



MATERION

1. Chemical and company identification

Name of chemical (Product name)	Silver Lead Alloy	
Supplier's company name, address and phone number		
Company name	Materion Electronic Materials	
Address	6070 Parkland Boulevard Mayfield Heights, OH 44124 United States	
Contact person	Theodore Knudson	
Telephone	EH&S	1.216.383.4019
e-mail address	ehs@materion.com	
Emergency telephone number	See Section 16.	
Reference number	W93	

2. Hazards identification

GHS classification

Physical hazards	The product is not classified according to GHS.	
Health hazards	Serious eye damage/eye irritation	Category 2B
	Sensitization, skin	Category 1
	Germ cell mutagenicity	Category 2
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 1A
	Specific target organ toxicity, single exposure	Category 1 (respiratory system)
	Specific target organ toxicity, repeated exposure	Category 1 (cardiovascular system, central nervous system, hematopoietic system, immune system, kidney, peripheral nervous system, respiratory system)
Environmental hazards	Short-term (acute) hazardous to the aquatic environment	Category 1
	Long-term (chronic) hazardous to the aquatic environment	Category 1

GHS label elements

Pictograms



Signal words

Danger

Hazard statement

The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated. May cause an allergic skin reaction. Causes eye irritation. Suspected of causing genetic defects. Suspected of causing cancer. May damage fertility or the unborn child. Causes damage to organs (respiratory system). Causes damage to organs (cardiovascular system, central nervous system, hematopoietic system, immune system, kidney, peripheral nervous system, respiratory system) through prolonged or repeated exposure. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response	IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Call a POISON CENTER/doctor. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Collect spillage.
Storage	Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Other hazards which do not result in classification	None known.
Supplemental information	For further information, please contact the Product Stewardship Department at +1.216.383.4019.
Main symptoms and emergency overview	
Main symptoms	Narcosis. Behavioral changes. Decrease in motor functions. Unconsciousness. Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. May cause an allergic skin reaction. Dermatitis. Rash. Edema. Cyanosis (blue tissue condition, nails, lips, and/or skin). Prolonged exposure may cause chronic effects.
Emergency overview	Causes damage to organs. Suspected of causing cancer. Causes eye irritation. May cause an allergic skin reaction. May cause reproductive effects. Suspected of causing genetic defects. Prolonged exposure may cause chronic effects. Dangerous for the environment if discharged into watercourses.

3. Composition/information on ingredients

Substance or mixture	Mixture
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Chemical name or generic name	CAS Number	Gazette notification		Concentration (%)
		ENCS no.	ISHL no.	
Silver	7440-22-4			90 - 97
Lead	7439-92-1		(1)-527	10

Chemical formula Ag (7440-22-4), Pb (7439-92-1)

4. First aid measures

If inhaled	Move to fresh air. Call a physician if symptoms develop or persist.
If on skin	Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.
If in eyes	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
If swallowed	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Narcosis. Behavioral changes. Decrease in motor functions. Unconsciousness. Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. May cause an allergic skin reaction. Dermatitis. Rash. Edema. Cyanosis (blue tissue condition, nails, lips, and/or skin). Prolonged exposure may cause chronic effects.
Protection of first-aid responders	IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.
Notes to physician	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

5. Fire-fighting measures

Extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Extinguishing media to avoid	None.
Specific hazards	During fire, gases hazardous to health may be formed.
Special fire fighting procedures	Use water spray to cool unopened containers.
Protection of fire-fighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
General fire hazards	No unusual fire or explosion hazards noted.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Environmental precautions Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

Methods and materials for containment and cleaning up Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Following product recovery, flush area with water.

Small Spills: Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

7. Handling and storage

Handling

Technical measures (e.g. Local and general ventilation) Provide adequate ventilation.

Safe handling advice Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices. Use personal protection recommended in Section 8 of the SDS.

Contact avoidance measures Acids. Strong oxidizing agents. Ammonia. Chlorine. For further information, please refer to section 10 of the SDS.

Hygiene measures Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

Storage

Safe storage conditions Store locked up. Keep container tightly closed. Store away from incompatible materials (see Section 10 of the SDS).

Safe packaging materials Store in original tightly closed container.

8. Exposure controls/personal protection

Control parameters Follow standard monitoring procedures.

Occupational exposure limits

Japan. OELs - ISHL. Working Environment Measurement Standards, Ministry of Labor Notice No. 79 of September 1, 1988, as amended

Components	Type	Value
Lead (CAS 7439-92-1)	TLV	0.05 mg/m3

Japan. OELs - JSOH (Japan Society of Occupational Health) Recommendation of Occupational Exposure Limits

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0.03 mg/m3
Silver (CAS 7440-22-4)	TWA	0.01 mg/m3

US. ACGIH Threshold Limit Values (TLV)

Components	Type	Value	Form
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Silver (CAS 7440-22-4)	TWA	0.1 mg/m3	Dust and fume.

