



## MATERION

### 1. Chemical and company identification

**Name of chemical (Product name)** Silver Palladium Copper Targets

**Supplier's company name, address and phone number**

**Company name** Materion Advanced 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** G61

### 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 1A  
Specific target organ toxicity, single exposure Category 1 (respiratory system)  
Specific target organ toxicity, repeated exposure Category 1 (respiratory system)

**Environmental hazards** The product is not classified according to GHS.

#### GHS label elements

##### Pictograms



##### Signal words

Danger

##### Hazard statement

May cause an allergic skin reaction. Causes eye irritation. Causes damage to organs (respiratory system). Causes damage to organs (respiratory system) through prolonged or repeated exposure.

#### Precautionary statement

##### Prevention

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. Wear protective gloves.

##### 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.

##### 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

Irritation of eyes. May cause an allergic skin reaction. Prolonged exposure may cause chronic effects.

##### Emergency overview

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.

### 3. Composition/information on ingredients

Substance or mixture	Mixture	Gazette notification			
		CAS Number	ENCS no.	ISHL no.	Concentration (%)
Silver		7440-22-4			98
Copper		7440-50-8			1 - 3
Palladium		7440-05-3			1 - 3

**Chemical formula** Ag (7440-22-4), Pd (7440-05-3), Cu (7440-50-8)

### 4. First aid measures

<b>If inhaled</b>	Move to fresh air. Call a physician if symptoms develop or persist.
<b>If on skin</b>	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.
<b>If in eyes</b>	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.
<b>If swallowed</b>	Rinse mouth. Get medical attention if symptoms occur.
<b>Most important symptoms/effects, acute and delayed</b>	Irritation of eyes. May cause an allergic skin reaction. Prolonged exposure may cause chronic effects.
<b>Protection of first-aid responders</b>	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. Wash contaminated clothing before reuse.
<b>Notes to physician</b>	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

### 5. Fire-fighting measures

<b>Extinguishing media</b>	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO <sub>2</sub> ).
<b>Extinguishing media to avoid</b>	None known.
<b>Specific hazards</b>	This product is not flammable.
<b>Special fire fighting procedures</b>	Use water spray to cool unopened containers.
<b>Protection of fire-fighters</b>	Use protective equipment appropriate for surrounding materials.
<b>General fire hazards</b>	No unusual fire or explosion hazards noted.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.

### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	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.
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground.
<b>Methods and materials for containment and cleaning up</b>	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.  Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.  Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

### 7. Handling and storage

<b>Handling</b>	
<b>Technical measures (e.g. Local and general ventilation)</b>	Provide adequate ventilation.

**Safe handling advice** 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. Wash hands thoroughly after handling. Observe good industrial hygiene practices. Use personal protection recommended in Section 8 of the SDS.

**Contact avoidance measures** Ammonia. Chlorine. For further information, please refer to section 10 of the SDS.

**Hygiene measures** 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** Follow precautions for safe handling described in this safety data sheet.

### 8. Exposure controls/personal protection

**Control parameters** Follow standard monitoring procedures.

#### Occupational exposure limits

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

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0.01 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Silver (CAS 7440-22-4)	TWA	0.1 mg/m3	Dust and fume.

**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** In case of insufficient ventilation, wear suitable respiratory equipment.

**Hand protection** Wear gloves to prevent metal cuts and skin abrasions during handling.

**Eye protection** Wear approved safety glasses, goggles, face shield and/or welder's helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume.

**Skin and body protection** Wear necessary protective equipment.

### 9. Physical and chemical properties

**Physical state** Solid.

**Form** Solid.

**Color** Silver.

**Odor** None.

**Odor threshold** Not applicable.

**Melting point/freezing point** 1760.9 °F (960.5 °C) estimated / Not applicable.

**Boiling point, initial boiling point, and boiling range** Not applicable.

**Combustibility** None known.

#### Lower and upper explosion limit / flammability limit

**Flammability limit - lower (%)** Not applicable.

**Flammability limit - upper (%)** Not applicable.

**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 available.
Solubility(ies)	
Solubility (water)	Insoluble.
Partition coefficient (n-octanol/water) (log value)	Not applicable.
Vapor pressure	Not applicable.
Density and/or relative density	
Density	10.49 g/cm <sup>3</sup> 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.
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	Ammonia. Chlorine.
Hazardous decomposition products	No hazardous decomposition products are known.

