



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

This safety data sheet represents a family grouping of all metal mixes that are blended with the same flux known as RA Flux. A table is provided that lists all metal groupings. To better serve all of our customers Indium Corporation has generated one SDS, for this product. Unless otherwise stated the health and safety information provided within is applicable to all products.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: INDALLOY WITH RA FLUX COATING

SDS NUMBER: SDS CP038

REVISED DATE: 25 OCTOBER 2017

PRODUCT USE: INDUSTRIAL USE (mixture) - METAL BLEND WITH FLUX COATING FOR SOLDERING APPLICATION'S. SEE ALLOY TABLE FOR THE LIST OF PRODUCTS AVAILABLE. SOME HEALTH AND SAFETY INFORMATION MAY NOT BE APPLICABLE TO THE SPECIFIC PRODUCT USED. REVIEW APPLICABLE DATA.

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2. HAZARDS IDENTIFICATION

GHS:

Lead free products



Warning Word: Warning

Hazard statement(s)

H315	Causes skin irritation
H317	May cause an allergic skin reaction
H335	May cause respiratory irritation
EUH208	Contains rosin. May produce an allergic reaction

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 + 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)

Lead containing products



Warning Word: Warning

Hazard statement(s)

H303	May be harmful if swallowed (lead/cadmium)
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H332	Harmful if inhaled (lead and cadmium containing)
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 (applicable to lead containing product)
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 harmful effects (lead) (cadmium)
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.
EUH208	Contains rosin. May produce an allergic reaction

Precautionary statement(s)

P233	Keep container tightly closed
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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)

PRIMARY ROUTES OF ENTRY:

*Eye *Inhalation *Skin *Ingestion NTP IARC OSHA *Not Listed

CARCINOGEN LISTED IN:

POTENTIAL HEALTH EFFECTS:

Eye Contact: 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 cause headache, nausea, abdominal pain, fatigue and pain in the legs, arms and joints. Inhalation can cause shortness of breath and sore throat. Inhalation of cadmium fume or dust can cause metal fume fever. Inhalation of cadmium may be fatal. Inhalation may be harmful.

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: Indium may cause damage to respiratory system. Kidney and liver damage from injection of indium compounds has been reported based on limited animal testing.

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 and muscle and joint pain and damage to the nervous system, blood system and kidneys.

Tin: has been shown to increase incidence of sarcoma in animal tests.

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.

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.

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.

NOTE: **The Indium Corporation does not recommend, manufacture, market or endorse any of its**

product's 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.

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

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #	PEL	TLV-TWA	TLV-STEL
mg/m ³	mg/m ³	mg/m ³			
INDIUM	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Canada)	-	0.1	0.3
		(Mexico)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(China)	-	0.1	0.3
TIN	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
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)	-
SILVER	*	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	-	-
BISMUTH	*	7440-69-9	N.E.	N.E.	N.E.
ANTIMONY	*	7440-36-0/231-146-5			
		(US)	0.5	0.5	-
		(EU)	0.5	-	-
		(Canada)	-	0.5	1.5
		(Mexico)	N.E.	0.5	-
		(Singapore)	0.5	-	-
		(China)	-	0.5	-
CADMIUM	*	7440-43-9 (US)	0.005	0.01	-
		(EU)	0.025	-	-
		(Singapore)	0.05	-	-
		(China)	-	0.01	0.02
		(Canada)	-	0.05	0.2
ROSIN MIXTURE	1.0-4.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15

N.E. = Not established
 * See Alloy Table at 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, not flammable. None combustible solid in bulk form, however, dust or powder may be flammable.		
Extinguishing Media:	Use extinguishers appropriate for the surrounding fire conditions, such as foam, carbon dioxide, dry chemical and water.		
Special Fire Fighting Procedures:	Firefighters must wear NIOSH approved self-contained breathing apparatus and full protective clothing.		
Explosion Data - Sensitivity to:	Mechanical Impact:	Not established	
	Static Discharge:	Not established	

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures:	Contain spill. If molten, cool to allow metal to solidify. If solid metal wear gloves, pick up and return to process. If dust, wear recommended personal protective equipment. Use a vacuum, place in barrels and return to process if possible. Metal can be recycled. Sweeping is not recommended if material can be airborne.
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7. HANDLING AND STORAGE

