



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

**Disclaimer - This safety data sheet (SDS) 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 and reduce the paperwork burden, 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 used globally.**

## SAFETY DATA SHEET

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH INDIUM8.9HF1 FLUX VEHICLE

**SDS Number:** SDS-5073

**Revised Date:** 26 APRIL 2016

**Product Use:** Industrial Use (mixture) - Solder paste consisting of a flux vehicle blended with 83-92 weight percent pre-alloyed metal powder.

#### MANUFACTURER:

##### In America:

The Indium Corporation of America  
1676 Lincoln Ave., Utica NY 13502  
Information: (315) 853-4900  
nswarts@indium.com

##### EMERGENCY PHONE:

**CHEMTREC 24 hrs.**  
**USA: 1 (800) 424-9300**  
**Outside USA: +1 (703) 527-3887**

##### In Europe:

Indium Corporation of Europe  
7 Newmarket Ct.  
Kingston, Milton Keynes, UK, MK 10 OAG  
Information: +44 [0] 1908 580400

##### In China:

Indium Corporation (Suzhou) Co., Ltd.  
No. 428 Xinglong Street  
Suzhou Industrial Park  
Suchun Industrial Square  
Unit No. 14-C  
Jiangsu Province, China 215126  
Information: (86) 512-6283-4900

##### In Asia:

Indium Corporation of America  
Asia-Pacific Operations-Singapore  
29 Kian Teck Avenue  
Singapore 628908  
Information: +65 6268-8678

## 2. HAZARDS IDENTIFICATION

GHS:



use  for lead containing products

Signal Word: Warning

Hazard statement(s)

- H317 May cause an allergic skin reaction
- H320 Causes eye irritation
- H334 May cause allergy or asthma symptoms or breathing difficulties 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)

- 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 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 content via approved waste handling or recycle if possible.

Classification:

- Eye Irritant (Category 2)
- Carcinogenicity (Category 2) (lead)
- Reproductive toxicity (Category 2) (lead)
- Acute aquatic toxicity (Category 1) (lead)
- Chronic aquatic toxicity (Category 1) (lead)

**PRIMARY ROUTES OF ENTRY:**

⊕Eye    ⊕Inhalation    ⊕Skin    ⊕Ingestion

**Carcinogen listed in**

NTP    IARC    OSHA    ⊕Not Listed  
See Section 11

**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.

<b>Ingestion:</b>	This product contains metal alloy powders and chemicals. Irritating to digestive tract. May be harmful.
<b>Inhalation:</b>	Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause irritation to the respiratory system. May be harmful, if inhaled. Inhalation of rosin fume may cause occupational asthma. Lead fumes, if applicable, may be harmful.
<b>Skin Contact:</b>	May cause skin irritation. Rosin may cause dermatitis and product may cause skin sensitization.
<b>Chronic:</b>	<p><u>SILVER</u>: 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.</p> <p><u>TIN</u>: Has been shown to increase incidence of sarcoma in animal tests.</p> <p><u>COPPER</u>: 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.</p> <p><u>LEAD</u>: 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.</p>
<b>Warning:</b>	This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (lead) (Applicable in the State of California Only)
<b>Note:</b>	<b>The Indium Corporation does not recommend, manufacture, market or endorse any of its products for human consumption.</b>
<b>Warning:</b>	<b>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.</b>

### 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>LEAD</b>	*	7439-92-1/231-100-4			
		(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)	- -

<b>TIN</b>	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
<b>SILVER</b>	*	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	-	-
<b>COPPER</b>	*	7440-50-8/231-159-6			
		(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
				0.2(fume)	0.6
<b>BISMUTH</b>	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
<b>ROSIN</b>	3.0-6.0	65997-05-9	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
<b>POLYGLYCOL ETHER</b>	3.0-5.0	9038-95-3	N.E.	N.E.	N.E.
<b>PROPRIETARY ACTIVATORS NON HAZARDOUS</b>	1.0-6.0	-	N.E.	N.E.	N.E.
N.E. = Not established					
Product complies with *RoHS 2 Restriction of Hazardous Substances (review directive for applicable exemptions)					
* See Alloy 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:** 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. Wear personal protective equipment.

## 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 (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 any permissible exposure limits are not exceeded. Exhaust ventilation is recommended when heating this product. Protect operators from potential lead fumes.
- Personal protection:**

<b>Eyes:</b>	Chemical safety glasses/goggles. Face shield for any splash hazards.
<b>Respirator:</b>	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.
<b>Skin:</b>	Compatible chemical resistant gloves. Latex gloves are not recommended.
<b>Other:</b>	Lab coat, eye-wash fountain in work area. Avoid the use of contact lenses in high fume areas.
<b>Work/Hygienic Practices:</b>	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

<b>General:</b>	Stable.
<b>Conditions to Avoid:</b>	Not established.
<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.
<b>Hazardous Polymerization:</b>	Will not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>Carcinogenicity:</b>	<b>NTP:</b> No		
	<b>OSHA:</b> No	29CFR1910.1025	
	<b>IARC:</b> Yes	Lead and lead compounds are listed as possible carcinogens	
<b>LD50:</b>	Not established.	<b>LC50:</b>	Not established.
<b>Other:</b>	Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma.		

