

SILVER (MICROTIP) CONDUCTIVE PEN

8420-PEN

Safety Data Sheet

NOTE: This SDS is not required for this consumer product/article according to the Canadian and US regulations; it is provided as a courtesy rather than by obligation. For the applicable exemption, refer to the Hazardous Product Act part 12, section f of Canada and the US Code of Federal regulation: 29 CFR 1910.1200(b)(5)(v & ix).

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: Silver (Microtip) Conductive Pen**SDS Code:** 8420-Pen**Related Part #** 8420P

Recommended Use and Restriction on Use

Use: For drawing or repairing conductive traces on circuits**Uses Advised Against:** Not available

Details of Manufacturer or Importer

Manufacturer

MG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADA

MG Chemicals (Head Office)
9347-193 Street
Surrey, British Columbia V4N 4E7
CANADA

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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 ☎: **+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 liquid	2	Danger	Flame
Specific target organ toxicity Repeated exposure	2	Warning	Health
Reproductive Toxicity	2	Warning	Health
Eye Irritation	2	Warning	Exclamation
Skin Irritation	2	Warning	Exclamation
Specific target organ toxicity Single exposure	3	Warning	Exclamation
Environmental Hazard Chronic Aqua. Tox.	1	Warning	Environment

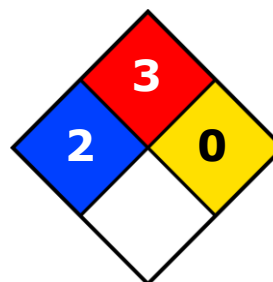
Note: The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

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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Label Elements

Signal Word	DANGER
Pictograms	Hazard Statements
	H225: Highly flammable liquid and vapor
	H373: May cause damage to central nervous system or inner ear through prolonged or repeated exposure H361: Suspected of damaging fertility or the unborn child
	H319: Causes serious eye irritation H315: Cause skin irritation H336: May cause dizziness or drowsiness
	H410: Very toxic to aquatic life with long lasting effects
Prevention	Precautionary Statements
P201 + P202	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P260 + P271	Do not breathe vapors/fumes. Use only outdoors or in well ventilated area.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/eye protection.
P273	Avoid release to the environment.

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Response	Precautionary Statements
P370 + P378	In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.
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 attention.
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.
P302 + P352	IF ON SKIN: Wash with plenty of water.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P301 + P330, P331, P391	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Collect spillage.
Storage	Precautionary Statements
P403 + P235	Store in well ventilated place. Keep cool.
P405	Store locked up.
Disposal	Precautionary Statements
P501	Dispose of contents/container in accordance to local/regional/international regulations.

Other Hazards

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
Skin Dryness	Repeated exposure may cause skin dryness or cracking.	Not applicable	Not applicable

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Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	Wt%
7440-22-4	silver	42-50%
108-88-3	toluene	12-14%
123-86-4	n-butyl acetate	8-10%
67-64-1	acetone	4-5%
110-19-0	isobutyl acetate	2-4%
110-43-0	2-heptanone ^{a)}	2-4%
64-17-5	ethanol	2-4%
141-78-6	ethyl acetate	1-2%
108-65-6	1-methoxy-2-propanol acetate	0.1-1%

a) Commonly known as methyl amyl ketone (MAK)

Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	<i>redness, irritation, pain</i>
Response	Rinse cautiously with water for 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
IF INHALED	P304 + P340, P312, P308 + P313
Immediate Symptoms	<i>cough, dizziness, drowsiness, headaches</i>
Response	Remove person to fresh air and keep comfortable for breathing. If feeling unwell: Call a POISON CENTRE/doctor. If exposed or concerned: Get medical advice.

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IF ON SKIN	P302 + P352, P332 + P313
Immediate Symptoms	<i>redness, irritation, dry skin</i>
Response	Wash with plenty of water. If skin irritation occurs: Get medical advice/attention.
IF SWALLOWED	P301 + P330 + P331, P308 +P313
Immediate Symptoms	<i>abdominal pain, burning sensation, nausea, headaches, dizziness, drowsiness, vomiting</i>
Response	Rinse mouth. Do NOT induce vomiting. If exposed or concerned: Get medical advice.

