TED PELLA, INC.
Microscopy Products for Science and Industry

Safety Data Sheet

Product No. 16031, 16034 Pelco® Colloidal Silver
Issue Date (05/29/2015)
Review Date (09/07/2021) Rev. 05

Section 1: Product and Company Identification

Product Name: Pelco® Colloidal Silver
Synonym: Pelco® Conductive Liquid Silver, Pelco® Colloidal Silver Paint
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 Classification in accordance with 29 CFR 1910.1200

Flammable Liquids:	Category 2
Skin irritation:	Category 2
Eye irritation:	Category 2A
Reproductive toxicity:	Category 2
Specific target organ systemic toxicity-single exposure:	Category 3 (Central nervous system)
Specific target organ systemic toxicity-repeated exposure:	Category 3 (Central nervous system)

GHS label elements
Hazard Pictograms

Signal Word: DANGER

Hazard Statements
H225: Highly flammable liquid and vapor.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H361d: Suspected of damaging the unborn child.
H373: May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

Precautionary Statements
P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapors/spray.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/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.

2.3 Other hazards
None known

Section 3: Composition / Information on Ingredients

Substance/Mixture: **Mixture**
Chemical Nature: **Inorganic**

Chemical Name	CAS-No. EC-No.	Concentration (% w/w)
Silver	7440-22-4	>=50-<70
Toluene	108-88-3 203-625-9	>=10-<20
Ethyl acetate	141-78-6 205-500-4	>=5-<10
Ethanol	64-17-5 200-578-6	>=5-<10
n-Butyl acetate	123-86-4 204-658-1	>=1-<5
Propan-2-ol	67-63-0 200-661-7	>=1-<5
Bornan-2-on	76-22-2 200-945-0	>=1-<5

Actual concentration is withheld as trade secret.

Section 4: First Aid Measures

If accidental overexposure is suspected

General advice:	First aid person needs to protect himself. Move out of dangerous area. Show this Safety Data Sheet to the doctor in attendance.
If Inhaled:	Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Get medical attention.
In case of Skin Contact:	Take off all contaminated clothing immediately. Wash off with soap and plenty of water.
In case of Eye(s) Contact:	In case of contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye open while rinsing. Protect unharmed eye. Call a physician immediately.
If swallowed:	Immediately give large quantities of water to drink. **Do not** induce vomiting. Get medical attention immediately

Most important symptoms and effects, both acute and delayed:

Causes skin irritation
Causes serious eye irritation
May cause drowsiness or dizziness
Suspected of damaging the unborn child
May cause damage to organs through prolonged or repeated exposure

Note to Physician: Treat symptomatically

Section 5: Fire Fighting Measures

Suitable extinguishing media	Dry powder, alcohol-resistant foam, dry sand, carbon dioxide (CO_2)
Unsuitable extinguishing media	Water
Specific hazards during fire fighting	Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	Silver compounds, Carbon oxides
Further information	Use a water spray to cool fully closed containers. Prevent fire extinguishing water from contamination surface water or the ground water system.
Special protective equipment for fire-fighters	In the event of a fire, wear self-contained breathing apparatus. Use personal protective equipment.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	Follow safe handling advice and personal protective equipment recommendations. Ensure adequate ventilation. Evacuate personnel to safe areas. Refer to protective measures listed in Sections 7 and 8.
Environmental precautions	Do not allow contact with soil, surface or ground water. Do not let product enter drains. If the product contaminates rivers, lakes or drains, inform respective authorities.
Methods and materials for containment and cleaning up	Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth vermiculite) and transfer to a container for disposal according to local/national regulations (see Section 13)

Section 7: Handling and Storage

Advice on safe handling	Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Wear protective equipment. Keep away from heat and sources of ignition. Avoid inhalation, ingestion, and contact with skin and eyes. Smoking eating and drinking should be prohibited in the application area.
Conditions for safe storage	Keep tightly closed in a dry cool and well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Section 8: Exposure Controls / Personal Protection/Biological occupational exposure limits

