



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

SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

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

SDS Number: SDS-IN 009

Revised Date: 12 MAY 2017

1.2 Relevant identified uses of the substance or mixture and uses advised against

Product Use: Industrial Use (Mixture) – METAL ALLOY CONSISTING OF INDIUM MIXED WITH ONLY TIN AND/OR, LEAD AND/OR SILVER AND/OR COPPER. CAN BE IN SOLID METAL OR POWDER FORM.
SEE TABLE FOR VARIOUS METAL MIX PERCENTAGES.

1.3 Details of the supplier of the safety data sheet

MANUFACTURER/SUPPLIER/IMPORTER:

In America:

The Indium Corporation of America
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1.4 Emergency telephone number**FOR CHEMICAL EMERGENCY ONLY PHONE *:****CHEMTREC 24 hrs.****USA: 1 (800) 424-9300****Outside USA: +1 (703) 527-3887***** Used only for spill/leak/fire/exposure/accident****ALL OTHER INQUIRIES: TOLL FREE: +1-800-448-9240 Indium Corporation****SECTION 2. HAZARDS IDENTIFICATION****PRIMARY ROUTES OF ENTRY:**

☒Eye

☒Inhalation

☒Skin

☒Ingestion

NTP

Carcinogen listed in

IARC

OSHA

☒Not Listed

2.1 Classification:

Mixture

2.2 Label Elements

General GHS:



lead containing products

Signal Word: Warning

Hazard statement(s)

H303 May be harmful if swallowed (lead)

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H351 Suspected of causing cancer (lead)

H361 Suspected of damaging fertility or the unborn child (applicable to lead containing product)

H373 May cause damage to organs through prolonged or repeated exposure (applicable to lead containing product)

H410 Very toxic to aquatic life with long lasting harmful 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 +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)

2.3 OTHER HAZARDS:

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 headache, nausea, abdominal pain, fatigue and pain in the legs, arms and joints. May be harmful.

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

Skin Contact: Normal handling of solid metal should not cause any adverse health effects. Hot molten metal may cause burns to the skin. Wear protective equipment when handling molten metal. Protect skin when grinding/cutting, may cause irritation.

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. Signs and symptoms of exposure – anemia.

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

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.2 Mixture:

Components	% wt	CAS Registry #/ EINECS#
TIN	*	7440-31-5/231-141-8
LEAD	*	7439-92-1/231-100-4
SILVER	*	7440-22-4/231-131-3
INDIUM	*	7440-74-6/231-180-0
COPPER	*	7440-50-8/231-159-6

* See Alloy Table at end of document for breakdown of percentages of alloy mixtures products

<http://www.indium.com>

SECTION 4. FIRST AID MEASURES

4.1 Description of 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.

4.2 Most important symptoms and effect, both acute and delayed:

Exposure to metal fumes may cause irritation to the respiratory system. Long term exposure by inhalation to metal fumes may cause illness such as metal fume fever.
Exposure to lead fume may cause harm. Sign of overexposure is anemia.

4.3 Indication of any immediate medical attention and special treatment needed:

No specific special treatment information is available on this mixture. Review data provided in this document to understand the hazards when working with the product. No other information is available at this time.

SECTION 5. FIRE FIGHTING MEASURES

- 5.1 Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Water, CO2, foam media.
- 5.2 Special hazards arising from the substance or mixture:** May produce toxic fumes of carbon monoxide if burning or metal oxide fumes.
- 5.3 Advice for Firefighters** Fire fighters must wear approved self-contained breathing apparatus and full protective clothing.

Material product is not flammable. Metal dust in air could pose a flammable issue. No other information is available.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Keep away from the spill. Remove sources of ignition. Keep exhaust ventilation system running. In the event of a fire evacuate area.

