



SAFETY DATA SHEET SILVER

1. Identification

Product identifier

Product name SILVER

Product number 3083

Recommended use of the chemical and restrictions on use

Application Industrial Use

Details of the supplier of the safety data sheet

Supplier SIFCO Applied Surface Concepts
5708 E. Schaaf Road
Independence, Ohio 44131
U.S.A.
Tel.: +1 216-524-0099
Fax: +1 216-524-6331
E-Mail: info@sifcoasc.com

Emergency telephone number

Emergency telephone CHEMTREC (United States) (800) 424-9300; CHEMTREC (International) +1 703-527-3887

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Not Classified

Health hazards Acute Tox. 3 - H301 Acute Tox. 3 - H311 Acute Tox. 3 - H331 Skin Corr. 1B - H314 Eye Dam. 1 - H318 Resp. Sens. 1 - H334 Skin Sens. 1 - H317

Environmental hazards Aquatic Chronic 2 - H411

Label elements

Pictogram



Signal word

Danger

Hazard statements

H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H411 Toxic to aquatic life with long lasting effects.

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Precautionary statements

P260 Do not breathe vapor/ spray.
 P264 Wash contaminated skin thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 P284 [In case of inadequate ventilation] wear respiratory protection.
 P301+P310 If swallowed: Immediately call a poison center/ doctor.
 P302+P352 If on skin: Wash with plenty of water.
 P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.
 P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P403+P233 Store in a well-ventilated place. Keep container tightly closed.
 P501 Dispose of contents/ container in accordance with national regulations.

Contains

SILVER CYANIDE, ETHYLENEDIAMINE, POTASSIUM CYANIDE

Other hazards

This product does not contain any substances classified as PBT or vPvB.

3. Composition/information on ingredients

Mixtures

SILVER CYANIDE 10-15% CAS number: 506-64-9 M factor (Acute) = 1 M factor (Chronic) = 1
Classification Acute Tox. 2 - H300 Acute Tox. 1 - H310 Acute Tox. 2 - H330 Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410
ETHYLENEDIAMINE 5-10% CAS number: 107-15-3
Classification Flam. Liq. 3 - H226 Acute Tox. 4 - H302 Acute Tox. 4 - H312 Skin Corr. 1B - H314 Eye Dam. 1 - H318 Resp. Sens. 1 - H334 Skin Sens. 1 - H317

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POTASSIUM CYANIDE	1-5%
CAS number: 151-50-8	
M factor (Acute) = 1 M factor (Chronic) = 1	
Classification	
Acute Tox. 1 - H300	
Acute Tox. 1 - H310	
Acute Tox. 1 - H330	
Aquatic Acute 1 - H400	
Aquatic Chronic 1 - H410	
SILVER NITRATE	1-5%
CAS number: 7761-88-8	
M factor (Acute) = 1 M factor (Chronic) = 1	
Classification	
Ox. Sol. 2 - H272	
Skin Corr. 1B - H314	
Eye Dam. 1 - H318	
Aquatic Acute 1 - H400	
Aquatic Chronic 1 - H410	

The full text for all hazard statements is displayed in Section 16.

4. First-aid measures

Description of first aid measures

Inhalation	Get medical attention immediately. If it is suspected that volatile contaminants are still present around the affected person, first aid personnel should wear an appropriate respirator or self-contained breathing apparatus. Remove affected person from source of contamination. Never give anything by mouth to an unconscious person.
Ingestion	Get medical attention immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.
Skin Contact	Remove contaminated clothing immediately and wash skin with soap and water. Continue to rinse for at least 15 minutes and get medical attention.
Eye contact	Remove affected person from source of contamination. Remove any contact lenses and open eyelids wide apart. Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes and get medical attention.
Protection of first aiders	First aid personnel should wear appropriate protective equipment during any rescue. It may be dangerous for first aid personnel to carry out mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

General information	Show this Safety Data Sheet to the medical personnel.
Inhalation	Toxic: danger of serious damage to health by prolonged exposure through inhalation. Immediate first aid is imperative. Coughing, chest tightness, feeling of chest pressure. Headache.
Ingestion	Toxic if swallowed. Immediate first aid is imperative. May cause chemical burns in mouth, esophagus and stomach. May cause stomach pain or vomiting. May cause unconsciousness, blindness and possibly death.