Biological limit values

Japan. BELs - JSOH (Japan Society of Occupational Health) Recommendation of Occupational Exposure Limits Based on Biological Monitoring

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	800 µg/l	Protoporphyrin	Blood	*
	2000 µg/l	Protoporphyrin	Reduction from individual baseline activity in red blood cells	*
	150 µg/l	Lead	Blood	*
	5 mg/l	δ-Aminolevulinic acid	Urine	*

* - For sampling details, please see the source document.

ACGIH Biological Exposure Indices (BEI)

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	200 µg/l	Lead	Blood	*

* - For sampling details, please see the source document.

Engineering measures

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station.

Personal protective equipment

Respiratory protection	Wear positive pressure self-contained breathing apparatus (SCBA).
Hand protection	Wear appropriate chemical resistant gloves.
Eye protection	Wear safety glasses with side shields (or goggles).
Skin and body protection	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

9. Physical and chemical properties

Physical state	Solid.
Form	Solid.
Color	Gray-silver
Odor	None.
Odor threshold	Not applicable.
Melting point/freezing point	621.32 °F (327.4 °C) estimated
Boiling point, initial boiling point, and boiling range	3164 °F (1740 °C) estimated
Combustibility	Not flammable
Lower and upper explosion limit / flammability limit	
Explosive limit - lower (%)	Not applicable.
Explosive limit - lower (%) temperature	Not applicable.
Explosive limit - upper (%)	Not applicable.
Explosive limit - upper (%) temperature	Not applicable.
Flash point	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not applicable.
pH	Not applicable.
Kinematic viscosity	Not applicable.

Solubility(ies)	
Solubility (water)	Insoluble
Partition coefficient (n-octanol/water) (log value)	Not applicable.
Vapor pressure	-0.01 hPa estimated
Density and/or relative density	
Density	10.57 g/cm ³ estimated
Relative density	Not applicable.
Vapor density	Not applicable.
Particle characteristics	Not available.
Other information	
Evaporation rate	Not applicable.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	10.57 estimated
Viscosity (Coefficient of viscosity)	Not applicable.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Acids. Strong oxidizing agents. Ammonia. Chlorine.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity	10% of the mixture consists of component(s) of unknown acute dermal toxicity. 10% of the mixture consists of component(s) of unknown acute oral toxicity.	
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.	
Serious eye damage/eye irritation	Causes eye irritation.	
Respiratory or skin sensitization		
Respiratory sensitization	Not a respiratory sensitizer.	
Skin sensitization	May cause an allergic skin reaction.	
Germ cell mutagenicity	Suspected of causing genetic defects.	
Carcinogenicity	Suspected of causing cancer.	
ACGIH Carcinogens		
Lead (CAS 7439-92-1)	A3 Confirmed animal carcinogen with unknown relevance to humans.	
IARC Monographs. Overall Evaluation of Carcinogenicity		
Lead (CAS 7439-92-1)	2B Possibly carcinogenic to humans.	
Japan Society for Occupational Health: Carcinogen		
Lead (CAS 7439-92-1)	2B Possibly carcinogenic to humans.	
NTP Report on Carcinogens		
Lead (CAS 7439-92-1)	Reasonably Anticipated to be a Human Carcinogen.	
Reproductive toxicity	May damage fertility or the unborn child.	
Specific target organ toxicity - single exposure	Causes damage to organs (respiratory system).	

Specific target organ toxicity - repeated exposure Causes damage to organs (cardiovascular system, central nervous system, hematopoietic system, immune system, kidney, peripheral nervous system, respiratory system) through prolonged or repeated exposure.

Aspiration hazard Not an aspiration hazard.

12. Ecological information

Ecotoxicological data

Product		Species	Test Results
Silver Lead Alloy			
Aquatic			
Crustacea	EC50	Daphnia	0.0052 mg/l, 48 hours
Fish	LC50	Fish	2.8785 mg/l, 96 hours
<i>Acute</i>			
Fish	LC50	Fish	0.0019 mg/l, 96 hours estimated

Components		Species	Test Results
Lead (CAS 7439-92-1)			
Aquatic			
<i>Acute</i>			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	1.17 mg/l, 96 hours

Silver (CAS 7440-22-4)			
Aquatic			
<i>Acute</i>			
Fish	LC50	Fathead minnow (Pimephales promelas)	0.0019 - 0.003 mg/l, 96 hours

Ecotoxicity Very toxic to aquatic life with long lasting effects.

Persistence and degradability No data is available on the degradability of any ingredients in the mixture.

Bioaccumulation No data available.

Mobility in soil No data available for this product.

Hazardous to the ozone layer No data available.

Other hazardous effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Residual waste Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Local disposal regulations Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste.