Component(s)	CAS-No.	Value type (Form of exposure)	Control Parameters/ Permissible concentrations	Basis	Biological sample/BEI	BEI Basis
Silver	7440-22-4	TWA Dust and fume	0.01mg/m^3 0.1mg/m3	OSHA Z-1 ACGIH	NA	NA
Toluene	108-88-3	TWA TWA ST TWA CEIL Peak ---------- Prior to last shift work week. End of shift work week (ASAP after exposure). End of shift work week (ASAP after exposure).	20 ppm 100 ppm (375mg/m^3) 150 ppm (560mg/m^3) 200 ppm 300 ppm 500 ppm (10 minutes) ---------- 0.02 mg/L 0.03 mg/L o-Cresol/0.3mg/g Creatinine	ACGIH NIOSH REL NIOSH REL OSHA Z-2 OSHA Z-2 OSHA Z-2 ----------	---------- In Blood Urine Urine	--------- ACGIH ACGIH ACGIH
Ethyl acetate	141-78-6	TWA TWA TWA	400 ppm 400 ppm(1400 mg/m3) 400 ppm(1400 mg/m3)	ACGIH NIOSH REL OSHA Z-1	NA	NA
Ethanol	64-17-5	TWA STEL TWA	1000 ppm(1900 mg/m3) 1000 ppm 1000 ppm(1900 mg/m3)	NIOSH REL ACGIH OSHA Z-1	NA	NA
n-Butyl acetate	123-86-4	TWA TWA ST TWA STEL	150 ppm (710 mg/m^3) 150 ppm (710 mg/m^3) 200 ppm (950 mg/m^3) 50 ppm 150 ppm	OSHA Z-1 NIOSH REL NIOSH REL ACGIH ACGIH	NA	NA
Propan-2-ol	67-63-0	TWA STEL TWA ST TWA ---------- End of shift at end work week	200 ppm 400 ppm 400 ppm (980 mg/m^3) 500 ppm(1225 mg/m^3) 400 ppm (980 mg/m^3) ---------- Acetone/40 mg/L	ACGIH ACGIH NIOSH REL NIOSH REL OSHA Z-1 ----------	---------- Urine	---------- ACGIH
Bornan-2-one	76-22-2	TWA TWA STEL TWA	2 mg/m3 2 ppm 3 ppm 2 mg/m3	OSHA Z-1 ACGIH ACGIH NIOSH REL	NA	NA

Engineering Controls

Ventilation required: Provide sufficient air exchange and/or exhaust in work rooms.

Personal Protection Equipment

Respiratory protection: Use respiratory protective unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Recommended Filter type: ABEK-P

Eye protection: Safety glasses with side-shields.

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hand protection:	Before removing gloves, clean them with soap and water. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion and the contact time. A the product is a mixture of several substances, the durability of the glove materials cannot be calculated in advance and has to be tested before use.
Hygiene measures:	Keep away from food and drink. Wash hands before breaks and at the end of workday. Keep working clothes separately. Remove and wash contaminated clothing and gloves, including the inside, before re-use.

Exposure Guidelines

See Composition/Information on Ingredients (Section 3)

Section 9 Physical and Chemical Properties

Appearance:	Paste
Color	Gray
Odor:	Aromatic
Odor Threshold:	ND
pH:	NA
Melting Point/Range	ND
Boiling Point/Range:	167^0F / 75^{o}C (1,013 hPa)
Flash Point:	30^0F / -1^{o}C (1,013 hPa)
Evaporation Rate:	ND
Flammability:	NA
Self-ignition:	NA
Flammable/Explosive Limits: Upper	7.0% (V); 68^0F / 20^{o}C (1,013 hPa)
Flammable/Explosive Limits: Lowe	1.2% (V); 68^0F / 20^{o}C (1,013 hPa)
Vapor Pressure:	29 hPa (122^0F / 50^{o}C)
Relative Vapor Density:	ND
Relative Density:	ND
Density:	ND
Water Solubility:	Insoluble: (68^0F / 20^{o}C, 1,013 hPa)
Solubility in other solvents:	ND
Partition Coefficient: (n-octanol/water)	ND
Auto-ignition Temperature:	797^0F / 425^{o}C (1,013 hPa)
Decomposition Temperature:	ND
Viscosity, dynamic:	20,000 mPa/s (73^0F / 23^{o}C)
Viscosity, kinematic:	>40 mm^2/s (73^0F / 23^{o}C) >20.5 mm^2/s (104^0F / 40^{o}C)
Explosive properties:	ND
Oxidizing properties:	ND