Section 5: Fire-Fighting Measures

Auto-Ignition Temperature ^{a)}	≥315 °C [599°F]	Flash Point ^{b)}	-17 °C [1.4 °F]	LFL [LEL]	1%	UFL [UEL] ^{c)}	13%
In case of fire	P370 + P378						
Extinguishing Media	Use dry chemical, carbon dioxide, or chemical foam to extinguish. Use water spray to cool containers.						
Specific Hazards	The vapors are heavier than air and may accumulate in low-lying areas.						
Combustion Products	Produces carbon oxides (CO, CO ₂)						
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.						

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

b) Closed cup value based on the acetone components.

c) Calculated based on Raoult's Law and Le Chatelier principle
LFL = Lower Flammability [or Explosion] Limit (in volume %);
UFL = Upper Flammability [or Explosion] Limit (in volume %)

SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Section 6: Accidental Release Measures**

Personal Protection	See personal protection equipment in Section 8.
Precautions for Response	Avoid breathing the vapors/fumes. Remove or keep away all sources of ignition or extreme heat.
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.

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. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Do not breathe vapors/fumes. Use only outdoors or in a well-ventilated area.
Handling	Wear protective gloves/eye protection. Wash hands thoroughly after handling. Avoid release to the environment.
Storage	Keep container tightly closed. Store in a well-ventilated area. Keep cool. Store locked up.

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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	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
silver (metal dust, mist) (metal) (Ag and its compounds) (metal, dust, fumes)	ACGIH	0.1 mg/m ³	Not established
	U.S.A. OSHA PEL	0.01 mg/m ³	Not established
	Canada AB	0.1 mg/m ³	Not established
	Canada BC	0.01 mg/m ³	0.03 mg/m ³
	Canada ON	0.1 mg/m ³	Not established
	Canada QC	3 mg/m ³	Not established
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
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
acetone	ACGIH	500 ppm	750 ppm
	U.S.A. OSHA PEL	1000 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	1000 ppm
heptan-2-one	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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Chemical Name	Country	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
isobutyl acetate	ACGIH	150 ppm	Not established
	U.S.A. OSHA PEL	150 ppm	Not established
	Canada AB	150 ppm	Not established
	Canada BC	150 ppm	Not established
	Canada ON	150 ppm	Not established
	Canada QC	150 ppm	Not established
ethanol	ACGIH	1 000 ppm	Not established
	U.S.A. OSHA PEL	1 000 ppm	Not established
	Canada AB	1 000 ppm	Not established
	Canada BC	Not established	1 000 ppm
	Canada ON	Not established	1 000 ppm
	Canada QC	1 000 ppm	500 ppm
ethyl acetate	ACGIH	400 ppm	Not established
	U.S.A. OSHA PEL	400 ppm	Not established
	Canada AB	400 ppm	Not established
	Canada BC	150 ppm	Not established
	Canada ON	Not established	Not established
	Canada QC	400	Not established
1-methoxy-2-propanol acetate	ACGIH	Not established	Not established
	U.S.A. OSHA PEL	50 ppm ^{a)}	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 ACGIH¹, OSHA, 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) USA Workplace Environmental Exposure Levels (WEEL)

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SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Engineering Controls**

Ventilation Keep airborne concentrations below exposure limits.

Personal Protective Equipment

Eye protection Wear appropriate protective eyeglasses or chemical safety goggles.

Skin Protection For incidental contacts, use of protective nitrile gloves or other chemically resistant gloves.

For extended contacts, use polyvinyl alcohol (PVA) or Viton 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. 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.

