

SILVER COATED COPPER CONDUCTIVE COATING 843-LIQUID

# Material Safety Data Sheet

## Section 1: Product and Company Identification

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

**MSDS Code:** 843-Liquid

**Related Part #:** 843-20G, 843-900ML, 843-1G

**Use:** Silver coated copper filled electrically conductive coating for reducing EMI/RFI interference and for repairing traces on printed circuit boards

### Emergency Contact

USA or CANADA: Call CHEMTREC ☎: 1-800-424-9300  
(For hazardous material incidents ONLY—leaks, spills, fires, exposures or accidents)

CANADA: Call CANUTEC ☎: 1-613-996-6666 or \*666 on cellular phones, Collect 24/7  
(For emergencies involving dangerous goods)

**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:** [support@mgchemicals.com](mailto:support@mgchemicals.com) **WEB** [www.mgchemicals.com](http://www.mgchemicals.com)

## Section 2: Hazards Identification

### WHMIS Classification



B2 - Flammable Liquid;  
D2A - Very Toxic Material (Teratogenicity/Embryotoxicity);  
D2B - Toxic Material (Skin/Eye Irritation)

### GHS Pictograms



Signal Word  
DANGER

*Continued on the next page*

**SILVER COATED COPPER CONDUCTIVE COATING**

**843-LIQUID**

**GHS Categories**

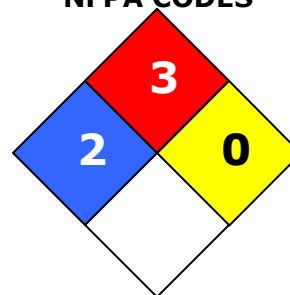
Criteria	Category	Signal Word	Symbol
Flammable Liquid	2	Danger	Flame
Eye Irritation	2A	Warning	Exclamation
Specific Target Organ Toxicity Repeated Exposure	2	Warning	Exclamation
Reproductive Toxicity	2	Warning	Health
Specific Target Organ Toxicity Single Exposure	3	Warning	Health
Skin Irritation	3	Warning	—
Acute Toxicity Oral <sup>a)</sup>	5	Warning	—
Acute Toxicity Inhalation <sup>a)</sup>	5	Warning	—
Environmental Hazard Acute Aqua. Tox.	3	—	—

a) Base on mixture acute toxicity estimate (ATE)

**HMIS RATING**

<b>HEALTH:</b>	<b>2</b>
<b>FLAMMABILITY:</b>	<b>3</b>
<b>PHYSICAL HAZARD:</b>	<b>0</b>
<b>PERSONAL PROTECTION:</b>	

**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*

H225: Highly flammable liquid and vapor

**Health Hazards**

*GHS Code: Hazard Statement*

H319: Causes serious eye irritation

H361: Suspected of damaging fertility or the unborn child

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

H335: May cause respiratory irritation

H336: May cause drowsiness and dizziness

H315: May cause skin irritation

H303 + H333: May be harmful if swallowed or inhaled

*Continued on the next page*

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

<b>Eyes</b>	Causes severe eye irritation if splashed in eyes or exposed to vapors. May also cause eye redness or pain. The coating contains mechanically abrasive particles.
<b>Skin</b>	May cause mild to moderate skin irritation.
<b>Inhalation</b>	May cause nose, throat and lung irritation. Inhalation of mist may cause irritation to the upper respiratory tract.
<b>Ingestion</b>	<i>Not a likely route of exposure.</i> Harmful if swallowed. It is a central nervous system depressant. It may cause irritation and burning sensation.
<b>Chronic</b>	<p>Prolonged and repeated exposure to the solvents used may cause dermatitis, defatting of the skin, 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 of its mist or vapors during pregnancy may increase the chances of fetal death and of developmental defects.</p>

**SILVER COATED COPPER CONDUCTIVE COATING**

**843-LIQUID**

**Section 3: Hazardous Ingredients**

CAS #	Chemical Name	Wt%	ACGIH TWA	OSHA PEL	STEL
7440-50-8	copper	30-60%	0.2 mg/m <sup>3</sup>	1.0 mg/m <sup>3</sup> <sup>a)</sup>	N/E
108-88-3	toluene	7-13%	20 ppm	200 ppm	150 ppm <sup>b)</sup>
67-64-1	2-propanone	5-10%	500 ppm	1 000 ppm	750 ppm <sup>c)</sup>
7440-22-4	silver	3-7%	0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	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	1-5%	1 000 ppm	1 000 ppm	N/E
14807-96-6	talc	1-5%	2 mg/m <sup>3</sup>	20 mppcf <sup>d)</sup>	
141-78-6	ethyl acetate	1-5%	400 ppm	N/E	N/E
108-65-6	1-methoxy-2-propanol acetate	0.5-1.5%	N/E	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) Limit presented is for dust or mist; the limit for Cu fume is 0.1 mg/m<sup>3</sup>