## 12. ECOLOGICAL INFORMATION

Product not tested.

An environmental hazard cannot be excluded in the event of mismanagement or unprofessional handling or disposal of this product.

Lead is very toxic to the aquatic environment with long lasting effects.

### 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 DOT (United States Department of Transportation).

Not regulated under IATA.

Non - hazardous under shipping requirements.

North American Emergency Guide Book – Product Not Classified

UN – none

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.).

Applicable ONLY in California - California PROP 65 (Safe Drinking Water Standard):

This product contains a chemical known to the State of California to cause cancer and/or birth defects or other reproductive harm. (lead)

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

SARA 313 Listing - 40 CFR 372.65

Silver Copper Lead 3.5% Proprietary glycol ether

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).



Canadian WHMIS: Class D 2 Materials causing other toxic effects (skin and eye irritant/skin sensitizer)  
D2A-Materials Causing Other Toxic Effects-Very Toxic Material (Chronic) (lead)

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 guidelines, NOM-018-STPS-2015 and NOM-010-STPS-2014.

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, GBZ2-2002.

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).

### ALLOY TABLE

%Metal mix with flux

<b>INDALLOY (METAL MIX)</b>	<b>%COPPER Cu</b>	<b>%TIN Sn</b>	<b>%SILVER Ag</b>	<b>%BISMUTH Bi</b>	<b>%LEAD Pb</b>	<b>*RoHS 2 Compliance</b>
<b>100</b> (62.6Sn/37Pb/0.4Ag)	-	<b>52-57.6</b>	<b>0.33-0.37</b>	-	<b>30.7-34</b>	<b>No</b>
<b>104</b> (62Sn/36Pb/2Ag)	-	<b>51.5-57</b>	<b>1.7-1.8</b>	-	<b>29.9-33</b>	<b>No</b>
<b>106</b> (63Sn/37Pb)	-	<b>52-57</b>	-	-	<b>30.7-34</b>	<b>No</b>
<b>241</b> (SAC 387) (95.5Sn/3.8Ag/ 0.7Cu)	<b>0.58-0.64</b>	<b>79.3-87.9</b>	<b>3.2-3.5</b>	-	-	<b>Yes</b>
<b>246</b> (SAC 405) (95.5Sn/4Ag/0.5Cu)	<b>0.42-0.46</b>	<b>79.3-87.9</b>	<b>3.3-3.7</b>	-	-	<b>Yes</b>
<b>256</b> (SAC 305) (96.5Sn/3Ag/0.5Cu)	<b>0.45-0.46</b>	<b>85.9-88.8</b>	<b>2.67-2.76</b>	-	-	<b>Yes</b>
<b>256</b> (SAC305) (96.5Sn/3Ag/0.5Cu doped with 0.19% Ce)	<b>0.45-0.46</b>	<b>85.9-88.8</b>	<b>2.67-2.76</b>	-	-	<b>Yes</b>
<b>258</b> (SAC105) (98.5Sn/1Ag/0.5Cu)	<b>0.45-0.46</b>	<b>81.8-90.6</b>	<b>0.83-0.92</b>			<b>Yes</b>
<b>260</b> <b>SACm 510</b> (98.5Sn/1Ag/0.5Cu/ Doped 0.05Mn)	<b>0.42-0.46</b>	<b>81.8-90.6</b>	<b>0.83-0.92</b>	-	-	<b>Yes</b>
<b>263</b> (99Sn/0.3Ag/0.7Cu)	<b>0.58-0.64</b>	<b>82-91</b>	<b>0.25-0.28</b>	-	-	<b>Yes</b>



<b>Non Standard Mix</b> (90.5Sn/7.5Bi/2Ag)	-	<b>75-83</b>	<b>1.7-1.8</b>	<b>6.2-6.9</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (94.25Sn/3Bi/2Ag/0.75Cu)	<b>0.62-0.69</b>	<b>78.2-86.71</b>	<b>1.7-1.8</b>	<b>2.5-2.8</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (92.3Sn/7Bi/0.7Cu)	<b>0.58-0.64</b>	<b>76.6-84.9</b>	-	<b>5.8-6.4</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (91.3Sn/7Bi/1Ag/0.7Cu)	<b>0.58-0.64</b>	<b>75.8-84</b>	<b>0.83-0.92</b>	<b>5.8-6.4</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (75.5Sn/24Bi/0.5Cu)	<b>0.42-0.46</b>	<b>62.7-69.5</b>	-	<b>19.9-22</b>	-	<b>Yes</b>

Non Standard = special or custom blend of metal alloys

RoHS 2= Restriction of Hazardous Substances EU Directive 2011/65/EU

Some products listed above meet the definition of lead free. Product contains trace levels of lead and other metals.

Product does not contain any flame-retardants.

Other products contain lead. Review any exemption to determine if they apply.

## 16. OTHER INFORMATION

**HMIS Hazard Rating:**

<b>Health:</b>	2
<b>Fire:</b>	1
<b>Physical Hazard:</b>	0

**Revised Date:** 26 APRIL 2016

**Prepared by:** Nancy Swarts, Indium Corporation of America

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

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**Note: This SDS may be translated into an international language. If there is any misinterpretation or misunderstanding of any words or phrases that may occur within any translation the ENGLISH language shall always prevail.**