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Section 9: Physical and Chemical Properties

Physical State	Liquid	Lower Flammability Limit ^{b)}	1%
Appearance	Metallic silver	Upper Flammability Limit ^{b)}	13%
Odor	Aromatic like, sweetish	Vapor Pressure ^{b)} @20 °C	68 kPa [51 mmHg]
Odor Threshold	2 ppm	Vapor Density	≥4 (Air =1)
pH	Not available	Specific Gravity @25 °C	1.8
Freezing/Melting Point	Not available	Solubility in Water	Partially soluble
Boiling Point ^{a)}	≥56 °C [≥132 °F]	Partition Coefficient	Not available
Flash Point ^{a)}	≥-17 °C [≥1.4 °F]	Auto-ignition Temperature ^{c)}	≥315 °C [≥599 °F]
Evaporation Rate	>1 (ButAc = 1)	Decomposition Temperature	Not available
Flammability (solid, gas)	Not applicable	Viscosity @40 °C ^{d)}	≥34 mm ² /s

a) Component with the lowest value—acetone

b) Calculated based on Raoult's Law and Le Chatelier's principle

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

d) Kinematic viscosity at 40 °C for separation layer

SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Section 10: Stability and Reactivity**

Reactivity	Not available
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Flames, sparks, other 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**Routes of Exposure**

Eye contact, ingestion, inhalation, and skin contact

Symptoms Summary

Eyes	Causes redness, tearing, or serious eye irritation.
Skin	Causes skin redness, irritation or dry skin.
Inhalation	May cause cough, dizziness, drowsiness, and headaches.
Ingestion	May cause abdominal pain, burning sensation, nausea, headaches, dizziness, drowsiness, vomiting. Also see inhalation symptoms.
Chronic	Prolonged or repeated skin contact may defat skin and cause skin dryness and cracking, and local redness and discomfort. Chronic inhalation may cause central nervous effects and lead to hearing loss with co-exposure to loud noises. Ingestion or inhalation of material, mist, or vapor during pregnancy increases the chances fetal death and developmental defects.

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SILVER (MICROTIP) CONDUCTIVE PEN
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Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
silver	>5 g/kg Guinea Pig	Not available	Not available
toluene	636 mg/kg Rat	12 124 mg/kg Rabbit	49 g/m ³ 4h Rat
n-butyl acetate	>10 768 mg/kg Rat	>17 600 mg/kg Rabbit	390 ppm 4 h Rat
acetone	5 800 mg/kg Rat	20 mL/kg Rabbit ^{a)}	16 000 ppm 6h Rat
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
ethanol	7 060 mg/kg Rat	Not available	20 000 ppm 10 h Rat
ethyl acetate	5 620 mg/kg Rat	>20 000 µL/kg Rabbit	45 g/m ³ 2 h Mouse
1-methoxy-2-propanol acetate	8 532 mg/kg Rat	> 5 g/kg Rabbit	Not available

Note: Representative toxicity data from by RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS)¹ data from supplier (M)SDS were also consulted.

a) According to supplier (M)SDS

Other Toxicological Effects

Skin corrosion/irritation	Skin irritant: Toluene can cause a skin irritation according to Draize tests on animals.
Serious eye damage/irritation	Severe Eye irritant: toluene, acetone, heptan-2-one, ethanol, and ethyl acetate are known serious eye irritant.
Sensitization (allergic reactions)	Based on available data, the classification criteria are not met.

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SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Carcinogenicity**

(risk of cancer)

Except for ethanol, none of the ingredients are classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP.

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 [CAS# 64-17-5]

IARC Group 1: Possibly carcinogenic to humans in the form of alcoholic beverages (not ethanol)

ACGIH A4: Not classified as a human carcinogen

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

NTP: When in alcoholic beverage consumption, it is listed as a known carcinogen

Mutagenicity

(risk of heritable genetic effects)

Based on available data, the classification criteria are not met.

Reproductive Toxicity

(risk to sex functions)

At high doses, spermatogenesis was observed in male rat by inhalation of toluene.

Teratogenicity

(risk of fetus malformation)

Fetotoxicity is observed in animal studies for inhalation and oral exposures for toluene. Extreme consumption of ethanol also presents risks for the newborn.

STOT-single exposure

Acetone, toluene, 1-methoxy-2-propanol acetate, isobutyl acetate, heptan-2-one, and ethyl acetate can affect the central nervous system by inhalation causing drowsiness or dizziness.

