

SILVER COATED COPPER CONDUCTIVE COATING 843-AEROSOL

Material Safety Data Sheet

Section 1: Product and Company Identification

Product Name: Super Shield™ Silver Coated Copper Conductive Coating

MSDS Code: 843-Aerosol

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

Use: Silvered copper filled conductive coating for reducing EMI/RFI interference and for providing electric continuity

Emergency Contact: CANUTECH ☎: 1-613-996-6666, Collect 24/7

Manufacturer: MG Chemicals (Head Office), 9347-193 Street, Surrey, B.C., V4N 4E7

Technical Contacts: ☎ 1-800-201-8822 FAX 1-800-708-9888

E-MAIL: SDS@mgchemicals.com **WEB** www.mgchemicals.com

Section 2: Hazards Identification

WHMIS Classification



A – Aerosol Container; B5 – Flammable Aerosols;
D2A – Very Toxic Material (Teratogenicity/Embryotoxicity);
D2B – Toxic Material (Skin/Eye Irritation)

GHS Pictograms



Signal Word
DANGER

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GHS Categories

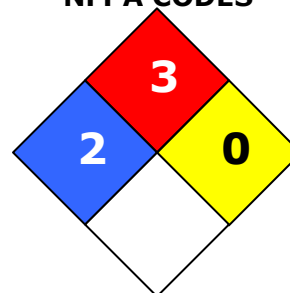
Criteria	Category	Signal Word	Symbol
Flammable Aerosol	2	Danger	Flame
Eye Irritation	2	Warning	Exclamation
Specific Target Organ Toxicity Repeated Exposure	2	Warning	Exclamation
Reproductive Toxicity	2	Warning	Health
Specific Target Organ Toxicity Single Exposure	3	Warning	Health
Skin Irritation	3	Warning	—
Acute Toxicity Oral ^{a)}	5	Warning	—
Acute Toxicity Inhalation ^{a)}	5	Warning	—
Environmental Hazard Acute Aquatic Tox.	3	—	—

a) Base on mixture acute toxicity estimate (ATE)

HMIS RATING

HEALTH:	2
FLAMMABILITY:	3
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	

NFPA CODES



Approximate HMIS and NFPA Risk Ratings Legend:

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

Physical Hazards

GHS Code: Hazard Statement

H223: Flammable aerosol

H229: Pressurized container: may burst if heated

Health Hazards

GHS Code: Hazard Statement

H319: Causes serious eye irritation

H373: May cause damages to central nervous system through prolonged or repeated exposure

H336: May cause drowsiness and dizziness

H335: May cause respiratory irritation

H303 + H333: May be harmful if swallowed or inhaled

H361: Suspected of damaging fertility or the unborn child

H316: Cause mild skin irritation

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Eyes	Causes severe eye irritation if splashed in eyes or exposed to vapors. May also cause eye redness or pain. Contains mechanically abrasive particles.
Skin	May cause mild to moderate skin irritation.
Inhalation	May cause nose, throat and lung irritation.
Ingestion	<i>Not a likely route of exposure.</i> Harmful if swallowed. It contains ingredients that are central nervous system depressants. It may cause irritation and burning sensation.
Chronic	<p>Prolonged and repeated exposure to the solvents used may cause dry skin, defatting of the skin, dermatitis, and adverse central nervous systems effects. Extreme doses can cause bladder, liver, and kidney damage.</p> <p>Long term accumulation of silver can lead to Argyria, which is an irreversible blue-grey discoloration of the skin.</p> <p>Ingestion of paint material or inhalation mist or vapor during pregnancy may increase the chances fetal death and developmental defects.</p>

SILVER COATED COPPER CONDUCTIVE COATING 843-AEROSOL**Section 3: Hazardous Ingredients**

CAS #	Chemical Name	Wt%	ACGIH TWA	OSHA PEL	STEL
811-97-2	1,1,1,2-tetrafluoroethane	30-60%	[1000 ppm] ^{a)}	N/E	N/E
7440-50-8	copper	10-30%	0.2 mg/m ³	1.0 mg/m ³ ^{b)}	N/E
67-64-1	2-propanone	10-30%	500 ppm	1000 ppm	750 ppm ^{c)}
108-88-3	toluene	3-7%	20 ppm	200 ppm	150 ppm ^{d)}
7440-22-4	silver	1-5%	0.1 mg/m ³	0.01 mg/m ³	N/E
110-19-0	isobutyl acetate	1-5%	N/E	N/E	N/E
110-43-0	2-heptanone	1-5%	N/E	N/E	N/E
64-17-5	ethanol	0.5-1.5%	1000 ppm	1000 ppm	N/E
141-78-6	ethyl acetate	0.1-1%	400 ppm	N/E	N/E

