



This safety data sheet represents a family grouping of all metal mixes that are blended with the same flux coating known as NC-9. 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.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH NC-9

SDS Number: SDS- CP4105

Revised Date: 16 OCTOBER 2018

Product Use: Industrial Use (mixture) - Flux Coated Metal Preform for soldering applications
See alloy table for metal mixtures.

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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

Lead free products:



Signal Word: Warning

Hazard statement(s)

H317 May cause an allergic skin reaction
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
 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)
 P501 Dispose of in accordance with applicable local/state and federal regulations. Consider recycling metal.

Lead/Cadmium containing products:



Signal Word: Warning

Hazard statement(s)

H303 May be harmful if swallowed (lead/cadmium)
 H317 May cause an allergic skin reaction
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
 H351 Suspected of causing cancer (lead) (cadmium)
 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 effects to aquatic life (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)
P501	Dispose of in accordance with applicable local/state and federal regulations. Consider recycling metal.

Classification:

Sensitisation- skin-Category 1B

Sensitisation- respiratory-Category 1B

Reproductive toxicity- Category 2 (lead)

Specific target organ toxicity, repeated exposure- Category 2 (lead)

Carcinogenicity- Category 2 (lead/cadmium)

Hazardous to aquatic environment, long term hazard- Category 1 (lead/cadmium)

POTENTIAL HEALTH EFFECTS:**Eye Contact:** Contact with powdered metal or fume from molten metal may cause irritation.**Ingestion:** May be harmful if swallowed.**Inhalation:** Inhalation of fume or dust may cause local irritation to the respiratory system. Rosin may cause occupational asthma.**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. Rosin and Antimony may cause irritation or dermatitis.**Chronic:** **TIN:** Has been shown to increase incidence of sarcoma in animal tests.**BISMUTH:** May cause kidney damage**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.**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.**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. Tissue damage of mucous membranes may follow chronic dust exposure**INDIUM:** May cause damage to respiratory system if inhaled over long periods of time.

ZINC: Prolonged exposure to high concentrations of zinc fumes may cause “zinc shakes” an involuntary twitching of the muscles. Repeated inhalation may cause chronic bronchitis.



WARNING: This product can expose you to chemicals including [lead, cadmium] which are 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

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

Warning: This product may contain lead. Lead may be harmful to your health. 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 #	PEL mg/m ³	TLV-TWA mg/m ³	TLV-STEL mg/m ³
BISMUTH	*	7440-69-9	N.E.	N.E.	N.E.
TIN	*	7440-31-5 (US)	2	2	-
		(EU)	-	2	4
		(Singapore)	2	-	-
		(Canada)	-	2	4
LEAD	*	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)	-
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
SILVER	*	7440-22-4 (US)	0.01	0.1	-
		(EU)	-	0.1	-

			(Canada)	-	0.1	0.3
			(Mexico)	-	0.1	-
			(Singapore)	0.1	-	=
COPPER	*	7440-50-8/231-159-6				
			(US)	0.1 (fume) 1(dust)	0.2 (fume)	-
			(EU)	-	0.2 (fume)	-
			(Singapore)	0.2(fume)	1(dust)	-
			(Mexico)	-	0.2	2
			(Canada)	N.E.	0.2 (fume)	0.6 (fume)
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
GOLD	*	7440-57-5/231-165-9		N.E.	N.E.	N.E.
ZINC	*	7440-66-6		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	-
GERMANIUM	*	7440-56-4		N.E.	N.E.	N.E.
ROSIN	1-5	65997-05-9		N.E.	N.E.	N.E.
			(EU)	0.05	-	0.15
PROPRIETARY	0.1-2			N.E.	N.E.	N.E.

N.E. = Not established

* See alloy table

TWA- time weighted average

STEL-short term exposure limit

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 applicable
- Flammable Limits:** Flammable in the form of dust when exposed to heat or flame.
- Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Use water spray, carbon dioxide, or foam. Do not allow water run-off to enter sewers or waterways.
- Special Fire Fighting Procedures:** Firefighters wear an approved self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

- Spill or Leak Procedures:** Wear HEPA (high efficiency particulate filter) filter respirator and other personal protective clothing. (See Exposure Controls/Personal Protection Section).
Clean up spill without generating or dispersing dust into the air. Vacuum solids instead of sweeping. Reduce airborne dust and prevent scattering by moistening with water. Place spilt material in a container and dispose of in accordance with applicable regulations.

