



SAFETY DATA SHEET

This safety data sheet represents a family grouping of all metal mixes that are blended with the same 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, to be used within the United States as well as internationally. Some of the regulatory information contained within may not be applicable to the customer's individual state or country. Unless otherwise stated the health and safety information provided within is applicable to all products.

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH RSA FLUX

SDS Number: SDS-4115

Revised Date: 26 SEPTEMBER 2018

Product Use: Industrial Use (mixture) - Alloy coated with flux. See alloy table.

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

⊕ Eye ⊕ Inhalation ⊕ Skin ⊕ Ingestion NTP

Carcinogen listed in

IARC OSHA ⊕Not Listed
See Section 11

GHS:

General non lead or cadmium products



Signal Word: Warning

Hazard statement(s)

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

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
- 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

Lead or cadmium containing



Signal Word: Warning

Hazard statement(s)

- H303 May be harmful if swallowed (lead)
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H350 May cause cancer (cadmium)
- H351 Suspected of causing cancer (lead)
- H361 Suspected of damaging fertility or the unborn child (lead) (cadmium)
- H373 May cause damage to organs through prolonged or repeated exposure (lead)
- 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. Comply with the safety instructions. (applicable only to the products listed that contain cadmium) Review listing.
- 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)

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 material at room temperature or fume from material at typical re-flow temperatures over 100°C may cause eye irritation. Molten metal can cause damage to eyes.

Ingestion: This product contains metal alloy powder and organic chemicals. May be harmful if swallowed.

Inhalation: Heated vapor concentrations may be harmful if inhaled. Prolonged or repeated exposure to smoke or fumes may cause respiratory sensitization. Inhalation of cadmium fume or dust can cause metal fume fever. Inhalation of cadmium may be harmful.

Skin Contact: Brief contact may cause slight irritation. Allergic reaction may occur with prolonged exposure to flux. **ANTIMONY** has been known to cause dermatitis

Chronic: Prolonged or repeated overexposure to mist or vapor generated at high temperatures may result in the inhalation of harmful amounts of material.

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 powder, 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 of copper 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.

BISMUTH: May cause kidney damage.

INDIUM: May cause damage to respiratory system. Kidney and liver damage from injection of indium compounds has been reported based on limited animal testing. Target organs: teeth and gums

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



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

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.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #/EINECS#	PEL mg/m ³	TLV-TWA mg/m ³	TLV-STEL mg/m ³
LEAD	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	-
		(EU)	-	0.15	-
		(Canada)	-	0.05	-
		(Singapore)	0.15	-	-
		(China)	0.05(dust)	0.03(fume)	-
		(Mexico)	-	0.15	-
TIN	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Singapore)	2	-	-
		(Canada)	-	2	4
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	-	-
COPPER	*	7440-50-8 (US)	0.1 (fume)	0.2 (fume)	-
		(EU)	-	0.2 (fume)	-
		(Canada)	-	0.2 (fume)	0.6 (fume)
		(Mexico)	-	0.2(fume)	2
		(Singapore)	0.2	-	-
		(China)	-	1(dust)	2.5

ANTIMONY	*	7440-36-0/231-146-5			
		(US)	0.5	0.5	-
		(EU)	0.5	-	-
		(Canada)	-	0.5	1.5
		(Mexico)	-	0.5	-
		(Singapore)	0.5	-	-
		(China)	-	0.5	-
BISMUTH	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
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
ZINC	*	7440-66-6	N.E.	N.E.	N.E.
INDIUM	*	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
ROSIN	0.96-2.88	65997-05-9(US)	N.E.	N.E.	N.E.
		(EU)	0.05	-	0.15(sensitiser)
PROPRIETARY	0.03-0.09	-	N.E.	N.E.	N.E.

EU = European Exposure Limits
 N.E. = Not established

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 flammable	Method:	Not established.
Auto-ignition Temperature:	Not established.		
Flammable Limits:	Limits not established.		
Extinguishing Media:	Use extinguishers appropriate for the surrounding fire conditions. Foam, dry chemical, water spray and carbon dioxide.		
Special Fire Fighting Procedures:	Firefighters must wear an approved self-contained breathing apparatus and full protective clothing.		

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures:	Wear respirator and other personal protective clothing. (See Exposure Controls/Personal Protection Section). Extinguish or remove all sources of ignition. Absorb/scoop up spill, then place in a chemical waste container. Keep unnecessary personnel away. Do Not Sweep material. Avoid generation of dust. Solid material may be reclaimed. Contain spill and do not allow material to enter water ways.
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7. HANDLING AND STORAGE

Handling	Avoid breathing vapors from heated material. Avoid contact with eyes, skin and clothing.
Precautions:	Follow routine safe handling procedures. Use with adequate ventilation.
Storage Precautions:	Keep away from heat and flame. Store in suitable, tightly capped, and labeled containers in cool dry, well-ventilated area. Store away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:	Exhaust ventilation is recommended especially during heating. Keep exposures to metal fumes and vapors as low as possible.
Personal protection:	
Eyes:	Chemical safety glasses/goggles. Face shield over eye protection for splash protection.
Respirator:	An authority approved or compliant marked air-purifying respirator with a particulate/fume/organic chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated. Areas of high fume or dust may require air testing to ensure that the proper respiratory protection is being worn.
Skin:	Compatible chemical resistant gloves. Hot gloves for handling molten metal.
Other:	Lab coat, eye-wash fountain in work area. Avoid the use of contact lenses in high fume/dusty 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. Avoid exposures to lead and cadmium.

