



**INDIUM CORPORATION OF AMERICA®\EUROPE®\ASIA-PACIFIC®
INDIUM CORPORATION (SUZHOU)®**

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: COPPER DOUBLE CLAD WITH SOLDER METALS
(copper with a mix of other metals) (see alloy table for actual products)

MSDS Number: MSDS-4356

Revised Date: 1 SEPTEMBER 2010

Product Use: INDUSTRIAL USE - METAL ALLOY MIX: COPPER WITH SOLDER PREFORM

MANUFACTURER:

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

√ Eye √ Inhalation √ Skin √ Ingestion

CARCINOGEN LISTED IN:

NTP IARC OSHA √Not Listed
(See Section 11)

GHS:



Warning: Lead - Danger
Warning Lead – free - irritant

POTENTIAL HEALTH EFFECTS:

- Eye Contact:** Contact with powdered metal alloy or fume from molten metal may cause irritation. Severe eye damage may result from hot molten metal being splashed into the eyes. Wear safety glasses and face shield when working with molten metal.
- Ingestion:** Ingestion of dust may cause nausea. May be harmful.
- Inhalation:** Inhalation of fume or dust may cause local irritation to the respiratory system.
- Skin Contact:** Normal handling should not cause any adverse health effects. Hot molten metal may cause burns to the skin. Wear protective equipment when handling molten metal. Exposure to copper dust may cause a greenish-black skin discoloration. Antimony may cause skin irritation.
- Chronic:**
- COPPER:** Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever; dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair.
- TIN:** Has been shown to increase incidence of sarcoma in animal tests.
- LEAD:** Prolonged exposure to vapors or fumes at higher temperatures may cause respiratory irritation and systematic lead poisoning. Symptoms of lead poisoning include headache, nausea, abdominal pain, muscle and joint pain and damage to the nervous system, blood system and kidneys.
- SILVER:** Chronic skin contact or ingestion of silver dust, salts, or fume can result in a condition known as Argyria, a condition with bluish pigmentation of the skin and eyes.
- BISMUTH:** May cause kidney damage.

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

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

WARNING: This product may contain lead. Lead may be harmful to your health. US Federal law prohibits the use of leaded solders in making joints or fittings in any private or public water supply

system. Keep out of the reach of children. Not intended for household use.

3. COMPOSITION / INFORMATION ON INGREDIENTS

| Components | % wt | CAS Registry # | PEL mg/m ³ | TLV-TWA mg/m ³ | TLV-STEL mg/m ³ |
|-----------------|------|---------------------|--------------------------|------------------------------|-------------------------------|
| TIN | * | 7440-31-5 (US) | 2 | 2 | - |
| | | (EU) | - | 2 | 4 |
| | | (Canada) | - | 2 | 4 |
| | | (Singapore) | 2 | - | - |
| COPPER | * | 7440-50-8 (US) | 0.1 | 0.1 | - |
| | | (EU) | - | 0.1 | - |
| | | (Canada) | - | 0.2 | 0.6 |
| | | (Singapore) | 0.2(fume) | 1(dust) | - |
| | | (Mexico) | - | 0.2(fume) 1(dust) | 2 |
| | | (China) | - | 1(dust) 0.2(fume) | 2.5 0.6 |
| LEAD | * | 7439-92-1 (US) | 0.05 | 0.05 | - |
| | | (EU) | - | 0.15 | - |
| | | (Canada) | 0.05 | 0.05 | - |
| | | (Singapore) | 0.15 | - | - |
| | | (Mexico) | N.E. | 0.15 | - |
| | | (China) | - | 0.05(dust) 0.03(fume) | - - |
| INDIUM | * | 7440-74-6/231-180-0 | | | |
| | | (US) | 0.1 | 0.1 | - |
| | | (EU) | - | 0.1 | 0.3 |
| | | (Canada) | - | 0.1 | 0.3 |
| | | (Singapore) | 0.1 | - | - |
| | | (Mexico) | 0.1 | - | 0.3 |
| (China) | 0.1 | - | 0.3 | | |
| ANTIMONY | * | 7440-36-0/231-146-5 | | | |
| | | (US) | 0.5 | 0.5 | - |
| | | (EU) | 0.5 | - | - |

| | | | | | |
|----------------|---|---------------------|------|------|------|
| | | (Canada) | - | 0.5 | 1.5 |
| | | (Mexico) | N.E. | 0.5 | - |
| | | (Singapore) | 0.5 | - | - |
| | | (China) | - | 0.5 | - |
| SILVER | * | 7440-22-4/231-131-3 | | | |
| | | (US) | 0.01 | 0.1 | - |
| | | (EU) | - | 0.1 | - |
| | | (Canada) | - | 0.1 | 0.3 |
| | | (Singapore) | 0.1 | - | - |
| | | (Mexico) | 0.1 | - | - |
| BISMUTH | * | 7440-69-9/231-177-4 | N.E. | N.E. | N.E. |

Symbol: X_n Risk Phrases: R20/21/22, R36/37/38 See Section 15
N.E. = Not established * See alloy table on page 7

4. FIRST AID MEASURES

- Eye Contact:** Hold eyelids apart and flush eyes with plenty of 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.
- 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.