Note: Limits from by RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS). Data from suppliers' MSDS were also consulted.

a) MG Chemicals established limit corresponding to prevalent international value; no established limit by ACGIH.

b) Limit for dust or mist; the limit for Cu fume is 0.1 mg/m³

c) ACGIH STEL

d) NIOSH STEL; Vacated (retracted) OSHA STEL of 150 ppm; International standard STEL range 100 ppm to 300 ppm

SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****Section 4: First Aid Measures**

<i>Exposure Condition</i>	<i>GHS Code: Precautionary Statement</i>
IF INHALED	P304
Symptoms	Immediate: <i>dizziness, drowsiness, headaches, nausea, cough, blurred vision, fatigue</i>
Response	P340: Remove person to fresh air and keep comfortable for breathing.
If feeling unwell	P312: Call a Poison Centre or doctor.
If exposed or concerned	P313: Get medical advice.
IF IN EYES	P305
Symptoms	Immediate: <i>irritation, redness, pain, blurred vision</i>
Response	P351: Rinse cautiously with water for several minutes. P338: Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists	P313: Get medical attention.
IF ON SKIN	P302
Symptoms	Immediate: <i>irritation, pain, redness</i> ; Delayed: <i>dry skin, rash</i>
Response	P362+ P364: Take off contaminated clothing and wash it before reuse. P352: Wash with plenty of water.
If skin irritation or rash persists	P313: Get medical attention.
IF SWALLOWED	P301 (<i>Not a likely route of exposure under normal use</i>)
Symptoms	Immediate: <i>nausea, vomiting, abdominal cramps, irritation, burning sensation, or dizziness</i>
Response	P312: Call a POISON CENTRE or physician if you feel unwell. P330: Rinse mouth. P331: Do NOT induce vomiting.
If you feel unwell	P313: Get medical attention.

Note: GHS codes and corresponding precaution statements are used when available.

SILVER COATED COPPER CONDUCTIVE COATING 843-AEROSOL**Section 5: Fire Fighting Measures**

Autoignition Temperature ^{a)}	≥363 °C [685 °F]	Flash Point ^{b)}	-18 °C [-0.4 °F]	LFL [LEL] ^{c)}	2%
				UFL [UEL]	12%

In case of fire P370

Response P378: Use dry chemical, carbon dioxide, or chemical foam to extinguish.

Combustion Products Produces CO, CO₂, nitrous oxides, and smoke.

Fire-Fighter Wear self-contained breathing apparatus for fire fighting

General Information Will burn if involved in a fire. Vapors are heavier than air, and may travel to sources of ignition near the ground.

Note: The GHS codes and the GHS precaution statements are used.

a) The autoignition value is based on ethanol, which is the component with the lowest value.

b) The closed cup flash point value is based on acetone.

c) Values calculated using Le Chatelier principle and component LFL and UFL limits.

LFL = Lower Flammability [or Explosion] Limit (in volume %);

UFL = Upper Flammability [or Explosion] Limit (in volume %)

Section 6: Accidental Release Measures

Personal Protection: See Section 8. Avoid breathing fume/mist/vapors.

Containment Remove all sources of ignition.

Cleaning Collect the liquid into a sealable, chemically resistant container. Sprinkle inert absorbent material onto spill, then sweep into the container. Wipe up further residue with paper towel and place in container. Wash spill area with soap and water to remove the last traces of residue.

RECOMMENDATION: A metal waste container is suggested.

Disposal Dispose of spill waste according to Section 13.

SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****Section 7: Handling and Storage**

- Prevention** P202: Do not handle until all safety precautions have been read and understood.
- P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P261 + P271 + P284: Avoid breathing mist/vapors. Use only outdoors or in well ventilated area. In cases of inadequate ventilation wear respiratory protection.
- P270: Do not eat, drink, or smoke when using this product.
- Handling** P280: Wear protective gloves/clothing/eye protection.
- P242 + P243: Use non-sparking tools. Take precautionary measures against static discharge.
- P264: Wash hands thoroughly after handling.
- Storage** P411+ P403 + P235: Store at temperatures not exceeding 40 °C [104 °F] Protect from sunlight. Store in a well-ventilated area.
- RECOMMENDATION :** Store in dry area. Do NOT store at temperatures below or equal to 26.5 °C [15.7 °F] since this may crush and damage the container.

Note: The GHS codes and the GHS precaution statements are used.

Section 8: Exposure Controls/Personal Protection**Routes of Entry**

Eyes, ingestion, inhalation, and skin

Engineering Controls

Ventilation Keep airborne concentrations below exposure limits given in section 3.

RECOMMENDATION: Respect the time weighted average of 20 ppm for toluene.

Personal Protective Equipment

Eye protection Wear appropriate protective eyeglasses or chemical safety goggles.

RECOMMENDATION: Use safety glasses with lateral protection (side shields).

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Skin Protection

Wear appropriate protective clothing to prevent skin contact.

RECOMMENDATION: Use latex rubber, latex, or other chemically resistant gloves to the product components.

Respiratory Protection

If the exposure limits are exceeded or exposed to mist, wear respirator such as a half-mask respirator.

RECOMMENDATION: Consult your local safety supply store to ensure your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in section 3 of this MSDS, and that the respirator is fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

Physical State	Liquid	Odor	Benzene like, sweetish	Odor Threshold	2 ppm
Appearance	Light brown metallic	Specific Gravity	1.70	Freezing Point	Not available
Boiling Point	≥56 °C ^{a)}	Vapor Pressure @ 20 °C ^{b)}	11 kPa [1.6 lb/in ²]	Evaporation Rate	fast
Autoignition Temperature ^{c)}	≥363 °C [≥685 °F]	Flash Point ^{a)}	-18 °C [-0.4 °F]	Vapor Density ^{b)}	≥2 (Air =1)
Lower Flammability Limit ^{b)}	2%	Upper Flammability Limit ^{b)}	12%	Decomposition Temp.	Not available
Viscosity	Not available	Partition Coefficient	Not available	Solubility in Water	Partially soluble
pH	7				

a) The flash point value and boiling point values are based on acetone

b) Values estimated with literature values of volatile components and by Raoult's Law

c) The autoignition value is based on ethanol, which is the component with the lowest value.

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

SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****Section 10: Stability and Reactivity**

Stabilities	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Temperatures greater than 40 °C, ignition sources, and incompatible substances
Incompatibilities	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

Skin corrosion/irritation	Skin irritant. Prolonged or repeated skin contact may cause dermatitis
Serious eye damage/irritation	Causes serious eye irritation and lesions. Contains mechanically abrasive particles
Respiratory and skin sensitization (allergic reactions)	Not known
Carcinogenicity (risk of cancer)	No known components listed in IARC, ACGIH, California Prop. 65, or NTP (National Toxicology Program)
Mutagenicity (risk of heritable genetic effects)	Not known
Reproductive Toxicity (risk to sex functions)	Toluene, ethanol, and acetone present reproductive and developmental hazards at high doses (>13,000 µg/day)
Teratogenicity (risk of fetus malformation)	Harmful to unborn fetus in large doses
STOT-single exposure	Inhalation of toluene may affect the central nervous system
STOT-repeated exposure	Toluene may cause damage to organs through prolonged or repeated exposure
Aspiration hazard	"Category 1" components <10%; therefore, it is not classified as aspiration hazard

