



## SAFETY DATA SHEET

This safety data sheet represents a family grouping of all metal mixes that contain indium metal. A table is provided at the end that lists all metal groupings.

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY CONTAINING INDIUM WITH TIN, LEAD, SILVER, COPPER

**SDS Number:** SDS-IN 009

**Revised Date:** 4 APRIL 2018

**Product Use:** INDUSTRIAL USE - METAL ALLOY CONSISTING OF INDIUM MIXED WITH ONLY TIN AND/OR, LEAD AND/OR SILVER AND/OR COPPER. SEE ALLOY TABLE FOR VARIOUS METAL MIX PERCENTAGES. CAN BE SOLID METAL OR POWDER FORM.

#### MANUFACTURER:

##### In America:

The Indium Corporation of America®  
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##### In China:

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##### In Asia:

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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

#### Lead free products



Signal Word: Warning

#### Hazard statement(s)

H319 Causes serious eye irritation  
H335 May cause respiratory irritation

#### 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 +P364 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 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing  
P305 + P351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

#### Lead containing products



Signal Word: Warning

#### Hazard statement(s)

H303 May be harmful if swallowed  
H319 Causes serious eye irritation  
H335 May cause respiratory irritation  
H351 Suspected of causing cancer  
H361 Suspected of damaging fertility or the unborn child  
H373 May cause damage to organs through prolonged or repeated exposure  
H410 Very toxic to aquatic life with long lasting harmful effects  
EUH201A Warning! Contains 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  
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Classification:

Carcinogenicity (Category 2) (lead)

Reproductive toxicity (Category 2 ) (lead)

Skin sensitizer-Category 1B

Respiratory sensitizer-Category 1B

Eye irritation-Category 2A

Acute aquatic toxicity – Category 1 for lead containing products (H400)

Chronic aquatic toxicity – Category 1 for lead containing products (H410)

**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:** May cause irritation. May be harmful.

**Inhalation:** Inhalation of fume or dust may cause local irritation to the respiratory system. Inhalation of dust or fume may be harmful. Inhalation of indium may cause additional respiratory issues.

**Skin Contact:** Normal handling should not cause any adverse health effects. May cause skin irritation. Hot molten metal may cause burns to the skin. Wear protective equipment when handling molten metal.

**Chronic:**

**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 dusts, 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 or kidney system. May be harmful if inhaled.

**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. Tissue damage of mucous membranes may follow chronic dust exposure

**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.



**WARNING:** This product can expose you to chemicals including [lead] which is known to the State of California to cause cancer, and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

### 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>TIN</b>	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
<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>SILVER</b>	*	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	-
<b>INDIUM</b>	*	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

<b>COPPER</b>	*	7440-50-8/231-159-6			
		(US)	0.1 (fume)	0.2 (fume)	-
			1(dust)		
		(EU)	-	0.2 (fume)	-
		(Singapore)	0.2(fume)	1(dust)	-
		(Mexico)	-	0.2	2
	(Canada)	N.E.	0.2 (fume)	0.6 (fume)	

N.E. = Not established

\* SEE ALLOY TABLE END OF DOCUMENT

#### 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 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 permissible exposure levels are not exceeded. Use ventilation when working with lead containing products.

### 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. Review job task to determine type and level of protection needed.

**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/splash 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. Use standard lead work practices as defined by regulations, if applicable.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Silver gray solid metal	<b>Boiling Point:</b>	Not applicable.
<b>Odor:</b>	Odorless	<b>Melting Point:</b>	See Table
<b>Specific Gravity:</b>	See Table	<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

**Other:** Chronic Toxicity: Lead can cause potential harm to the developing fetus.

RTECS# : OF7525000 (lead), NL1050000 (indium), VM3500000 (silver), XP7320000 (tin), GL5325000 (dusts)  
GL7900000 (fume) (copper)

## 12. ECOLOGICAL INFORMATION

Mix not tested. Avoid release to environment.

## 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:

Not hazardous for shipping.

UN – NONE

MARINE POLLUTANT: NO

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Lead containing Powder form: DOT/IATA/IMDG only if it meets or exceeds the reportable quantity (RQ), in a single package.

Lead- RQ = 10 lbs

RQ = reportable quantity

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



MARINE POLLUTANT: NO

## 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.).



**WARNING:** This product can expose you to chemicals including [lead] which is known to the State of California to cause cancer, and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

SARA 313 Listing - 40 CFR 372.65:      Lead CAS# 7439-92-1      Silver CAS# 7440-22-4

All ingredients are listed on the EPA TSCA Inventory.

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

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), otherwise not classified.



All ingredients are listed on the Canadian Domestic Substance List.

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

Malaysia:

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).

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

Regulatory Information China:

GB/T 16483-2008, GB/T 17519-2013, Safety Data Sheets for Chemical Products  
GB 30000.2-29-2013, Rules for classification and labeling of chemicals (GHS)  
Decree No. 591: Regulations on the Control Over Safety of Hazardous Chemicals.

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

**Japan:**

Poisonous and Deleterious Substance Control Law (PDSCL): No ingredients are listed.

Fire Service Law (FSL): Not regulated/not dangerous.