Handling Precautions:	Only dry metals should be added to molten bath. If working with molten metal, or exposed to fume or dust, use appropriate personal protective equipment. Always thoroughly wash your hands after handling this product. DO NOT touch or rub eyes until hands are washed.
Storage Precautions:	Store product in a cool, dry area away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:	Exhaust ventilation is necessary to control any air contaminants and keep exposures as low as possible. Use ventilation for worker protection.		
Personal protection:			
Eyes:	Chemical safety glasses/goggles and face shield with molten metal. Face shield for splash hazards.		
Respirator:	An authority approved or compliant marked air-purifying respirator with a HEPA particulate/fume cartridge is recommended when contaminants are elevated or during cutting or melting. Certain conditions may require monitoring to determine the correct respiratory protection.		
Skin:	Rubber or heat resistant gloves. Apron, boots, sleeve protectors may be necessary depending on the type of work performed.		
Other:	Lab coat, eye-wash fountain in work area. Avoid the use of contact lenses in high fume/dust areas.		
Work/Hygienic	Maintain good housekeeping. Clean up spills immediately. Wash hands thoroughly with soap and water immediately upon leaving the work area and before eating. Refrain from eating or smoking in work areas. When applicable in US, review, OSHA lead and cadmium worker requirements. Certain work practice and medical monitoring may be required.		

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Metal preform/shape	Boiling Point:	Not determined
Odor:	Odorless.	Melting Point:	See table
Specific Gravity:	See Table	pH:	Not applicable
Vapor Pressure:	Not applicable.	Solubility in Water:	Insoluble
Vapor Density:	(air=1) Not applicable.	Flash point:	Not Applicable

10. STABILITY AND REACTIVITY

General:	Stable.
Conditions to Avoid:	Not established.
Incompatible Materials:	Avoid contact with acids, sulfur or oxidizing agents. Ignites and incandesces on heating with sulfur.
Hazardous Decomposition / Combustion:	Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity Listing: **National Testing Program (NTP):** Cadmium is listed as a possible carcinogen. (Yes)
Occupational Safety & Health Administration (OSHA):
Cadmium is listed as a possible carcinogen (Yes)
U.N. International Agency for Research on Cancer (IARC):
Cadmium is listed as a possible carcinogen and lead and lead compounds are listed (Yes)

LD50: Not established.

LC50: Not established.

Other: Chronic Toxicity: Overexposure to fumes may cause respiratory tract irritation. Lead and Cadmium may cause potential harm to the developing fetus.

Cadmium:

Inhalation, human, 39 mg/m³, LCLO

Oral, rat, 2330 mg/kg, LD50

Women, inhalation, dose: 129 ug/m³, 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.

See NIOSH RTECS Number for additional information: NL1050000 (indium metal); 7525000(lead only); 5325000 (copper only); VW3500000(silver only); EU9800000 (cadmium only)

12. ECOLOGICAL INFORMATION

Product not tested. Contains substances that are harmful to the aquatic organisms.

Cadmium: 4.26mg/l LC 50 96h, 0.0004-0.003 mg/l LC50 96h, 0.006 mg/l LC50 96h

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. Do not dispose of on the ground or into any waterway. Lead

and cadmium materials are considered to be hazardous waste and should be disposed of properly if they are not recycled. Do not reuse any containers that this product was packaged in. Product container may contain residue of hazardous materials.

14. TRANSPORT INFORMATION

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

Non hazardous under shipping modes.

UN – none.

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) (lead/cadmium) D2B Materials Causing Other Toxic Effects (irritant).
D1A – Materials causing immediate and serious toxic effects –Very Toxic Material (cadmium)

SARA 313 Listing - 40 CFR 372.65 Lead, Antimony, Copper, Cadmium and Silver

EPA Toxicology Program Lead and Cadmium

All ingredients are listed on the EPA TSCA Inventory.

California Prop 65: Warning: This product contains chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm).

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.

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

For compliance with EU Directive 2011/65/EU, Restriction of Hazardous Substances (RoHS), see Alloy Table.