Section 10: Stability and Reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical stability:	Stable under normal conditions.
Possibility of hazardous reaction:	No dangerous reaction known under conditions of normal use.
Conditions to Avoid:	ND
Incompatible materials:	ND
Hazardous decomposition products	ND

Section 11: Toxicological Information

Acute toxicity: Not classified based on available information.

Product:

Acute oral toxicity:	Acute toxicity estimate: > 5,000 mg.kg Method: Calculation method
Acute inhalation toxicity:	Acute toxicity estimate: 64.35 mg/L Exposure time: 4 h Test atmosphere: vapor Method: Calculation method
Skin corrosion/irritation:	Causes skin irritation
Serious eye damage/eye irritation	Causes serious eye irritation
Respiratory or skin sensitization	Not classified based on available information
Germ cell mutagenicity	Not classified based on available information

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified is probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified is on OSHA's list of regulated carcinogens.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

STOT – single exposure	May cause drowsiness or dizziness
STOT – repeated exposure	May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
Aspiration toxicity	Not classified based on available information

Components:

Silver:

Acute oral toxicity:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 401 Remarks: Based on data from similar materials
Skin corrosion/irritation:	Species: Rabbit Method: OECD Test Guideline 404 Result: No skin irritation
Serious eye damage/eye irritation:	Species: Rabbit Method: OECD Test Guideline 405 Result: No eye irritation
Respiratory or skin sensitization:	Test Type: Maximization Test

	Routes of exposure: Skin contact Species: Guinea pig Method: OECD Test Guideline 406 Result: negative Remarks: Based on data from similar materials
Germ cell mutagenicity:	
Genotoxicity in vitro:	Test Type: Chromosome aberration test in vitro Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: Intraperitoneal injection Remarks: Based on data from similar materials
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fetal development:	Test Type: Embryo-fetal development Species: Rat Application route: Ingestion Result: negative Remarks: Based on data from similar materials
STOT – repeated exposure	Routes of exposure: Inhalation (dust/mist/fume) Assessment: No significant health effects observed in animals at concentrations on 0.2 mg/l/6h/d or less.
Repeated dose toxicity	Species: Rat NOAEL: 30 mg/kg LOAEL: 125 mg/kg Application route: Ingestion Exposure time: 13 weeks Method: OECD Test Guideline 408
	Species: Rat NOAEL: 0.133 mg/m^3 Application route: Inhalation (dust/mist/fume) Exposure time: 13 weeks Method: OECD Test Guideline 413

Toluene:

Acute oral toxicity:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity:	LC50 (Rat) 28.1 mg/L Exposure time: 4 h Test atmosphere: vapor
Acute dermal toxicity:	LD50 (Rabbit): > 5,000 mg/kg
Skin corrosion/irritation:	Species: Rabbit Method: Directive 67/548/EEC, Annex V, B.4. Result: Skin irritation
Serious eye damage/eye irritation:	Species: Rabbit Method: OECD Test Guideline 405 Result: No eye irritation