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Skin contact May cause serious chemical burns to the skin. May cause sensitization or allergic reactions in sensitive individuals.

Eye contact May cause blurred vision and serious eye damage. Causes serious eye irritation. Immediate first aid is imperative.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media The product is not flammable. Use fire-extinguishing media suitable for the surrounding fire.

Special hazards arising from the substance or mixture

Specific hazards Toxic gases or vapors.

Advice for firefighters

Special protective equipment for firefighters Use protective equipment appropriate for surrounding materials. Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Follow precautions for safe handling described in this safety data sheet. Contact with acids liberates very toxic gas. Avoid inhalation of vapors and contact with skin and eyes. Evacuate area. Provide adequate general and local exhaust ventilation. If ventilation is inadequate, suitable respiratory protection must be worn. Treat the spilled material according to the instructions in the clean-up section.

Environmental precautions

Environmental precautions Do not discharge into drains or watercourses or onto the ground. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Methods for cleaning up Wear suitable protective equipment, including gloves, goggles/face shield, respirator, boots, clothing or apron, as appropriate. Flush contaminated area with plenty of water. Avoid the spillage or runoff entering drains, sewers or watercourses. Contain and absorb spillage with sand, earth or other non-combustible material. Collect and dispose of spillage as indicated in Section 13. Wash thoroughly after dealing with a spillage.

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Avoid spilling. Avoid contact with skin and eyes. Contact with acids liberates very toxic gas. Avoid inhalation of vapors and spray/mists. Provide adequate general and local exhaust ventilation.

Conditions for safe storage, including any incompatibilities

Storage precautions Keep only in the original container. Keep container tightly closed in a cool place. Protect from freezing and direct sunlight. Store away from the following materials: Acids.

Storage class Toxic storage.

Specific end uses(s)

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Specific end use(s) The identified uses for this product are detailed in Section 1.

8. Exposure Controls/personal protection

Control parameters

Occupational exposure limits

ETHYLENEDIAMINE

Long-term exposure limit (8-hour TWA): OSHA 10 ppm 25 mg/m³

POTASSIUM CYANIDE

Ceiling exposure limit: ACGIH 5 mg/m³

as CN

Sk

OSHA = Occupational Safety and Health Administration.

ACGIH = American Conference of Governmental Industrial Hygienists.

Sk = Danger of cutaneous absorption.

Exposure controls

Protective equipment



Appropriate engineering controls

As this product contains ingredients with exposure limits, process enclosures, local exhaust ventilation or other engineering controls should be used to keep worker exposure below any statutory or recommended limits, if use generates dust, fumes, gas, vapor or mist.

Eye/face protection

Tight-fitting safety glasses.

Hand protection

It is recommended that chemical-resistant, impervious gloves are worn. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. It is recommended that gloves are made of the following material: Nitrile rubber.

Other skin and body protection

Appropriate footwear and additional protective clothing complying with an approved standard should be worn if a risk assessment indicates skin contamination is possible.

Hygiene measures

Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet.

Respiratory protection

If ventilation is inadequate, suitable respiratory protection must be worn. Seek advice from supervisor on the company's respiratory protection standards.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance	Liquid.
Color	Clear liquid.
pH	pH (concentrated solution): 11-12
Flash point	°C N/A.
Relative density	1.107-1.117 @ 20°C
Other information	Not available.
Volatile organic compound	This product contains a maximum VOC content of EDA 81 g/l.

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10. Stability and reactivity

Reactivity	Do not mix with acid. Contact with acids liberates very toxic gas. Hydrogen cyanide (HCN).
Stability	Stable at normal ambient temperatures and when used as recommended.
Possibility of hazardous reactions	Do not mix with acid. Contact with acids liberates very toxic gas. Hydrogen cyanide (HCN).
Conditions to avoid	Avoid contact with acids. Avoid contact with oxidizing agents. Avoid excessive heat for prolonged periods of time.
Materials to avoid	1. Acids 4. Chlorates Magnesium. 12. Nitrites and their mixtures
Hazardous decomposition products	Hydrogen cyanide (HCN).

