



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

## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Identifier:** INDALLOY WITH NC-10HF FLUX COATING

**MSDS Number:** MSDS-5352

**Revised Date:** 2 DECEMBER 2010

**Product Use:** Industrial Use (Mixture) – Flux coated perform for soldering applications. Review alloy table for exact product identification. Note: this SDS covers various metal mixtures using the same flux.

See alloy table for listing of products included under this SDS.

**FOR CHEMICAL EMERGENCY ONLY PHONE \*:**

**CHEMTREC 24 hrs.**

**USA: 1 (800) 424-9300**

**Outside USA: +1 (703) 527-3887**

**\* Used only for spill/leak/fire/exposure/accident**

**ALL OTHER INQUIRIES: TOLL FREE: +1-800-448-9240 Indium Corporation**

**MANUFACTURER/SUPPLIER/IMPORTER:**

**In America:**

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1676 Lincoln Ave., Utica NY 13502

Technical & Safety Information: (315) 853-4900

Safety & SDS Information: [nswarts@indium.com](mailto:nswarts@indium.com)

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**2. HAZARDS IDENTIFICATION****PRIMARY ROUTES OF ENTRY:**

Eye    Inhalation    Skin    Ingestion    NTP    IARC    OSHA    Not Listed

**Carcinogen listed in****Classification:**

Xn                      Risk Phrases: R20/21/22, R36/37/38, R42/43, R33, R40, R48, R61, R52/53

**General GHS:**

Signal Word: Warning

**Hazard statement(s)**

H302	Harmful if swallowed
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
H351	Suspected of causing cancer (lead)
H360	May damage 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)
H400+H413	Very toxic to aquatic life, may cause long lasting harmful effects to aquatic life (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)

- P233 Keep container tightly closed
- P261 Avoid breathing dust/fume/gas/mist/vapours/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 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

**Label:**

Specific labeling information for products. Please review information in metal alloy table for the specific product in question.

Lead – free :



Signal Word: Warning

**Hazard statement(s)**

- Harmful if swallowed
- Causes skin irritation
- May cause an allergic skin reaction
- May cause allergy or asthma symptoms or breathing difficulties if inhaled
- May cause respiratory irritation
- Harmful if inhaled
- Contains rosin. May produce an allergic reaction

**Precautionary statement(s)**

- Keep container tightly closed
- Avoid breathing dust/fume/gas/mist/vapours/spray
- Do not eat, drink or smoke when using this product
- Avoid release to the environment
- Wear protective gloves/protective clothing/eye protection/face protection
- Take off contaminated clothing and wash before reuse
- IF ON SKIN: Wash with plenty of soap and water
- IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
- IF IN EYES: Rinse continuously with water for several minutes

**Lead containing:**

Signal Word: Danger

**Hazard statement(s)**

Harmful if swallowed  
 Causes skin irritation  
 May cause an allergic skin reaction  
 May cause allergy or asthma symptoms or breathing difficulties if inhaled  
 May cause respiratory irritation  
 Harmful if inhaled  
 Suspected of causing cancer  
 May damage fertility or the unborn child  
 May cause damage to organs through prolonged or repeated exposure  
 Very toxic to aquatic life, may cause long lasting harmful effects to aquatic life  
 Warning! Contains lead. Review listing.  
 Contains rosin. May produce an allergic reaction

**Precautionary statement(s)**

Keep container tightly closed  
 Avoid breathing dust/fume/gas/mist/vapours/spray  
 Do not eat, drink or smoke when using this product  
 Avoid release to the environment  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Take off contaminated clothing and wash before reuse  
 IF ON SKIN: Wash with plenty of soap and water  
 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing  
 IF IN EYES: Rinse continuously with water for several minutes

**OTHER HAZARDS:****POTENTIAL HEALTH EFFECTS:**

- Eye Contact:** Fume from heated material at typical temperatures over 100°C may cause eye irritation. Hot materials may cause damage.
- Ingestion:** This product contains metal alloys, rosin and organic chemicals. May be harmful if swallowed. May cause burns to the digestive tract and systematic effects.
- Inhalation:** Vapors or fumes from this material at typical temperatures over 100°C may cause local irritation to the respiratory system. May be harmful if inhaled. Rosin may cause occupational asthma.
- Skin Contact:** May cause skin irritation or dermatitis. Rosin may cause skin sensitization. Hot material may cause burns to the skin.

**Chronic:** 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.

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. Signs and symptoms of exposure – anemia.