Respiratory or skin sensitization:	Test Type: Maximization Test Routes of exposure: Skin contact Species: Guinea pig Method: Directive 67/548/EEC, Annex V, B.6. Result: negative
Germ cell mutagenicity: Genotoxicity in vitro:	Test Type: In vitro mammalian cell gene mutation test Result: negative
	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Genotoxicity in vivo:	Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Rat Application Route: Intraperitoneal injection Remarks: negative
	Test Type: Rodent dominant lethal test (germ cell) (in vivo) Species: Mouse Application Route: Inhalation (vapor) Method: OECD Test Guideline 478 Remarks: negative
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fertility:	Test Type: Two-generation reproduction toxicity study Species: Rat Application route: Inhalation (vapor) Method: OECD Test Guideline 416 Result: negative
Effects on fetal development:	Test Type: Embryo-fetal development Species: Rat Application route: Inhalation (vapor) Result: positive
Reproductive toxicity	Assessment: Some evidence of adverse effects on development, based on animal experiments.
STOT – single exposure	Assessment: May cause drowsiness or dizziness
STOT – repeated exposure	Routes of exposure: Inhalation Target Organs: Central nervous system Assessment: May cause damage to organs through prolonged or repeated exposure.
Repeated dose toxicity	Species: Rat LOAEL: 1.875 mg/l Application route: Inhalation (vapor) Exposure time: 6 months Method: OECD Test Guideline 408
	Species: Rat NOAEL: 625 mg/kg Application route: Ingestion

	Exposure time: 13 week
Aspiration toxicity	The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration hazard.
Experience with human exposure	Inhalation: Target Organs: Central Nervous System Symptoms: Neurological disorders

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Ethyl acetate:

Acute oral toxicity:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity:	LC50 (Rat) 22.5 mg/L Exposure time: 6 h Test atmosphere: vapor Assessment: The substance or mixture has no acute inhalation toxicity.
Acute dermal toxicity:	LD50 (Rabbit): > 20,000 mg/kg
Skin corrosion/irritation:	Species: Rabbit Result: No skin irritation
Serious eye damage/eye irritation:	Species: Rabbit Method: OECD Test Guideline 405 Result: No eye irritation
Respiratory or skin sensitization:	Test Type: Maximization Test Routes of exposure: Skin contact Species: Guinea pig Method: OECD Test Guideline 406 Result: negative
Germ cell mutagenicity:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Genotoxicity in vitro:	Test Type: Chromosome aberration test in vitro Result: negative
	Test Type: In vitro mammalian cell gene mutation test Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Hamster Application Route: Ingestion Result: negative
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fertility:	Test Type: Two-generation reproduction toxicity study Species: Mouse Application route: Ingestion Result: negative Remarks: Based on data from similar materials
	Species: Rat Application route: Inhalation (vapor) Result: negative

Effects on fetal development:	Test Type: Embryo-fetal development Species: Rat Application route: Inhalation Result: negative Remarks: Based on data from similar materials Test Type: Embryo-fetal development Species: Mouse Application route: Ingestion Result: negative Remarks: Based on data from similar materials
STOT – single exposure	Assessment: May cause drowsiness or dizziness
Repeated dose toxicity	Species: Rat NOAEL: 900 mg/kg LOAEL: 3,600 mg/kg Application route: Ingestion Exposure time: 90 days Species: Rat NOAEL: 1.28 mg/l LOAEL: 2.75 mg/kg Application route: Inhalation (vapor) Exposure time: 94 days
Experience with human exposure	Eye contact: Target Organs: Eye Symptoms: Irritation

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Ethanol:

Acute oral toxicity:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity:	LC50 (Rat) 124.7 mg/L Exposure time: 4 h Test atmosphere: vapor
Skin corrosion/irritation:	Species: Rabbit Method: OECD Test Guideline 404 Result: No skin irritation
Serious eye damage/eye irritation:	Species: Rabbit Method: OECD Test Guideline 405 Result: Irritation to eyes, reversing within 21 days
Respiratory or skin sensitization:	Test Type: Local lymph node assay (LLNA) Routes of exposure: Skin contact Species: Mouse Result: negative
Germ cell mutagenicity: Genotoxicity in vitro:	Test Type: In vitro mammalian cell gene mutation test Result: negative Test Type: Bacterial reverse mutation assay (AMES) Result: negative