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; however dust or powder may be 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. If molten, cool to allow metal to solidify. If a solid metal, wear gloves, pick up and return to process. If dust, wear recommended personal protective equipment. DO NOT SWEEP. Use a vacuum, place in barrels and return to process if applicable. Otherwise, dispose of following all Federal, State and Local regulations. In the EU refer to the Special Waste Regulations. Metal may have reclaim value.

7. HANDLING AND STORAGE

Handling Precautions: Only dry metals should be added to molten bath. If working with molten metals, or exposed to fume or dust, use appropriate personal protective equipment.

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. Control concentration of all components so that their exposure levels are not exceeded.

Personal protection:

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

Respirator: An approved or compliant marked air-purifying respirator with a fume/dust chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated.

Skin: Gloves-leather or impervious (vinyl) type. 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

| | | | |
|--------------------------|-------------------------|-----------------------------|----------------|
| Appearance: | Silver grey solid metal | Boiling Point: | 2595C (copper) |
| Odor: | Odorless | Melting Point: | 1083C (copper) |
| Specific Gravity: | See table | pH: | Not applicable |
| Vapor Pressure: | Not applicable. | Solubility in Water: | Insoluble |
| Vapor Density: | (air=1) Not applicable. | | |

10. STABILITY AND REACTIVITY

General: Stable.

Conditions to Avoid: Not established.

Incompatible Materials: Avoid contact with mineral acids.

Hazardous Decomposition / Harmful organic fumes and toxic oxide fumes may form at elevated

Combustion: temperatures.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity: National Toxicity Program (NTP): No
Occupational Safety & Health Administration (OSHA): No
U.N. International Agency for Research on Cancer (IARC): Yes (Lead)
 Lead and lead compounds are listed as possible carcinogens

LD50: Not established **LC50:** Not established

Reproductive Toxicity: Lead can cause potential harm to the developing fetus.

12. ECOLOGICAL INFORMATION

This section is subject to future development.

Biodegradability: Data not established.

Aquatic Toxicity: Data not established.

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. Not regulated under US DOT (United States Department of Transportation). Non hazardous for shipping.

North America Emergency Guide Book – Not applicable

15. REGULATORY INFORMATION

The information in this Material 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.).

The information in this Material Safety Data Sheet meets the requirements of the EU under Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP 2) Regulation 6.

This product has been classified in accordance with the hazard criteria of the Commission Directive 91/155/EEC and EH40.

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).

Canadian WHMIS: D2A-Materials Causing Other Toxic Effects-Very Toxic Material (Chronic) (lead)



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

This product has been classified using the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2002.

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

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

SARA 313 Listing - 40 CFR 372.65: Copper, Lead, Antimony, Silver

All ingredients are listed on the EPA TSCA Inventory.

Ingredients are listed on the Canadian Domestic Substance List.

EPA Genetic Toxicology Program - Lead CAS# 7439-92-1

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X_n

Risk Phrases:

- R20/21/22 Harmful by inhalation, in contact with skin and if swallowed
- R36/37/38 Irritating to eyes, respiratory system and skin
- R33 Danger of cumulative effects (lead)
- R40 Limited evidence of carcinogenic effect (lead)
- R48 Danger of serious damage to health by prolonged exposure (lead)
- R61 May cause harm to the unborn child (lead)

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

HMIS Hazard Rating:

Health:

2

Fire: 0
Physical Hazard: 0

Revised Date: 1 SEPTEMBER 2010
Prepared by: Nancy Swarts, Indium Corporation of America
Approved by: Nancy Swarts, Indium Corporation of America

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TABLE

Total copper will vary according to customer specifications. Solder identified below as Indalloy will vary according to customer's specifications and requirements. Therefore the following information will vary and should not be taken as the only data total percentages. Please consult C of A for product ordered and received for exact information and %metal content.

| INDALLOY | %TIN Sn | %LEAD Pb | %INDIUM In | %SILVER Sn | BISMUTH Bi | %COPPER Cu | %ANTIMONY Sb | RoHS* Compliance | Specific Gravity |
|------------------------|------------|-------------|---------------|---------------|---------------|---------------|-----------------|---------------------|---------------------|
| 106 (63Sn/37Pb) | 0.5 | 0.3 | - | - | - | 99.2 | - | No | 8.96 |
| 133 (95Sn/5Sb) | 0.76 | - | - | - | - | 99.2 | 0.04 | Yes | 8.94 |
| 206 (60Pb/40In) | - | 0.48 | 0.32 | - | - | 99.2 | - | No | 8.96 |
| 228 (88Pb/10Sn/2Ag) | 0.08 | 0.7 | - | 0.016 | - | 99.2 | - | Yes (high lead) | 8.97 |
| 282 (57Bi/42Sn/1Ag) | 0.34 | - | - | 0.008 | 0.46 | 99.2 | - | Yes | 8.96 |
| | | | | | | | | | |
| | | | | | | | | | |

*RoHS = Restriction on Hazardous Substances (Review directive for applicable exemptions)

EU Directive 2002/95/EC

- http://europa.eu.int/comm/environment/waste/weee_index.tm
- <http://www.pbfree.com>