

842AR-P

SILVER CONDUCTIVE PEN

# Safety Data Sheet

## Section 1: Identification



### Product Identifier and Other Means of Identification

**Product Identifier:** 842AR-P**Other Means of Identification:** Silver Conductive Pen**Related Part #** 842AR-PS, 842AR-P, 842AR-PCA

### Recommended Use and Restriction on Use

**Use:** Electrically conductive coating and EMI/RFI shield**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**FAX** +1-800-340-0773**E-MAIL** [support@mgchemicals.com](mailto:support@mgchemicals.com)**WEB** [www.mgchemicals.com](http://www.mgchemicals.com) +1-905-331-1396**FAX** +1-905-331-2682**E-MAIL** (Competent Person): [sds@mgchemicals.com](mailto:sds@mgchemicals.com)

### Emergency Phone Number

**For hazardous material incidents ONLY** (leaks, spills, fires, exposures or accidents)USA or CANADA—Call Verisk 3E at **+1-866-519-4752** or **+1-760-476-3962**

(Service access code: 335388)




**For emergencies involving the transport of dangerous goods;** 24/7 serviceCANADA—Call CANUTEC collect at **+1-613-996-6666** or **\*666** on cellular phones

**842AR-P**
**SILVER CONDUCTIVE PEN**
**Section 2: Hazard(s) Identification**
**Classification of Hazardous Chemical**
**GHS Categories**

Criteria	Category	Signal Word	Pictograms
Flammable Liquid	2	Danger	Flame
Eye Irritation	2	Warning	Exclamation
Specific Target Organ Toxicity Single Exposure	3	Warning	Exclamation
Hazardous to the Aquatic Environment Chronic	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**

<b>Signal Word</b>	<b>DANGER</b>
<b>Pictograms</b>	<b>Hazard Statements</b>
	H225: Highly flammable liquid and vapor
	H319: Causes serious eye irritation H336: May cause drowsiness or dizziness
	H410: Very toxic to aquatic life with long lasting effects

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**842AR-P**
**SILVER CONDUCTIVE PEN**
*Continued ...*

<b>Prevention</b>	<b>Precautionary Statements</b>
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No Smoking.
P261 + P271	Avoid breathing vapors. Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves and eye protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
<b>Response</b>	<b>Precautionary Statements</b>
P370 + P378	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340, P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell.
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 or attention.
P391	Collect spillage.
<b>Storage</b>	<b>Precautionary Statements</b>
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
<b>Disposal</b>	<b>Precautionary Statements</b>
P501	Dispose of contents and container in accordance to local, regional, national, and international regulations.

**Hazards Not Otherwise Classified**

<b>Other Criteria</b>	<b>Hazard Statements/Precautionary Statement</b>	<b>Signal Word</b>	<b>Pictograms</b>
Defats skin	Repeated exposure may cause skin dryness or cracking.	<i>None</i>	<i>None</i>
Argyria	Long term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin.	<i>None</i>	<i>None</i>

**842AR-P**
**SILVER CONDUCTIVE PEN**
**Section 3: Composition/Information on Ingredients**

CAS #	Chemical Name	% (weight)
7440-22-4	silver	50%
616-38-6	dimethyl carbonate	20%
67-64-1	acetone	10%
110-43-0	heptan-2-one <sup>a)</sup>	9%
108-65-6	1-methoxy-2-propanol acetate	1%

a) Also known as methyl amyl ketone (MAK)

**Section 4: First-Aid Measures**

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
<b>IF ON SKIN (or hair)</b>	P303 + P361 + P353, P308 + P313, P263
<b>Immediate Symptoms</b>	<i>redness, mild irritation, dry skin</i>
<b>Response</b>	Take off immediately all contaminated clothing. Rinse skin with water or shower.
<b>IF INHALED</b>	P304 + P340, P312
<b>Immediate Symptoms</b>	<i>cough, drowsiness, dizziness, headaches, nausea, unconsciousness</i>
<b>Response</b>	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE or doctor if you feel unwell.
<b>IF IN EYES</b>	P305 + P351 + P338, P337 + P313
<b>Immediate Symptoms</b>	<i>severe irritation, redness, pain</i>
<b>Response</b>	Rinse cautiously with water for 20 minutes or more. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention.
<b>IF SWALLOWED</b>	P301 + P330 + P331
<b>Immediate Symptoms</b>	<i>nausea, sore throat, abdominal pain, diarrhea, drowsiness, dizziness</i>
<b>Response</b>	Rinse mouth. Do NOT induce vomiting.

**842AR-P****SILVER CONDUCTIVE PEN****Section 5: Fire-Fighting Measures**

<b>Extinguishing Media</b>	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.  Use water spray to cool containers.
<b>Specific Hazards</b>	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.
<b>Fire-Fighter</b>	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.
<b>Precautions for Response</b>	Avoid breathing vapors. Remove or keep away all sources of extreme heat or open flames.
<b>Environmental Precautions</b>	Avoid releasing to the environment. Prevent spill from entering drains and waterways.
<b>Containment Methods</b>	Not applicable
<b>Cleaning Methods</b>	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.