Genotoxicity in vivo:	Test Type: Rodent dominant lethal test (germ cell) (in vivo) Species: Mouse Application Route: Ingestion Remarks: equivocal
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fertility:	Test Type: Two-generation reproduction toxicity study Species: Mouse Application route: Ingestion Result: negative
Repeated dose toxicity	Species: Rat NOAEL: 1,280 mg/kg LOAEL: 3,156 mg/kg Application route: Ingestion Exposure time: 90 days

n-Butyl acetate:

Acute oral toxicity:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity:	LC50 (Rat) 21.1 mg/L Exposure time: 4 h Test atmosphere: vapor Method: OECD Test Guideline 403
Acute dermal toxicity:	LD50 (Rabbit): > 5,000 mg/kg
Skin corrosion/irritation:	Species: Rabbit Result: No skin irritation Assessment: Repeated exposure may cause skin dryness or cracking.
Serious eye damage/eye irritation:	Species: Rabbit Method: OECD Test Guideline 405 Result: No eye irritation
Respiratory or skin sensitization:	Test Type: Maximization Test Routes of exposure: Skin contact Species: Guinea pig Result: negative
Germ cell mutagenicity:	
Genotoxicity in vitro:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fertility:	Test Type: Two-generation reproduction toxicity study Species: Rat Application route: Inhalation (vapor) Method: OECD Test Guideline 416 Result: negative
Effects on fetal development:	Test Type: Embryo-fetal development Species: Rat

	Application route: Inhalation (vapor) Result: negative
STOT – single exposure	Assessment: May cause drowsiness or dizziness
Repeated dose toxicity	Species: Rat NOAEL: 2.4 mg/l Application route: Inhalation (vapor) Exposure time: 90 days

Propan-2-one:

Acute oral toxicity:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity:	LC50 (Rat) > 25 mg/L Exposure time: 6 h Test atmosphere: vapor
Acute dermal toxicity:	LD50 (Rabbit): > 5,000 mg/kg
Skin corrosion/irritation:	Species: Rabbit Result: No skin irritation
Serious eye damage/eye irritation:	Species: Rabbit Result: Irritation to eyes, reversing within 21 days
Respiratory or skin sensitization:	Test Type: Buehler Test Routes of exposure: Skin contact Species: Guinea pig Method: OECD Test Guideline 406 Result: negative
Germ cell mutagenicity:	
Genotoxicity in vitro:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
	Test Type: In vitro mammalian cell gene mutation test Result: negative
Genotoxicity in vivo:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection Result: negative
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fertility:	Test Type: Two-generation reproduction toxicity study Species: Rat Application route: Ingestion Result: negative
Effects on fetal development:	Test Type: Embryo-fetal development Species: Rat Application route: Ingestion Result: negative
STOT – single exposure	Assessment: May cause drowsiness or dizziness
Repeated dose toxicity	Species: Rat

	NOAEL: 12.5 mg/l Application route: Inhalation (vapor) Exposure time: 104 weeks

Bornan-2-one:

Acute oral toxicity:	LD50 (Mouse): 1,310 mg/kg Acute toxicity estimate (Humans): > 50-500 mg/kg Method: Expert judgement
Acute inhalation toxicity:	LC50 (Rat) > 0.5 mg/L Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity:	LD50 (Rat): > 2,000 mg/kg
Skin corrosion/irritation:	Species: Rabbit Result: No skin irritation
Serious eye damage/eye irritation:	Result: Eye irritation to eyes
Respiratory or skin sensitization:	Test Type: Buehler Test Routes of exposure: Skin contact Species: Guinea pig Method: OECD Test Guideline 406 Result: negative
Germ cell mutagenicity:	
Genotoxicity in vitro:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
	Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative
Genotoxicity in vivo:	Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Mouse Application Route: Ingestion Results: negative
	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Skin contact Result: negative
Reproductive toxicity:	Suspected of damaging the unborn child
Effects on fetal development:	Test Type: Fertility/early embryonic development Species: Rat Application route: Ingestion Result: negative
STOT – single exposure	Assessment: May cause respiratory irritation
Repeated dose toxicity	Species: Rat NOAEL: 250 mg/kg Application route: Skin contact Exposure time: 13 weeks