11. Toxicological information

Information on toxicological effects

Acute toxicity - oral

ATE oral (mg/kg) 100.0

Acute toxicity - dermal

ATE dermal (mg/kg) 300.0

Acute toxicity - inhalation

ATE inhalation (vapours mg/l) 3.0

Inhalation	Vapor from this product may be hazardous by inhalation.
Ingestion	Very toxic if swallowed. May cause stomach pain or vomiting. May cause severe internal injury.
Skin Contact	May cause skin irritation. May cause sensitization or allergic reactions in sensitive individuals.
Eye contact	May cause serious eye damage. Immediate first aid is imperative.
Route of entry	Ingestion Inhalation Skin and/or eye contact

Toxicological information on ingredients.

SILVER CYANIDE

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 123.0

Species Rat

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg) 24.0

Species Rabbit

Acute toxicity - inhalation

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ATE inhalation (vapours
mg/l) 0.5

ETHYLENEDIAMINE**Acute toxicity - oral**

Acute toxicity oral (LD₅₀
mg/kg) 1,200.0

Species Rat

ATE oral (mg/kg) 500.0

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀
mg/kg) 560.0

Species Rabbit

ATE dermal (mg/kg) 1,100.0

Acute toxicity - inhalation

Acute toxicity inhalation
(LC₅₀ dust/mist mg/l) 14.7

Species Rat

ATE inhalation (vapours
mg/l) 11.0

POTASSIUM CYANIDE**Acute toxicity - oral**

Acute toxicity oral (LD₅₀
mg/kg) 2.86

Species Human

ATE oral (mg/kg) 2.86

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀
mg/kg) 33.3

Species Rabbit

Acute toxicity - inhalation

ATE inhalation (vapours
mg/l) 0.05

12. Ecological Information

Ecotoxicity The product contains a substance which is toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment.

Toxicity No data available.

Ecological information on ingredients.

SILVER**SILVER CYANIDE****Acute aquatic toxicity**LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

Chronic aquatic toxicity

NOEC 0.01 < NOEC ≤ 0.1

Degradability Non-rapidly degradable

M factor (Chronic) 1

ETHYLENEDIAMINE

Acute toxicity - fish , 96 hour: 115.7 mg/l, Pimephales promelas (Fat-head Minnow)

Acute toxicity - aquatic invertebrates , 48 hour: 3 mg/l, Daphnia magna

Acute toxicity - aquatic plants , 96 hour: 151 mg/l, Pseudokirchneriella subcapitata

POTASSIUM CYANIDE**Acute aquatic toxicity**LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

Chronic aquatic toxicity

NOEC 0.01 < NOEC ≤ 0.1

Degradability Non-rapidly degradable

M factor (Chronic) 1

SILVER NITRATE**Acute aquatic toxicity**LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1

M factor (Acute) 1

Acute toxicity - fish LC₅₀, 96 hours: 0.029 mg/l, Leuciscus idus (Golden orfe)
LC₅₀, 96 hours: 0.006 mg/l, Onchorhynchus mykiss (Rainbow trout)Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 0.0006 mg/l, Daphnia magna**Chronic aquatic toxicity**

NOEC 0.01 < NOEC ≤ 0.1

Degradability Non-rapidly degradable

M factor (Chronic) 1

Persistence and degradability**Persistence and degradability** No data available.

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Ecological information on ingredients.

ETHYLENEDIAMINE

Biodegradation - 94: ~ 28 days

Bioaccumulative potential

Bio-Accumulative Potential The product does not contain any substances expected to be bioaccumulating.

Ecological information on ingredients.

SILVER NITRATE

Bio-Accumulative Potential BCF > 100

Mobility in soil

Mobility The product is soluble in water.

Other adverse effects

Other adverse effects Not determined.

