

SILVER COATED COPPER CONDUCTIVE COATING

843-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:** 843-Aerosol**Related Part #** 843-140G, 843-340G

Recommended Use and Restriction on Use

Use: A coating for reducing EMI/RFI interference.**Uses Advised Against:** Not available

Details of Manufacturer or Importer

ManufacturerMG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADAMG Chemicals (Head Office)
9347-193 Street
Surrey, British Columbia V4N 4E7
CANADA**☎** +1-800-340-0772**FAX** +1-800-340-0773**E-MAIL** support@mgchemicals.com**WEB** www.mgchemicals.com**☎** +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 accidentsUSA or CANADA: Call CHEMTREC ☎: **+1-800-424-9300****For emergencies involving dangerous goods;** Collect 24/7CANADA: 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	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 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
	H223: Flammable aerosol
	H229: Pressurized container: may burst if heated
	H319: Causes serious eye irritation H336: May cause drowsiness or dizziness

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Pictograms	Hazard Statements
	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.
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.

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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.

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
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)
811-97-2	1,1,1,2-tetrafluoroethane	38%
67-64-1	acetone	27%
7440-50-8	copper	18%
108-88-3	toluene	5%
7440-22-4	silver	2%
110-19-0	isobutyl acetate	1%
110-43-0	heptan-2-one ^{a)}	1%
64-17-5	ethanol	1%

a) Also known as methyl amyl ketone (MAK)

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Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF INHALED	P304 + P340, P312, P308 + P313
Immediate Symptoms	<i>drowsiness, dizziness, cough, headaches, nausea, unconsciousness</i>
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	<i>irritation, redness</i>
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	<i>nausea, sore throat, diarrhea, drowsiness, dizziness</i>
Response	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. If exposed or concerned: Get medical advice/attention.
IF ON SKIN	P302 + P352, P332 + P313
Immediate Symptoms	<i>redness, mild irritation, dry skin</i>
Response	IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention.

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]. 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.

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Combustion Products	Produces carbon oxides (CO,CO ₂), metal oxide 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

Personal Protection	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.
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.

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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

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)
acetone	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	500 ppm 1000 ppm 500 ppm 250 ppm 500 ppm 750 ppm	750 ppm Not established 750 ppm 500 ppm 750 ppm 1000 ppm
copper (dust and mist)	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	1.0 mg/m ³ 1.0 mg/m ³ 1 mg/m ³ 1.0 mg/m ³ 1 mg/m ³ 1 mg/m ³	Not established Not established Not established Not established Not established Not established
toluene	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	20 ppm 200 ppm 50 ppm 20 ppm 20 ppm 100 ppm	Not established 300 ppm Not established Not established Not established 150 ppm
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 0.1 mg/m ³	Not established Not established Not established 0.03 mg/m ³ Not established Not established
isobutyl acetate	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	150 ppm 150 ppm 150 ppm 150 ppm 150 ppm 150 ppm	Not established Not established Not established Not established Not established Not established
heptan-2-one methy amyl ketone	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	50 ppm 100 ppm 50 ppm 50 ppm 25 ppm 50 ppm	Not established Not established Not established Not established Not established Not established
ethanol	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	1 000 ppm 1 000 ppm 1 000 ppm Not established Not established 1 000 ppm	Not established Not established Not established 1 000 ppm 1 000 ppm Not established

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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.

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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Section 9: Physical and Chemical Properties

Physical State	Liquid, in aerosol format	Lower Flammability Limit ^{b)}	1%
Appearance	Light brown metallic	Upper Flammability Limit ^{b)}	11%
Odor	Benzene like, sweetish	Vapor Pressure @20 °C	69 hPa [52 mmHg]
Odor Threshold ^{a)}	2 ppm	Vapor Density ^{a)}	4.1 (Air =1)
pH	7	Specific Gravity @25 °C	1.70
Freezing/Melting Point	Not available	Solubility in Water	Partially soluble
Boiling Point ^{a)}	56 °C [132 °F]	Partition Coefficient	Not available
Flash Point ^{a)}	-16 °C [3.2 °F]	Auto-ignition Temperature ^{a)}	465 °C [869 °F]
Evaporation Rate	fast	Decomposition Temperature	Not available
Flammability (solid, gas)	Not available	Viscosity @40 °C	Not available

a) Values based on acetone component.