Section 12: Ecological Information

Ecotoxicity

Ingredients:

Silver:

Toxicity to fish: LL50 (Pimephales promelas (fathead minnow)): >0.1 – 1 mg/l
Exposure time: 96 h, Remarks: Based on data from similar materials. Based on transformation/dissolution testing and data from soluble metal compounds.
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): >0.1 – 1 mg/l
Exposure time: 48 h. Remarks: Based on data from similar materials. Based on transformation/dissolution testing and data from soluble metal compounds.
Toxicity to algae/aquatic plants: EL50 (Pseudokirchneriella subcapitata (green algae)): >1 – 10 mg/l
Exposure time: 72 h. Remarks: Based on data from similar materials. Based on transformation/dissolution testing and data from soluble metal compounds.
NOELR Pseudokirchneriella subcapitata (green algae)): >0.01 – 0.1 mg/l
Exposure time: 72 h. Remarks: Based on data from similar materials. Based on transformation/dissolution testing and data from soluble metal compounds.
M-Factor (Acute aquatic toxicity): 10
Toxicity to fish (Chronic toxicity): NOEC (Oncorhynchus mykiss (rainbow trout)): >0.0001 – 0.001 mg/l
Exposure time: 60 d. Remarks: Based on data from similar materials. Based on transformation/dissolution testing and data from soluble metal compounds.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): EC10 (Daphnia magna (Water flea)): 0.00214 mg/l Exposure time: 21 d Remarks: Based on data from similar materials.
M-Factor (Chronic aquatic toxicity): 10

Toluene:

Toxicity to fish: LC50 (Oncorhynchus kisutch (coho salmon)): 5.5 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 (Ceriodaphnia dubia (water flea)): 3.78 mg/l
Exposure time: 48 h.
Toxicity to algae/aquatic plants: NOEC (Skeletonema costatum (marine diatom)): 10 mg/l
Exposure time: 72 h.
Toxicity to fish (Chronic toxicity): NOEC (Oncorhynchus kisutch (coho salmon)): 1.39 mg/l
Exposure time: 40 d.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Ceriodaphnia dubia (water flea)): 0.74 mg/l, Exposure time: 7 d.
Toxicity to microorganisms: EC50 (Nitrosomonas sp.): 84 mg/l Exposure time: 24 h.

Ethyl acetate:

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 220 mg/l, Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 3,090 mg/l
Exposure time: 24 h, Method: DIN 38412.
Toxicity to algae/aquatic plants: NOEC (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h, Method: OECD Test Guideline 201.
Toxicity to fish (Chronic toxicity): NOEC (Pimephales promelas (fathead minnow)): > 1 - 9.65 mg/l Exposure time: 32 d.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): 2.4 mg/l, Exposure time: 24 d.
Toxicity to microorganisms: EC10 (Photobacterium phosphoreum): 1,650 mg/l, Exposure time: 0.25 h

Ethanol:

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): > 1,000 mg/l, Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 (Ceriodaphnia (water flea)): > 1,000 mg/l
Exposure time: 48 h.

Toxicity to algae: ErC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l Exposure time: 72 h.
EC10 (Chlorella vulgaris (Fresh water algae)): 11.5 mg/l, Exposure time: 72 h
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): 9.6 mg/l. Exposure time: 9 d.
Toxicity to microorganisms: EC50 (Pseudomonas putida): 6,500 mg/l, Exposure time: 16 h.

n-Butyl acetate:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 18 mg/l, Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia sp. (Water flea)): 44 mg/l
Exposure time: 48 h.
Toxicity to algae/aquatic plants: ErC50 (Pseudokirchneriella subcapitata (green algae)): 397 mg/l
Exposure time: 72 h, Method: OECD Test Guideline 201. Remarks: Based on data from similar materials
NOEC (Pseudokirchneriella subcapitata (green algae)): 196 mg/l, Exposure time: 72 h. Method: OECD Test Guideline 201. Remarks: Based on data from similar materials.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): 23.2 mg/l, Exposure time: 21 d. Method: OECD Test Guideline 21. Remarks: Based on data from similar materials.
Toxicity to microorganisms: IC50 (Tetrahymena pyriformis): 356 mg/l, Exposure time: 40 h.