For emergency responders:

Wear safety glasses, gloves when cleaning up any spill. Other equipment may be necessary based on the immediate area and other chemicals unrelated to the product that may be in use. Adequate ventilation should be available. Keep unnecessary personnel away from area during clean up. Solid metal can easily be cleaned up. Do not sweep. Vacuum solids and avoid creating dust in air.

6.2 Environmental Precautions: Metals are not generally suited for release to any body of water including drains. Avoid release to environment.

6.3 Methods and material for containment and cleaning up:

Spill or leak procedures: Solid metal can be picked up and placed into metal container. If hot allow to cool then place into metal container. Recycle metal.

6.4 Reference to other sections: See Section 8 for exposure levels.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions Keep containers tightly closed when not in use. Use care to avoid spills. Wear appropriate personal protective equipment when working or handling product. Always thoroughly wash your hands after handling this product. DO NOT touch or rub eyes until hands are washed. Do not eat, drink or smoke when handling this product. Utilize exhaust ventilation when heating product. Emissions contain metal fumes.

7.2 Conditions for Safe Storage, including any incompatibilities:

Storage Precautions: Store product in tightly capped original containers in a cool, dry area. Refer to product label and product data sheet for specific storage temperature requirements. Rotate stock to ensure use before expiration date.

7.3 Specific End Use(s): Soldering applications and other applications.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters:

			<u>TWA</u>	<u>STEL</u>
		<u>CAS#/EINECS#</u>	mg/m3	mg/m3
TIN	*	7440-31-5/231-141-8		
		(UK)	2	4
		(Belgium)	2	-
		(Germany)	2	-
		(Netherlands)	2	-
		(Spain)	2	-
		(Poland)	2	-
LEAD	*	7439-92-1/231-100-4		
		(UK)	0.15	-
		(France)	0.1	-
		(Spain)	0.15	-
		(Italy)	0.15	-
		(Portugal)	0.05	-
		(Finland)	0.1	-
		(Denmark)	0.05	-
		(Austria)	0.1	0.4
		(Switzerland)	0.1	0.8
		(Poland)	0.05	-
		(Norway)	0.05	-
		(Ireland)	0.15	-
		(Poland)	0.05	-
SILVER	*	7440-22-4/231-131-3		
		(UK)	0.1	0.3
		(Belgium)	0.1	-
		(France)	0.1	-
		(Germany)	0.1	-
		(Netherlands)	0.1	-
		(Spain)	0.1	-
		(Poland)	0.05	-

COPPER	*	7440-50-8 /231-159-6		
		(UK)	0.2 (fume)	0.6(fume)
		(France)	2	0.2(fume)
		(Belgium)	1	-
			0.2(fume)	
		(Spain)	1	-
			0.2(fume)	
		(Portugal)	1	0.2(fume)
		(Netherlands)	0.1	-
		(Finland)	1	-
			0.1	
		(Denmark)	1	-
			0.1	
		(Austria)	1	4
			0.1(fume)	0.4
		(Switzerland)	0.1	0.2
		(Norway)	1	0.1
		(Ireland)	1	2
			0.2 (fume)	
		(Poland)	0.2	-
INDIUM	*	7440-74-6/231-180-0		
		(UK)	0.1	0.3
		(Belgium)	0.1	-
		(Spain)	0.1	-
		(Portugal)	0.1	-
		(Finland)	0.1	-
		(Denmark)	0.1	-
		(Austria)	0.1	0.2
		(Switzerland)	0.1	-
		(Norway)	0.1	-
		(Ireland)	0.1	0.3

N.E. = Not established

TWA = time weighted average
 STEL = short term exposure limit

8.2 Exposure Controls:

Engineering Controls: Use with proper equipment with adequate exhaust ventilation and other safety features specifically designed for use with solder applications or other industrial uses. Control concentration of all components with established exposure limits so they are not exceeded. Use exhaust ventilation when heating product. Air emission control equipment may be necessary based on the local governmental requirements for contaminants entering the atmosphere. Emissions contain metal fumes.

