

SAI Global File #004008 Burlington, Ontario, Canada

## SUPER SHIELD SILVER CONDUCTIVE COATING

842-AEROSOL

# **Safety Data Sheet**

#### **Section 1: Identification**

#### **Product Identifier and Other Means of Identification**

Product Name: Super Shield Silver Conductive Coating

SDS Code: 842-Aerosol

Related Part # 842-140G, 842-340G

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

**Use:** A coating for reducing EMI/RFI interference.

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 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): <a href="mailto:sds@mgchemicals.com">sds@mgchemicals.com</a>

## **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 **2**: +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	Liquefied Gas	Warning	Gas Cylinder
Eye Irritation		2	Warning	Exclamation
Specific Target Organ Toxicity	Single Exposure	3	Warning	Exclamation
Reproductive Toxicity		2	Warning	Health
Specific Target Organ Toxicity	Repeated Exposure	2	Warning	Health
Environmental Hazard	Chronic Aqua. Tox.	1	Warning	Environment

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

#### **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)

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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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# **Label Elements**

Signal Word	WARNING
Pictograms	Hazard Statements
	H223: Flammable aerosol
	H229: Pressurized container: may burst if heated
_	H319: Causes serious eye irritation
	H336: May cause drowsiness or dizziness
	H361: Suspected of damaging fertility or the unborn child
	H373: May cause damage to organs (inner ear or central nervous system) through prolonged or repeated exposure
***	H410: Very 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.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260 + P271	Do not breathe mist/vapors/spray. Use only outdoors or in a well-ventilated area.
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Prevention	Precautionary Statements
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P280	Wear protective gloves/eye protection/face protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
Response	Precautionary Statements
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
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.
Storage	Precautionary Statements
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C [122 °F].
P403 + P233	Store in well-ventilated place.
P405	Store locked up.
Disposal	Precautionary Statements
P501	Dispose of contents/container in accordance to local/regional/international regulations.

# **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

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

CAS#	Chemical Name	Wt%
811-97-2	1,1,1,2-tetrafluoroethane	38%
78-93-3	butan-2-one <sup>a)</sup>	19%
7440-22-4	silver	16%
67-63-0	propan-2-ol	16%
123-86-4	n-butyl acetate	5%
108-88-3	toluene	2%

a) Also known as methy ethyl ketone (MEK)

## **Section 4: First-Aid Measures**

Exposure Condition	GHS Code/Symptoms/Precautionary Statements
IF INHALED	P304 + P340, P312, P308 + P313
Immediate Symptoms	drowsiness, dizziness, cough, headaches, nausea, unconsciousness
Response	Remove person to fresh air and keep comfortable for breathing.
	If you feel unwell: Call a POISON CENTRE/doctor.
	IF exposed or concerned: Get medical advice/attention.
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	redness, pain, severe irritation
Response	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	If eye irritation persists: Get medical advice/attention.
IF SWALLOWED	P301 + P330, P331
Immediate Symptoms	drowsiness, dizziness, nausea, sore throat, diarrhea,
Response	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	IF exposed or concerned: Get medical advice/attention.

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IF ON SKIN	P302 + P352, P332 + P313
Immediate Symptoms	redness, mild irritation, dry skin
Response	IF ON SKIN: Wash with plenty of water.

If skin irritation occurs: Get medical advice/attention.

# Section 5: Fire-Fighting Measures

In case of fire	P370 + P378	
Extinguishing Media	Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.	
	Use water spray to cool containers.	
Specific Hazards	Aerosols containers may erupt with force at temperatures above 50 °C [122 °F].	
	Produces irritating and toxic fumes in fires or in contact with hot surfaces.	
	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.	
<b>Combustion Products</b>	Produces carbon oxides ( $CO,CO_2$ ), silver oxide metal fumes, halogenated compounds, and hydrogen fluorides.	
Fire-Fighter	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.		
Precautions for Response	Do not breathe the 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.		
<b>Containment Methods</b>	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.		
<b>Disposal Methods</b>	Dispose of spill waste according to Section 13.		



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## **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.

Do not spray on open flame or other ignition source.

Do not pierce or burn, even after use.

Do not breathe mist/vapors/spray. Use only outdoors or in a well-

ventilated area.

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

**Handling** Wear protective gloves/clothing/eye protection.

Take off contaminated clothing and wash it before reuse.

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.