Propan-2-ol:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 9,640 mg/l, Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 10,000 mg/l
Exposure time: 24 h.
Toxicity to microorganisms: EC50 (Pseudomonas putida): > 1,050 mg/l Exposure time: 16 h.

Bornan-2-one:
Toxicity to fish: LC50 (Danio rerio (zebra fish)): 33.25 mg/l, Exposure time: 96 h.
Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 4.23 mg/l
Exposure time: 24 h. Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants: ErC50 (Pseudokirchneriella subcapitata (green algae)): 1.71 mg/l
Exposure time: 72 h, Method: OECD Test Guideline 201. NOEC (Pseudokirchneriella subcapitata (green algae)): 0.032 mg/l, Exposure time: 72 h. Method: OECD Test Guideline 201.
Toxicity to microorganisms: EC50: > 100 mg/l, Exposure time: 3 h. Method: OECD Test Guideline 209.

Persistence and degradability
Components:
Toluene:
Biodegradability: Result: Readily biodegradable. Biodegradation: 80%, Exposure time: 20 d.

Ethyl acetate:
Biodegradability: Result: Readily biodegradable. Biodegradation: 69%, Exposure time: 20 d.

Ethanol:
Biodegradability: Result: Readily biodegradable. Biodegradation: 84%, Exposure time: 20 d.

n-Butyl acetate:
Biodegradability: Result: Readily biodegradable. Biodegradation: 83%, Exposure time: 28 d
Method: OECD Test Guideline 301D.

Propan-2-ol:
Biodegradability: Result: rapidly degradable. BOD/COD: BOD: 1.19 (BOD5)COD: 2.23 BOD/COD: 53%

Bornan-2-one:
Biodegradability: Result: Readily biodegradable. Biodegradation: 77%, Exposure time: 28 d
Method: OECD Test Guideline 301F.

Bioaccumulative potential
Components:
Silver:
Bioaccumulation: Species: Cyprinus carpio (Carp), Bioconcentration factor (BCF): <500
Remarks: Based on data from similar materials.

Toluene:
Bioaccumulation: Species: Leuciscus idus (Golden orfe), Bioconcentration factor (BCF): 90
Partition coefficient: n-octanol/water: log Pow: 2.73.

Ethyl acetate:
Bioaccumulation: Species: Leuciscus idus (Golden orfe) Bioconcentration factor (BCF): 30
Partition coefficient: n-octanol/water: log Pow: 0.68.

Ethanol:
Partition coefficient: n-octanol/water: log Pow: -0.35.

n-Butyl acetate:
Partition coefficient: n-octanol/water: log Pow: 2.3.

Propan-2-ol:
Partition coefficient: n-octanol/water: log Pow: 0.05.

Bornan-2-one:
Partition coefficient: n-octanol/water: log Pow: 2.414. Method: OECD Test Guideline 107.

Mobility in soil: No data available
Other adverse effects:
Product: Ozone-Depletion Potential: Regulation: 40 CFR Protection of Environment; Part 82 Pro-tection of Stratospheric Ozone - CAA Section 602 Class I Substances.
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Section 13 Disposal Considerations
Disposal methods

Waste from residues:	If recycling is not practical, dispose of in compliance with local regulations.
Contaminated packaging:	Dispose of as unused product.