Personal protection:

Eyes: Chemical safety glasses/goggles. Face shield for molten metal.

Respiratory: An approved or EU compliant CE marked air-purifying respirator with a fume/organic chemical cartridge is recommended under certain circumstances (i.e. when re-flowing manually on a plate instead of a ventilated re-flow furnace) where airborne concentrations are expected to be elevated or exceed exposure limits.

Skin: Compatible chemical resistant gloves. Recommend a nitrile disposable or other chemical glove. Hot gloves for handling molten metal.

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

Work/Hygienic 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 standard lead work practices as established under governmental guidelines when applicable.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance:	Solid metal or powder	Boiling Point/Range:	Not determined
Odor:	None.	Melting Point/Freezing Point:	Not applicable
Odor Threshold:	Not established	Evaporation Rate:	Not applicable
Specific Gravity:	See alloy table	pH:	Not applicable
Vapour Pressure:	Not applicable.	Solubility in Water:	Insoluble
Vapour Density:	(air=1) Not applicable.	Partition coefficient:	Not established
Relative Density:	Not established	Flammability:	Not applicable
Flash Point:	Not applicable	Method:	Not applicable
Auto-ignition Temperature:	Not applicable	Flammable Limits:	Limits not established
UEL/LEL Limits:	Not applicable	Decomposition Temp:	Not applicable
Viscosity:	Not established	Explosive properties:	Not applicable
Oxidizing Properties:	Not established		

9.2 Other Information: Above data for the whole mixture.

SECTION 10. STABILITY AND REACTIVITY

- 10.1 Reactivity:** Stable.
- 10.2 Chemical Stability:** Stable
- 10.3 Possibility of Hazardous Reactions:** Not established
- 10.4 Conditions To Avoid:** None known
- 10.5 Incompatible Materials:** Avoid contact with acids, bases or oxidizing agents.
- 10.6 Hazardous Decomposition / Combustion:** Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. Metal oxide fumes.
- 10.7 Hazardous Polymerization:** Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Acute toxicity:	Not established	Mutagenicity:	Not established
Irritation:	Not established	Toxicity for Reproduction:	Not Established
Corrosivity:	Not applicable	Absence of specific data:	None available (not tested)
Sensitization:	Not available		
Repeated dose toxicity:	Not established		
Carcinogenicity:	Not established		
Likely Routes of Entry:	eyes (irritation) /skin (irritation) /inhalation (irritation/harmful) ingestion (may be harmful)		
Interactive effects:	None known		

Symptoms related to the physical, chemical and toxicological characteristics:

May cause irritation or harm by inhalation.

Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Exposure to lead fume, if applicable, may cause harm by inhalation and ingestion. Chronic exposures to lead fume, if applicable, can cause potential harm to the developing fetus. Lead exposure can be toxic.

Mixture verses substance information: None known

Other Information:

Carcinogenicity: **NTP:** No (National Toxicity Program)

Listing **OSHA:** No (US Occupational Safety & Health Administration)

IARC: Yes - Lead and lead compounds are listed as possible carcinogens. (International Agency for Research on Cancer)

Lead – Suspected human reproductive toxicant. May cause damage to organs through prolonged or repeated exposure. Reproductive toxicity – rat –inhalation, oral/ effects on newborn.

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

RTECS – Registry of Toxic Effects of Chemical Substances

SECTION 12. ECOLOGICAL INFORMATION

Product mixtures not tested.

12.1 Toxicity: No information available

12.2 Persistence and degradability: No information available

12.3 Bioaccumulative potential: No information available

12.4 Mobility in soil: No information available

12.5 Results of PBT and vPvB assessments: No data is available

12.6 Other adverse effects: No information is available for mixture. Avoid release to environment.

Lead – Toxicity to fish – mortality LOEC – rainbow trout – 1.19 mg/l – 96h. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Bioaccumulation – Oncorhynchus kisutch – 2 weeks
Bioconcentration factor (BCF): 12

SECTION 13. DISPOSAL CONSIDERATION

13.1 Waste treatment method: Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with environmental regulations. Containerize material and classify according to applicable regulations. No pre-treatment on site is recommended. Do not dispose of down any drain or waterway. Utilize the same personal protective equipment as the user when handling for disposal.