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.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

#### 3.2 Mixture:

Components	% wt	CAS Registry #/ EINECS#
TIN	*	7440-31-5/231-141-8
SILVER	*	7440-22-4/231-131-3
LEAD	*	7439-92-1/231-100-4
COPPER	*	7440-50-8 /231-159-6
ROSIN FLUX MIXTURE	3.0-4.0	65997-05-9

**THIS PRODUCT DOES NOT CONTAIN ANY EU REPORTABLE SUBSTANCES OF VERY HIGH CONCERN (SVHC).**

N.E. = Not established

\* See Alloy Table for breakdown of percentages of alloy mixtures

<http://www.indium.com>

**ALLOY TABLE**  
Metal mixed with flux coating

INDALLOY	%LEAD Pb	%TIN Sn	%SILVER Ag	%COPPER Cu	Specific Gravity	RoHS Compliance
104 (Sn62/Pb36/Ag2)	34.6-35.9	59.5-61.9	1.92-1.99	-	8.41	No
NON STANDARD (96.3Sn/3.7Ag)	-	92.4 - 96.2	3.55 - 3.69	-	7.36	Yes
241 (95.5Sn/3.8Ag/0.7Cu)	-	91.7- 95.4	3.6 - 3.79	0.67- 0.69	7.40	Yes
244 (99.3Sn/0.7Cu)	-	95.3 – 99.2	-	0.67 - 0.69	7.31	Yes

Non Standard = non standard alloy mixture

**\*RoHS = Restriction on Hazardous Substances (review applicable exemptions that may apply)**

- [http://europa.eu.int/comm/environment/waste/weee\\_index.tm](http://europa.eu.int/comm/environment/waste/weee_index.tm)

#### 4. FIRST AID MEASURES

**Description of first aid measures:**

- Eye Contact:** Hold eyelids apart and flush eyes with plenty of 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.

**Most important symptoms and effect, both acute and delayed:**

Skin contact may cause irritation. Long term contact may cause dermatitis.  
Inhalation of decomposed rosin fume may cause irritation or occupational asthma.  
Exposure to metal fumes may cause irritation to the respiratory system. Long term exposure by inhalation to metal fumes may cause illness such as metal fume fever.  
Exposure to lead fume may cause harm. Sign of overexposure is anemia.

**Indication of any immediate medical attention and special treatment needed:**

No specific special treatment information is available on this mixture. Review data provided in this document to understand the hazards when working with the product. No other information is available at this time.

#### 5. FIRE FIGHTING MEASURES

**Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Water, CO2, foam media.

**Special hazards arising from the substance or mixture:**

May produce toxic fumes of carbon monoxide if burning or metal oxide fumes.

**Advice for Firefighters**

Firefighters must wear approved self-contained breathing apparatus and full protective clothing.

Material product is not flammable. No other information is available.

## 6. ACCIDENTAL RELEASE MEASURES

### **Personal precautions, protective equipment and emergency procedures:**

#### **For non-emergency personnel:**

Keep away from the spill. Remove sources of ignition. Keep exhaust ventilation system running. In the event of a fire evacuate area.

#### **For emergency responders:**

Wear safety glasses, gloves when cleaning up any spill. Other equipment may be necessary based on the immediate area and other chemicals unrelated to the product that may be in use. Adequate ventilation should be available. Keep unnecessary personnel away from area during clean up. Solid metal can easily be cleaned up.

**Environmental Precautions:** Metals and organic chemicals are not suited for release to any body of water including drains.

### **Methods and material for containment and cleaning up:**

Spill or leak procedures: Solid metal can be picked up and placed into metal container. If hot allow to cool then place into metal container. Recycle metal.

**Reference to other sections:** See Section 8 for exposure levels.

## 7. HANDLING AND STORAGE

### **Precautions**

Keep containers tightly closed when not in use. Use care to avoid spills. Wear appropriate personal protective equipment when working or handling product. Always thoroughly wash your hands after handling this product. DO NOT touch or rub eyes until hands are washed. Do not eat, drink or smoke when handling this product. Utilize exhaust ventilation when heating product. Emissions may contain metal fumes, rosin and organic compounds.

### **Conditions for Safe Storage, including any incompatibilities:**

**Storage Precautions:** Store product in tightly capped original containers in a cool, dry area. Refer to product label and product data sheet for specific storage temperature requirements. Rotate stock to ensure use before expiration date.