Section 14: Transportation Information
International Regulations
UN/ID No.: UN 1993
Proper shipping name: Flammable liquids, n.o.s. (Toluene, Ethyl acetate)
Hazard Class: 3
Packaging group: II
Labels: Flammable Liquids
Packing instruction (cargo aircraft): 364
Packing instruction (passenger aircraft): 353

IMDG Code
UN number: UN 1993
Proper shipping name: Flammable liquid, n.o.s. (Toluene, Ethyl acetate, Silver)
Hazard Class: 3

Packing group: II
Labels: 3
EmS Code: F-E, S-E
Marine Pollutant: Yes

Transport in bulk according to Annex II or MARPOL 73/78 and the IBC Code.
Not applicable for product as supplied.

Domestic Regulations- DOT
UN/ID/NA No.: UN 1993
Proper shipping name: Flammable liquids, n.o.s. (Toluene, Ethyl acetate)
Hazard Class: 3
Packaging group: II
Labels: Flammable Liquids
ERG Code: 128
Marine Pollutant: Yes

Special precautions for user: The transport classification (s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as is described within the Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional and country regulations.

Section 15: Regulatory Information

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Silver	7440-22-4	1000	1666
Silver	7440-22-4	1	1 (D011)

SARA 304 Extremely Hazardous Substances Reportable Quantity:
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity:
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards: Flammable (gases, aerosols, liquids, or solids)
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313: The following components are subject to reporting levels established by SARA Title III, Section 313:

Silver	7440-22-4	>= 50% - < 70%
Toluene	108-88-3	>= 10% - < 20%
Propan-2-ol	67-63-0	>= 1% - < 5%

Clean Air Act:
This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

Toluene	108-88-3	>= 10% - < 20%

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):

Toluene,	108-88-3,	>= 10% - < 20%
Ethyl acetate,	141-78-6,	>= 5% - < 10%
Ethanol,	64-17-5,	>= 5% - < 10%
n-Butyl acetate,	123-86-4,	>= 1% - < 5%
Propan-2-ol,	67-63-0,	>= 1% - < 5%

Clean Water Act
The following Hazardous Substances are listed under the U.S. Clean Water Act, Section 311, Table 116.4A:

Toluene,	108-88-3,	>= 10% - < 20%
n-Butyl acetate,	123-86-4,	>= 1% - < 5%

The following Hazardous Chemicals are listed under the U.S. Clean Water Act, Section 311, Table 117.3:

Toluene,	108-88-3,	>= 10% - < 20%
n-Butyl acetate,	123-86-4,	>= 1% - < 5%

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Silver,	7440-22-4,	>= 50% - < 70%
Toluene,	108-88-3,	>= 10% - < 20%

This product contains the following priority pollutants related to the U.S. Clean Water Act

Toluene,	108-88-3,	>= 10% - < 20%

State Regulations
Massachusetts Right To Know and Pennsylvania Right To Know:
Silver 7440-22-4, Toluene 108-88-3, Ethyl acetate 141-78-6, Ethanol 64-17-5, n-Butyl acetate 123-86-4 Propan-2-ol 67-63-0, Bornan-2-one 76-22-2.
Maine Chemicals of High Concern: Toluene 108-88-3.
Vermont Chemicals of High Concern: Toluene 108-88-3.
Washington Chemicals of High Concern: Toluene 108-88-3.

California Proposition 65:
WARNING: This product can expose you to chemicals including Toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances and California Permissible Exposure Limits for Chemical Contaminants:
Silver 7440-22-4, Toluene 108-88-3, Ethyl acetate 141-78-6, Ethanol 64-17-5, n-Butyl acetate 123-86-4 Propan-2-ol 67-63-0, Bornan-2-one 76-22-2.

The ingredients of this product are reported in the following inventories:

TSCA:	All substances listed as active on the TSCA inventor.
TSCA List:	No substances are subject to a Significant New Use Rule. No substances are subject to TSCA 12(b) export notification requirements.
Other regulations:	Storage class (TRGS 510): 3: Flammable liquids

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Section 16: Other Information

Label Information: Flammable
European Risk and Safety Phrases: ND
European symbols needed: ND
Canadian WHMIS Symbols: ND

Abbreviations used in this document

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

Disclaimer

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