STOT-repeated exposure

Contains $\leq 14\%$ toluene, which is a Cat 2 STOT repeated exposure hazard for the central nervous system and cochlear systems.

Toluene is listed as an ototoxic according to animal studies. Co-exposure to toluene and loud noises may lead to hearing loss.

Aspiration hazard

The liquid content does not meet the aspiration hazard criteria. Although it contain more than 10% components of category 1 for aspiration hazard, the mixture has a kinematic viscosity of $>20.5 \text{ mm}^2/\text{s}$ at $40 \text{ }^\circ\text{C}$ for the separation layer.

SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Section 12: Ecological Information**

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

Contains silver particles of less than a 1 mm but more than 100 nm (larger than nanoparticles), which releases ionic silver at levels that are very toxic to the environment. While massive silver is insoluble in water, silver powders are considered sufficiently soluble to give rise to an ecological hazard by European Union regulators. The classification that follows takes into account to European Union classification.

Toluene is an acute category 2 environmental toxicant (rapidly biodegradable, with a minimal LC50 96 h of 7.63 mg/L for *Oncorhynchus mykiss* (rainbow trout); EC50 24 h of 8.9 mg/L for *Daphnia magna* (water flea); and EC50 24 h of 10 mg/L for *Pseudokirchneriella subcapitata* (green algae)). It is removed by volatilization and biodegradation; and it does not bioaccumulate.

The n-butyl acetate ingredient is an acute category 3 environmental toxicant (biodegradable with minimal LC50 of 18 mg/L for *Pimephales promelas* (fathead minnow)).

Acetone, isobutyl acetate, heptan-2-one, ethanol and ethyl acetate do not meet classification criteria for aquatic environmental toxicants with LC50 and EC50 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.
- Ethyl acetate is has a minimal LC50 96 h of 220 mg/L for *Pimephales promelas* (fathead minnow); a LC50 48 h of 560 mg/L and EC50 24 h of 2 300 mg/L *Daphnia magna* (water flea); and an EC50 72 h 1 800 mg/L for *Selenastrum*.
- The 1-methoxy-2-propanol acetate component has a minimal LC50 96 h of \geq 100 mg/L *Salmo gairdneri*; and EC50 48 h >500 mg/L *Daphnia magna* (water flea).

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SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****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

Except for silver and the resin, presumed to be intrinsically biodegradable. Volatile components oxidize rapidly in air by photochemical reactions.

Other Effects

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

Actual VOC = 34% [603 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 Regulations (Canadian Transportation of Dangerous Goods regulations); **USA DOT 49 CFR** (Parts 100 to 185) **Regulations.**

Sizes 1 liter and under

Limited Quantity



Sizes greater than 1 liter

UN number: UN1263
Shipping Name: PAINT
Class: 3
Packing Group: II
Marine Pollutant: Yes

Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 30 mL and under

Excepted Quantity

Document as class **E2**



UN number: UN1263
Shipping Name: PAINT
Class: 3
Packing Group: II
Marine Pollutant: Yes

Sea

Refer to IMDG regulations.

Sizes 30 mL and under

Excepted Quantity

Document as class **E2**



UN number: UN1263
Shipping Name: PAINT
Class: 3
Packing Group: II
Marine Pollutant: Yes

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

SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Section 15: Regulatory Information****Canada****WHMIS 1988 Classification**

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

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 2015 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 toluene (CAS# 108-88-3; reportable quantity = 1000 lb) and silver (CAS# 7440-22-4, 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 acetone (CAS# 67-64-1), isobutyl acetate (CAS# 110-19-0) and ethyl acetate (CAS# 141-78-6), which are subject to the CERCLA reporting requirements at the 5000 lb (2268 kg) threshold.

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SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****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.

Section 16: Other Information**SDS Prepared by** Michel Hachey**Date of Creation** 24 February 2015**Supersedes** 22 Mai 2014**Reason for Changes:** Minor change to ensure conformity with both HCS 2012 and WHMIS 2015.**References**

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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SILVER (MICROTIP) CONDUCTIVE PEN**8420-PEN****Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
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.

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