14. Transport information

IATA	
UN number	3077
UN proper shipping name	Environmentally hazardous substance, solid, n.o.s. (Silver, Lead)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III

Environmental hazards	Yes
ERG Code	9L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

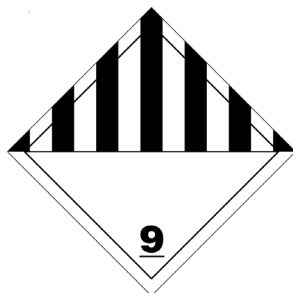
IMDG

UN number	3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Silver, Lead), MARINE POLLUTANT (Silver, Lead)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	Yes
EmS	F-A, S-F
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Silver	
Lead	

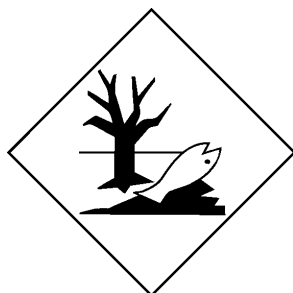
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

General information IMDG Regulated Marine Pollutant.

IATA; IMDG



Marine pollutant



National regulations Follow regulation in section 15 for domestic transportation.

Emergency Response Guide Number 171

15. Regulatory information

Industrial Safety and Health Act

Rules for the Prevention of Lead Poisoning

LEAD 7439-92-1

Notifiable substances

Lead and Lead compounds, inorganic Table 9 Ordinance No. 411 3.0 - 10 %

Silver and Silver compounds, water-soluble Table 9 Ordinance No. 137 90 - 97 %

Labeling substances

Lead and Lead compounds, inorganic 3.0 - 10 %

Silver and Silver compounds, water-soluble

90 - 97 %

SDS and Risk Assessment

Lead and Lead compounds, inorganic

Silver and Silver compounds, water-soluble

Poisonous and Deleterious Substances Control Act

Specified poisonous substances

Not regulated.

Poisonous substances

Not regulated.

Deleterious substances

Not regulated.

Act on the Regulation of Manufacture and Evaluation of Chemical Substances

Class I specified chemical substances

Not regulated.

Class II specified chemical substances

Not regulated.

Monitoring chemical substances

Not regulated.

Priority Assessment Chemical Substances (PACs)

Not regulated.

Reporting Exempted Substances

Not regulated.

Law concerning Pollutant Release and Transfer Register until March 31, 2023

Specified class 1 substances (substance name, ordinance number and content)

Lead compounds (As Pb) Ordinance No. 305 10 % (Lead)

Class 1 substances (substance name, ordinance number and content)

Lead Ordinance No. 304 10 % (Lead)

Silver and its water-soluble compounds (As Ag) Ordinance No. 82 97 % (Silver)

Class 2 substances (substance name, ordinance number and content)

Not regulated.

Law concerning Pollutant Release and Transfer Register from April 1, 2023

Specified class 1 substances (substance name, control number and content)

Lead and its compounds Control No. 697 10 % (Lead)

Class 1 substances (substance name, control number and content)

Silver and its water-soluble compounds Control No. 82 97 % (Silver)

Class 2 substances (substance name, control number and content)

Not regulated.

Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule

Miscellaneous dangerous substances

Air Law, Enforcement Rule

Miscellaneous dangerous goods

Explosives Control Act

Not regulated.

Soil Pollution Control Law

Class 2 Specified harmful substance

Lead & its compounds

Cutoff for 2nd elution standard	0.3 MG/L Total Pb
Cutoff for ground water standard	0.01 MG/L Total Pb
Cutoff for soil content standard	150 MG/KG Total Pb
Cutoff for soil elution standard	0.01 MG/L Total Pb

Waste Management and Public Cleansing Act

DUST CONTAINING LEAD AND ITS COMPOUNDS

SLUDGE, SPENT ACID, AND WASTE ALKALI CONTAINING LEAD AND ITS COMPOUNDS

Water Pollution Control Act

LEAD AND ITS COMPOUNDS (TOTAL PB)

Air Pollution Control Act

LEAD AND ITS COMPOUNDS-BAKING FURNACE AND SMELTING FURNACE FOR MANUFACTURING GLASS USING LEAD OXIDES AS RAW MATERIALS

LEAD AND ITS COMPOUNDS-CALCINATION FURNACE, CONVERTER, SMELTING FURNACE AND DRYING FURNACE FOR REFINING COPPER, LEAD OR ZINC

LEAD AND ITS COMPOUNDS-SINTERING FURNACE AND BLAST FURNACE FOR REFINING COPPER, LEAD OR ZINC

LEAD AND ITS COMPOUNDS-SMELTING FURNACE, ETC., FOR SECONDARY REFINING OF LEAD FOR MANUFACTURING LEAD PIPE, SHEET, WIRE, LEAD STORAGE BATTERY OR LEAD PIGMENT

Sewage Act

Lead and its compounds (as Pb)

0.1 MG/L

16. Other information**Bibliography**

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2019
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits
JIS Z 7252:2019 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"
JIS Z 7253:2019 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS)
National Toxicology Program (NTP) Report on Carcinogens

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Revision information

Product and Company Identification: Product and Company Identification
Composition / Information on Ingredients: Ingredients
GHS: Classification