

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product identifier

Trade name:	Silver
Applicable Product Forms:	Solid forms, including but not limited to wire, strip, anodes, and sputtering targets. Exclusions include but not limited to powders and silver containing chemicals.
Synonym(s):	None
Preparation/Revision date:	June 1, 2017

Relevant identified uses of the substance or mixture and uses advised against

Identified uses:	Primary metal; casting; alloying; feedstock for other manufacturing processes
Uses advised against:	None known

Details of the supplier of the safety data sheet

Manufacturer / Supplier

Company name:	Reliable Silver Corporation
Address:	302 Platts Mill Rd. Naugatuck, CT 06770
Customer service:	(203) 574-7732

Emergency telephone number

For Hazardous Materials Incident Spill, Leak, Fire,
Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

This product has been assessed and/or tested for its physical, health and environmental hazards and the following classifications apply.

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Classification according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Classification: Combustible dust

Label elements

Hazard pictogram: None

SECTION 2: HAZARDS IDENTIFICATION (CONT'D)

Signal word: Warning!

Hazard statements: May form combustible dust concentrations in air.

Precautionary statements:

- Prevention: None
- Response: None
- Storage: None
- Disposal: None

Other Hazards Product is not hazardous in massive form.

Hazard summary

Physical hazards: In massive form, this product does not exhibit physical hazards. Finely divided powder or dust can be a fire and explosion hazard when exposed to high temperatures or ignition sources. Particle size and dispersion in air determine reactivity.

Health hazards: In massive form, this product is not considered a health hazard. Powder or dust may cause mechanical irritation of the skin, eyes, respiratory tract and digestive tract. Fumes can cause metal fume fever characterized by flu-like symptoms, metallic taste, fever, chills cough, weakness, chest pain and muscle pain. Argyria (silver poisoning) can be caused by large exposures. Argyria causes a characteristic blue tint to the skin.

Environmental hazards: In massive form, this product is not considered an environmental hazard. Powder or dust is very toxic to aquatic life with long lasting effects.

Main symptoms: In massive form, this product is not considered a health hazard. Powder or dust may cause skin, eye, respiratory tract and digestive tract irritation. Fumes can cause metal fume fever characterized by flu-like symptoms, metallic taste, fever, chills cough, weakness, chest pain and muscle pain. Ingestion can cause abdominal pain, convulsions and shock. Argyria (silver poisoning) can be caused by large exposures. Argyria causes a characteristic blue tint to the skin.

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SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS Number	%
Silver	7440-22-4	99.95 minimum

SECTION 4: FIRST AID MEASURES

General Information

Show this Safety Data Sheet to the medical professional in attendance. If symptoms occur, follow first aid measures as appropriate.

Description of first aid measures

Inhalation:

Inhaled dust can cause coughing. Remove victim to fresh air. If breathing is difficult give oxygen. If breathing has stopped, administer artificial respiration. Get medical attention.

Skin contact:

Wash skin with soap and water. If skin becomes irritated, seek medical attention.

Eye contact:

Dust can be irritating to the eyes. Hold eyelids open and flush with water for 15 minutes. Get medical attention.

Ingestion:

DO NOT INDUCE VOMITING unless directed to do so by a medical professional! Give water or milk to conscious victims. Seek medical attention.

Notes to Physician:

Not specified

Most important symptoms and effects, both acute and delayed

In massive form, this product is not considered a health hazard. Powder or dust may cause skin, eye, respiratory tract and digestive tract irritation. Fumes can cause metal fume fever characterized by flu-like symptoms, metallic taste, fever, chills cough, weakness, chest pain and muscle pain. Ingestion can cause abdominal pain, convulsions and shock. Argyria (silver poisoning) can be caused by large exposures. Argyria causes a characteristic blue tint to the skin.

Indication of any immediate medical attention and special treatment needed

If any adverse reaction or discomfort continues from any of the above exposures, seek professional medical advice.

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SECTION 5: FIRE FIGHTING MEASURES

Extinguishing Media

Suitable extinguishing media:	Dry chemical or sand should be used on molten metal. Use extinguishing agents appropriate for surrounding fire.
Unsuitable extinguishing media:	Do not apply water to molten metal.

