



## SAFETY DATA SHEET

### 1. PRODUCT AND COMPANY IDENTIFICATION

**General Product Class Identifier:** **INDALLOY WITH INDIUM 3.2HF (No Lead)**  
(View product table for individual product descriptions)

**SDS Number:** SDS-5172-LF

**Revised Date:** 11 AUGUST 2022

Revision 1.6

**Product Use:** Industrial Use- water- wash solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder used for solder applications. See Alloy table for metal mixes with the same flux.

#### MANUFACTURER:

##### In America:

**The Indium Corporation of America®.**  
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##### In China:

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## 2. HAZARDS IDENTIFICATION

### PRIMARY ROUTES OF ENTRY:

Eye    Inhalation    Skin    Ingestion

### CARCINOGEN LISTED IN:

NTP    IARC    OSHA    Not Listed

#### Classification:

Skin sensitizer (Category 1B)

Respiratory sensitizer (Category 1B)

#### GHS



Signal Word: Warning

#### Hazard statement(s)

H319 Causes serious eye irritation

H335 May cause respiratory irritation

#### 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+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P302+P352 IF ON SKIN: Wash with plenty of soap and water

P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

### 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 serious eye irritation.

**Ingestion:** May cause irritation. May be harmful (lead containing).

**Inhalation:** Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local irritation to the respiratory system.

**Skin Contact:** May cause skin irritation. Antimony may cause dermatitis.

**Chronic:** **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. Chronic exposure to tin dusts and fume may result in "stannosis" a mild form of pneumoconiosis.

**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.

**BISMUTH:** May cause kidney damage.

**ANTIMONY:** May be harmful if inhaled. May cause respiratory irritation

**NICKEL** – poison by ingestion. Can cause pulmonary asthma, and hypersensitivity.



**WARNING:** This product can expose you to chemicals including [trace levels of lead, ethylene oxide, 1,4 dioxane, and propylene oxide] which are known to the State of California to cause cancer and [trace levels of lead and ethylene oxide] which are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Components	% wt	CAS Registry #/EINECS#	PEL mg/m <sup>3</sup>	TLV-TWA mg/m <sup>3</sup>	TLV-STEL mg/m <sup>3</sup>
<b>TIN</b>	34.9 - 92	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
<b>SILVER</b>	0 – 3.5	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	N.E.	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	0.1	-	-
<b>COPPER</b>	0 – 3.5	7440-50-8/231-159-6			
		(US)	0.1	0.2	-
		(EU)	-	0.2 (fume)	2(dust)
		(Canada)	-	0.2	0.6
		(Singapore)	0.2(fume)	1(dust)	-
		(Mexico)	0.2	-	2
		(China)	-	0.2(fume)	0.6(fume)

<b>ANTIMONY</b>	0 – 9.2	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	-
			<b>INDIUM</b>	0 – 16.3	7440-74-6/231-180-0	(US)
(EU)	-	0.1				0.3
(Canada)	-	0.1				0.3
(Mexico)	-	0.1				0.3
(Singapore)	0.1	-				-
(China)	-	0.1				0.3
<b>BISMUTH</b>	0 - 53	7440-69-9/231-177-4				N.E.
<b>NICKEL</b>	0 – 2.5	7440-02-0/231-111-4	(US)	1	1.5	-
			(Canada)	-	1	2
			(Mexico)	-	1	-
			(Singapore)	1	-	-
			(China)	-	1	2.5
			<b>ORGANIC ACIDS</b>	0 – 4	68937-72-4	N.E.
<b>METHOXY POLYGLYCOL ETHER</b>	3.0-7.0	9004-74-4	N.E.	N.E.	N.E.	
<b>ETHANOLAMINE</b>	1.0-5.0	141-43-5	N.E.	5	N.E.	
		(Singapore)	5	-	-	

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 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:** Using a spatula, scoop up paste and place in a plastic or glass jar and tightly cap. Remove traces of paste residue using cloth rags or paper towels moistened with ethyl or isopropyl alcohol. Dispose contaminated cloth rags or paper towels following all Federal, State and Local regulations. In the EU refer to the Special Waste Regulations. Material may have reclaim value.

#### **7. HANDLING AND STORAGE**

**Handling Precautions:** Keep containers tightly closed when not in use. Use care to avoid spills. Use only with production equipment specifically designed for use with solder paste. Wear appropriate personal protective equipment when working or handling solder paste. 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.

#### **8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Engineering Controls:** Use only with production equipment (such as stencil printers and re-flow furnaces) with adequate ventilation and other safety features specifically designed for use with solder paste. Control concentration of all components so that exposure levels are not exceeded. Use ventilation.

**Personal protection:**

- Eyes:** Chemical safety glasses/goggles. Face shield for splash hazards.
- Respirator:** An authority approved or compliant 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. Latex gloves not recommended.
- Other:** Lab coat, eyewash fountain in work area. Avoid the use of contact lenses in high fume areas.

**Work/Hygienic Practices:** Maintain good housekeeping. Clean up spills immediately. DO NOT allow rags or paper towels contaminated with solder paste to accumulate in the work area. 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.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Grey colored paste.	<b>Boiling Point:</b>	Not applicable.
<b>Odor:</b>	Mild characteristic odor.	<b>Melting Point:</b>	Not applicable
<b>Specific Gravity:</b>	1 g/cc	<b>pH:</b>	4 -8 (flux)
<b>Vapor Pressure:</b>	Not applicable.	<b>Solubility in Water:</b>	Insoluble (paste)
<b>Vapor Density:</b>	(air=1) Not applicable.		

