
	Canada AB	1 mg/m <sup>3</sup>	Not established
	Canada BC	1.0 mg/m <sup>3</sup>	Not established
	Canada ON	1 mg/m <sup>3</sup>	Not established
	Canada QC	1 mg/m <sup>3</sup>	Not established
isobutane	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	Not established	Not established
	Canada AB	Not established	Not established
	Canada BC	Not established	Not established
	Canada ON	1 000 ppm	Not established
	Canada QC	Not established	Not established
heptan-2-one	ACGIH	50 ppm	Not established
methyl amyl ketone	U.S.A. OSHA PEL	100 ppm	Not established
•	Canada AB	50 ppm	Not established
	Canada BC	50 ppm	Not established
	Canada ON	25 ppm	Not established
	Canada QC	50 ppm	Not established

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Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
1-methoxy-2-propanol	ACGIH	Not established	Not established
acetate	U.S.A. OSHA PEL	50 ppm	Not established
	Canada AB	Not established	Not established
Not established	Canada BC	50 ppm	75 ppm
	Canada ON	50 ppm	Not established
	Canada QC	Not established	Not established
silver	ACGIH	0.1 mg/m <sup>3</sup>	Not established
(metal dust, mist)	U.S.A. OSHA PEL	0.01 mg/m <sup>3</sup>	Not established
(metal)	Canada AB	0.1 mg/m <sup>3</sup>	Not established
(Ag and its compounds)	Canada BC	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>
(metal, dust, fumes)	Canada ON	0.1 mg/m <sup>3</sup>	Not established
	Canada QC	0.1 mg/m <sup>3</sup>	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 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.

a) Refer to the ACGIH Appendix F: Mininum Oxygen Content for Asphyxia TLV Basis

# **Engineering Controls**

**Ventilation** Keep airborne concentrations below the occupational exposure

limits (OEL).

# **Personal Protective Equipment**

**Eye protection** Wear appropriate protective eyeglasses or chemical safety

goggles.

**Recommendation:** Ensure that glasses have side shields for

lateral protection.

**Skin Protection** For likely contacts, use of protective butyl rubber or other

chemically resistant gloves.

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#### **Respiratory Protection**

For over-exposures up to  $10 \times OEL$  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.

**RECOMMENDATION:** Consult your local safety supply store to ensure that your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in Section 3. The respirator should be fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.

# **General Hygiene Considerations**

Wash hands thoroughly with water and soap after handling.

# Section 9: Physical and Chemical Properties

Physical State	Liquid, in an aerosol format	Lower Flammability Limit c)	2%
Appearance	Light brown metallic	Upper Flammability Limit <sup>c)</sup>	13%
Odor	Acetone-like	Vapor Pressure @21 °C	16 kPa [118 mmHg]
Odor Threshold a)	5 ppm	Vapor Density	≥2 (Air =1)
pH	Not available	Specific Gravity @25 °C	1.2
Freezing/Melting	Not	Solubility in	Partially miscible
Point	available	Water	
Boiling Point a)	≥56 °C	Partition	Not
	[≥132 °F]	Coefficient	available
Flash Point a)	-17 °C	Auto-ignition	≥315 °C
	[1.4 °F]	Temperature b)	[≥599 °F]
Evaporation	Fast	Decomposition	Not
Rate		Temperature	available
Flammability	Not	Viscosity	87 cP
(solid, gas)	available	@25 °C	

a) Based on the acetone component.

b) The auto-ignition value is based on 1-methoxy-2-propanol acetate, which is the component with the lowest value.

c) Lower and Upper Explosive Limits of mixture calculated using Le Chatelier principle and liquid component LFL and UFL limits



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#### **Section 10: Stability and Reactivity**

**Reactivity** The copper may form shock sensitive compounds in the presence of

acetylenic compounds.

**Chemical Stability** Chemically stable at normal temperatures and pressures

**Conditions to** Temperatures above 50 °C [122 °F], open flames, and incompatible

**Avoid** substances

**Incompatibilities** Oxidizing agents, strong acids, peroxides, alkali or alkali earth metals

**Polymerization** Will not occur

**Decomposition** Will not decompose under normal conditions. For thermal

decomposition, see combustion products in Section 5.