SECTION 5: FIRE FIGHTING MEASURES (CONT'D)

Special hazards arising from the substance or mixture	In massive form, this product does not exhibit physical hazards. Finely divided powder or dust can be a fire and explosion hazard when exposed to high temperatures or ignition sources. Particle size and dispersion in air determine reactivity. When heated to decomposition, may produce metal oxides or fumes. Use self-contained breathing apparatus.
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Advice for firefighters

Special protective equipment for firefighters:	Expect the production of silver oxide fumes in fire conditions. Use self-contained breathing apparatus.
Special firefighting procedures:	None.

SECTION 6: ACCIDENTAL RELEASE MEASURES

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Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: Use personal protective equipment as recommended in Section 8. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Non-sparking tools should be used. Ensure adequate ventilation. Avoid breathing dust.

For emergency responders: Not relevant

Environmental Precautions Do not wash materials down drains.

Methods and materials for containing and cleaning up Minimize dust production and contain the spilled material. Do not dry sweep materials, use a vacuum equipped with a HEPA filter or wet mop.

Reference to other Sections Use personal protective equipment as recommended in Section 8. Dispose of in accordance with Section 13.

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SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Conditions for safe storage, including any incompatibilities	No special precautions are necessary.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

United States. Occupational Exposure Limits:

Component	CAS No.	Type	Value	Form
Silver	7440-22-4	ACGIH TLV-TWA	0.1 mg/m ³	Dust and fume
		NIOSH IDLH	10 mg/m ³	Dust
		NIOSH TWA	0.01 mg/m ³	Dust
		OSHA TWA	0.01 mg/m ³	N/A

Consult local authorities for acceptable exposure limits

Exposure Controls

Appropriate engineering controls:

Local exhaust ventilation should be used during melting, screening grinding, soldering and other operations where exposures may occur. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen- deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Eye/face protection:

Where dusts or fumes exist, goggles should be worn.

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Skin protection:

Bulk metal should be handled with cotton or leather gloves. Full protective clothing should be worn during activities with a high exposure potential.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION (CONT'D)

Respiratory protection:

Whenever dust or fumes are not removed by engineering controls, respiratory protection (air purifying half or full face with HEPA filter cartridges) should be worn. Selection of the respiratory protection equipment depends on the concentration and form of silver present. Each workplace where exposure potentials exist must be evaluated to determine the selection of respiratory protection.

Thermal hazards:

None

Hygiene measures

Practice good housekeeping and personal hygiene procedures. No tobacco, smoking, or food in the work area. Wash thoroughly before leaving the work area, eating, drinking, applying cosmetics or smoking. Avoid ingestion or inhalation. Do not use compressed air for blowing dust off clothing.

Where exposures occur take a shower and change clothes at end of shift. Do not wear contaminated clothing home.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	Solid	Explosive properties	Not applicable
Color	Silver metal	Explosive limit	Not applicable
Odor	None	Vapor pressure	100 mm @ 1865 deg C
Odor threshold	Not applicable	Vapor density	Not applicable
pH	Not applicable	Evaporation rate	Not applicable
Melting/freezing point	961 deg C (1671 deg F)	Relative density	10.5 (water = 1)
Boiling point, initial boiling point and boiling range	1950 deg C (3542 deg F)	Partition coefficient (n-octanol/water)	Not applicable
Flash point	Not applicable	Solubility (water)	<0.01 mg/L
Auto-ignition temperature	Not applicable	Decomposition temperature	Not applicable
Flammability (solid, gas)	Not available	Bulk density	Not applicable

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Flammability limit-lower%	Not available	Viscosity	Not applicable
Flammability limit-upper%	Not available	VOC (weight %)	0%
Oxidizing properties	Not applicable	Percent volatile	Not applicable

Other Information

No relevant additional information available

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	None
Chemical Stability:	Stable
Possibility of hazardous reactions:	Does not occur
Conditions to avoid:	Avoid creating dusts or exposing silver to high temperatures.
Incompatible materials:	Strong acids, strong bases and ethyleneimine.
Hazardous decompositions products:	When heated to decomposition, may produce metal oxides or fumes. Volatile salts of silver are produced when silver is exposed to oxidizing agents and when exposed to air at temperatures above 900 deg F.

SECTION 11: TOXICOLOGICAL INFORMATION

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General information on likely routes of exposure

Ingestion: In massive form, this product is not a health hazard. Exposure to powder or dust may cause mechanical irritation of the digestive tract. Can cause abdominal pain, convulsions and shock. Argyria (silver poisoning) can be caused by large exposures. Argyria causes a characteristic blue tint to the skin.

