TED PELLA, INC.
Microscopy Products for Science and Industry

Safety Data Sheet

Product No. 16062, 16062-15 PELCO® Conductive Silver Paint
Issue Date (04-28-15)
Review Date (06-16-21)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: PELCO® Conductive Silver Paint
Synonym: None
Company Name:
Ted Pella, Inc., P.O. Box 492477, Redding, CA 96049-2477
Inside USA and Canada 1-800-237-3526 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)
Outside USA and Canada 1-530-243-2200 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)
CHEMTREC USA and Canada Emergency Contact Number 1-800-424-9300 24 hours a day
CHEMTREC Outside USA and Canada Emergency Contact Number +1-703-741-5970 24 hours a day

SECTION 2: HAZARD IDENTIFICATION

Classification of The Substance or Mixture
GHS Pictograms

GHS02 GHS07 GHS09

GHS Categories

GHS02	Flammable
	H225: Highly flammable liquid and vapor
GHS07	Harmful
	H319: Causes serious eye irritation
	H336: May cause drowsiness or dizziness
GHS09	Environmental Hazard
	H410: Very toxic to aquatic life with long-lasting effects

Label Elements

Signal Word: DANGER

Hazard Statements

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

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.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof equipment.
P243	Take action to prevent static discharges.
P261+P271	Avoid breathing dust/fumes/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/eye protection/face protection.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.

Response: - Precautionary Statements

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 CENTER 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/attention.
P391	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.

2.3 Other Hazards

Hazards Not Otherwise Classified

Defats skin: Repeated exposure may cause skin dryness or cracking.

Argyria: Long-term exposure to silver powder or compounds can lead to an irreversible blue-grey discoloration of the skin.

HMIS Hazard Rating:

Health: 2
Flammability: 3
Physical Hazard: 0

NFPA Hazard Rating:

Health: 2
Fire: 3
Instability: 0

(0=least, 1=Slight, 2=Moderate, 3=High, 4=Extreme

Emergency Overview

Appearance: Metallic silver

Immediate Effects:

If inhaled: Dizziness, drowsiness, headaches, nausea, cough, blurred vision, fatigue.

Eye contact: Irritation, redness, pain, blurred vision.

Skin contact: Irritation, pain, redness.

If swallowed: Nausea, vomiting, abdominal cramps, irritation, burning sensation, or dizziness.

Potential Health Effects

Primary Routes of Entry: Eyes, ingestion, inhalation, and skin.

Signs and Symptoms of Overexposure:

Eyes: 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.

Skin: May cause mild to moderate skin irritation.

Ingestion: Not a likely route of exposure. Harmful if swallowed. It is a central nervous system depressant. It may cause irritation and burning sensation

Inhalation: Solvents may cause respiratory tract irritation, headache, and possible dizziness.

Chronic Exposure: 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. Long term accumulation of silver can lead to Argyria, which is an irreversible blue-grey discoloration of the skin.

Ingestion of paint material or inhalation of its mist or vapors during pregnancy may increase the chances of fetal death and of developmental defects.

Chemical Listed as Carcinogen or Potential Carcinogen: None

See Toxicological Information (Section 11)

Potential environmental effects:

See Ecological Information (Section 12)

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Principle Hazardous Component(s) (chemical and common name(s)) (Cas. No)	%	OSHA PEL mg/m3	ACGIH TWA mg/m3	NTP	IARC	OSHA regulated
Silver (7440-22-4)	50	0.01	0.1	No	No	No
Dimethyl Carbonate (616-38-6)	16	5 1 ppm	400 ppm	No	No	No
Acetone (67-64-1)	11	2,400 1000 ppm	500 ppm	No	No	No
Heptan-2-one (110-43-0)	10	465 100 ppm	50 ppm	No	No	No
1-methoxy-2-propanol acetate (108-65-6)	1	368 100 ppm	50 ppm	No	No	No

SECTION 4: FIRST AID MEASURES

Skin Contact: (P303+P361+P353, P263)

Immediate Symptoms: redness, mild irritation, dry skin.

Response: Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse.

Inhalation: (P304+P340, P312)

Immediate Symptoms: cough, drowsiness, dizziness, headache, nausea, unconsciousness.

Response: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.

Eye(s) Contact: (P305+P351+P338, P337+P313)

Immediate Symptoms: irritation, redness, pain

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 or attention.

Ingestion: (P301+P330+P331)

Immediate Symptoms: nausea, sore throat, abdominal pain, diarrhea, drowsiness, dizziness.

Response: Rinse mouth. Do NOT induce vomiting.

SECTION 5: FIRE FIGHTING MEASURES

Extinguishing Media: In case of fire: Use dry chemical, carbon dioxide, chemical foam, or water spray to extinguish.

Specific Hazards: 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.

Combustions Products: Produces carbon oxides (CO, CO2) and metal oxide fumes.

Fire-Fighter: Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

DOT Class: Flammable

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Protection: See personal protection recommendations in Section 8

Precautions for Response: Avoid breathing mist, spray, and vapors. Remove or keep away all sources of extreme heat or open flame.

Environmental Precautions: Avoid releasing to the environment. Prevent spill from entering drains and waterways.

Containment Methods: Contain with inert absorbent (such as soil, sand, vermiculite).

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.
Keep away from heat, hot surfaces, sparks, flames, and other ignition sources. No smoking.
Avoid breathing mist, vapors, and spray. Use only outdoors or in a well-ventilated area.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof equipment.
Take action to prevent static discharges.

