1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** SILVER DOUBLE CLAD

**SDS Number:** SDS-5915  
**Revised Date:** 7 JULY 2014

**Product Use:** METAL ALLOY SILVER WITH SILVER/TIN CLAD

**MANUFACTURER:**

**In America:**
The Indium Corporation of America  
1676 Lincoln Ave., Utica NY 13502  
Information: (315) 853-4900  
nswarts@indium.com

**EMERGENCY PHONE:**
CHEMTREC 24 hrs.  
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Outside USA: +1 (703) 527-3887

**In Europe:**
Indium Corporation of Europe  
7 Newmarket Ct.  
Kingston, Milton Keynes, UK, MK 10 OAG  
Information: +44 [0] 1908 580400

**In China:**
Indium Corporation (Suzhou), Co. Ltd.  
No. 428 Xinglong Street  
Suzhou Industrial Park  
Suchun Industrial Square  
Unit No. 14-C  
Jiangsu Province, China 215126  
Information: (86) 512-6283-4900

**In Asia:**
Indium Corporation of America  
Asia-Pacific Operations-Singapore  
29 Kian Teck Avenue  
Singapore 628908  
Information: +65 6268-8678
2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:  
- Eye  
- Inhalation  
- Skin  
- Ingestion  

CARCINOGEN LISTED IN:  
- NTP  
- IARC  
- OSHA  
- Not Listed

GHS
Signal Word: None

Hazard statement(s): none

Precautionary statement(s):
- P261  Avoid breathing dust/fume/gas/mist/vapors/spray
- P270  Do not eat, drink or smoke when using this product
- P273  Avoid release to the environment
- P280  Wear protective gloves/protective clothing/eye protection/face protection
- P362  Take off contaminated clothing and wash before reuse
- P301 + P314 IF SWALLOWED: Get Medical advice/attention if you feel unwell
- P302 + P352 IF ON SKIN: Wash with plenty of soap and water
- P304 + 341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
- P305 + 351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

POTENTIAL HEALTH EFFECTS:

Eye Contact:  Contact may cause eye irritation.

Ingestion:  Ingestion may be harmful.

Inhalation:  Heavy exposure of a worker to heated metallic silver vapor may cause lung damage and pulmonary edema.

Skin Contact:  Contact may cause irritation and discoloration.

Chronic:  Chronic inhalation may cause Argyria characterized by a permanent blue-gray discoloration of the eyes, skin, mucous membranes and internal organs. Target organ: Kidneys

WARNING:  This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (trace levels of lead)

NOTE:  The Indium Corporation does not recommend, manufacturer, market or endorse any of it's products for human consumption.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>% wt</th>
<th>CAS Registry #/EINECS</th>
<th>PEL mg/m³</th>
<th>TLV-TWA mg/m³</th>
<th>TLV-STELO mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILVER</td>
<td>70-99</td>
<td>7440-22-4/231-131-3</td>
<td></td>
<td>0.01</td>
<td>0.1</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Eye Contact: Hold eyelids apart and flush eyes with plenty of tepid water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: If patient is conscious, ONLY induce vomiting as directed by trained personnel. NEVER give anything by mouth to an unconscious person. Seek medical attention immediately. Contact a poison control center.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration or oxygen by trained personnel. Seek immediate medical attention.

Skin Contact: Remove contaminated clothing. Wash affected area with soap and water. Wash clothing before reuse. If irritation persists, obtain medical attention.

Note to Physician: Silver deposited in tissues is relatively inert and does not respond well to chelation therapy. There is no known treatment for Argyria. Background serum levels of silver vary widely: 0.004 mcg/g to 0.03 mcg/g of blood. Discoloration of Descemet’s membrane is the most sensitive indicator of chronic exposure to silver. Background excretion is 8 to 28 nmol/L. Kidney, liver and neurologic damage has been associated with silver, but these cases are not well documented.

5. FIRE FIGHTING MEASURES

Flash Point: Not established. Method: Not established.

Auto-ignition Temperature: Not established.
Flammable Limits: Limits not established. Massive metal is not flammable.
Extinguishing Media: Use extinguishers appropriate for the surrounding fire conditions.
Special Fire Fighting Procedures: Firefighters must wear NIOSH approved self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Contain spill. Vacuum rather than sweep to clean up solids and keep exposure to
7. HANDLING AND STORAGE

Handling Precautions: If working with molten metals, or exposed to fume or dust, use appropriate personal protective equipment. Use with adequate ventilation.