7. HANDLING AND STORAGE

- Handling Precautions:** Avoid breathing vapors from heated material and dusts from powder form. Avoid contact with eyes, skin and clothing. 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. Empty containers may be hazardous as they contain product residue.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- Engineering Controls:** Local exhaust ventilation is recommended to control any fume or dust air contaminants.

Keep exposures as low as possible. Avoid exposure to dust and fume containing lead and/or cadmium.

Personal protection:

Eyes: Chemical safety glasses/goggles and face shield with molten metal. Safety glasses should be worn at all times.

Respirator: An approved or compliant marked air-purifying respirator with a fume/dust HEPA type chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated. Warning: Air purifying respirators do not protect the worker in oxygen-deficient atmospheres.

Skin: Wear protective gloves, clothing such as lab coat, coveralls, apron and boots.

Other: Eye-wash fountain/shower in work area. Avoid the use of contact lenses in high fume and dust areas. Regular shower facilities and industry laundry service may be required. Review regulations regarding lead and cadmium proper work practices, if applicable.

Work/Hygienic Maintain good housekeeping. Clean up spills immediately. Good personal hygiene is essential especially when working with lead and cadmium products. Avoid eating, smoking or drinking in the lead/cadmium work areas. Wash hands and face thoroughly with soap and water immediately upon leaving the work area and before eating.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid, gray metal	Boiling Point:	Not available
Odor:	Odorless	Melting Point:	See Table
Specific Gravity:	See Table	pH:	Not applicable
Vapor Pressure:	Not established	Solubility in Water:	Insoluble
Vapor Density:	(air=1) Not applicable.		

10. STABILITY AND REACTIVITY

General:	Stable.
Conditions to Avoid:	Not established
Incompatible Materials:	Not established
Hazardous Decomposition / Combustion:	Toxic fumes are emitted at elevated temperatures.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity:	NTP(National Toxicity Program):	No	
	OSHA (Occupational Safety & Health Administration):	Yes, Cadmium is listed as a possible carcinogen.	
	IARC (International Agency for Research on Cancer):	Yes – lead and lead compounds and cadmium and cadmium compounds are listed as possible carcinogens.	
LD50:	Not established.	LC50:	Not established.

Other: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma. Lead and cadmium can cause potential harm to the developing fetus.

NIOSH RTECS# EU9800000 Cadmium	NIOSH RTECS# NL105000 Indium
NIOSH RTECS# OF7525000 Lead	NIOSH RTECS# VM3500000 Silver
NIOSH RTECS# XP7320000 Tin	NIOSH RTECS# GL5325000 (dust) Copper,
#GL7900000 (fume) Copper	
Product mixtures not tested.	

12. ECOLOGICAL INFORMATION

Product mixtures not tested.

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: 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 down any drain or waterway.

14. TRANSPORT INFORMATION

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

Non - hazardous under all shipping modes (DOT/IATA/IMDG).

North American Emergency Guide Book – Not applicable

UN – none

Marine Pollutant: No

Product is non-hazardous for shipping.

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.).

New Jersey Right To Know – Tin #1858, Silver #1669, Lead #1096, Copper #0528, Cadmium #0305 and Indium #1025



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

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

Ingredient is listed on the USEPA TSCA Inventory.

Ingredients are listed on the Canadian Domestic Substance List.

Ingredients are listed on the Philippines Inventory of Chemicals

Ingredients are listed on the Korean Existing Inventory of Chemicals.

Ingredients are listed on the China Inventory of Chemicals.