# Section 11: Toxicological Information

# **Routes of Exposure**

Eye contact, Ingestion, Inhalation, and Skin contact

# **Symptoms Summary**

**Eyes** May cause redness, severe irritation, and pain.

**Inhalation** May cause cough, drowsiness, dizziness, headaches, nausea, or

unconsciousness.

**Ingestion** May cause nausea, sore throat, abdominal pain, and diarrhea (also

see inhalation symptoms).

**Skin** May cause skin redness, mild irritation, and dry skin.

**Chronic** Prolonged or repeated exposure may cause skin dryness, cracking, as

well as defatting the skin. Exposure to silver powder may also cause

argyria, an irreversible blue-grey discoloration of the skin.

# **Acute Toxicity (Lethal Exposure Concentrations)**

Chemical Name	LD50	LD50	LC50
	oral	dermal	inhalation
acetone	5 800 mg/kg	20 mL/kg	16 000 ppm
	Rat	Rabbit <sup>a)</sup>	4 h Rat <sup>a)</sup>
propane	Not	Not	>800 000 ppm
	Applicable	Applicable	Rat 4 h

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Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
n-butyl acetate	>10 768 mg/kg	>17 600 mg/kg	390 ppm
	Rat	Rabbit	4 h Rat
copper	>481 mg/kg	<2 000 mg/kg	Not
	Rat <sup>b)</sup>	Rabbit	established
dimethyl carbonate	>6.4 g/kg	>5 000 mg/kg	Not
	Rat & Mouse	Rabbit	established
isobutane	Not	Not	>570 000 ppm
	applicable	applicable	Rat 4 h
heptan-2-one	1 670 mg/kg	12 600 μL/kg	>16.7 mg/kg
	Rat	Rabbit	4 h Rat
1-methoxy-2-propanol acetate	8 532 mg/kg	>5 g/kg	Not
	Rat	Rabbit	established
silver	>2 000 mg/kg	>2 000 mg/kg	5.16 mg/m³
	Rat	Rat	4 h Rat (dust)

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

- a) According to supplier safety data sheet
- b) Copper flake

# **Other Toxicological Effects**

Skin corrosion/irritation	Based on available data, the classification criteria are not met.
Serious eye damage/irritation	Acetone is a known serious eye irritant. Mixture contains mechanically abrasive particles.
Sensitization (allergic reactions)	Based on available data, the classification criteria are not met.
Carcinogenicity (risk of cancer)	Based on available data, the classification criteria are not met.
<b>Mutagenicity</b> (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.

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**Teratogenicity** Based on available data, the classification criteria are not

(risk of fetus malformation) met.

**STOT-single exposure** Inhalation of acetone, n-butyl acetate, heptan-2-one,

may affect the central nervous system.

**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 less than 10% category 1 components.

# **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 (<a href="http://echa.europa.eu">http://echa.europa.eu</a>), and other reliable sources.

Contains silver and copper particles of less than a 1 mm but more than 100 nm (larger than nanoparticles), which release ionic silver and ionic copper levels that are very toxic to the environment. While massive silver and copper are insoluble in water, their powders are 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 and M = 1 for copper) of the EU.

The n-butyl acetate ingredient is an acute category 3 environmental toxicant (biodegradable, with minimal LC50 of 18 mg/L for fathead minnow).

Acetone, heptan-2-one, 1-methoxy-2-propanol are not classifiable as an environmental toxicant (with minimal LC50 of >100 mg/L).

- Acetone has a minimal LC50 96 h of 5 540 mg/L for Oncorhynchus mykiss (rainbow trout) and an EC50 48 h of 13 500 mg/L for Daphnia magna (water flea).
- Heptan-2-one has a minimal LC50 96 h of 126 mg/L for Pimephales promelas (fathead minnow).
- The 1-methoxy-2-propanol acetate component has a minimal LC50 96 h of ≥100 mg/L Salmo gairdneri and an EC50 48 h of >500 mg/L for Daphnia magna (water flea).

There is insufficient data to classify dimethyl carbonate for aqueous toxicity.