Handling: Wear protective gloves, protective clothing, eye protection, and face protection.
Wash hands thoroughly after handling.
Take off contaminated clothing and wash it before reuse.
Avoid release to the environment. Collect spillage.

Storage: Store in a well-ventilated place. Keep cool.
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)
Silver *(metal dust, mist)* *(metal)* *(Ag and its compounds)* *(metal, dust, fumes)*	ACGIH USA 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
Acetone	ACGIH USA 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
Heptan-2-one *Methyl amyl ketone*	ACGIH USA 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
1-methoxy-2-propanol acetate	ACGIH USA OSHA PEL Canada AB Canada BC Canada ON Canada QC	Not established 50 ppm Not established 50 ppm 50 ppm Not established	Not established Not established Not established 75 ppm Not established Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH[1], OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from by RTECS database[2] and 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 Protection 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 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 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.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid	**Lower Flammability Limit** [b)]	2%
Appearance	Light gray	**Upper Flammability Limit** [b)]	13%
Odor	Acetone-like	**Vapor Pressure** [b)] **@20 ^{0}C**	11 kPa (86 mmHg)
Odor Threshold [a)]	5 ppm	**Vapor Density**	≥2 (Air =1)
pH	Not available	**Relative Density @25 ^{0}C**	1.7
Freezing/Melting Point	Not available	**Solubility in Water**	Partially miscible
Initial Boiling Point [a)]	56 °C (132 °F)	**Partition Coefficient n-octanol/water**	Not available
Flash Point [a)]	-17 °C (1.4 °F)	**Auto-ignition Temperature** [c)]	≥315 ^{0}C (≥599 ^{0}F)
Evaporation Rate	Fast	**Decomposition Temperature**	Not available
Flammability	Not applicable	**Viscosity @25 ^{0}C**	873 cP

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

Reactivity: Not available

Chemical Stability: Chemically stable at normal temperatures and pressures.

Conditions to Avoid: Ignition sources, open flames, excessive heat, and incompatible substances.

Incompatibilities: Oxidizing agents, strong acids, peroxides, acetylenic compounds

Polymerization: Will not occur.

Decomposition: Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5

SECTION 11: TOXICOLOGICAL INFORMATION

Summary of Effects and Symptoms by Routes of Exposure
Eyes: Causes redness, severe irritation, and pain.
Inhalation: May cause cough, drowsiness, dizziness, headaches, nausea, or unconsciousness
Ingestion: May cause nausea, sore throat, abdominal pain, and diarrhea (also see inhalation symptoms)
Skin: Causes skin redness, mild irritation, and dry skin.
Chronic: 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.

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
Acetone	5,800 mg/kg Rat	20 mL/kg Rabbit	16,000 ppm 4h Rat [a)]
Silver	>2,000 mg/kg Rat	>2,000 mg/kg Rat	5.16 mg/m^3 4h 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 4h Rat (vapor)
1-methoxy-2-propanol acetate	8,532 mg/kg Rat	>5 g/kg Rabbit	Not available

Note: Toxicity data from the RTECS[2] and ECHA databases were consulted. The data from supplier SDS were also consulted.

a) Supplier safety data sheet

Other Toxicological Effects:

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

Serious eye damage/irritation — Acetone is a known serious eye irritant.
Contains mechanically abrasive particles.

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

Carcinogenicity (risk of cancer) — Based on available data, the classification criteria are not met.

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

Reproductive Toxicity (risk to sex functions) — Based on available data, the classification criteria are not met.

Teratogenicity (risk of fetus malformation) — Based on available data, the classification criteria are not met.

STOT-single exposure — Inhalation of acetone, heptan-2-one, may affect the central nervous system.

STOT-repeated exposure — Based on available data, the classification criteria are not met.

Aspiration hazard — 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 1mm but more than 100nm (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 chronic aqueous toxicity of category 1 (M=10 for silver) of the EU.

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 ≥100 mg/L for 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 U.S. (EPA) and Canadian (CEPA) authorities.

Actual VOC = 12% [200g/L]; Regulated VOC = 430 g/L

SECTION 13 DISPOSAL CONSIDERATIONS

Federal, State and local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

SECTION 14: TRANSPORTATION INFORMATION

US DOT Information:

Limited Quantity: Sizes 5 L and under

Shipping name: Paint

Hazard Class: 3

Packaging group: II

UN Number: UN1263

Marine Pollutant: Yes

ICAO-IATA:

Limited Quantity: Sizes 0.5 L and under (Total Net QTY per package 1.0 L)

Shipping name: Paint

Hazard Class: 3

Packing group: II

UN Number: UN1263

Marine Pollutant: Yes.

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

SECTION 15: REGULATORY INFORMATION

United States Federal Regulations

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 hazardous air pollutants.
SARA Title III: 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.

State Regulations

California Proposition 65: (Chemicals known to cause cancer or reproductive toxicity).
This product does not contain any substances known to be listed in California.

Europe

RoHS: 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

Label Information: Flammable
Reference:

1) ACGIH 2017 TLV's and BEI's: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental Industrial Hygienist, Cincinnati, OH (2017)
2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

Abbreviations used in this document

NE = Not established
NA = Not applicable
NIF = No Information Found
ND = No Data

Disclaimer

Ted Pella, Inc. makes no warranty of any kind regarding the information furnished herein. Users should independently determine the suitability and completeness of information from all sources. While this data is presented in good faith and believed to be accurate, it should be considered only as a supplement to other information gathered by the user. It is the User's responsibility to assure the proper use and disposal of these materials as well as the safety and health of all personnel who may work with or otherwise come in contact with these materials.