



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

This material 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 the Indium Corporation has generated one MSDS, 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.

## SAFETY DATA SHEET

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH INDIUM8.9E FLUX VEHICLE  
**MSDS Number:** MSDS-4713M **Revised Date:** 28 OCTOBER 2010  
**Product Use:** Industrial use - solder paste consisting of a flux vehicle blended with 89-92 weight percent pre-alloyed mixed metal powder.

\*See alloy table for exact name of each product.

#### MANUFACTURER:

##### In America:

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

##### CHEMICAL 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:

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

## 2. HAZARDS IDENTIFICATION

### PRIMARY ROUTES OF ENTRY:

⊕Eye    ⊕Inhalation    ⊕Skin    ⊕Ingestion    NTP    IARC    OSHA    ⊕Not Listed

### Carcinogen listed in

GHS:



### 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

### Precautionary statement(s)

P261            Avoid breathing dust/fume/gas/mist/vapours/spray  
 P270            Do not eat, drink or smoke when using this product  
 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

### 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 chemicals. Irritating to digestive tract.

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

**Skin Contact:**     May cause skin irritation. Rosin may cause dermatitis and product may cause skin sensitization.

**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.

INDIUM: May cause damage to respiratory system.

**WARNING:** This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). [trace levels of state listed metals (lead) and epichlorohydrin] (Applicable in the State of California)

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

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS Registry #/ EINECS#
TIN	7440-31-5/231-141-8
SILVER	7440-22-4/231-131-3
COPPER	7440-50-8/231-159-6
INDIUM	7440-74-6/231-180-0
MANGANESE	7439-96-5
ROSIN	65997-05-9
POLYGLYCOL ETHER	9038-95-3
CARBOXYLIC ACID NON HAZARDOUS ACTIVATORS	-

PRODUCT DOES NOT CONTAIN A REPORTABLE AMOUNT OF AN EU SUBSTANCES OF VERY HIGH CONCERN (SVHC)

Symbol: XI Risk Phrases: R36/37/38, R42/43  
N.E. = Not established

Product complies with \*RoHS Restriction of Hazardous Substances (review directive for applicable exemptions)  
<http://www.pbfree.com> \* See Alloy Table at end of MSDS

### 4. 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.

<b>Ingestion:</b>	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.
<b>Inhalation:</b>	Remove to fresh air. If not breathing, give artificial respiration or oxygen by trained personnel. Seek immediate medical attention.
<b>Skin Contact:</b>	Remove contaminated clothing. Wash affected area with soap and water. Wash clothing before reuse. If irritation persists, obtain medical attention.

## 5. FIRE FIGHTING MEASURES

<b>Flash Point:</b>	Not established.	<b>Method:</b>	Not established.
<b>Auto-ignition Temperature:</b>	Not established.		
<b>Flammable Limits:</b>	Limits not established.		
<b>Extinguishing Media:</b>	Use extinguishers appropriate for the surrounding fire conditions.		
<b>Special Fire Fighting Procedures:</b>	Firefighters must wear NIOSH approved self-contained breathing apparatus and full protective clothing.		

## 6. ACCIDENTAL RELEASE MEASURES

<b>Spill or Leak Procedures:</b>	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

<b>Handling Precautions:</b>	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.
<b>Storage Precautions:</b>	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

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>
TIN	*	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>INDIUM</b>	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	N.E.
		(EU)	N.E.	0.1	0.3
		(Canada)	N.E.	0.1	0.3
		(Mexico)	0.1	N.E.	0.3
		(Singapore)	0.1	N.E.	N.E.
		(China)	-	0.1	0.3
<b>MANGANESE</b>	(TRACE)	7439-96-5	1	0.2	3
		(EU)	-	1(fume)	3(fume)
		(Canada)	-	1(fume)	3(fume)
		(Singapore)	5(dust)	1(fume)	3(fume)
		(Mexico)	-	1(fume)	3(fume)
<b>ROSIN</b>	4.0-6.0	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>CARBOXYLIC ACID</b>	1.0-4.0	-	N.E.	N.E.	N.E.

**NON HAZARDOUS ACTIVATORS**

**PRODUCT DOES NOT CONTAIN A REPORTABLE AMOUNT OF AN EU SUBSTANCES OF VERY HIGH CONCERN (SVHC)**

Symbol: XI Risk Phrases: R36/37/38, R42/43  
N.E. = Not established

Product complies with \*RoHS Restriction of Hazardous Substances (review directive for applicable exemptions)

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

<http://www.pbfree.com>

\* See Alloy Table at end of MSDS

**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.

**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.

**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>	1 g/cc	<b>pH:</b>	4 - 8
<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**

**Carcinogenicity:**        **NTP:** No  
                                   **OSHA:** No  
                                   **IARC:** No

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

**Other:** Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma.

**12. ECOLOGICAL INFORMATION**

This section is subject to future development.

Product not tested.

**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 shipping requirements.

North American Emergency Guide Book 2004 – Not Classified

**15. REGULATORY INFORMATION**

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.).

The information in this Material Safety Data Sheet meets the requirements of the EU under Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP 2) Regulation 6.

This product has been classified in accordance with the hazard criteria of the Commission Directive 91/155/EEC and EH40.

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)

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-2000 and NOM-010-STPS-1999.

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

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. [(trace levels of listed metals (lead) and epichlorohydrin]

SARA 313 Listing - 40 CFR 372.65

Silver CAS# 7440-22-4

Copper CAS# 7440-50-8

3.5% Proprietary glycol ether

All ingredients are listed on the EPA TSCA Inventory.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X<sub>i</sub>

**Risk Phrases:**

R42/43 May cause sensitization by inhalation or by skin contact

R36/37/38 Irritating to eyes, respiratory system and skin

**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

S62 If swallowed, do not induce vomiting seek medical advice immediately and show container or label

S7 Keep container tightly closed



**ALLOY TABLE**

## %Metal mix with flux

INDALLOY (METAL)	% COPPER Cu	% TIN Sn	% SILVER Ag	% MANGANESE Mn	% INDIUM In	*RoHS Compliance
<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>254</b> (86.9Sn/10In/3.1A g)	-	<b>72.1-80</b>	<b>2.6-2.9</b>	-	<b>8.3-9.2</b>	<b>Yes</b>
<b>256</b> (SAC 305) (96.5Sn/3Ag/ 0.5Cu)	<b>0.42-0.46</b>	<b>80.1-88.8</b>	<b>2.5-2.8</b>	-	-	<b>Yes</b>
NON STANDARD (SAC105) (98.5Sn/1Ag/0.5C u/doped with 0.05Mn)	<b>0.42-0.46</b>	<b>81.8-90.6</b>	<b>0.83-0.92</b>	<b>Doped 0.05</b>	-	<b>Yes</b>
NON STANDARD (SAC307) (99Sn/0.3Ag/0.7C u)	<b>0.58-0.64</b>	<b>82.2-91.1</b>	<b>0.25-0.28</b>	-	-	<b>Yes</b>

RoHS= Restriction of Hazardous Substances EU Directive 2002/95/EC

All 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.

**16. OTHER INFORMATION**

**HMIS Hazard Rating:**

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

**Revised Date:** 28 OCTOBER 2010

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

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

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.