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

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: **INDALLOY WITH NC-7 FLUX COATING**

SDS Number: SDS-CP 4061 **Revised Date:** 7 OCTOBER 2015

Product : Industrial Use (mixture) - Flux coated pre-form (solid metal alloy with variable flux coating)
See alloy table for various combinations of metal alloy with the flux NC-7.

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

✓Eye ✓Inhalation ✓Skin ✓Ingestion

Carcinogen listed in

NTP IARC OSHA ✓Not Listed

See Section 11

GHS:

lead products only

Signal Word: Warning

Hazard statement(s)

H303	May be harmful if swallowed
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
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 effects (lead)
EUH201A	Warning! Contains lead (applicable only to the products listed that contain lead) Review listing.
EUH208	Contains rosin. May produce an allergic reaction

Precautionary statement(s)

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
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)

POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact with metal fume from molten metal may cause irritation. Severe eye damage may result from hot molten metal being splashed into the eyes. Wear safety glasses or goggles and face shield for protection from molten metal.

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

Inhalation: Vapors or fumes from this material may cause irritation to the respiratory system. When heated rosin may be a respiratory sensitizer. Rosin may cause occupational asthma.

Skin Contact: May cause skin irritation. Hot molten metal may cause burns to the skin. Rosin may cause dermatitis.

Chronic: **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 dust, salts, or fume can result in a condition

known as Argyria, a condition with bluish pigmentation of the skin and eyes.

TIN: Has been shown to increase incidence of sarcoma in animal tests.

BISMUTH: May cause kidney damage.

INDIUM: May cause irritation or damage to respiratory system.

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.

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)**

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. 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/m³	TLV-TWA mg/m³	TLV-STEL mg/m³
TIN	*	7440-31-5/231-141-8 (US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
LEAD	*	7439-92-1 (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	-	-
INDIUM	*	7440-74-6 (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
BISMUTH	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
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 (fog)	2 (powder)
		(Singapore)	0.2(fume)	1(dust)	-
		(China)	-	1(dust) 0.2(fume)	2.5 0.6
GOLD	*	7440-57-5	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)	-	0.5	-
		(Singapore)	0.5	-	-
		(China)	-	0.5	-
ROSIN MIX	1.0-5.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)

N.E. = Not established EU = European Union Occupational Exposure Limits * See table

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.

Extinguishing Media: Use extinguishers appropriate for the surrounding fire conditions.

Special Fire Fighting Procedures: Firefighters must wear NIOSH approved self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Contain spill. If molten, cool to allow metal to solidify**.** If metal, wear applicable personal protective equipment and clean up. Do not sweep any powder or any form that may become airborne. Vacuum if necessary. Place into containers and return to process or send to metals reclaimer. Follow the applicable Federal, State and Local regulations.

7. HANDLING AND STORAGE

Handling Precautions: Keep containers tightly closed when not in use. Use only with production equipment specifically designed for use. Wear appropriate personal protective equipment when working or handling material. Always thoroughly wash your hands after handling this product. DO NOT touch or rub eyes until hands are washed.

Storage Precautions: Store product in tightly capped original containers in a cool, dry area. Refer to product label for specific storage temperature requirements. Rotate stock to ensure use before expiration date on the label. Consult Product Data Sheet for additional information.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use with adequate ventilation and other safety features specifically designed for use with solder flux materials. Control concentration of all components so that the exposure levels are not exceeded. Conduct monitoring if necessary. Avoid breathing metal fumes.

Personal protection:

Eyes: Chemical safety glasses/goggles, plus face shield for molten application where there is a splash hazard.

Respirator: An authority approved or compliant marked air-purifying respirator with a fume/organic chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated or exceed exposure limits.

Skin: Compatible chemical resistant gloves or hot gloves. Additional clothing such as apron and sleeve protectors for splash hazards.

Other: Lab coat, eyewash fountain in work area. Avoid the use of contact lenses in high fume/splash areas.

Work/Hygienic Practices: 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. When using lead containing products use standard lead work procedures to avoid exposure to lead fumes

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Metal with flux coating	**Boiling Point:**	Not applicable.
Odor:	Mild or None	**Melting Point:**	Not applicable
Specific Gravity:	See table	**pH:**	Not applicable
Vapor Pressure:	Not applicable.	**Solubility in Water:**	Insoluble
Vapor Density:	(air=1) Not applicable.		

10. STABILITY AND REACTIVITY

General:	Stable.
Conditions to Avoid:	Not established.
Incompatible Materials:	Avoid contact with mineral acids.
Hazardous Decomposition / Combustion:	Harmful toxic oxide fumes may form at elevated temperatures
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity: **NTP:** No

OSHA: No
IARC: Yes Lead and lead compounds are listed as possible carcinogens.

LD50: Not established. **LC50:** Not established.

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

Copper - LD50 – intraperitoneal mouse 3.5 mg/kg.

Silver – LD50 oral – rat > 5,000 mg/kg

Bismuth – LD50 oral-rat 5,000 mg/kg

Antimony - LD50 oral – rat 7,000 mg/kg

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

12. ECOLOGICAL INFORMATION

Product not tested.