**842AR-P**
**SILVER CONDUCTIVE PEN**
**Section 7: Handling and Storage**

<b>Prevention</b>	Keep out of reach of children.  Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No Smoking.  Avoid breathing vapors. Use only outdoors or in a well-ventilated area.
<b>Handling</b>	Wear protective gloves and eye protection.  Wash hands thoroughly after handling.  Take off contaminated clothing and wash it before reuse.  Avoid release to the environment. Collect spillage.
<b>Storage</b>	Store in a well-ventilated place. Keep cool.  Store locked up.

**Section 8: Exposure Controls/Personal Protection**
**Substances with Occupational Exposure Limit Values**

<b>Chemical Name</b>	<b>Country/ Provinces</b>	<b>Long Term Exposure Limits (PEL)</b>	<b>Short Term Exposure Limits (STEL)</b>
silver <i>(metal dust, mist)</i> <i>(metal)</i> <i>(Ag and its compounds)</i> <i>(metal, dust, fumes)</i>	ACGIH	0.1 mg/m <sup>3</sup>	Not established
	U.S.A. OSHA PEL	0.01 mg/m <sup>3</sup>	Not established
	Canada AB	0.1 mg/m <sup>3</sup>	Not established
	Canada BC	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>
	Canada ON	0.1 mg/m <sup>3</sup>	Not established
	Canada QC	0.1 mg/m <sup>3</sup>	Not established
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
heptan-2-one <i>methyl amyl ketone</i>	ACGIH	50 ppm	Not established
	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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**842AR-P**
**SILVER CONDUCTIVE PEN**
*Continued...*

Chemical Name	Country/ Provinces	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
1-methoxy-2-propanol acetate	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	50 ppm	Not established
	Canada AB	Not established	Not established
	Canada BC	50 ppm	75 ppm
	Canada ON	50 ppm	Not established
	Canada QC	Not established	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 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 or other chemically resistant gloves.

**Respiratory Protection** For over-exposures up to 10 x OEL of vapors, 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.

**842AR-P**
**SILVER CONDUCTIVE PEN**
**Section 9: Physical and Chemical Properties**

<b>Physical State</b>	Liquid	<b>Lower Flammability Limit</b> <sup>b)</sup>	2%
<b>Appearance</b>	Light gray	<b>Upper Flammability Limit</b> <sup>b)</sup>	13%
<b>Odor</b>	Acetone-like	<b>Vapor Pressure</b> <sup>b)</sup> @20 °C	11 kPa [86 mmHg]
<b>Odor Threshold</b> <sup>a)</sup>	5 ppm	<b>Vapor Density</b>	≥2 (Air =1)
<b>pH</b>	Not available	<b>Relative Density</b> @25 °C	1.75
<b>Freezing/Melting Point</b>	Not available	<b>Solubility in Water</b>	Partially miscible
<b>Initial Boiling Point</b> <sup>a)</sup>	56 °C [132 °F]	<b>Partition Coefficient n-octanol/water</b>	Not available
<b>Flash Point</b> <sup>a)</sup>	-17 °C [1.4 °F]	<b>Auto-ignition Temperature</b> <sup>c)</sup>	≥330 °C [≥626 °F]
<b>Evaporation Rate</b>	Fast	<b>Decomposition Temperature</b>	Not available
<b>Flammability</b>	Highly Flammable	<b>Viscosity</b> @25 °C	>20.5 mm <sup>2</sup> /s

a) Values based on acetone component.

b) Lower and Upper Explosive Limits, and vapor pressure of mixture calculated using Le Chatelier principle and component physical values.

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

**Section 10: Stability and Reactivity**

<b>Reactivity</b>	Not available
<b>Chemical Stability</b>	Chemically stable at normal temperatures and pressures
<b>Conditions to Avoid</b>	Ignition sources, open flames, excessive heat, and incompatible substances
<b>Incompatibilities</b>	Oxidizing agents, strong acids, peroxides, acetylenic compounds
<b>Polymerization</b>	Will not occur
<b>Decomposition</b>	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.