Inhalation: In massive form, this product is not a health hazard. Exposure to powder or dust may cause mechanical irritation of the respiratory tract. Fumes can cause metal fume fever characterized by flu-like symptoms, metallic taste, fever, chills cough, weakness, chest pain and muscle pain.

Skin contact: In massive form, this product is not a health hazard. Exposure to powder or dust may cause mechanical skin irritation. Inorganic silver will not be absorbed through the skin.

Eye contact: In massive form, this product is not a health hazard. Exposure to powder or dust may cause mechanical eye irritation.

Symptoms: In massive form, this product is not considered a health hazard. Powder or dust may cause skin, eye, respiratory tract and digestive tract irritation. Fumes can cause metal fume fever characterized by flu-like symptoms, metallic taste, fever, chills cough, weakness, chest pain and muscle pain. Ingestion can cause abdominal pain, convulsions and shock. Argyria (silver poisoning) can be caused by large exposures. Argyria causes a characteristic blue tint to the skin.

SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)

Information on toxicological effects

Acute Toxicity:

Ingredient name	Result	Species	Dose	Exposure
Silver	LD ₅₀	Rat	>2000 mg/kg	Oral
	LD ₅₀	Rat	N/A	Dermal
	LD ₅₀	Rat	> 5.16 mg/L	Inhalation (Dust)

Serious Eye Damage/Irritation: Silver may cause mechanical irritation to the eyes.

Skin Corrosion/Irritation: Silver may cause mechanical irritation to the skin.

Respiratory/Skin Sensitization: Silver is not a known skin sensitizer.

Germ Cell Mutagenicity: No data were identified for this product.

Carcinogenicity: Silver is not listed as a carcinogen by OSHA, IARC or NTP.

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Reproductive and Developmental Effects:	No data were identified for this product.
STOT – Single Exposure:	No data were identified for this product.
STOT – Repeated Exposure:	No data were identified for this product.
Aspiration Hazard:	Not relevant.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity:

Product / ingredient name	Test	Result	Species	Exposure
Silver	No data	No data	No data	No data

Persistence and Degradability:	Metals as a class do not biodegrade.
Bioaccumulative Potential:	Silver may bioaccumulate but it is unlikely.
Mobility:	Silver is not readily mobile in water.

SECTION 13: DISPOSAL CONSIDERATIONS

Responsibility for proper waste disposal is with the owner of the waste. Disposal should be in accordance with applicable regional, national and local laws and regulations and in accordance with RCRA. Characteristic Waste, Code D011.

SECTION 14: TRANSPORT INFORMATION

UN Number:	Not regulated in massive form.
UN Proper Shipping Name:	Not regulated in massive form.
Transport Hazard Class(es):	Not regulated in massive form.
Packing Group:	Not regulated in massive form.
Environmental Hazards:	Not regulated in massive form. 1000 lbs RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).)

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Transport in bulk according to Annex II Not regulated in massive form.

MARPOL73/78 and the IBC Code:

Special Precautions for User: Not regulated in massive form.

SECTION 15: REGULATORY INFORMATION

TSCA Inventory Status:

This product is listed or exempt from listing on the TSCA Inventory.

CAA HAP:

Not listed

CWA Priority Pollutants:

Listed

CWA Toxic Pollutants:

Listed

CWA Hazardous Substances:

Not listed

CERCLA RQ:

1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

SARA 313:

1.0% de minimis concentration

State Right-to-Know:

Component	CA Prop 65	Massachusetts	New Jersey	Pennsylvania
Silver	Not Listed	Listed	Listed	Listed

SECTION 16: OTHER INFORMATION

List of abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
EC50/90	Effective Concentration (median / 90th percentile)
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life and Health
LC50/90	Lethal Concentration (median / 90th percentile)
NOEC	No Observed Effect Concentration
NIOSH	National Institute of Occupational Safety and Health

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NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration (United States)
PEL	Permissible Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
REL	Recommended Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
USEPA	United States Environmental Protection Agency

SDS Revisions

SDS prepared on May 26, 2015.

Disclaimer

This material safety data sheet was developed based on the technical and toxicological information available and is offered solely for your information, consideration and investigation. It provides no warranties, either express or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.