9. PHYSICAL AND CHEMICAL PROPERTIES			
Appearance:	solid metal	Boiling Point:	Not applicable.
Odor:	mild	Melting Point:	See Table
Specific Gravity:	See Table	pH:	Not applicable
Vapor Pressure:	Not applicable.	Solubility in Water:	Not soluble
Vapor Density:	(air=1) Not applicable.		

10. STABILITY AND REACTIVITY	
General:	Stable.
Conditions to Avoid:	High temperatures.
Incompatible Materials:	Acids, bases, oxidizers
Hazardous Decomposition / Combustion:	Carbon monoxide, Carbon dioxide
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION			
Carcinogenicity:	NTP: Cadmium is listed as a possible carcinogen.	Yes	
	OSHA: Cadmium is listed as a possible carcinogen.	Yes	
	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: 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.			
Follow lead and cadmium work practices as required under regulatory agencies. US following: 29CFR 1910.1027 and 29 CFR 1910.1025			

12. ECOLOGICAL INFORMATION
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. Fresh fish: 0.44 mg/l LC50 96h/ 1.32 mg/l LC50 96h/water Flea: 600 ug/l EC50 = 48h
Copper – Toxicity to daphnia and other aquatic invertebrates mortality NOEC – Daphnia 0.004 mg/l – 24h.
Antimony – Toxicity to fish – mortality NOEC (sheepshead minnow) 6.2 mg/l – 96h. Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Dispose of in accordance with all Federal, State and Local environmental regulations. In Europe follow the Special Waste Regulations. Suggested waste disposal is recycling and metals recovery. Otherwise may be classified as hazardous waste. Do not dispose of in any waterway.

14. TRANSPORT INFORMATION

Transport in accordance with applicable international regulations and requirements. Not regulated under US DOT (United States Department of Transportation). Not hazardous under shipping regulations.

North American Emergency Guide Book – Not applicable

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.).

SARA 313 Listing - 40 CFR 372.65 (FORM R REPORTING) – Lead, Antimony, Silver, Copper, Cadmium

All ingredients are listed on the EPA TSCA Inventory.

EPA Toxicology Program Lead and Cadmium



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

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).



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

D1A – Materials causing immediate and serious toxic effects –Very Toxic Material (cadmium)

D2B Materials Causing Other Toxic Effects -irritant

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.

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).

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.

16. OTHER INFORMATION

HMIS Hazard Rating:	Health:	2
	Fire:	1
	Reactivity:	0

Revised Date: 26 SEPTEMBER 2018

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ALLOY TABLE

Alloy reported as whole. Flux coating is 1-3%

INDALLOY	RoHS 2/3 Compliance	%TIN Sn	%LEAD Pb	%COPPER Cu	%Indium In	%SILVER Ag	%ANTIMONY Sb	%ZINC Zn	%BISMUTH Bi	%CADMIUM Cd	SPECIFIC GRAVITY	MELTING
1E (52In/48Sn)	Yes	48	-	-	52	-	-	-	-	-	7.30	118C/244F
38 (52.5Bi/32Pb/15.5Sn)	No	15.5	32	-	-	-	-	-	52.5	-	9.71	95C/203F
106 (Sn63/Pb37)	No	63	37	-	-	-	-	-	-	-	8.40	183C/361F
121 (96.5Sn/3.5Ag)	Yes	96.5	-	-	-	3.5	-	-	-	-	7.50	221C/430F
132 (95Sn/5Ag)	Yes	95	-	-	-	5	-	-	-	-	7.39	240C/464F
133 (95Sn/5Sb)	Yes	95	-	-	-	-	5	-	-	-	7.25	240C/464F
165 (97.5Pb/1.5Ag/1Sn)	No*	1	97.5	-	-	1.5	-	-	-	-	11.28	309C/588F
181 (51.2 Sn/30.6Pb/18.2Cd)	No	51.2	30.6	-	-	-	-	-	-	18.2	8.45	145C/293F
201 (91Sn/9Zn)	Yes	91	-	-	-	-	-	9	-	-	7.27	199C/390F
246 (95.5Sn/4Ag/0.5Cu)	Yes	95.5	-	0.5	-	4	-	-	-	-	7.40	225C/437F
256 (96.5Sn/3Ag/0.5Cu)	Yes	96.5	-	0.5	-	3	-	-	-	-	7.40	220C/428F
281 (Bi58/Sn42)	Yes	42	-	-	-	-	-	-	58	-	8.56	138.3C/281F

RoHS 2 = Restriction of Hazardous Substances under EU Directive 2011/65/EU. *Review for any exemptions that may apply.

RoHS 3 = products do not contain any listed phthalates