13. Disposal considerations

Waste treatment methods

General information Disposal of this product, process solutions, residues and by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any local authority requirements.

14. Transport information

UN Number

UN No. (TDG) 1935

UN No. (IMDG) 1935

UN No. (ICAO) 1935

UN No. (DOT) 1935

UN proper shipping name

Proper shipping name (TDG) CYANIDE SOLUTION, N.O.S. (SILVER CYANIDE, POTASSIUM CYANIDE)

Proper shipping name (IMDG) CYANIDE SOLUTION, N.O.S. (SILVER CYANIDE, POTASSIUM CYANIDE)

Proper shipping name (ICAO) CYANIDE SOLUTION, N.O.S. (SILVER CYANIDE, POTASSIUM CYANIDE)

Proper shipping name (DOT) CYANIDE SOLUTION, N.O.S. (SILVER CYANIDE, POTASSIUM CYANIDE)

Transport hazard class(es)

TDG class 6.1

TDG label(s) 6.1

IMDG Class 6.1

ICAO class/division 6.1

SILVER**Transport labels****Packing group**

TDG Packing Group II

IMDG packing group II

ICAO packing group II

DOT packing group II

Environmental hazards**Environmentally Hazardous Substance****Special precautions for user**

EmS F-A, S-A

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No information required.

15. Regulatory information**US Federal Regulations****SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities**

Potassium Cyanide 100 lbs

Ethylenediamine 10000 lbs

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)

Final CERCLA RQ: 10 lbs

Potassium Cyanide

Final CERCLA RQ: 1 lbs

Silver Cyanide

Final CERCLA RQ: 5000 lbs

Ethylenediamine

SARA Extremely Hazardous Substances EPCRA Reportable Quantities

EPCRA RQ: 10 lbs

Potassium Cyanide

EPCRA RQ: 5000 lbs

Ethylenediamine

SARA 313 Emission Reporting

Silver Cyanide

Potassium Cyanide

CAA Accidental Release Prevention

Ethylenediamine

Threshold Quantity: 20,000 lbs

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SARA (311/312) Hazard Categories

Acute
Chronic
Reactivity

OSHA Highly Hazardous Chemicals

Exempt.

US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins

Exempt.

California Directors List of Hazardous Substances

Ethylenediamine
Potassium Cyanide

Inventories

US - TSCA

All ingredients are present.

16. Other information

Classification abbreviations and acronyms

Acute Tox. = Acute toxicity
Carc. = Carcinogenicity
Eye Dam. = Serious eye damage
Eye Irrit. = Eye irritation
Flam. Liq. = Flammable liquid
Repr. = Reproductive toxicity
Resp. Sens. = Respiratory sensitisation
Skin Corr. = Skin corrosion
Skin Irrit. = Skin irritation
Skin Sens. = Skin sensitisation
STOT RE = Specific target organ toxicity-repeated exposure
STOT SE = Specific target organ toxicity-single exposure

Revision date

8/18/2017

Revision

4

Hazard statements in full

H226 Flammable liquid and vapor.
H272 May intensify fire; oxidizer.
H300 Fatal if swallowed.
H301 Toxic if swallowed.
H302 Harmful if swallowed.
H310 Fatal in contact with skin.
H311 Toxic in contact with skin.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H330 Fatal if inhaled.
H331 Toxic if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
H411 Toxic to aquatic life with long lasting effects.

NFPA - instability hazard

Unstable if heated. (1)

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NFPA - health hazard Extremely hazardous, serious injury. (3)
NFPA - flammability hazard Will not burn. (0)

The Information in this data sheet is believed to be correct but neither we nor our employees or agents give any warranty or make any representation to the accuracy thereof and accept no liability for any loss, injury or damage which may result in it's use. The sole purpose of this data sheet is to provide guidance on the safe handling and use of the products to which it relates. It does not form part of any product specification nor part of any contract. It is not practical for the guidance and information in this data sheet to cover every conceivable application of a product and as we may not be aware of the use to which the products covered by this data sheet are to be put it remains the responsibility of the user to conduct it's own tests and to satisfy itself as to the suitability of the product.