**Specific End Use(s):** Soldering applications.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control Parameters:

		<u>CAS#/EINECS#</u>	<u>TWA</u> mg/m3	<u>STEL</u> mg/m3
<b>TIN</b>	*	7440-31-5/231-141-8		
		(UK)	2	4
		(Belgium)	2	-
		(Germany)	2	-
		(Netherlands)	2	-
		(Spain)	2	-
<b>SILVER</b>	*	7440-22-4/231-131-3		
		(UK)	0.1	0.3
		(Belgium)	0.1	-
		(France)	0.1	-
		(Germany)	0.1	-
		(Netherlands)	0.1	-
(Spain)	0.1	-		
<b>LEAD</b>	*	7439-92-1/231-100-4		
		(UK)	0.15	-
		(France)	0.1	-
		(Spain)	0.15	-
		(Italy)	0.15	-
		(Portugal)	0.05	-
		(Finland)	0.1	-
		(Denmark)	0.05	-
		(Austria)	0.1	0.4
		(Switzerland)	0.1	0.8
		(Poland)	0.05	-
(Norway)	0.05	-		



(Ireland) 0.15 -

**COPPER** \* 7440-50-8 /231-159-6  
(UK) - 0.2 (fume) -

**ROSIN** 3.0-4.0 65997-05-9  
(EU) 0.05 N.E. 0.15 (sensitiser)

N.E. = Not established

**Exposure Controls:**

**Engineering Controls:** Use with proper equipment with adequate exhaust ventilation and other safety features specifically designed for use with solder applications. Control concentration of all components with established exposure limits so they are not exceeded. Use exhaust ventilation when heating product. Air emission control equipment may be necessary based on the local governmental requirements for contaminants entering the atmosphere. Emissions may contain metal fume, rosin and organic compounds.

**Personal protection:**

**Eyes:** Chemical safety glasses/goggles. Face shield for molten metal.

**Respiratory:** An approved or EU compliant CE marked air-purifying respirator with a fume/organic chemical cartridge is recommended under certain circumstances (i.e. when re-flowing manually on a plate instead of a ventilated re-flow furnace) where airborne concentrations are expected to be elevated or exceed exposure limits.

**Skin:** Compatible chemical resistant gloves. Recommend a nitril disposable or other chemical glove. Hot gloves for handling molten metal.

**Other:** Lab coat, eye-wash fountain in work area. Avoid the use of contact lenses in high fume 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. Follow standard lead work practices, if applicable.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties:**

<b>Appearance:</b>	Solid metal	<b>Boiling Point/Range:</b>	Not determined
<b>Odor:</b>	None.	<b>Melting Point/Freezing Point:</b>	Not applicable
<b>Odor Threshold:</b>	Not established	<b>Evaporation Rate:</b>	Not applicable
<b>Specific Gravity:</b>	See alloy table	<b>pH:</b>	Not applicable
<b>Vapour Pressure:</b>	Not applicable.	<b>Solubility in Water:</b>	Insoluble
<b>Vapour Density:</b>	(air=1) Not applicable.	<b>Partition coefficient:</b>	Not established
<b>Relative Density:</b>	Not established	<b>Flammability:</b>	Not applicable
<b>Flash Point:</b>	Not applicable	<b>Method:</b>	Not applicable

<b>Auto-ignition Temperature:</b> Not applicable	<b>Flammable Limits:</b> Limits not established
<b>UEL/LEL Limits:</b> Not applicable	<b>Decomposition Temp:</b> Not applicable
<b>Viscosity:</b> Not established	<b>Explosive properties:</b> Not applicable
<b>Oxidizing Properties:</b> Not established	

**Other Information:** Above data for the whole mixture.

## 10. STABILITY AND REACTIVITY

<b>Reactivity:</b>	Stable.
<b>Chemical Stability:</b>	Stable
<b>Possibility of Hazardous Reactions:</b>	Not established
<b>Conditions To Avoid:</b>	None known
<b>Incompatible Materials:</b>	Avoid contact with acids, bases or oxidizing agents.
<b>Hazardous Decomposition / Combustion:</b>	Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. Metal oxide fumes.
<b>Hazardous Polymerization:</b>	Will not occur.

## 11. TOXICOLOGICAL INFORMATION

### Information on toxicological effects:

<b>Acute toxicity:</b> Not established	<b>Mutagenicity:</b> Not established
<b>Irritation:</b> Not established	<b>Toxicity for Reproduction:</b> Not Established
<b>Corrosivity:</b> Not applicable	<b>Absence of specific data:</b> None available (not tested)
<b>Sensitization:</b> Not available	

**Repeated dose toxicity:** Not established

**Carcinogenicity:** Not established

**Likely Routes of Entry:** eyes (irritation) /skin (irritation or sensitization) /inhalation (irritation/sensitization) ingestion (may be harmful)

**Interactive effects:** None known

### Symptoms related to the physical, chemical and toxicological characteristics:

May cause irritation or sensitization by skin and inhalation.

### Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Exposure to rosin fume has been known to cause occupational asthma. Exposure to lead fume, if applicable, may cause harm by inhalation and ingestion. Chronic exposures to lead fume, if applicable, can cause potential harm to the developing fetus. Lead exposure can be toxic.

**Mixture verses substance information:** None known

### Other Information:

<b>Carcinogenicity:</b>	<b>NTP:</b> No (National Toxicity Program)
<b>Listing</b>	<b>OSHA:</b> No (US Occupational Safety & Health Administration)
	<b>IARC:</b> Yes - Lead and lead compounds are listed as possible carcinogens. (International Agency for Research on Cancer)

Copper - LD50 – intraperitoneal mouse 3.5 mg/kg.

Silver – LD50 oral – rat > 5,000 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

This section is subject to future development. Product mixtures not tested.

**Toxicity:** No information available

**Persistence and degradability:** No information available

**Bioaccumulative potential:** No information available

**Mobility in soil:** No information available

**Results of PBT and vPvB assessments:** No data is available

**Other adverse effects:** No information is available for mixture. Avoid release to environment.

Copper – Toxicity to daphnia and other aquatic invertebrates mortality NOEC – Daphnia 0.004 mg/l – 24h.

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 treatment method:** Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with environmental regulations. Containerize material and classify according to applicable regulations. No pre-treatment on site is recommended. Do not dispose of down any drain or waterway. Utilize the same personal protective equipment as the user when handling for disposal.

**RoHS (Restriction of Hazardous Substances):** some of the product mixtures are RoHS compliant because they are lead free. Product mixtures do not contain any PBB or PBDT brominated compounds.

RoHS – Note that some of the product mixtures do contain lead and are therefore not complaint with RoHS. Users should review their particular use for any applicable exemptions that may apply. Review alloy table for products.

## 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

Not regulated/non hazardous under US DOT (United States Department of Transportation).

Not regulated/non hazardous under international shipping requirements.

**UN proper shipping name:** None

**Transport hazard class(s):** None

**Packing group:** None

**Environmental hazards:** None

**Special precautions for user:** None

**Transport in bulk:** Not applicable

## 15. REGULATORY INFORMATION

### **Safety, health and environmental regulations/legislation specific for the substance or mixture:**

The information in this Material 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.).

All ingredients are listed on the USEPA TSCA Inventory.

All ingredients are listed on EINECS. Note Rosin was recently listed under the No Longer Polymer List, Notification of New Chemical Substances in Accordance with Directive 67/548/EEC.

Safety data sheet was developed using EC 1907/2006 amended as of 20 May 2010 EU No 453/2010 and information as stated under regulation EC No 1272/2008 CLP Regulation.

GHS = Global Harmonized System

CLP= Classification, labeling and packaging

Product does not contain any substances ozone depleting substances and therefore not subject to EC 2037/2000.

**Chemical safety assessment:** None performed for mixture.

## 16. OTHER INFORMATION

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

### **Risk Phrases:**

- R42/43        May cause sensitization by inhalation or by skin contact  
R36/37/38    Irritating to eyes, respiratory system and skin  
R20/21/22    Harmful by inhalation, in contact with skin and if swallowed  
R33            Danger of cumulative effects (lead)  
R40            Limited evidence of carcinogenic effect (lead)  
R48            Danger of serious damage to health by prolonged exposure (lead)  
R61            May cause harm to the unborn child (lead)  
R52/53        Harmful to aquatic organisms and may cause long-term effects in the aquatic environment (lead)

### **Safety Phrases:**

- S20/21        When using do not eat, drink or smoke  
S23            Do not breathe fumes  
S24/25        Avoid contact with skin and eyes  
S27            Take off immediately all contaminated clothing  
S28            After contact with skin wash immediately with plenty of soap and water  
S36/37/39    Wear suitable protective clothing, gloves and eye/face protection  
S7             Keep container tightly closed

**Revised Date:**                2 DECEMBER 2010

**Prepared by:**                Nancy Swarts, The Indium Corporation of America, nswarts@indium.com

**Approved by:**                Nancy Swarts, The Indium Corporation of America

Changes provided on this SDS were based on the requirements of EU No. 453/2010 of May 20, 2010 regarding amendments to EC No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

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.