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

#### **Routes of Entry**

Eye contact, ingestion, inhalation, and skin contact

## **Substances with Occupational Exposure Limit Values**

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
1,1,1,2- tetrafluoroethane	MG Chemicals a) ACGIH U.S.A. OSHA PEL Canada	1 000 ppm Not established Not established Not established	Not established Not established Not established Not established



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Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
butan-2-one	ACGIH	200 ppm	125 ppm
	U.S.A. OSHA PEL	200 ppm	300 ppm
	Canada AB	200 ppm	300 ppm
	Canada BC	50 ppm	100 ppm
	Canada ON	200 ppm	300 ppm
	Canada QC	150 ppm	300 ppm
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	$0.01 \text{ mg/m}^3$	0.03 mg/m <sup>3</sup>
(metal, dust, fumes)	Canada ON	0.1 mg/m <sup>3</sup>	Not established
	Canada QC	3 mg/m <sup>3</sup>	Not established
propan-2-ol	ACGIH	200 ppm (TWA)	400 ppm
	U.S.A. OSHA PEL	400 ppm	_
	Canada AB	200 ppm	400 ppm
	Canada BC	200 ppm	400 ppm
	Canada ON	200 ppm	400 ppm
	Canada QC	400 ppm	500 ppm
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
toluene	ACGIH	20 ppm	Not established
	U.S.A. OSHA PEL	100 ppm	150 ppm
	Canada AB	50 ppm	Not established
	Canada BC	20 ppm	Not established
	Canada ON	50 ppm	Not established
	Canada QC	100 ppm	150 ppm

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH¹, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from by RTECS database² of the Canadian Centre for Occupational Health and Safety (CCOHS) a data from suppliers' SDS were also consulted. Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

a) MG Chemicals recommended limit corresponding to prevalent international threshold values

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## **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, fluorinated

rubber, or other chemically resistant gloves.

For incidental contacts, use nitrile, neoprene, PVC gloves, 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.

**RECOMMENDATION:** Consult your local safety supply store to ensure your respirator has 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.

## **General Hygiene Considerations**

Wash hands thoroughly with water and soap after handling.



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Physical State	Liquid, in aerosol format	Lower Flammability Limit <sup>b)</sup>	1.8%
Appearance	Metallic silver	Upper Flammability Limit <sup>b)</sup>	11.0%
Odor	Benzene like,	Vapor Pressure	63 hPa
	sweetish	@20°C	[47 mmHg]
Odor Threshold	Not available	Vapor Density	4 (Air =1)
pH	Not Available	Specific Gravity @25 °C	1.08
Freezing/Melting	Not	Solubility in	Partially soluble
Point	available	Water	
Boiling Point a)	80 °C	Partition	Not
	[176 °F]	Coefficient	available
Flash Point a)	-3 °C	Auto-ignition	421 °C
	[26.6 °F]	Temperature <sup>c)</sup>	[790°F]
Evaporation	fast	Decomposition	Not
Rate		Temperature	available
Flammability	Not	Viscosity	Not
(solid, gas)	available	@40 °C	available

- a) Values based on butan-2-one component.
- b) Lower and Upper Explosive Limits of mixture calculated using Le Chatelier principle and component LFL and UFL limits
- c) Values based on n-butyl acetate component.

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

Reactivity	Silver may react violently with hydrogen peroxides releasing oxygen.		
Chemical Stability	Chemically stable at normal temperatures and pressures.		
Conditions to Avoid	Temperatures above 50 °C [122 °F], open flames, and incompatible 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.		



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## **Section 11: Toxicological Information**

## **Routes of Exposure**

Eye contact, Ingestion, Inhalation, and Skin contact

## **Symptoms Summary**

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

**Skin** redness, mild irritation, dry skin

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

unconsciousness.

**Ingestion** May cause nausea, sore throat, and diarrhea (see inhalation symptoms).

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

well as defatting the skin.

Chronic inhalation exposure may effect the central nervous system and

lead to hearing loss with co-exposure to loud noises.

Ingestion or inhalation of paint material, mist, or vapor during pregnancy

may increase the chances fetal death and developmental defects.

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

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
1,1,1,2-tetrafluoroethane	Not	Not	1 500 g/m³
	available	available	4 h Rat
butan-2-one	2 737 mg/kg	6 480 mg/kg	23 500 mg/m <sup>3</sup>
	Rat	Rabbit	8 h Rat
silver	>5 g/kg	Not	Not
	Guinea Pig	available	available
propan-2-ol	3 600 mg/kg	12 800 mg/kg	16 000 ppm
	Rat	Rabbit	8 h Rat
n-butyl acetate	>10 768 mg/kg	>17 600 mg/kg	390 ppm
	Rat	Rabbit	4 h Rat
toluene	636 mg/kg	12 124 mg/kg	49 g/m³
	Rat	Rabbit	4h Rat

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



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## **Other Toxicological Effects**

**Skin corrosion/irritation**Based on available data, the classification criteria are

not met.

**Serious eye** 2-Butanone, propan-2-ol, and toluene are known

**damage/irritation** serious eye irritants.

**Sensitization** Based on available data, the classification criteria are

(allergic reactions) not met.

**Carcinogenicity** Based on available data, the classification criteria are

(risk of cancer) not met.

**Mutagenicity** Based on available data, the classification criteria are

(risk of heritable genetic effects) not met.

