



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

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH LEAD AND/OR TIN SILVER, COPPER

**MSDS Number:** MSDS-IN 037

**Revised Date:** 25 OCTOBER 2017

**Product Use:** INDUSTRIAL USE - METAL ALLOY MIX CONSISTING OF ONLY LEAD AND/OR TIN, SILVER COPPER (MIXTURE). REVIEW ALLOY TABLE FOR MIXTURES AVAILABLE.

### 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



**Signal Word: Warning****Hazard statement(s)**

H303	May be harmful if swallowed
H351	Suspected of causing cancer (lead)
H361	Suspected of damaging fertility or the unborn child (lead)
H373	May cause damage to organs through prolonged or repeated exposure (lead)
H410	Very toxic to aquatic life with long lasting effects (lead)
EUH201A	Warning! Contains lead (applicable only to the products listed that contain lead) Review listing.

**Precautionary statement(s)**

P233	Keep container tightly closed
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 + P312	IF SWALLOWED: Call a POISON CENTER/doctor 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)

**Classification:**

Acute toxicity, Oral (Category 4) (lead)  
 Carcinogenicity (Category 2) (lead)  
 Reproductive toxicity (Category 2) (lead)  
 Specific target organ toxicity-repeated exposure-Category 2 (lead)  
 Acute aquatic toxicity (Category 1) (lead)  
 Chronic aquatic toxicity (Category 1) (lead)

**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, cutting or grinding.
- Ingestion:** Ingestion of dust may cause headache, nausea, abdominal pain, fatigue and pain in the legs, arms and joints. May be harmful if swallowed.
- Inhalation:** Inhalation of fume or dust may cause local irritation to the respiratory system. Inhalation of fume or dust may cause headache, nausea, abdominal pain, fatigue and pain in the legs, arms and joints. Normal handling of solid form has no inhalation issues.
- Skin Contact:** Normal handling of solid form should not cause any adverse health effects. Powder form may cause skin irritation. Hot molten metal may cause burns to the skin. Wear protective equipment when handling molten metal.
- Chronic:** 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 powder, salts or fume can result in a condition known as Argyria, a condition with bluish pigmentation of the skin and eyes.

TIN: Has been shown to increase incidence of sarcoma in animal tests.

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.

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

**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.

### ALLOY MIXTURE TABLE

INDALLOY (METAL MIX)	%TIN Sn	%LEAD Pb	%COPPER Cu	%SILVER Ag	LIQUIDUS °C/°F	DENSITY (gm/cm <sup>3</sup> )	RoHS 2 Compliance**
100	62.6	37	-	0.4	182C/361F	8.40	NO
104	62.5	36.1	-	1.4	179C/354F	8.41	NO
	62	36	-	2		8.42	NO
115	44	55	-	1	210C/410F	9.11	NO
127	37	60	-	3	232C/450F	9.39	NO
137	61.5	35.5	-	3	189C/372F	8.43	NO
142	50	47	-	3	260C/500F	8.86	NO
151	5	92.5	-	2.5	296C/565F	11.02	YES^
154	40	57	-	3	289C/552F	9.26	NO
155	5	90	-	5	292C/558F	11.00	YES^
161	-	97.5	-	2.5	303/577	11.33	YES^
163	2	95.5	-	2.5	304C/579F	11.20	YES^
165	1	97.5	-	1.5	309C/588F	11.28	YES^
175	-	95	-	5	364C/687F	11.30	YES^
210	27	70	-	3	253C/487F	9.84	NO
228	10	88	-	2	299C/570F	10.75	YES^
229	-	94.5	-	5.5	365C/689	11.35	YES^