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).
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 the 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). (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

16. OTHER INFORMATION

HMIS Hazard Rating:

Health:	2
Fire:	1
Reactivity:	0

Revised Date: 16 OCTOBER 2018

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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

% Metal Alloy Content Only

INDALLOY Metal Mix	RoHS 2/3** Compliance	%TIN Sn	%ANTIMONY Sb	%INDIUM In	%SILVER Ag	%COPPER Cu	%LEAD Pb	%CADMIUM Cd	GERMANIUM Ge	%BISMUTH Bi	%ZINC Zn	%GOLD Au
1E (Sn48/In52)	Yes	48	-	52	-	-	-	-	-	-	-	-
4 (In)	Yes	-	-	99.99	-	-	-	-	-	-	-	-
7 (In50/Pb50)	No	-	-	50	-	-	50	-	-	-	-	-
104 (Sn62/Ag1.4/Pb36)	No	62	-	-	1.4	-	36	-	-	-	-	-
106 (Sn63/Pb37)	No	63	-	-	-	-	37	-	-	-	-	-
109 (Sn60/Pb40)	No	60	-	-	-	-	40	-	-	-	-	-
121 (Sn96.5/Ag3.5)	Yes	96.5	-	-	3.5	-	-	-	-	-	-	-
133 (Sn95/Sb5)	Yes	95	5	-	-	-	-	-	-	-	-	-
145 (Sn25/Pb75)	No	25	-	-	-	-	75	-	-	-	-	-
151 (Sn5/Ag2.5/Pb92.5)	Yes(high lead)	5	-	-	2.5	-	92.5	-	-	-	-	-
164 (In5/Ag2.5/Pb92.5)	Yes(high lead)	-	-	5	2.5	-	92.5	-	-	-	-	-
165 (Sn1/Ag1.5/Pb97.5)	Yes(high lead)	1	-	-	1.5	-	97.5	-	-	-	-	-
171 (Sn5/Pb95)	Yes(high lead)	5	-	-	-	-	95	-	-	-	-	-
181 (Sn51.2/Pb30.6/Cd18. 2)	No	51.2	-	-	-	-	30.6	18.2	-	-	-	-
182 (Sn20/Au80)	Yes	20	-	-	-	-	-	-	-	-	-	80
201 (Sn91/Zn9)	Yes	91	-	-	-	-	-	-	-	-	9	-
206 (In40/Pb60)	No	-	-	40	-	-	60	-	-	-	-	-

INDALLOY Metal Mix	RoHS 2/3** Compliance	%TIN Sn	%ANTIMONY Sb	%INDIUM In	%SILVER Ag	%COPPER Cu	%LEAD Pb	%CADMIUM Cd	GERMANIUM Ge	%BISMUTH Bi	%ZINC Zn	%GOLD Au
227 (Sn77.2/In20/Ag2.8)	Yes	77.2	-	20	2.8	-	-	-	-	-	-	-
238 (Sn90/Au10)	Yes	90	-	-	-	-	-	-	-	-	-	10
241 (Sn95.5/Ag3.8/Cu0.7)	Yes	95.5	-	-	3.8	0.7	-	-	-	-	-	-
243 (Sn99/Cu1)	Yes	99	-	-	-	1	-	-	-	-	-	-
246 (Sn95.5/Ag4/Cu0.5)	Yes	95.5	-	-	4	0.5	-	-	-	-	-	-
249 (Sn91.8/Ag3.4/Bi4.8)	Yes	91.8	-	-	3.4	-	-	-	-	4.8	-	-
256 (Sn96.5/Ag3/Cu0.5)	Yes	96.5	-	-	3	0.5	-	-	-	-	-	-
281 (Sn42/Bi58)	Yes	42	-	-	-	-	-	-	-	58	-	-
282 (Sn42/Ag1/Bi57)	Yes	42	-	-	1	-	-	-	-	57	-	-
290 (In97/Ag3)	Yes	-	-	97	3	-	-	-	-	-	-	-
NS	No	18.6-19.8	-	-	-	-	17.7-18.8	12.1-12.9	-	44.6-47.5	-	-
NS	Yes(high lead)	4.7-4.9	-	-	1.40-1.48	-	87-92.5	-	-	-	-	-
NS	Yes	91.98	8	-	-	-	-	-	0.02	-	-	-

NS= NON STANDARD ALLOY MIXTURE

2011/65/EU- RoHS 2 Compliance

High lead – review exemptions that may apply.

***RoHS 3- products do not contain any listed phthalates**

<http://www.indium.com>