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# **Acute Ecotoxicity**

Category 2

Toxic to aquatic life

# **Chronic Ecotoxicity**

Category 2

Toxic to aquatic life with long lasting effects.

Avoid release to the environment. Collect spillage.

#### **Biodegradability**

Solvent part expected to be biodegradable, but not the polymer or metal filler. The volatile solvent constituents will oxidize rapidly in air by photochemical reaction.

#### **Other Effects**

Actual VOC (Volatile Organic Compounds) content according to the US (EPA) and Canadian (CEPA) authorities.

Actual VOC = 41% [485 g/L]

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

#### **Limited Quantity**



FOR REFERENCE ONLY

UN number: UN1950 Shipping Name: AEROSOL,

flammable **Class:** 2.1

Packing Group: Not applicable

**Marine Pollutant:** Yes Flash Point -17 °C [1.4 °F]

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#### Air

#### Refer to ICAO-IATA Dangerous Goods Regulations.

#### **Limited Quantity**



UN number: UN1950 Shipping Name: AEROSOL,

flammable **Class:** 2.1

Packing Group: Not applicable

**Marine Pollutant:** Yes Flash Point -17 °C [1.4 °F]

#### Sea

#### Refer to IMDG regulations.

#### **Limited Quantity**



UN number: UN1950 Shipping Name: AEROSOL,

flammable **Class:** 2.1

Packing Group: Not applicable

Marine Pollutant: Yes Flash Point -17 °C [1.4 °F]

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

# **Section 15: Regulatory Information**

#### Canada

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

All hazardous ingredients are listed on the DSL.

#### **Industry and Science Canada**

MG Labels products intended for the workplace to conform to WHMIS labeling regulations. Product identification, net quantity declaration, minimum printing type size heights, and packaging of this product are in compliance.

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#### SILVER COATED COTTER CONDUCTIVE COATING

# **USA**

#### **Other Classifications**

#### **HMIS® RATING**

HEALTH:	*	2
FLAMMABILITY:		3
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 products that are listed as hazardous air pollutants.

**EPCRA** (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product contains copper (CAS# 7440-50-8; reportable quantity = 5 000 lb) and silver (CAS# 7440-22-4; reportable quantity = 1 000 lb), which are subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

This product contains acetone (CAS# 67-64-1), which is subject to the CERCLA reporting requirements at the 5 000 lb (2 268 kg) threshold.

**TSCA** (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

**California Proposition 65** (Chemicals known to cause cancer or reproductive toxicity, June 06, 2014 revision, USA).

This product does not contain any substances known to be listed in California.

#### **Europe**

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

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

**WEEE** (Waste Electrical and Electronic Equipment Directive)

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



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# Section 16: Other Information

SDS Prepared by Michel Hachey

Date of Review 07 October 2017

Supersedes 06 September 2016

Reason for Changes: Change in formulation.

#### Reference

- 1) ACGIH 2013 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2013).
- 2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

#### **Abbreviations**

ations
American Conference of Governmental Industrial Hygienists (USA)
European Chemicals Agency
European Union
Half maximal effective concentration
Half maximal effective loading
International Agency for Research on Cancer
No observable effect loading ratio
National Toxicology Program
Globally Harmonized System of Classification of Labeling of Chemicals
Lethal Concentration 50%
Lowest published lethal concentration
Lethal Dose 50%
Occupational Exposure Limit
Permissible Exposure Limit
Safety Data Sheet
Short-Term Exposure Limit
Lowest published toxic concentration
Time Weighted Average
Volatile Organic Content

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**Technical Queries** Contact us regarding any questions, improvement suggestions, or

problems with this product. Application notes, instructions, and FAQs

are located at www.mgchemicals.com.

Email: <a href="mailto:support@mgchemicals.com">support@mgchemicals.com</a>

Mailing Addresses Manufacturing & Support Head Office

1210 Corporate Drive 9347–193rd Street

Burlington, Ontario, Canada Surrey, British Columbia, Canada

L7L 5R6 V4N 4E7

**Disclaimer** This material safety data sheet is provided as an information resource only.

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

regulations.