Industrial Safety and Health Law (ISHL): ingredients are listed

PRTR and Promotion of Chemical Management law, Class I Substance: Not applicable.

Waste Disposal and Public Cleaning Law: Specific Harmful Industrial Wastes: Some contents of the family grouping may contain lead within the solder paste. Review alloy table and product label/ purchased and used.

Class II Designated Chemical Substances: No ingredients are listed.

Ingredients are listed on the Japanese Inventory Chemical Substance List/Industrial Safety and Health Law Substance List.

Review SDS and apply regulations where applicable.



**16. OTHER INFORMATION**

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

**Revised Date:** 4 APRIL 2018  
**Prepared by:** Nancy Swarts, Indium Corporation of America  
**Approved by:** Nancy Swarts, Indium Corporation of America

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Note: This SDS may be translated into an international language. If there is any misinterpretation or misunderstanding of any words or phrases that may occur within any translation the ENGLISH language shall always prevail.

**ALLOY TABLE**

INDALLOY METAL MIX	%INDIUM (In)	%TIN (Sn)	%LEAD (Pb)	%SILVER (Ag)	%COPPER (Cu)	RoHS 2*** Compliance	LIQUIDUS °C/°F	DENSITY (gm/cm <sup>3</sup> )
1	50	50	-	-	-	Y	125C/257F	7.30
1E	52	48	-	-	-	Y	118C/244F	7.30
2	80	-	15	5	-	N	154C/309F	7.85
3	90	-	-	10	-	Y	237C/459F	7.54
5	25	37.5	37.5	-	-	N	181C/358F	8.42
6	4.76	-	92.86*	2.38	-	Y	300C/572	11.03
7	50	-	50	-	-	N	210C/410F	8.86
9	12	70	18	-	-	N	167C/333F	7.79
10	25	-	75	-	-	N	260C/500F	9.97
11	5	-	95*	-	-	Y	313C/595F	11.06
12	5	-	90*	5	-	Y	310C/590F	11.00
70	40	40	20	-	-	N	130C/266F	7.86
71	48	52	-	-	-	Y	131C/268F	7.30
87	42	58	-	-	-	Y	145C/293F	7.30
150	19	-	81	-	-	Y	275C/527F	10.27
164	5	-	92.5*	2.5	-	Y	310C/590F	11.02
204	70	-	30	-	-	N	175C/347F	8.19
205	60	-	40	-	-	N	181C/358F	8.52
206	40	-	60	-	-	N	231C/448F	9.30
225	90	10	-	-	-	Y	151C/304F	7.31
227	20	77.2	-	2.8	-	Y	187C/369F	7.25
230	20	54	26	-	Doped with 0.12-0.16%	N	152C/306F	8.06
235	58	-	39	3	-	N	195C/383F	8.59

INDALLOY METAL MIX	%INDIUM (In)	%TIN (Sn)	%LEAD (Pb)	%SILVER (Ag)	%COPPER (Cu)	RoHS 2*** Compliance	LIQUIDUS °C/°F	DENSITY (gm/cm <sup>3</sup> )
237	2	3	93*	2	-	Y	304C/579F	11.07
239	1	4	91*	4	-	Y	313C/595F	11.05
254	10	86.9	-	3.1	-	Y	205C/401F	7.37
290	97	-	-	3	-	Y	143.3C/290F	7.38
532*	20	54	26	-	-	N	152C/306F	8.06
NS	0.75	-	96.75*	2.5	-	Y	-	11.28
NS	2	98	-	-	-	Y	-	7.28
NS	10	-	90*	-	-	Y	-	10.79
NS	14.5	-	-	61.5	24	Y	-	9.50
NS	30	70	-	-	-	Y	-	7.29
NS	35	65	-	-	-	Y	-	7.29
NS	37	-	62.6	0.4	-	N	-	9.41
NS	38	62	-	-	-	Y	-	7.29
NS	20	40	40	-	-	N	-	8.50
NS	50	48	-	2	-	Y	-	7.34
NS	52.8	-	43.9	3.3	-	N	-	8.76
NS	59.65	-	-	-	40.35	Y	-	7.89
NS	65	30	-	4.5	0.5	Y	-	7.40
NS	65	32.5	-	2.5	-	Y	-	7.35
NS	65	35	-	-	-	Y	-	7.29
NS	75	-	25	-	-	N	-	8.01
NS	75	25	-	-	-	Y	-	7.29
NS	80	20	-	-	-	Y	-	7.30
NS	95	5	-	-	-	Y	-	7.30
NS	97	-	-	3	-	Y	-	7.37

INDALLOY METAL MIX	%INDIUM (In)	%TIN (Sn)	%LEAD (Pb)	%SILVER (Ag)	%COPPER (Cu)	RoHS 2*** Compliance	LIQUIDUS °C/°F	DENSITY (gm/cm <sup>3</sup> )
NS	98	-	-	2	-	Y	-	7.34
NS	98	2	-	-	-	Y	-	7.30

NS = Non Standard Alloy Mixture

\*\*\*RoHS 2/3 = Restriction on Hazardous Substances (review applicable exemptions that may apply). (2011/65/EU)