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Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation	TCLo inhalation ^{a)}
1,1,1,2-tetrafluoroethane	N/E	N/E	1,500 g/m ³ 4 h Rat ----- 1,700 g/m ³ 2 h Mouse	N/E
copper	>5,000 mg/kg Mouse ----- 413 mg/kg Mouse	N/E	N/E	N/E
toluene	636 mg/kg Rat	12,124 mg/kg Rabbit	49 g/m ³ 4h Rat	200 ppm Human
2-propanone	5,800 mg/kg Rat ----- 5,340 mg/kg Rabbit	>9,400 µL/kg Guinea pig	44 g/m ³ 4 h Rat ----- 50.1 g/m ³ 8 h Rat	10 mg/m ³ 6 h Human ----- 30 g/m ³ 2 h Rat
silver	>5 g/kg Guinea Pig	N/E	N/E	N/E
isobutyl acetate	13,400 mg/kg Rat	>17400 mg/kg Rabbit	N/E	8,000 ppm 4h Rat LCLo ^{b)}
2-heptanone	1,670 mg/kg Rat ----- 730 mg/kg Mouse	12,600 µL/kg Rabbit	N/E	7,000 mg/m ³ 4 h Guinea pig
ethanol	7,060 mg/kg Rat ----- 3,450 mg/kg Mouse	N/E	20,000 ppm 10 h Rat ----- 39 g/m ³ 4 h Mouse	2,500 mg/m ³ 20 min Human ----- 50,000 mg/m ³ 2 h Mouse
ethyl Acetate	5,620 mg/kg Rat ----- 4,100 mg/kg Mouse	>20,000 µL/kg Rabbit	45 g/m ³ 2 h Mouse	1,105 mg/m ³ 4 h Rat

Note: Representative toxicity data from by RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS) data from supplier MSDS were also consulted.

a) Lowest toxic concentration tested

b) Lowest lethal concentration tested

SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****Section 12: Ecological Information****Acute Ecotoxicity**

Category 2

GHS Code: Hazard Statement

H402: Harmful to aquatic life.

P273: Avoid release to the environment.

Chronic Ecotoxicity

Not classified for long term hazard.

Biodegradability

Metallic components are not biodegradable.

VOC* (EPA, WHIMS, and Europe) = 10% [134 g/L]

Regulated Volatile Organic Compound Content*Section 13: Disposal Information***GHS Code: Disposal Statement*

P501: Dispose of contents in accordance with all local, regional, national, and international regulations.

SILVER COATED COPPER CONDUCTIVE COATING 843-AEROSOL

Section 14: Transport Information

Ground (less than 4 liter size)

Consumer Commodity; ORM-D

Recommend Shipper be trained and certified. Refer to TDG regulations
(Canadian Transportation of Dangerous Goods regulations); **USA CFR 49**
Regulations (Parts 100 to 185).

Air

Shipper must be trained and certified. Refer to IATA Dangerous Goods Regulations.

UN number: UN1950; **Shipping Name:** AEROSOL, flammable; **Class:** 2.1,
Flash Point = -18 °C

Sea

Shipper must be trained and certified. Refer to IMDG regulations.

UN number: UN1950; **Shipping Name:** AEROSOL, flammable; **Class:** 2.1,
Flash Point = -18 °C

Section 15: Regulatory Information

Canada

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

All hazardous ingredients are listed on the DSL/NDSL.

Health Canada

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

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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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 (CAS# 108-88-3), which is listed as hazardous air pollutants.

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

This product contains toluene (CAS# 108-88-3), copper (CAS# 7440-50-8), and silver (CAS# 7440-22-4) subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372

TSCA (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, Sept 2, 2011 revision, USA).

This product contains toluene, which is listed as reproductively toxic.

Europe**RoHS** (Restriction of Hazardous Substance 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.

SILVER COATED COPPER CONDUCTIVE COATING**843-AEROSOL****Section 16: Other Information**

MSDS Prepared by	Michel Hachey
Date of Revision	27 April 2012
Supersedes	Version 2.00; 09 March 2012
Reasons for Changes	Updated hazards in Section 2, ingredient ranges in Section 3, and properties in Section 9, including grammatical and spelling error corrections.
Reference	All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

Abbreviations

GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest Lethal <i>Airborne</i> Concentration <i>Tested/Published</i>
LD50	Lethal Dose 50%
N/A	Not Applicable
N/E	Not Estimated
PEL	Permissible Exposure Limit
SDS	Safety Data Sheet
STEL	Short-Term Exposure Limit
TCLo	Lowest Toxic <i>Airborne</i> Concentration <i>Tested/Published</i>
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: SDS@mgchemicals.com or support@mgchemicals.com

Phone: 1-905-331-1396 or 1-800-340-0772

Mailing Addresses	<i>Manufacturing & Support</i>	<i>Head Office</i>
	1210 Corporate Drive	9347-193rd Street
	Burlington, Ontario, Canada	Surrey, British Columbia, Canada
	L7L 5R6	V4N 4E7

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