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

c) ACGIH STEL

d) Millions of particle per cubic foot of air for talc not containing asbestos; 706 millions of particles per cubic meter

**SILVER COATED COPPER CONDUCTIVE COATING**

**843-LIQUID**

**Section 4: First Aid Measures**

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

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

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

<b>Autoignition Temperature</b> <sup>a)</sup>	≥315 °C [599 °F]	<b>Flash Point</b> <sup>b)</sup>	-18 °C [-0.4 °F]	<b>LFL [LEL]</b> <sup>c)</sup>	1%
				<b>UFL [UEL]</b>	11%

**In case of fire** P370**Response** P378: Use dry chemical, carbon dioxide, or chemical foam to extinguish.**Combustion Products** Produces CO, CO<sub>2</sub>, 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. The format is  
*GHS Codes: Statements.*

a) Values based on 1-methoxy-2-propanol acetate, which is the component with the lowest autoignition value.

b) Lower bound FP estimate is based on the closed cup value for the acetone component.

c) 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 the mist/vapors.**Containment** Remove all sources of ignition.**Cleaning** Collect liquid in a sealable, solvent-resistant container. Sprinkle inert absorbent compound 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 container is suggested.**Disposal** Dispose of spill waste according to Section 13.

## SILVER COATED COPPER CONDUCTIVE COATING

## 843-LIQUID

### Section 7: Handling and Storage

- Prevention** P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P261 + P271 + P284: Avoid breathing fume/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. Wash thoroughly after handling.  
P242 + P243: Use non-sparking tools. Take precautionary measures against static discharge.  
P264: Wash hands thoroughly after handling.
- Storage** P403 + P233+ P235: Keep Container tightly closed. Store in a well-ventilated area. Keep cool.  
**RECOMMENDATION:** Keep in a dry and clean area, away from incompatible substances.

*Note:* The GHS codes and the GHS precaution statements are used. The format is *GHS Codes: Statements.*

### 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.
- Skin Protection** Wear appropriate protective clothing to prevent skin contact.  
**RECOMMENDATION:** Use of protective gloves in butyl rubber, latex, neoprene, or other chemically resistant gloves.

*Continued on the next page*

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

**Respiratory Protection** If the exposure limits to vapors are exceeded or if you are exposed to the mist, wear respirator equipment such as a half-mask respirator.

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

<b>Physical State</b>	Liquid	<b>Odor</b>	Benzene like, sweetish	<b>Odor Threshold</b>	2 ppm
<b>Appearance</b>	Light brown metallic	<b>Specific Gravity</b>	1.70	<b>Melting Point</b>	Not established
<b>Boiling Point</b> <sup>a)</sup>	≥56 °C	<b>Vapor Pressure @ 20 °C</b> <sup>b)</sup>	≥10 kPa [≥1.5 lb/in <sup>2</sup> ]	<b>Evaporation Rate</b>	fast
<b>Autoignition Temperature</b> <sup>c)</sup>	≥315 °C [599 °F]	<b>Flash Point</b> <sup>a)</sup>	-18 °C [-0.4 °F]	<b>Vapor Density</b> <sup>b)</sup>	>2 (Air =1)
<b>Lower Flammability Limit</b> <sup>d)</sup>	1%	<b>Upper Flammability Limit</b> <sup>d)</sup>	11%	<b>Decomposition Temp.</b>	Not available
<b>Viscosity</b> <sup>e)</sup>	≥34 mm <sup>2</sup> /s	<b>Partition Coefficient</b>	Not established	<b>Solubility in Water</b>	Partially soluble
<b>pH</b>	7				

a) The values for the boiling point and closed cup flash point are based on the acetone component.

b) Value estimated with the literature values of volatile components or with Raoult's Law

c) The autoignition value is based on 1-methoxy-2-propanol acetate, 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

e) Kinematic viscosity at 40 °C for separation layer

**SILVER COATED COPPER CONDUCTIVE COATING**

**843-LIQUID**

**Section 10: Stability and Reactivity**

<b>Stabilities</b>	Chemically stable at normal temperatures and pressures
<b>Conditions to Avoid</b>	Ignition sources and incompatible substances
<b>Incompatibilities</b>	Strong oxidizing agents, strong acids, strong bases
<b>Polymerization</b>	Will not occur
<b>Decomposition</b>	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5

**Section 11: Toxicological Information**

<b>Skin corrosion/irritation</b>	Skin irritant. Prolonged or repeated skin contact may cause dermatitis
<b>Serious eye damage/irritation</b>	Causes serious eye irritation and lesions. Contains mechanically abrasive particles.
<b>Sensitization</b> (allergic reactions)	No known hazard
<b>Carcinogenicity</b> (risk of cancer)	No known components listed in IARC, ACGIH, CA Prop 65, or NTP
<b>Mutagenicity</b> (risk of heritable genetic effects)	Not known
<b>Reproductive Toxicity</b> (risk to sex functions)	Toluene, ethanol, and acetone present reproductive and developmental hazards at high doses (>13 000 µg/day)
<b>Teratogenicity</b> (risk of fetus malformation)	Harmful to unborn fetus in large doses
<b>STOT-single exposure</b>	Inhalation of toluene may affect the central nervous system
<b>STOT-repeated exposure</b>	Toluene may cause damage to organs through prolonged or repeated exposure.
<b>Aspiration hazard</b>	Viscosity at 40 °C is >20.5 mm <sup>2</sup> /s, thus not classified as aspiration hazard.