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

Section 10: Stability and Reactivity

Reactivity	Not available
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 and severe irritation.
- Skin** Acetone, toluene, and ethanol are known serious eye irritant.
- 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 available	Not available	1 500 g/m ³ 4 h Rat
acetone	5 800 mg/kg Rat	20 mL/kg Rabbit ^{a)}	16 000 ppm 6h Rat
copper	>5 000 mg/kg Mouse	Not available	Not available
toluene	636 mg/kg Rat	12 124 mg/kg Rabbit	49 g/m ³ 4h Rat
silver	>5 g/kg Guinea Pig	Not available	Not available
isobutyl acetate	13 400 mg/kg Rat	>17 400 mg/kg Rabbit	>13.24 mg/L 6 h Rat
heptan-2-one	1 670 mg/kg Rat	12 600 µL/kg Rabbit	Not available

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Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
ethanol	7 060 mg/kg Rat	Not available	20 000 ppm 10 h Rat

Note: Toxicity data from the RTECS² and ECHA databases were consulted. The data from supplier (M)SDS were also consulted.

a) Supplier MSDS

Other Toxicological Effects

Skin corrosion/irritation Based on available data, the classification criteria are not met.

Serious eye damage/irritation Acetone and ethanol are known serious eye irritants.

Sensitization
(allergic reactions) Based on available data, the classification criteria are not met.

Carcinogenicity
(risk of cancer) Evidence of carcinogenicity of ethanol relates to excessive alcoholic beverage consumption, and doesn't relate to exposure risks when used in the workplace or as a non-comestible consumer product.

Ethanol [64-17-5]

IARC Group 1: Carcinogenic to human when consumed as beverage.

ACGIH A3: Confirmed animal carcinogen with unknown relevance to humans

CA Prop 65: Listed as a carcinogen when consumed as a beverage

NTP: Not listed

Mutagenicity
(risk of heritable genetic effects) Based on available data, the classification criteria are not met.

Reproductive Toxicity
(risk to sex functions) Toluene and ethanol present reproductive and developmental hazards at high doses (>13,000 µg/day)

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Teratogenicity (risk of fetus malformation)	Harmful to unborn fetus
STOT-single exposure	Acetone, toluene, isobutyl acetate, and methy amyl ketone can affect the central nervous system by inhalation causing drowsiness or dizziness.
STOT-repeated exposure	Contains 5% 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, and the kinematic viscosity is >20.5 mm ² /s at 40 °C.

Section 12: Ecological Information

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

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.

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

Acetone, isobutyl acetate, heptan-2-one, ethanol 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).
- Isobutyl acetate as a minimal LC50 48 h of 101 mg/L for *Leuciscus idus melanotus* and 250 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).
- Ethanol is biodegradable and has a minimal LC50 of >1 000 mg/L for fish, invertebrates, and algae.

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SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****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

Expected to be biodegradable. 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.

VOC = 10% [98 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: No

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: No



Sea

Refer to IMDG regulations.

Limited Quantity



UN number: UN1950

Shipping Name:
AEROSOLS, flammable

Class: 2.1

Packing Group: Not applicable

Marine Pollutant: No

Note: Shipper must be appropriately trained and certified 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.

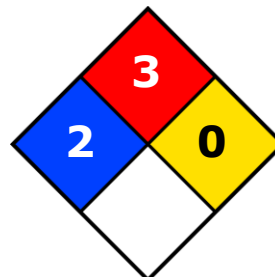
USA

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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SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****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 toluene (CAS# 108-88-3; reportable quantity = 1000 lb), which is subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

This product contains acetone (CAS# 67-64-1), and isobutyl acetate (CAS# 110-19-0), which are subject to the CERCLA reporting requirements at the 5000 lb (2268 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 contains toluene, which is listed as reproductively toxic.

This product contains ethanol, which is listed as reproductively toxic. It is also listed as a carcinogen when in an alcoholic beverage.

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.

Section 16: Other Information

SDS Prepared by	Michel Hachey
Date of Review	19 November 2015
Supersedes	06 April 2015
Reason for Changes:	Addition of part number and minor format changes.

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SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****Reference**

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

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
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: 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

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