INDALLOY (METAL MIX)	%TIN Sn	%LEAD Pb	%COPPER Cu	%SILVER Ag	LIQUIDUS °C/°F	DENSITY (gm/cm <sup>3</sup> )	RoHS 2 Compliance**
<b>NON STANDARD ALLOY MIXTURES</b>							
NS	1	97	-	2	-	11.28	YES <sup>^</sup>
NS	1	98	-	1	-	11.28	YES
NS	3.9	95.5	-	0.6	-	11.10	YES <sup>^</sup>
NS	5	93.5	-	1.5	-	11.03	YES
NS	15	82.7	-	2.3	-	9.39	NO
NS	20	77	-	3	-	10.19	NO
NS	45	54	-	1	-	9.06	NO
NS	59	40	-	1	-	8.53	NO
NS	60	38	-	2	-	8.41	NO
NS	60	38	2	-	-	8.47	NO
NS	60	36	-	4	-	8.41	NO
NS	61.5	36	2.5	-	-	8.40	NO
NS	62.5	36	-	1.5	-	8.40	NO
NS	64	34	-	2	-	8.35	NO
NS	78.4	20	0.2	1.4	-	7.88	NO
NS	92	5	0.4	2.6	-	7.48	NO
NS	95.6	1	0.5	2.9	-	7.38	NO
NS	-	96.5	-	3.5	-	11.32	YES <sup>^</sup>
NS	-	96	-	4	-	11.31	YES <sup>^</sup>
NS	3	96	-	1	-	11.15	YES <sup>'</sup>

NS = Non Standard alloy mixtures

\*\* READ BELOW

\*\*RoHS 2 =Restriction of Hazardous Substances (review applicable exemptions) EU Directive 2011/65/EU. Review any applicable exemptions that may apply for lead<sup>^</sup> containing. It is the responsibility of the customer to determine compliance with RoHS<sup>^</sup> if taking the lead exemption for high melting lead, otherwise follow company guidelines. This is not a decision for Indium Corporation to make.

<http://www.indium.com>

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Components	% wt	CAS Registry #/EINECS	PEL mg/m <sup>3</sup>	TLV-TWA mg/m <sup>3</sup>	TLV-STEL mg/m <sup>3</sup>
<b>LEAD</b>	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	-
		(EU)	-	0.15	-
		(Canada)	-	0.05	-
		(Singapore)	0.15	-	-
		(Mexico)	-	0.15	-
		(China)	-	0.05(dust) 0.03(fume)	-
<b>COPPER</b>	*	7440-50-8/231-159-6			
		(US)	0.1 (fume)	0.2 (fume)	-
		(EU)	-	0.2 (fume)	-
		(Canada)	-	0.2 (fume)	0.6 (fume)
		(Mexico)	-	0.2 (fog)	2 (powder)
		(Singapore)	0.2(fume)	1(dust)	-
<b>TIN</b>	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
<b>SILVER</b>	*	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	-	0.1	0.3
		(Singapore)	0.1	-	-

N.E. = Not established

\* See alloy tables

#### 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.
- 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 proper HEPA vacuum, place in barrels and return to process if applicable. Keep dust levels as low as possible. 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 authority 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.

<b>Skin:</b>	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.
<b>Other:</b>	Lab coat or other clothing/skin protection, safety shower and eye-wash fountain in work area. Avoid the use of contact lenses in high fume areas.
<b>Work/Hygienic Practices:</b>	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. Follow proper lead work practices. Vacuum spills of powder.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Silver grey solid metal or powder form	<b>Boiling Point:</b>	Not applicable.
<b>Odor:</b>	Odorless	<b>Melting Point:</b>	See Tables
<b>Specific Gravity:</b>	See Tables	<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	Not applicable.	<b>Solubility in Water:</b>	Insoluble
<b>Vapor Density:</b>	(air=1) Not applicable.		