## 10. STABILITY AND REACTIVITY

**General:** Stable.

**Conditions to Avoid:** Not established.

**Incompatible Materials:** Avoid contact with acids, bases or oxidizing agents.

**Hazardous Decomposition / Combustion:** Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.

**Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Carcinogenicity:** **NTP:** Yes - Nickel (National Toxicity Program)  
**OSHA:** No (Occupational Safety & Health Administration)  
**IARC:** Yes - Nickel (International Agency for Research on Cancer)

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

Product not tested.

### Other:

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

Tin – LD 50 oral-rat >2000 mg/kg

Antimony – LD50 – Oral (rat) 7000 mg/kg

Bismuth – LD50 oral-rat 5,000 mg/kg

NICKEL RTECS# QR5950000; INDIUM RTECS# NL1050000

## 12. ECOLOGICAL INFORMATION

Product not tested.

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.

Silver- Toxicity to fish: semi static test LC 50 (fathead minnow) 0.0021 mg/l- 96h. (Remarks – Ecotox Database). Skin (rabbit) – result – no skin irritation. Eye (rabbit) – result – no eye irritation.

### 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 international regulations and requirements. Not regulated (US Department of Transportation).

Not hazardous under shipping regulations. (ground/air/ocean)

UN – none

Not regulation under IATA.

North American Emergency Guide Book – Not applicable

Marine Pollutant- no.

### 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.).



**WARNING:** This product can expose you to chemicals including [trace levels of lead, ethylene oxide, 1,4 dioxane, and propylene oxide] which are known to the State of California to cause cancer and [trace levels of lead and ethylene oxide] which are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

SARA 313 Listing - 40 CFR 372.65

Silver

Copper

Antimony

Nickel

All ingredients are listed on the EPA TSCA Inventory.

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

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.

Canadian WHMIS:



Nickel: D2A Very Toxic Material Causing Other Toxic Effects carcinogenicity: IARC group 2B

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 Limit for Hazardous Agents in the Workplace, GBZ2-2007.

#### 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)

All ingredients are listed on the Korean Existing Chemical Inventory.

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).

## **16. OTHER INFORMATION**

<b>HMIS Hazard Rating:</b>	<b>Health:</b>	1
	<b>Fire:</b>	1
	<b>Reactivity:</b>	0

**Revised Date:** 11 AUGUST, 2022

**Prepared by:** Piumi Liyanage, Indium Corporation of America

**Approved by:** Piumi Liyanage, Indium Corporation of America

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**ALLOY TABLE (DATA)****%Metal Mix in Flux**

<b>Indalloy Mixture (%Metal)</b>	<b>%TIN Sn</b>	<b>% SILVER Ag</b>	<b>% COPPER Cu</b>	<b>% BISMUTH Bi</b>	<b>% ANTIMONY Sb</b>	<b>% INDIUM In</b>	<b>% NICKEL Ni</b>	<b>RoHS 2/3* Compliance (2011/65/EU)</b>
<b>121 (96.5Sn/3.5Ag)</b>	80-88.8	2.9-3.2	-	-	-	-	-	YES
<b>128 100Sn</b>	83-92	-	-	-	-	-	-	YES
<b>133 (95Sn/5Sb)</b>	78.9-87	-	-	-	4.2-4.6	-	-	YES
<b>241 (SAC 387) (95.5Sn/3.8Ag/0.7Cu)</b>	79.2-87.9	3.2-3.5	0.58-0.64	-	-	-	-	YES
<b>244 (99.3Sn/0.7Cu)</b>	82.4-91.4	-	0.58-0.64	-	-	-	-	YES
<b>254 (86.9Sn/10 In/3.1Ag)</b>	72-80	2.6-2.9	-	-	-	8.3-9.2	-	YES
<b>256 (SAC 305) (96.5Sn/3Ag/0.5Cu)</b>	80.1-88.8	2.5-2.8	0.42-0.46	-	-	-	-	YES
<b>259 (Sn90/Sb10)</b>	74.7-82.8	-	-	-	8.3-9.2	-	-	YES
<b>263 (SAC0307) (99Sn/0.3Ag/0.7Cu)</b>	82-91	0.25-0.28	0.58-0.64	-	-	-	-	YES
<b>276 (90.6Sn/5.5Sb/Ag 3.2/Cu0.7)</b>	75.2-83.4	2.66-2.9	0.58-0.64	-	4.6-5.1	-	-	YES
<b>281 (Bi58/Sn42)</b>	34.9-38.6	-	-	48-53	-	-	-	YES
<b>292</b>	71.9-79.8	2.6-2.9	0.58-0.64	2.6-2.9	4.6-5.1	0.41-0.46	0.16-0.2	YES
<b>Non-standard (96Sn/4Ag)</b>	79.7-88.3	3.3-3.7	-	-	-	-	-	YES
<b>945-3-1</b>	77.8-86.2	2.86-3.17	0.64-0.71	-	1.7-1.8	-	-	YES
<b>945-3-2</b>	76.7-85	3.05-3.39	0.76-0.84	-	2.5-2.8	-	-	YES
<b>874-71-1</b>	78.4 – 86.6	2.1 – 2.7	0.9 – 1.1	-	-	14.1 – 16.3	-	YES
<b>940-44-1</b>	77.4 – 85.8	2.4 – 2.7	3.15 – 3.5	-	-	-	-	YES

\*RoHS 2 = Restriction on Hazardous Substances (review for applicable exemptions) (2011/65/EU)

\*RoHS 3 = Products do not contain any listed phthalates