



**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 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.

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH INDIUM3.2 FLUX VEHICLE

**SDS Number:** SDS- 4145

**Revised Date:** 16 MARCH 2015

**Product Use:** Industrial Use - Water wash solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder. ( mixture) Review metal alloy table for listing of mixtures with the same flux.

### MANUFACTURER:

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## 2. HAZARDS IDENTIFICATION

### PRIMARY ROUTES OF ENTRY:

⊗ Eye    ⊗ Inhalation    ⊗ Skin    ⊗ Ingestion    NTP

### Carcinogen listed in

IARC    OSHA    ⊗Not Listed  
**\*See Section 11**

GHS:



lead

Signal Word: Warning

#### Hazard statement(s)

H303	May be harmful if swallowed
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
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 harmful effects (lead)
EUH201A	Warning! Contains lead (applicable only to the products listed that contain lead) Review listing.

#### 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)

### 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:** This product contains metal alloy powder and organic chemicals. May be harmful if swallowed.
- Inhalation:** Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local irritation to mucous membranes and the upper respiratory tract.
- Skin Contact:** May cause skin irritation. Contact with **Antimony** may cause irritation or dermatitis.
- Chronic:** **TIN:** Has been shown to increase incidence of sarcoma in animal tests.

**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.

**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. Kidney and liver damage from injection of indium compounds has been reported based on limited animal testing. Target organs: teeth and gums

**BISMUTH:** May cause kidney damage.

**Warning:** This product contains 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 it's 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/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	0.01	N.E.
		(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	0.2	-
		(EU)	-	0.2	2
		(Canada)	-	0.2	0.6
		(Singapore)	0.2	1(dust)	-

		(Mexico)	-	0.2	2
		(China)	-	0.2(fume)	0.6
			-	1(dust)	2.5
<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	N.E.	N.E.	N.E.
<b>INDIUM</b>	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Canada)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	0.1	-	0.3
		(China)	0.1	-	0.3
<b>GOLD</b>	*	7440-57-5	N.E.	N.E.	N.E.
<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>MANGANESE</b>	*	7439-96-5/231-105-1	N.E.	N.E.	N.E.
<b>PROPRIETARY ACTIVATOR</b>	3.4-6.7		N.E.	N.E.	N.E.
<b>PROPRIETARY AMINE</b>	1.6-3.3	(US)	N.E.	5	N.E.
		(Singapore)	5	-	-
<b>POLYGLYCOL ETHER</b>	3.0-7.0	9038-95-3	N.E.	N.E.	N.E.

\* See alloy table at end of document

Symbol: Xn Risk Phrases: R20/21/22,R36/37/38, See Section 15 for additional information  
N.E. = Not established EU = European Union Occupational Exposure Limits

#### 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 proper personal protective equipment during clean up.

#### 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 they're permissible exposure levels are not exceeded.

**Personal protection:**

**Eyes:** Chemical safety glasses/goggles. Face shield for splash hazards.

**Respirator:** An 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.

**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

**Appearance:** Grey colored paste.

**Boiling Point:** Not applicable.

**Odor:** Mild characteristic odor.

**Melting Point:** Not applicable

**Specific Gravity:** Not applicable.

**pH:** Not applicable

**Vapor Pressure:** Not applicable.

**Solubility in Water:** Soluble

**Vapor Density:** (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 /** Harmful toxic oxide fumes may form at elevated temperatures. CO/CO<sub>2</sub>/HBr

**Hazardous Polymerization:** Will not occur.

### 11. TOXICOLOGICAL INFORMATION

**Carcinogenicity:** **NTP:** Yes (Lead )

**OSHA:** 29CFR1910.1025

**IARC:** Yes Lead and lead compounds are listed as possible carcinogens.

**Other:** Lead can cause potential harm to the developing fetus.

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.

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 (Department of Transportation).  
Non hazardous under shipping regulations, all modes (ground/IATA/IMDG)  
UN - none

## 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)



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 regulations NOM-018-STPS-2000 and NOM-010-STPS-1999.

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

California PROP 65: WARNING: State of California Applicable Only

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

SARA 313 Listing - 40 CFR 372.65

Silver CAS# 7440-22-4

Copper CAS# 7440-50-8

Antimony CAS# 7440-36-0

Lead CAS# 7439-92-1

All ingredients in this product are listed on the EPA TSCA Inventory.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

 $X_n$ **Risk Phrases:**

- R20/22 Harmful by inhalation and if swallowed (lead)  
R36/37/38 Irritating to eyes, respiratory system and skin  
R33 Danger of cumulative effects (lead)  
R61 May cause harm to the unborn child (lead)  
R40 Limited evidence of carcinogenic effect (lead)  
R48 Danger of serious damage to health by prolonged exposure (lead)  
R50/53 Very toxic 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  
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  
S62 If swallowed, do not induce vomiting seek medical advice immediately and show container or label  
S7 Keep container tightly closed

**16. OTHER INFORMATION**

**HMIS Hazard Rating:**    **Health:**        2  
   **Fire:**                1  
   **Reactivity:**        0

**Revised Date:**                16 MARCH 2015

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

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

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Note: This MSDS 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.

