



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

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: COPPER DOUBLE CLAD ALLOY WITH NC-9 FLUX

MSDS Number: MSDS-4340

Revised Date: 28 MARCH 2006

Product Use: METAL ALLOY MIX: Double copper clad with alloy mix and a flux coating.

MANUFACTURER:

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2. 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	-	-

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	-
COPPER	*	7440-50-8/231-159-6			
		(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
INDIUM	*	7440-74-8/231-180-0			
		(US)	0.1	0.1	-
		(EU)	N.E.	0.1	0.3
		(Canada)	N.E.	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	0.1	-	0.3
		(China)	-	0.1	0.3
LEAD	*	7439-92-1/231-100-4			
		(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)	- -
ROSIN	1-5	65997-05-9	N.E.	N.E.	N.E.
		(EU)	0.05	-	0.15

PROPRIETARY	0.1-2	N.E.	N.E.	N.E.
Symbol: X _n	Risk Phrases: R20, R36/37/38			
N.E. = Not established	* See table			

3. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

√ Eye √ Inhalation √ Skin √ Ingestion

CARCINOGEN LISTED IN:

NTP ✓ IARC OSHA Not Listed

POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact with powered 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. May cause systematic lead poisoning and burns to the digestive tract. Symptoms of lead poisoning include headache, nausea, abdominal pain, muscle and joint pain and damage to the nervous system, blood system and kidneys.

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.

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.

SILVER: Chronic skin contact or ingestion of silver powder, salts or fume can result in a condition known as Argyria, a condition with bluish pigmentation of the skin and eyes.

INDIUM: May cause damage to respiratory system.

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.

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.

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:** 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.

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:	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 / Combustion:	Harmful organic fumes and toxic oxide fumes may form at elevated 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 and lead compounds are listed as possible carcinogens].

LD50:	Not established	LC50:	Not established
Irritancy of Product:	Not established	Mutagenicity:	Not established
Sensitization to Product:	Not established	Teratogenicity:	Not established
Reproductive Toxicity:	No specific data is available	Synergistic Products:	Not established

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).

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).

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

WHMIS: Not information available

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: Silver CAS# 7440-22-4 Copper CAS# 7440-50-8 Lead CAS# 7439-92-1

All ingredients are listed on the EPA TSCA Inventory.

Ingredients are listed on the Canadian Domestic Substance List.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X_n

Risk Phrases:

R20 Harmful by inhalation
R36/37/38 Irritating to eyes, respiratory system and skin

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
 Reactivity: 0

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ALLOY TABLE

Copper with Indalloy Alloy and flux

INDALLOY (ALLOY)	Specific Gravity	%TIN	%LEAD	%INDIUM	%SILVER	COPPER	RoHS* Compliance
104 (Sn62) (as is)	8.41	62.5	36.1	-	1.4	-	NO
227(as is)	7.25	77.2	-	20	2.8	-	YES

***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>
- <http://www.indium.com>