



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

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** CADMIUM CONTAINING METALS

**SDS Number:** SDS- 4030

**Revised Date:** 21 NOVEMBER 2016

**Product Use:** INDUSTRIAL USE – (MIXTURE) METAL ALLOY CONSISTING OF CADMIUM MIXED WITH OTHER METAL ALLOYS. REVIEW ALLOY TABLE FOR MIXTURES. SOME HAZARDS MAY NOT BE APPLICABLE.

### MANUFACTURER:

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## 2. HAZARDS IDENTIFICATION

GHS



for cadmium containing products

Signal Word: Danger

Hazard statement(s)

H301	Toxic if swallowed
H331	Toxic if inhaled (cadmium)
H332	Harmful if inhaled (lead)
H333	May be harmful by inhalation (indium)
H341	Suspected of causing genetic defects (cadmium)
H350	May cause cancer (cadmium)
H351	Suspected of causing cancer (lead)
H361	Suspected of damaging fertility or the unborn child (cadmium) (lead)
H372	Causes damage to organs through prolonged or repeated exposure (cadmium)
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 effects
EUH201A	Warning! Contains lead (applicable only to the products listed that contain lead) Review listing.
EUH207	Warning! Contains cadmium. Dangerous fumes are formed during use. Review document. Comply with safety instructions.

Precautionary statement(s)

P233	Keep container tightly closed
P260	Do not breathe 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
P284	Wear respiratory protection
P362 + P364	Take off contaminated clothing and wash before reuse
P301 + P310	IF SWALLOWED: Immediate call a POISON CENTER or doctor/physician
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)
P501-2	Metal may have reclaim value. Contact recycler

Note: the GHS classification of these metal mixtures will vary slightly depending on the % and constituents of the other metals mixed with cadmium. Review information and review the exact metal mixture being used. Consult the alloy table at the end of the document. If the product does not contain any lead then those hazards are not included in the review.

The list of hazards noted above are general and based on the use of the material. If solid metal, it does not pose a hazard.

If cut, is ground or if in powder form material can be hazardous. Everything noted above can be applicable.

Classification:

Summary of classifications for cadmium

Acute toxicity, Oral - Category 3

Acute toxicity, inhalation - Category 1

Germ cell mutagenicity- Category 2  
 Carcinogenicity- Category 1B  
 Reproductive toxicity- Category 2  
 Specific target organ-repeated exposure-Category 1  
 Acute aquatic toxicity- Category 1 (H400)  
 Chronic aquatic toxicity- Category 1 (H410)

**PRIMARY ROUTES OF ENTRY:**

√Eye    √Inhalation    √Skin    √Ingestion

**CARCINOGEN LISTED IN:**

√ NTP    √IARC    √OSHA    Not Listed

\*\*\*See Section 11

**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 or fatal.

**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. Inhalation of cadmium fume or dust can cause metal fume fever. Inhalation of cadmium may be fatal.

**Skin Contact:** 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. Prolonged exposure of tin dust or fumes may produce distinctive changes in the lungs with no apparent complications.

**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.

**INDIUM:** May cause damage to respiratory system if inhaled over long exposure.

**CADMIUM:** Overexposure can cause damage to the lungs and kidneys. Cadmium is a toxic metal and ingestion or inhalation of fumes and dust can be harmful. Included effects may be obstructive lung disease such as emphysema, bone demineralization, micro fractures and osteomalacia, gastrointestinal symptoms, rhinitis and discoloration of the teeth. May cause cancer.

**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.

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

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

US Federal law prohibits the use of leaded solders in the making of joints and fittings in any private or public potable (drinking) water system. Keep out of the reach of children.

**Metal solid form such as wire, ribbon, preforms do not pose a hazard when handling as is.**

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #	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 (US)	2	2	-
		(EU)	-	2	4
		(Singapore)	2	-	-
		(Canada)	-	2	4
<b>LEAD</b>	*	7439-92-1 (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>INDIUM</b>	*	7440-74-6 (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>SILVER</b>	*	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	-	0.1	0.3
		(Mexico)	0.1	-	-
		(Singapore)	0.1	-	-
<b>ZINC</b>	*	7440-66-6	N.E.	N.E.	N.E.
<b>CADMIUM</b>	*	7440-43-9 (US)	0.005	0.01	-
		(EU)	0.025	-	-
		(Singapore)	0.05	-	-
		(China)	-	0.01	0.02

(Canada)

-

0.05

0.2

#### 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.

Seek medical advice in situations where there has been inhalation or ingestion of lead and cadmium containing dust and fumes. Blood tests may be required for monitoring body lead and cadmium levels.

#### 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 or form an explosive mixture in air.
- Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Do not use water on molten metal. Use dry sand, graphite or dry powder/chemical.
- Special Fire Fighting Procedures:** Firefighters must wear NIOSH approved self-contained breathing apparatus and full protective clothing.
- Emits toxic fumes – thermal decomposition can lead to release of irritation gases and vapors. Fine dusts dispersed in air may ignite dust.

#### 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 including respiratory protection. 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. Ensure powdered product

is covered when not in use.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering Controls:** Local exhaust ventilation or point source ventilation is required to control any air contaminants. Control concentration of all components so that their exposure levels are not exceeded. Keep exposure as low as possible. If possible work within a laboratory hood.