**Reproductive Toxicity**Toluene presents reproductive and developmental

(risk to sex functions) hazards at high doses (>13 000  $\mu$ g/day)

**Teratogenicity** Harmful to unborn fetus

(risk of fetus malformation)

**STOT-single exposure** Butan-2-one, propan-2-ol, n-butyl acetate, and toluene

can affect the central nervous system by inhalation

causing drowsiness or dizziness.

**STOT-repeated exposure** Contains 2% toluene, which is a Cat 2 STOT repeated

exposure hazard for the central nervous system and cochlear systems. Toluene is ototoxic chemicals according to rat studies: inhalation exposure in the presence of noise may lead to cochlear impairment.

**Aspiration hazard** Based on available data, the classification criteria are

not met. There is less than 10% category 1

components.

## **Section 12: Ecological Information**

The IMDG Code criteria, the raw-material safety data sheets, and supporting data from the European Chemical Agency database (<a href="http://echa.europa.eu">http://echa.europa.eu</a>) were used to support the classification.

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  $1 \, (M = 10 \, \text{for silver})$  of the EU.

# N Chemicals

#### Quality System Certified to ISO 9001:2008

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Toluene is an acute category 2 environmental toxicant (with minimal LC50 of 7.63 mg/L for Oncorhhynchus mykiss (rainbow trout); 8.9 mg/L 24 h Daphnia magna (water flea); 10 mg/L 24 h Pseudokirchneriella subcapitata (green algae)).

N-butyl acetate is an acute category 3 environmental toxicant (biodegradable, with minimal LC50 of 18 mg/L for fathead minnow; EC50 72 h of 648 mg/L for algae).

The 1,1,1,2-tetrafluoroethane, 2-butanone and propan-2-ol (with minimal LC50 of >100 mg/L) are not classifiable as aqueous environmental toxicants.

- The 2-butanone has minimal LC50 of 3 130 mg/L 96 h for Pimephales promelas (fathead minnow); EC50 24 h 5 102 mg/L 24 h Daphnia magna (water flea).
- Propan-2-ol has a minimal LC50 96 h of 9 640 mg/L for Pimephales promelas (fathead minnow); EC50 24 h of 5 102 mg/L for Daphnia magna (water flea); EC50 24 h of >2 000 mg/L Desmodesmus subspiccatus (green algae).

## **Acute Ecotoxicity**

Category 1

H400: Very toxic to aquatic life

## **Chronic Ecotoxicity**

Category 1

H410: Very toxic to aquatic life with long lasting effects

Avoid release to the environment. Collect spillage.

## Biodegradability

Expected to be partly biodegrable, except for the metal. The volatile solvent constituents will oxidize rapidly in air by photochemical reaction.

#### Other Effects

The 1,1,1,2-tetrafluoroethane has a global warming potential scores of 4300.

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

VOC = 43% [471 g/L]

## **Section 13: Disposal Information**

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



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## **Section 14: Transport Information**

#### Ground

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

**Limited Quantity** 



**UN number**: UN1950 **Shipping Name**: AEROSOLS, flammable

**Class: 2.1** 

Packing Group: Not applicable

**Marine Pollutant:** Yes

#### Air

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

## **Limited Quantity**

See package instruction Y203

Max Net Qty/Pkg 30 kg G



**UN number**: UN1950 **Shipping Name**: AEROSOLS, flammable

**Class:** 2.1

Packing Group: Not applicable

Marine Pollutant: Yes



## Sea

#### Refer to IMDG regulations.

**Limited Quantity** 



**UN number**: UN1950 **Shipping Name**: AEROSOLS, flammable

**Class:** 2.1

Packing Group: Not applicable

Marine Pollutant: Yes

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



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## **Section 15: Regulatory Information**

#### Canada

## WHMIS 1988 Classification







A – Aerosol Container; B5 – Flammable Aerosols; D2A – Very Toxic (Embryotoxicant); D2B – Toxic Other (Eye Irritant)

## **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.

#### **Health Canada**

Products produced by MG Chemicals intended for retail display conform to the Canadian Consumer Labeling Regulations.

#### USA

#### **CAA** (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product contains toluene, which is listed as hazardous air pollutants.

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

This product contains silver (CAS# 7440-22-4; reportable quantity = 1000 lb) and toluene (CAS# 108-88-3; reportable quantity = 1000 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 n-butyl acetate (CAS# 123-86-4), and isobutyl acetate (CAS# 110-19-0), which can be subject to the CERCLA reporting requirements at a threshold of 5000 lb (2268 kg).

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**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 contains toluene, which is listed as reproductively toxic.

## **Europe**

#### **RoHS**

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

#### WEEE

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

#### **Section 16: Other Information**

**SDS Prepared by** Michel Hachey **Date of Creation** 06 May 2015 **Supersedes** Not applicable

**Reason for Changes:** Compliance adjustments to meet both HCS2012 and WHMIS 2015 regulations.

#### 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®)



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#### **Abbreviations**

ACGIH American Conference of Governmental Industrial Hygienists (USA)

ECHA European Chemicals Agency

EU European Union

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: <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

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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.