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). (GHS)

In China:

Decree No. 591: Regulations on the Control over Safety of Hazardous Chemicals

GB 30000.2-29-2013, Rules for classification and labeling of chemicals. (GHS)

GB/T 16483-2008, GB/T 17517-2013

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

All ingredients are listed on the China Chemical Inventory.

16. OTHER INFORMATION

HMIS Hazard Rating:	Health:	2
	Fire:	0
	Reactivity:	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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ALLOY TABLE

(Alloy mixture with a 1-4% rosin coating)

INDALLOY	RoHS 2 Compliance	%BISMUTH Bi	%COPPER Cu	%INDIUM In	%LEAD Pb	%TIN Sn	%SILVER Ag	%CADMIUM Cd	%ANTIMONY Sb	MELTING POINT	SG
1E (In52, Sn48)	YES	-	-	49.9-51.5	-	46.1-47.5	-	-	-	118C/244F	7.30
4 (100In)	YES	-	-	100	-	-	-	-	-	156C/314F	7.31
104 (Sn62, Pb36)	NO	-	-	-	34.6-35.6	59.5-61.4	1.92-1.98	-	-	179C/354F	8.41
106 (Sn63, Pb37)	NO	-	-	-	35.5-36.6	60.5-62.4	-	-	-	183C/361F	8.40
109 (Pb40, Sn60)	NO	--	-	-	38.4-39.6	57.6-59.4	-	-	-	179C/354F	8.50
130 (Pb60, Sn40)	NO	-	-	-	57.6-59.4	38.4-39.6	-	-	-	238C/460F	9.28
132 (Sn95, Ag5)	YES	--	-	-	-	91.2-94.1	4.8-4.95	-	-	240C/430F	7.39
156 (Sn90, Ag10)	YES	-	-	-	-	86.4-89.1	9.6-9.9	-	-	295C/563F	7.51
181 (Pb30.6, Sn51.2, Cd18.2)	NO	-	-	-	29.4-30.3	49.2-50.7	-	17.5-18.0	-	145C/293F	8.45
206 (In40, Pb60)	NO	-	-	38.4-39.6	57.6-59.4	-	-	-	-	231C/448F	9.30
241 (SAC387) (Cu0.7, Sn95.5, Ag3.8)	YES	-	0.67-0.69	-	-	91.7-94.5	3.6-3.76	-	-	220C/428F	7.40
244 (Cu0.7, Sn99.3)	YES	--	0.67-0.69	-	-	95.3-98.3	-	-	-	227C/441F	7.31
256 (SAC241) (Cu0.5, Sn96.5, Ag3)	YES	-	0.48-0.49	-	-	92.6-95.5	2.9-2.97	-	-	220C/428F	7.40

INDALLOY	RoHS 2 Compliance	%BISMUTH Bi	%COPPER Cu	%INDIUM In	%LEAD Pb	%TIN Sn	%SILVER Ag	%CADMIUM Cd	%ANTIMONY Sb	MELTING POINT	SG
281 (Bi58, Sn42)	YES	55.7-57.4	-	-	-	40.3-41.6	-	-	-	138C/281F	8.56
290 (In97, Ag3)	YES	-	-	93.1-96.0	-	-	2.9-2.97	-	-		
NS (Cu2, 97Sn, 0.2Ag, 0.8Sb)	YES	-	1.92-1.98	-	-	93.1-96.0	0.19-0.198	-	0.77-0.79	-	7.31
NS (Sn96, Ag4)	YES	-	-	-	-	92.2-95.0	3.8-3.96	-	-	-	7.37
NS (Pb38, Sn60, Ag2)	NO	-	-	-	36.5-37.6	57.6-59.4	1.92-1.98	-	-	-	8.49
NS (Bi97.5, Ag2.5)	YES	93.6-96.5	-	-	-	-	2.4-2.48	-	-	-	9.82

RoHS 2 Compliance = Restriction of Hazardous Substances EU Directive 2011/65/EU. Review any applicable exemptions.

Visit <http://www.indium.com>.

Solder related products are not directly related to RoHS. Therefore the above is provided as information only. It is the customer's responsibility to determine compliance with any applicable regulation.