### Personal Protection:

**Eyes:** Chemical safety glasses/goggles and face shield with molten metal or powdered product.

**Respirator:** An authority 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. Additional respiratory protection may be required based on the work performed. Avoid inhalation of cadmium containing materials in the form of fume/particulate or powder. Additionally, avoid inhalation of lead containing materials in the form of fume/particulate or powder.

**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. Gloves, such as disposable, are recommended when handling powdered product. Avoid skin contact with molten or powder form.

**Other:** Lab coat and work clothes, safety shower and eye-wash fountain in work area. Avoid the use of contact lenses in high fume or dusty areas.

**Work/Hygienic Practices:** Maintain good housekeeping. Clean up spills immediately. Good personal hygiene is essential. Do not eat, drink or smoke in the work area. Wash hands thoroughly with soap and water immediately upon leaving the work area and before eating, drinking or smoking.

Do not re-use product containers. Dispose of in accordance with applicable regulations. Empty containers may still have product residual.

In US, see OSHA regulatory requirements for worker protection when working with cadmium and lead containing products. Additional protection and medical monitoring may be required.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Silver grey 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>	Dust generation
<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.

**Hazardous Polymerization:** Will not occur.

**11. TOXICOLOGICAL INFORMATION**

**Carcinogenicity: National Toxicity Program (NTP):** Yes  
 Cadmium is listed as known to be a carcinogen.  
 Lead reasonably anticipated to be a human carcinogen

**Occupational Safety & Health Administration (OSHA):** Yes  
 Cadmium is listed as a possible carcinogen.  
 Lead [1910.1025]

**U.N. International Agency for Research on Cancer (IARC):** Yes  
 Lead and Lead compounds are listed as possible carcinogens.  
 Cadmium is listed as possible carcinogen.

Cadmium:

Inhalation, human, 39 mg/m<sup>3</sup>, LCLO  
 Oral, rat, 2330 mg/kg, LD50  
 Women, inhalation, dose: 129 ug/m<sup>3</sup>, 20 years  
 Chronic Exposure: Teratogen/Mutagen/Reproductive Hazard

Lead:

Genotoxicity in vivo – rat- inhalation  
 Developmental Toxicity – rat – inhalation  
 Developmental Toxicity –rat-oral  
 Reproductive toxicity – rat - inhalation

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

Cadmium: See NIOSH RTECS# EU9800000 for additional information.  
 Lead: See NIOSH RTECS# OF7525000 for additional information.  
 Indium: See NIOSH RTECS #NL1050000 for additional information.

**12. ECOLOGICAL INFORMATION**

No information available on the metal mixtures.

Lead:

Toxicity to fish: mortality LOEC – Oncorhynchus myliss (rainbow trout) – 1.190 mg/l – 96h  
 LC50 – Micropterus dolomieu – 2.2 mg/l – 96h

Bioaccumulation: Oncorhynchus kisutch – 2 weeks. Bioconcentration factor (BCF): 12

Cadmium:

4.26 mg/l LC50 96h                      0.0244 mg/l EC50 = 48h  
 0.003mg/l LC50 96h

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
 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. Empty containers may still have residual product and therefore must be disposed of in accordance with applicable regulations. Empty containers should not be crushed or burned unless under the control of an incinerator or approved disposer. Containers and material would generally be classified as hazardous waste.

### 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated under US DOT (United States Department of Transportation). IATA/IMDG non-hazardous.

Non – hazardous for solid metal form.

UN – none

Note: Lead Containing or Cadmium Containing Powder Form: DOT/IATA/IMDG, only if it meets or exceeds the reportable quantity (RQ), in a single package

Reportable Quantity (RQ): 10 lbs (lead) Reportable Quantity (RQ): 10 lbs (cadmium)

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



IMDG: EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packaging and combination packaging's containing inner packaging's 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.).

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

Lead and Cadmium are on the Massachusetts/New Jersey/Pennsylvania: Right To Know Components.

SARA 313 Listing - 40 CFR 372.65: Lead , Cadmium, Zinc, Silver

All ingredients are listed on the EPA TSCA Inventory.

All ingredients are listed on the Canadian Domestic Substance List.

EPA Genetic Toxicology Program - Lead CAS# 7439-92-1, Cadmium CAS# 7440-43-9





	Sn	Pb	Cd	In	Ag	Zn		(gm/cm <sup>3</sup> )
8	42	-	14	44	-	-	93/199	7.45
13	15	9.6	5.4	70	-	-	257/125	7.63
103	67.8	-	32.2	-	-	-	177/351	7.67
181	51.2	30.6	18.2	-	-	-	145/293	8.45
185	-	-	95	-	5	-	395/743	8.73
253	-	-	26	74	-	-	123/253	7.62
NS	50	32	18	-	-	-	-	8.50
NS	66.5	-	29	-	-	4.5	-	7.62
NS	-	-	30.3	2.6	67.10	-	-	9.76
NS	-	99.2	0.8	-	-	-	-	11.32
NS	99.2	-	0.8	-	-	-	-	7.29
NS	-	99.7	0.3	-	-	-	-	11.34
NS	99.7	-	0.3	-	-	-	-	7.28
CADMIUM	-	-	100	-	-	-	321/609	8.65

**NS = NON STANDARD ALLOY MIX**

**\*RoHS – The above products do not meet the requirements under the EU Directive Restriction of Hazardous Substances. Cadmium levels exceed the regulations. Lead exceeds RoHS limits in some products, where there may not be any exemptions.**