## 10. STABILITY AND REACTIVITY

<b>General:</b>	Stable.
<b>Conditions to Avoid:</b>	Not established.
<b>Incompatible Materials:</b>	Avoid contact with mineral acids.
<b>Hazardous Decomposition / Combustion:</b>	Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.
<b>Hazardous Polymerization:</b>	Will not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>Carcinogenicity: National Toxicity Program (NTP):</b>	No
<b>Occupational Safety &amp; Health Administration (OSHA):</b>	No
<b>U.N. International Agency for Research on Cancer (IARC):</b>	Yes
Lead and Lead compounds are listed as possible carcinogens.	
<b>LD50:</b>	Not established
<b>LC50:</b>	Not established
<b>Other: Chronic Toxicity:</b>	Lead can cause potential harm to the developing fetus.
<b>Irritancy of Product:</b>	Not established
<b>Mutagenicity:</b>	Not established
<b>Sensitization to Product:</b>	Not established
<b>Teratogenicity:</b>	Not established
<b>Reproductive Toxicity:</b>	No specific data is available
<b>Synergistic Products:</b>	Not established

Tin: RTECS XP 7320000 Lead: RTECS OF 7525000 Antimony: RTECS CC 4025000

RTECS: OF7525000 (lead)

Lead  
 reproductive toxicity – rat –inhalation  
 reproductive toxicity – rat – oral  
 reproductive toxicity – mouse-oral

Teratogenicity  
 Developmental toxicity – rat- inhalation  
 Developmental toxicity- rat- oral  
 Suspected human reproductive toxicant

GHS- Specific target organ toxicity- repeated exposure  
 May cause damage to organs through prolonged or repeated exposure

Lead- OSHA Hazards- carcinogen/target organ effect/harmful by ingestion/teratogen.

## 12. ECOLOGICAL INFORMATION

. Environmental: Lead: If this is released or deposited on soil it generally will remain in the top 2-5 cm of soil. Leaching is not a factor under normal conditions.

. Lead:

Toxicity to fish:

Rainbow trout- 1.19mg/l-96h

LC50 micropterus dolomieu- 2.2 mg/l-96h

Mortality NOEC-salvelinus fontinalis-1.7 mg/l-10d

Toxicity to algae

Mortality EC50-skeletonema costatum-7.94mg/l-10d

An environmental hazard cannot be excluded in the event of unprofessional handling, use and or disposal of this product.

Contains a substance (lead) that is very toxic to aquatic life with long lasting effects.

## 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).

Solid metal form (wire/chips/preform/ribbon): Non - hazardous under shipping. UN – none Marine Pollutant: No

Lead Containing Powder Form: DOT/IATA/IMDG if the lead exceeds the reportable quantity in a single package:

UN 3077, Environmentally Hazardous Substance, Solid, N.O.S., 9, PG III (lead)

Reportable Quantity (RQ): 10 lbs (lead)





IMDG: EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packaging and combination packagings containing inner packagings with Dangerous Goods > 5L liquids or > 5 kg for solids.

## 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).

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



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). (lead)

SARA 313 Listing - 40 CFR 372.65: Lead Silver Copper

All ingredients are listed on the EPA TSCA Inventory.

Most of the ingredients are listed on the Canadian Domestic Substance List.

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

This product has been classified in accordance with Mexican regulations NOM-018-STPS-2015 and NOM-010-STPS-2014

This product has been classified in accordance with: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS).

All ingredients are listed on the Canadian Domestic Substance List, the Chinese Chemical Inventory, the Philippines Inventory of Chemicals, the Korea Inventory of Existing Chemicals, the European Inventory of Existing Commercial Chemical Substances, the New Zealand Inventory of Chemicals and the Australian Inventory of Chemicals.

This product has been classified using the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2007.

## 16. OTHER INFORMATION

<b>HMIS Hazard Rating:</b>	<b>Health:</b>	2
	<b>Fire:</b>	1
	<b>Reactivity:</b>	0

**Revised Date:** 25 OCTOBER 2017

**Prepared by:** Nancy Swarts, Indium Corporation of America

**Approved by:** Nancy Swarts, Indium Corporation of America

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