Storage Precautions: Store product in a cool, dry area away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Local exhaust ventilation is recommended to control any air contaminants.

Personal protection:
Eyes: Chemical safety glasses/goggles and face shield with molten metal.

Respirator: A NIOSH approved or EU compliant CE marked air-purifying respirator with a fume/dust chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated. Otherwise a positive pressure self-contained breathing apparatus is recommended when exposure to contaminants is expected to be elevated or when ventilation is not available.

Skin: Gloves-leather or other appropriate types to avoid exposure. Heat resistant gloves if handling hot metal. Safety type boots. Personal protective equipment is recommended when working with molten metal to avoid burns.

Other: Lab coat, safety shower and eye-wash fountain in work area. Avoid the use of contact lenses in high fume areas.

Work/Hygienic Practices: Maintain good housekeeping. Clean up spills immediately. Good personal hygiene is essential. Avoid eating, smoking or drinking in the work area. Wash hands thoroughly with soap and water immediately upon leaving the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid malleable metal</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>2212 C (4013 F) (silver)</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Melting Point</td>
<td>961 C (1763F) (silver)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>10.5 g/cm³ (silver)</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>100 mm Hg @1865 C (silver)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>(air=1) Not available</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>107.8682 (silver)</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

General: Stable.
Conditions to Avoid: Not established.
Incompatible Materials: Strong acids & strong bases

Hazardous Decomposition / Combustion: Toxic gases and fumes, silver fumes

Hazardous Polymerization: Has not been reported.
11. TOXICOLOGICAL INFORMATION

Carcinogenicity: National Toxicity Program (NTP): No
Occupational Safety & Health Administration (OSHA): No
U.N. International Agency for Research on Cancer (IARC): No

LD50: Not established
RTECS#: VW3500000 (SILVER)  XP7320000 (TIN)
Irritancy of Product: Not established
Sensitization to Product: Not established
Reproductive Toxicity: Not established

2000 mg/kg (rat) LD 50 oral(silver)

12. ECOLOGICAL INFORMATION

Environmental: Aquatic Fate: Sorption and precipitation processes are effective in reducing the concern of dissolved silver and result in higher concentrations in the bed sediments than in the overlying waters. Sorption by manganese dioxide and precipitation with halides are probably the dominant controls on the mobility of silver in the aquatic environment.

Aquatic Toxicity: Algae, daphnia, fresh water mussels, fathead minnows were all found capable of accumulating silver; but the food chain was not an important route of silver accumulation for animals at higher tropic levels, suggesting no food chain magnification.

Silver:
Fresh water fish: 0.0062 mg/l LC50 96h
0.064 mg/l LC50 96h
0.00155-0.00293 mg/l LC50 96h

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with all Federal, State and Local environmental regulations. In Europe follow the Special Waste Regulations.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.
Non - hazardous under shipping

UN - NONE

15. REGULATORY INFORMATION

The information in this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated hereunder (29 CFR 1910.1200 ET. SEQ.).
This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).

Canada -WHMIS: D2A
Silver appears on the Canadian Ingredient Disclosure List and the DSL List.

This product has been classified in accordance with the Mexican regulations: NOM-018-STPS-2000 and NOM-010-STPS-1999.

This product has been classified in accordance with the guidelines set by the Dept of Industrial Health of the Republic of Singapore.

California PROP 65: WARNING : This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (contains trace levels of lead)

SARA 313 Listing - 40 CFR 372.65: silver

Silver is listed on the EPA TSCA Inventory.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

**Risk Phrases:**

None

**Safety Phrases:**

S20/21 When using do not eat, drink or smoke
S22 Do not breathe dust
S23 Do not breathe fumes
S24/25 Avoid contact with skin and eyes
S27 Take off immediately all contaminated clothing
S28 After contact with skin wash immediately with plenty of soap and water
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection
16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>HMIS Hazard Rating:</th>
<th>Health: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fire: 1</td>
</tr>
<tr>
<td></td>
<td>Reactivity: 0</td>
</tr>
</tbody>
</table>

Revised Date: 7 JULY 2014
Prepared by: Nancy Swarts, Indium Corporation of America
Approved by: Nancy Swarts, Indium Corporation of America

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