



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

## SAFETY DATA SHEET

This safety data sheet 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 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. For EU format contact Indium or visit <http://www.indium.com>.

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH INDIUM9.88 FLUX VEHICLE

**MSDS Number:** SDS-4716

**Revised Date:** 7 APRIL 2017

**Product Use:** Industrial Use - Solder paste consisting of a flux vehicle blended with 80-92 weight percent pre-alloyed metal powder for soldering applications.

#### MANUFACTURER:

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## 2. HAZARDS IDENTIFICATION

### PRIMARY ROUTES OF ENTRY:

Eye   
 Inhalation   
 Skin   
 Ingestion   
 NTP   
 IARC   
 OSHA   
 Not Listed

### Carcinogen listed in

GHS:

For 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)

For lead – containing products



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  
 H351            Suspected of causing cancer (lead)  
 H361            Suspected of damaging fertility or the unborn child  
 H373            May cause damage to organs through prolonged or repeated exposure  
 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)

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**Classification:**

Carcinogenicity (Category 2) (lead)

Reproductive toxicity (Category 2 ) (lead)

Skin sensitizer-Category 1B

Respiratory sensitizer-Category 1B

Acute aquatic toxicity – Category 1 for lead containing products (H400)

Chronic aquatic toxicity – Category 1 for lead containing products (H410)

**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.

**Ingestion:** This product contains metal alloy powders and organic chemicals. May be harmful if swallowed. May cause irritation.

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

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

**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.

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.

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.

INDIUM: May cause damage to respiratory system.

BISMUTH: May cause kidney damage.

**WARNING:** **Applicable in California: This product contains a chemical 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 joints and fittings of 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/m <sup>3</sup>	TLV-TWA mg/m <sup>3</sup>	TLV-STEL mg/m <sup>3</sup>
<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>LEAD</b>	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	-
		(EU)	-	0.15	-
		(Canada)	-	0.05	-

		(Singapore)	0.15	-	-
		(Mexico)	-	0.15	-
		(China)	-	0.05(dust)	-
			-	0.03(fume)	-
<b>INDIUM</b>	*	7440-74-6/231-180-0			
		(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
<b>ANTIMONY</b>	*	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>BISMUTH</b>	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
<b>ROSIN</b>	4.0-8.0	65997-05-9	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
<b>PROPRIETARY ACTIVATORS</b>	1.0-5.0		N.E.	N.E.	N.E.
<b>POLYGLYCOL ETHER</b>	3.0-6.0	9038-95-3	N.E.	N.E.	N.E.

N.E. = Not established

\* See Alloy Table

**ALLOY TABLE****Note: 80-92 %Metal mix with flux**

INDALLOY (METAL)	%COPPER Cu	%TIN Sn	%SILVER Ag	%LEAD Pb	ANTIMONY Sb	%INDIUM In	%BISMUTH Bi	^RoHS 2 Compliance
<b>4</b> (100 In)	-	-	-	-	-	<b>80-92</b>	-	<b>Yes</b>
<b>100</b> (62.6Sn/37Pb/0.4Ag)	-	<b>50-57.6</b>	<b>0.32-0.37</b>	<b>29.6-34</b>	-	-	-	<b>No</b>
<b>106</b> (63Sn/37Pb)	-	<b>50-58</b>	-	<b>29.6-34</b>	-	-	-	<b>No</b>
<b>121</b> (96.5Sn/3.5Ag)	-	<b>77.2-88.8</b>	<b>2.8-3.2</b>	-	-	-	-	<b>Yes</b>
<b>150</b> (81Pb/19In)	-	-	-	<b>64.8-74.5</b>	-	<b>15.2-17.5</b>	-	<b>No</b>
<b>241</b> (SAC387) (95.5Sn/3.8Ag/0.7Cu)	<b>0.56-0.64</b>	<b>76.4-87.9</b>	<b>3.0-3.5</b>	-	-	-	-	<b>Yes</b>
INDALLOY (METAL)	%COPPER Cu	%TIN Sn	%SILVER Ag	%LEAD Pb	ANTIMONY Sb	%INDIUM In	%BISMUTH Bi	^RoHS 2 Compliance
<b>243</b> (99Sn/1Cu)	<b>0.80-0.92</b>	<b>79.2-91.1</b>	-	-	-	-	-	<b>Yes</b>
<b>244</b> (99.3Sn/0.70Cu)	<b>0.56-0.64</b>	<b>79.4-91.4</b>	-	-	-	-	-	<b>Yes</b>
<b>256</b> (SAC 305) (96.5Sn/3Ag/0.5Cu)	<b>0.4-0.46</b>	<b>77.2-88.8</b>	<b>2.4-2.8</b>	-	-	-	-	<b>Yes</b>
<b>258</b> (SAC 105) (98.5Sn/1.0Ag/0.5Cu)	<b>0.4-0.46</b>	<b>78.8-90.6</b>	<b>0.80-0.92</b>	-	-	-	-	<b>Yes</b>
<b>NS</b> (90Sn/10Sb)	-	<b>72-82.8</b>	-	-	<b>8.0-9.2</b>	-	-	<b>Yes</b>
<b>NS</b> (89Bi/11Ag/ Doped 0.05Ge)	-	-	<b>8.8-10</b>	-	-	-	<b>71-81.9</b>	<b>Yes</b>
<b>Compositi on 1 Mix</b> (95.6Sn/2.9Ag/0.5Cu/1Pb)	<b>0.4-0.46</b>	<b>79.5-88</b>	<b>2.3-2.7</b>	<b>0.80-0.92</b>	-	-	-	<b>Yes</b>
<b>Compositi on 2 Mix</b> (92Sn/2.6Ag/ 5Pb/0.4Cu)	<b>0.32-0.37</b>	<b>73.6-84.6</b>	<b>2.0 -2.4</b>	<b>4-4.6</b>	-	-	-	<b>No</b>
<b>Compositi on 3 Mix</b> (78.4Sn/1.4Ag/ 20Pb/0.2Cu)	<b>0.16-0.18</b> <b>4</b>	<b>62.7-72</b>	<b>1.1-1.3</b>	<b>16-18</b>	-	-	-	<b>No</b>

#### 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.

#### 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 the permissible exposure limits are not exceeded. Use proper exhaust ventilation.

### Personal protection:

- Eyes:** Chemical safety glasses/goggles. Face shield for splash hazards.
- Respirator:** A 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, eye-wash 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> | Not applicable.           | <b>pH:</b>                  | Not applicable    |
| <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:** 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

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 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. Fresh fish: 0.44 mg/l LC50 96h/ 1.32 mg/l LC50 96h/water Flea: 600 ug/l EC50 = 48h

## 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).

Non hazardous under all shipping requirements.

North American Emergency Guide Book – Not Classified

UN – none

Non- hazardous- ground/IATA/IMDG

## 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.).

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. (lead0

SARA 313 Listing - 40 CFR 372.65

Silver                  Copper                  Lead                  Antimony

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).

WHMIS: D2B –Materials Causing Other Toxic Effects (irritant or sensitizer)

WHMIS: 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.

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

<b>HMIS Hazard Rating:</b>	<b>Health:</b>	2
	<b>Fire:</b>	1
	<b>Reactivity:</b>	0

**Revised Date:** 7 April 2017

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

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

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