Copper – Toxicity to daphia and other aquatic invertibrates 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.

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

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.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated under US Department of Transportation as hazardous. Non-hazardous under air transport. Non-hazardous for all shipping (ground/IATA/Ocean).

UN - none

North American Emergency Response Guidebook: Not Applicable

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)

Class D 2B 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 Standards: NOM-010-STPS-1999 and NOM-018-STPS-2000.

This product has been classified under the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2002.

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)

SARA 313 Listing - 40 CFR 372.65

Lead CAS# 7439-92-1	Silver CAS# 7440-22-4
Copper CAS# 7440-50-8	Antimony CAS# 7440-36-0

EPA Genetic Toxicology Program – Lead CAS# 7439-92-1

All ingredients are listed on the EPA TSCA Inventory.

16. OTHER INFORMATION

HMIS Hazard Rating:	**Health:**	2
	Fire:	1
	Reactivity:	0
Revised Date:	7 OCTOBER 2015	
Prepared by:	Nancy Swarts, Indium Corporation of America	
Approved by:	Nancy Swarts, Indium Corporation of America	

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.

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ALLOY TABLE

Metal mix based on flux variation of 0.5-5%

Indalloy (Metal Mix)	Specific Gravity	RoHS 2 Compliance ***	%TIN Sn	%GOLD Au	%SILVER Ag	%LEAD Pb	%BISMUTH Bi	%INDIUM In	%COPPER Cu	%ANTIMONY
1E 52In/48Sn	7.30	Yes	45.6-47.8	-	-	-	-	49.4-51.7	-	-
2 80In/15Pb/5Ag	7.85	No	-	-	4.75-4.98	14.3-14.9	-	76 - 79.6	-	-
4 100In	7.31	Yes	95-99.5	-	-	-	-	-	-	-
7 50In/50Pb	8.86	No	-	-	-	47.5-49.8	-	47.5-49.8	-	-
42 46Bi/34Sn/20Pb	8.99	No	32.3-33.8	-	-	19 - 19.9	43.7-45.8	-	-	-
104 Sn62/36Pb/2Ag	8.41	No	59.4-61.7	-	1.3-1.4	34.3-35.8	-	-	-	-
106 Sn63/Pb37	8.25	No	59.9-62.7	-	-	35.2-36.8	-	-	-	-
121 96.5Sn/3.5Ag	7.36	Yes	91.7-96	-	3.3-3.5	-	-	-	-	-
133 Sn95/Sb5	7.25	Yes	90.3 - 94.5	-	-	-	-	-	-	4.75 - 4.9
156 90Sn/10Ag	7.51	Yes	85.5 - 89.6	-	9.5 -10	-	-	-	-	-
161 97.5Pb/2.5Ag	11.33	Yes	-	-	2.38-2.48	92.6-97	-	-		-
171 95Pb/5Sn	11.06	Yes	4.75-4.95	-	-	90-94.5	-	-	-	-
182 80Au/20Sn	14.51	Yes	19-19.8	76-79.6	-	-	-	-	-	-
204 70In/30Pb	8.19	No	-	-	-	28.5-29.9	-	66.5-69.7	-	-
228 88Pb/10Sn2Ag	10.75	Yes	9.5-9.9	-	1.9-1.98	83.6-87.6	-	-	-	-

241 **95.5Sn/3.8Ag/0.7Cu**	7.40	Yes	90.7-95	-	3.6-3.8	-	-	-	0.67-0.69	----
246 **95.5Sn/4Ag/0.5Cu**	7.40	Yes	90.7-95	-	3.8-3.98	-	-	-	0.48-0.495	-
254 **(86.9Sn/10In/3.1**	7.37	Yes	82.6-86.5	-	2.9-3.08	-	-	9.5-9.95	-	-
256 **96.5Sn/3Ag/0.5Cu**	7.40	Yes	91.7 - 96	-	2.85-2.98	-	-	-	0.48 – 0.50	-
Indalloy (metal mix)	**Specific Gravity**	**RoHS 2 Compliance *****	**%TIN Sn**	**%GOLD Au**	**%SILVER Ag**	**%LEAD Pb**	**%BISMUTH Bi**	**%INDIUM In**	**%COPPER Cu**	**-**
281 **58Bi/42Sn**	8.56	Yes	39.9-41.8	-	-	-	55-57.7	-	-	-
282 **57Bi/42Sn/1Ag**	8.57	Yes	39.9-41.6	-	0.95-0.99	-	54.2-56.7	-	-	-
290 **97In/3Ag**	7.38	Yes	-	-	2.85-2.98	-	-	92.2-96.5	-	-
NS **96Sn/4Ag**	7.36	Yes	91.5-95.5	-	3.8-3.68	-	-	-	-	-
NS **96.3Sn/3.7Ag**	7.36	Yes	91.5-95.8	-	3.5-3.68	-	-	-	-	-
NS **77Pb/20Sn/3Ag**	10.19	No	19-19.9	-	2.85-2.98	73-76.6	-	-	-	-

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RoHS 2= Restriction of Hazardous Substances ***EU Directive 2011/65/EU (review for any applicable exemptions for high melting lead products above)

NS = Non Standard Alloy Mixture