**842AR-P**
**SILVER CONDUCTIVE PEN**
**Section 11: Toxicological Information**
**Summary of Effects and Symptoms by Routes of Exposure**

<b>Eyes</b>	Causes redness, severe irritation, and pain.
<b>Inhalation</b>	May cause cough, drowsiness, dizziness, headaches, nausea, or unconsciousness.
<b>Ingestion</b>	May cause nausea, sore throat, abdominal pain, and diarrhea (also see inhalation symptoms).
<b>Skin</b>	Causes skin redness, mild irritation, and dry skin.
<b>Chronic</b>	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)**

<b>Chemical Name</b>	<b>LD50 oral</b>	<b>LD50 dermal</b>	<b>LC50 inhalation</b>
acetone	5 800 mg/kg Rat	20 mL/kg Rabbit <sup>a)</sup>	16 000 ppm 4 h Rat <sup>a)</sup>
silver	>2 000 mg/kg Rat	>2 000 mg/kg Rat	5.16 mg/m <sup>3</sup> 4 h Rat (dust)
dimethyl carbonate	>6.4 g/kg Rat & Mouse	>5 000 mg/kg Rabbit	Not available
heptan-2-one	1 670 mg/kg Rat	12 600 µL/kg Rabbit	>16.7 mg/kg 4 h Rat (vapor)
1-methoxy-2-propanol acetate	8 532 mg/kg Rat	>5 g/kg Rabbit	Not available

*Note:* Toxicity data from the ECHA database was consulted. The data from supplier SDS were also consulted.

a) Supplier safety data sheet

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**842AR-P****SILVER CONDUCTIVE PEN****Other Toxicological Effects**

<b>Skin corrosion/irritation</b>	Based on available data, the classification criteria are not met.
<b>Serious eye damage/irritation</b>	Acetone is a known serious eye irritant. Contains mechanically abrasive particles.
<b>Sensitization</b> (allergic reactions)	Based on available data, the classification criteria are not met.
<b>Carcinogenicity</b> (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.
<b>Reproductive Toxicity</b> (risk to sex functions)	Based on available data, the classification criteria are not met.
<b>Teratogenicity</b> (risk of fetus malformation)	Based on available data, the classification criteria are not met.
<b>STOT-single exposure</b>	Inhalation of acetone, heptan-2-one, and distillates (petroleum), light distillate hydrotreating process, low-boiling may affect the central nervous system.
<b>STOT-repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	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 (<http://echa.europa.eu>), and other reliable sources.

Contains silver of less than a 1 mm but more than 100 nm (larger than nanoparticles), which release ionic silver 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) of the EU.

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**842AR-P****SILVER CONDUCTIVE PEN**

Acetone, heptan-2-one, and 1-methoxy-2-propanol acetate 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).
- 1-methoxy-2-propanol acetate has a minimal LC50 96 h of  $\geq 100$  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.

**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**

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 = 12% [200 g/L]; Regulated VOC = 449 g/L

**Section 13: Disposal Information**

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

**842AR-P****SILVER CONDUCTIVE PEN****Section 14: Transport Information****Ground**

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

Sizes 30 mL and under  
842AR-PS, 842AR-P, 842AR-PCA

**Excepted Quantity**  
Code **E2**

**Air**

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

Sizes 30 mL and under  
842AR-PS, 842AR-P, 842AR-PCA

**Excepted Quantity**  
Code E2



On air waybill, write:  
"Dangerous Goods in  
Excepted Quantities".

*FOR REFERENCE ONLY*  
**UN number:** UN1263  
**Shipping Name:** PAINT  
**Class:** 3  
**Packing Group:** II  
**Marine Pollutant:** No

**Sea**

**Refer to IMDG regulations.**

Sizes 30 mL and under  
842AR-PS, 842AR-P, 842AR-PCA

**Excepted Quantity**  
Code **E2**



In transport document,  
write:  
"Dangerous Goods in  
Excepted Quantities".

*FOR REFERENCE ONLY*  
**UN number:** UN1263  
**Shipping Name:** PAINT  
**Class:** 3  
**Packing Group:** II  
**Marine Pollutant:** No

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

**842AR-P**
**SILVER CONDUCTIVE PEN**
**Section 15: Regulatory Information**
**Canada**
**Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)**

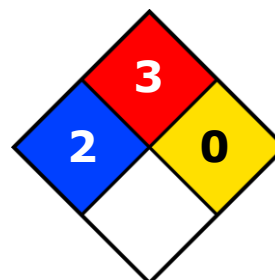
All hazardous ingredients are listed on the DSL.

**Hazardous Products Act (R.S.C., 1985, c. H-3)**

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

**USA**
**Other Classifications**
**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® 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 silver (CAS# 7440-22-4; reportable quantity = 1 000 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), 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.

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Page **13** of **15**

Date of Revision: 12 June 2023 / Ver. 2.03

**842AR-P****SILVER CONDUCTIVE PEN**

**California Proposition 65** (Chemicals known to cause cancer or reproductive toxicity, 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, PBDE's, DEHP, BBP, DBP, or DIBP 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** MG Chemicals' Regulatory Department

**Date of Review** 12 June 2023

**Supersedes** 05 November 2020

**Reason for Changes:** Update to size information.

**Reference**

1) ACGIH 2023 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 (2023).

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**842AR-P****SILVER CONDUCTIVE PEN****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](http://www.mgchemicals.com).

Email: [support@mgchemicals.com](mailto:support@mgchemicals.com)

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**Disclaimer**

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