**ALLOY TABLE**

## Metal alloy mix with flux

<b>INDALLOY</b> Metal Product Mixture	<b>%TIN</b> Sn	<b>%SILVER</b> Ag	<b>%ANTIMONY</b> Sb	<b>%COPPER</b> Cu	<b>%</b> <b>INDIUM</b> In	<b>%BISMUTH</b> Bi	<b>%LEAD</b> Pb	<b>%GOLD</b> Au	<b>%</b> <b>COB</b> <b>ALT</b> <b>Co</b>	<b>%MANGAN</b> <b>ESE</b> <b>Mn</b>	<b>RoHS 2*</b> <b>Compliance</b> <b>(2011/65/EU)</b>
<b>106</b> <b>(Sn63/Pb37)</b>	<b>52.3-58</b>	-	-	-	-	-	<b>30.7-34</b>	-	-		NO
<b>121</b> <b>(Sn96.5/Ag3.5)</b>	<b>80-88.8</b>	<b>2.9-3.2</b>	-	-	-	-	-	-	-		YES
<b>128</b> <b>(100Sn)</b>	<b>83-92</b>	-	-	-	-	-	-	-	-		YES
<b>131</b> <b>(97Sn/3Sb)</b>	<b>80.5-89</b>	-	<b>2.49-2.76</b>	-	-	-	-	-	-		YES
<b>133</b> <b>(Sn95/Sb5)</b>	<b>78.9-87.4</b>	-	<b>4.2-4.6</b>	-	-	-	-	-	-		YES
<b>182</b> <b>(Au80/Sn20)</b>	<b>16.6-18.4</b>	-	-	-	-	-	-	<b>66.4-73.6</b>	-		YES
<b>209</b> <b>(Sn65/Ag25/Sb10)</b>	<b>54-59.8</b>	<b>20.8-23.0</b>	<b>8.3-9.2</b>	-	-	-	-	-	-		YES
<b>228</b> <b>(Pb88/Sn10/Ag2)</b>	<b>8.3-9.2</b>	<b>1.7-1.8</b>	-	-	-	-	<b>73-80.9</b>	-	-		Yes with exemption
<b>241 (SAC387)</b> <b>(Sn95.5/Ag3.8/Cu0.7)</b>	<b>79.3-87.9</b>	<b>3.2-3.5</b>	-	<b>0.58-0.64</b>	-	-	-	-	-		YES
<b>244</b> <b>(99.3Sn/0.7Cu)</b>	<b>82.4 – 91.3</b>	-	-	<b>0.58 – 0.64</b>	-	-	-	-	-		YES
<b>246</b> <b>(Sn95.5/Ag4/Cu0.5)</b>	<b>79.3-87.9</b>	<b>3.3-3.7</b>	-	<b>0.42-0.46</b>	-	-	-	-	-		YES
<b>249</b> <b>(Sn91.8/Bi4.8/Ag3.4)</b>	<b>76.2-84.5</b>	<b>2.8-3.1</b>	-	-	-	<b>4.0-4.4</b>	-	-	-		YES

<b>INDALLOY</b> Metal Product Mixture	%TIN Sn	%SILVER Ag	%ANTIMONY Sb	%COPPER Cu	% INDIUM In	%BISMUTH Bi	%LEAD Pb	%GOLD Au	% COB ALT Co	%MANGAN ESE Mn	<b>RoHS 2*</b> <b>Compliance</b> <b>(2011/65/EU)</b>
<b>252</b> <b>(Sn95.5/Ag3.9/Cu0.6)</b>	<b>79.3-</b> <b>87.9</b>	<b>3.2-3.6</b>	-	<b>0.50-</b> <b>0.55</b>	-	-	-	-	-		YES
<b>254</b> <b>(86.9Sn/10In/3.1Ag)</b>	<b>72-80</b>	<b>2.6-2.9</b>	-	-	<b>8.3-</b> <b>9.2</b>	-	-	-	-		YES
<b>256 (SAC 305)</b> <b>(Sn96.5/Ag3.0/Cu0.5)</b>	<b>80.1-</b> <b>88.8</b>	<b>2.5-2.8</b>	-	<b>0.42-</b> <b>0.46</b>	-	-	-	-	-		YES
<b>258</b> <b>(Sn98.5/Ag1/Cu 0.5)</b>	<b>81.8-</b> <b>90.6</b>	<b>0.83-</b> <b>0.92</b>	-	<b>0.42-</b> <b>0.46</b>	-	-	-	-	-		YES
<b>259</b> <b>(Sn90/Sb10)</b>	<b>74.7-</b> <b>82.8</b>	-	<b>8.3-9.2</b>	-	-	-	-	-	-		YES
<b>264</b> <b>Sn91.5/Sb8.5</b>	<b>75.9-</b> <b>84.2</b>	-	<b>7.1-7.8</b>	-	-	-	-	-	-		YES
<b>268</b> <b>(SACM0510)</b> <b>(98.5Sn/0.5Ag/1Cu)</b> <b>Doped 0.05Mn</b>	<b>81.8-</b> <b>90.6</b>	<b>0.42-</b> <b>0.46</b>	-	<b>0.83-</b> <b>0.92</b>	-	-	-	-	-	0.05	YES
<b>282</b> <b>(Bi57/Sn42/Ag1)</b>	<b>34.9-</b> <b>38.6</b>	<b>0.83-</b> <b>0.92</b>	-	-	-	<b>47.3-52.4</b>	-	-	-		YES
<b>Sn 992</b>	<b>82-91</b>	-	-	<b>0.42-</b> <b>0.46</b>	-	<b>0.25-0.28</b>	-	-	<b>0.04</b> <b>2-</b> <b>0.04</b> <b>6</b>		YES
<b>Non Standard</b> <b>(Sn96/Ag4)</b>	<b>79.7-</b> <b>88.3</b>	<b>3.3-3.7</b>	-	-	-	-	-	-	-		YES

\*RoHS 2 = Restriction of Hazardous Substances Solder related products are not directly related to the regulations. It is the customer's responsibility to ensure compliance. Review any applicable exemptions that may apply.