RoHS (Restriction of Hazardous Substances): Product mixtures do not contain any PBB or PBDT brominated compounds.

Note that product mixtures do contain lead and are therefore not compliant with RoHS. Users should review their particular use for any applicable exemptions that may apply. Review alloy table for products.

SECTION 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

Solid metal form:

Not regulated/non - hazardous under US DOT (United States Department of Transportation).

Not regulated/non - hazardous under international shipping requirements.

14.1 UN Number: Not applicable

14.2 UN proper shipping name: Not applicable

14.3 Transport hazard class(s): Not applicable

14.4 Packing group: Not applicable

14.5 Environmental hazards: Not applicable

14.6 Special precautions for user: Not applicable

14.7 Transport in bulk: Not applicable

Note: Lead Powder form: only if it meets or exceeds the reportable quantity (RQ) in a single package

Lead- RQ = 10 lbs

RQ is defined as reportable quality

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



Otherwise this does not meet the definition of a hazardous substance as defined under US DOT Regulation 49 CFR 171.8 as well as international shipping regulations.

All other metal powder mixtures are not hazardous for shipping. UN: NONE

MARINE POLLUTANT: NO

SECTION 15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

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.).

All ingredients are listed on the USEPA TSCA Inventory.

All ingredients are listed on EINECS.

Safety data sheet was developed using EC 1907/2006 amended as of 20 May 2010 EU No 453/2010 and information as stated under regulation EC No 1272/2008 CLP Regulation.

GHS = Global Harmonized System

CLP= Classification, labeling and packaging

Product does not contain any substances ozone depleting substances and therefore not subject to EC 2037/2000.

15.2 Chemical safety assessment: None performed for mixture.

SECTION 16. OTHER INFORMATION

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

Revised Date: 12 MAY 2017

Prepared by: Nancy Swarts, The Indium Corporation of America, nswarts@indium.com

Approved by: Nancy Swarts, The Indium Corporation of America

Changes provided on this SDS were based on the requirements of EU No. 453/2010 of May 20, 2010 regarding amendments to EC No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

The information and recommendations contained herein are, to the best of The Indium Corporation of America's knowledge and belief, accurate and reliable as of the date issued. The Indium Corporation of America does not warrant or guarantee their accuracy or reliability, and The Indium Corporation of America shall not be liable for any loss or damage arising out of the user thereof. The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

ALLOY TABLE

INDALLOY METAL MIX	%INDIUM (In)	%TIN (Sn)	%LEAD (Pb)	%SILVER (Ag)	%COPPER (Cu)	RoHS 2*** Compliance	LIQUIDUS °C/°F	DENSITY (gm/cm ³)
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*** Compliance	LIQUIDUS °C/°F	DENSITY (gm/cm ³)
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	25	-	-	-	75	Y	-	8.48
NS	30	70	-	-	-	Y	-	7.29
NS	35	65	-	-	-	Y	-	7.29
NS	37	-	62.6	0.4	-	N	-	9.41
INDALLOY METAL MIX	%INDIUM (In)	%TIN (Sn)	%LEAD (Pb)	%SILVER (Ag)	%COPPER (Cu)	RoHS*** Compliance	LIQUIDUS °C/°F	DENSITY (gm/cm ³)
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
NS	98	-	-	2	-	Y	-	7.34
NS	98	2	-	-	-	Y	-	7.30

Y = yes

N = no

NS = Non Standard Alloy Mixture

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

*Please review any exemptions that may apply. High content lead has been marked as compliant however customer must determine whether they can take the exemptions for this, otherwise the product is not compliant.