*Continued on the next page*

**SILVER COATED COPPER CONDUCTIVE COATING**
**843-LIQUID**
**Acute Toxicity (Lethal Exposure Concentrations)**

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation	TCLo inhalation <sup>a)</sup>
copper	>5000 mg/kg Mouse	N/E	N/E	N/E
	413 mg/kg Mouse			
toluene	636 mg/kg Rat	12 124 mg/kg Rabbit	49 g/m <sup>3</sup> 4h Rat	200 ppm Human
2-propanone	5 800 mg/kg Rat	>9 400 µL/kg Guinea pig	44 g/m <sup>3</sup> 4 h Rat	10 mg/m <sup>3</sup> 6 h Human
	5 340 mg/kg Rabbit		50.1 g/m <sup>3</sup> 8 h Rat	30 g/m <sup>3</sup> 2 h Rat
silver	>5 g/kg Guinea Pig	N/E	N/E	N/E
isobutyl acetate	13 400 mg/kg Rat	>17 400 mg/kg Rabbit	N/E	8 000 ppm 4h Rat LCLo <sup>b)</sup>
2-heptanone	1 670 mg/kg Rat	12 600 µL/kg Rabbit	N/E	7 000 mg/m <sup>3</sup> 4 h Guinea pig
	730 mg/kg Mouse			
ethanol	7 060 mg/kg Rat	N/E	20 000 ppm 10 h Rat	2 500 mg/m <sup>3</sup> 20 min Human
	3 450 mg/kg Mouse		39 g/m <sup>3</sup> 4 h Mouse	50 000 mg/m <sup>3</sup> 2 h Mouse
talc	N/E	N/E	N/E	17 mg/m <sup>3</sup> 6 h 26 d Rat
ethyl Acetate	5 620 mg/kg Rat	>20 000 µL/kg Rabbit	45 g/m <sup>3</sup> 2 h Mouse	1 105 mg/m <sup>3</sup> 4 h Rat
	4,100 mg/kg Mouse			
1-methoxy-2-propanol acetate	8 532 mg/kg Rat	>5 g/kg Rabbit	N/E	400 ppm Human
	>5 000 mg/kg Mouse			

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 published lethal concentration

b) Lethal concentration low

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

Data not available

**Biodegradability**

The metal content is not biodegradable.

VOC (EPA, WHIMS, and Europe) = 27% [466 g/L]

*\*VOC = Volatile Organic Content***Section 13: Disposal Information**

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

## SILVER COATED COPPER CONDUCTIVE COATING

**843-LIQUID**

### Section 14: Transport Information

#### Ground (less than 4 liter size)

Consumer Commodity; ORM-D

#### (greater than 4 liter size)

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

**UN number:** UN1263; **Shipping Name:** PAINT; **Class:** 3, **Packing Group:** II, Flashpoint -18 °C

#### Air

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

**UN number:** UN1263; **Shipping Name:** PAINT; **Class:** 3, **Packing Group:** II, Flashpoint -18 °C

#### Sea

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

**UN number:** UN1263; **Shipping Name:** PAINT; **Class:** 3, **Packing Group:** II, Flashpoint -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.

##### 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.

*Continued on the next page*

---

**SILVER COATED COPPER CONDUCTIVE COATING****843-LIQUID****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 Right to Know Act, USA, 40 CFR 372.45)

This product contains toluene (CAS# 108-88-3) and silver (CAS# 7440-22-4), which are 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**

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.

## SILVER COATED COPPER CONDUCTIVE COATING

## 843-LIQUID

### Section 16: Other Information

**MSDS Prepared by** Michel Hachey

**Date of Revision** 17 April 2013

**Supersedes** Version 2.01; 17 April 2012

**Reasons for Changes:** Added a new part number and updated emergency contact information.

**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 published lethal concentration

LD50 Lethal Dose 50%

N/A Not Applicable

N/E Not Estimated

PEL Permissible Exposure Limit

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](http://www.mgchemicals.com).

Email: [support@mgchemicals.com](mailto: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 material safety data sheet is provided as an information resource only. M.G. Chemicals, Inc. believes the information contained herein is accurate and compiled from reliable sources. It is the responsibility of the user to verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with federal, state, and local regulations.