## 11. Toxicological information

Acute toxicity	Not known.
Skin corrosion/irritation	Not likely, due to the form of the product.
Serious eye damage/eye irritation	Not likely, due to the form of the product.
Respiratory or skin sensitization	
Japan Society for Occupational Health: Skin sensitizer	
Copper (CAS 7440-50-8)	2 Probable skin sensitizer.
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	Not a skin sensitizer.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not classified.
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.

<b>Specific target organ toxicity - single exposure</b>	Causes damage to organs (respiratory system).
<b>Specific target organ toxicity - repeated exposure</b>	Causes damage to organs (respiratory system) through prolonged or repeated exposure.
<b>Aspiration hazard</b>	Not an aspiration hazard.

## 12. Ecological information

### Ecotoxicological data

Product	Species	Test Results
Silver Palladium Copper Targets		
<b>Aquatic</b>		
<i>Acute</i>		
Fish	LC50	1.0817 mg/l, 96 hours estimated

Components	Species	Test Results
Copper (CAS 7440-50-8)		
<b>Aquatic</b>		
<i>Acute</i>		
Crustacea	EC50	0.0031 mg/l
Fish	LC50	0.0219 - 0.0446 mg/l, 96 hours

<b>Ecotoxicity</b>	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
<b>Persistence and degradability</b>	No data is available on the degradability of any ingredients in the mixture.
<b>Bioaccumulation</b>	No data available.
<b>Mobility in soil</b>	The product is insoluble in water.
<b>Hazardous to the ozone layer</b>	No data available.
<b>Other hazardous effects</b>	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

<b>Residual waste</b>	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).
<b>Contaminated packaging</b>	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.
<b>Local disposal regulations</b>	Contract with a disposal operator licensed by the Law on Disposal and Cleaning. 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

Not regulated as dangerous goods.

### IMDG

Not regulated as dangerous goods.

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

**National regulations** Follow regulation in section 15 for domestic transportation.

## 15. Regulatory information

### Industrial Safety and Health Act

#### Notifiable substances

COPPER AND COPPER COMPOUNDS	Table 9 Ordinance No. 379	1.0 - 3.0 %
SILVER AND SILVER COMPOUNDS, WATER-SOLUBLE	Table 9 Ordinance No. 137	94 - 98 %

### Labeling substances

COPPER (POWDER)	1.0 - 3.0 %
COPPER AND COPPER COMPOUNDS	1.0 - 3.0 %
SILVER (POWDER)	94 - 98 %
SILVER AND SILVER COMPOUNDS, WATER-SOLUBLE	94 - 98 %

### 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

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

Not regulated.

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

SILVER AND ITS WATER-SOLUBLE COMPOUNDS (AS AG)	Ordinance No. 82	98 %	(Silver)
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#### Class 2 substances (substance name, ordinance number and content)

Not regulated.

#### Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule

Not regulated.

#### Air Law, Enforcement Rule

Not regulated.

#### Explosives Control Act

Not regulated.

#### Water Pollution Control Act

COPPER

#### Sewage Act

COPPER AND ITS COMPOUNDS (AS CU)	3 MG/L
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## 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  
National Toxicology Program (NTP) Report on Carcinogens  
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits  
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012  
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of  
Classification and Labelling of Chemicals (GHS)"  
JIS Z 7253:2012 Hazard communication of chemicals based on GHS - Labelling and Safety Data  
Sheet (SDS)

**Further information**

Transportation Emergency  
Call Chemtrec at:  
International: 703.741.5970  
Spain: 900.868.538  
Switzerland: 0800.564.402  
Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059

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**Other information**

Revised information in Section 16.