



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

User must review the contents of this (SDS) and determine what is applicable to their own country laws under Health and Safety and apply them as necessary. This (SDS) will not reference every countries Health and Safety Laws. It is the user's responsibility to determine what is applicable to them, including but not limited to review of any specific chemical lists and apply the requirements as necessary.

## 1. PRODUCT AND COMPANY IDENTIFICATION

**General Product Class Identifier:** INDALLOY WITH INDIUM RMA-155

(View product table for individual product descriptions)

**SDS Number:** SDS-5825

**Revised Date:** 21 APRIL 2014

**Product Use:** Industrial Use -No-clean solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder used for solder applications. (mixture). Review alloy table listing of all metal combinations with the same family flux.

### MANUFACTURER:

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## 2. HAZARDS IDENTIFICATION

### GHS



lead and/or antimony containing products

Signal Word: Warning

#### Hazard statement(s):

H303	May be harmful if swallowed
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H351	Suspected of causing cancer (lead)
H360	May damage 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)
H400+H413	Very toxic to aquatic life, may cause long lasting harmful effects to aquatic life (lead)
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 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)

#### PRIMARY ROUTES OF ENTRY:

Eye    Inhalation    Skin    Ingestion

#### CARCINOGEN LISTED IN:

NTP    IARC    OSHA    Not Listed

#### 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:** Irritating to digestive tract. May cause burns. Some products may contain lead. Lead may cause systematic lead poisoning and burns to the digestive tract. Symptoms of lead poisoning include headache, nausea, abdominal pain, muscle and joint pain and damage to the nervous system, blood system and kidneys. Ingestion of lead may be harmful.

**Inhalation:** Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local

irritation to the respiratory system. Rosin fume may cause occupational asthma.

**Skin Contact:** May cause skin irritation. Rosin 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.

**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.

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

**WARNING:** This product contains a chemical (s) known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (trace levels of lead not intentionally added)

**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 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	0.1	-
		(EU)	-	0.1	-
		(Canada)	N.E.	0.1	0.3

			(Singapore)	0.1	-	-
			(Mexico)	0.1	-	-
<b>COPPER</b>	*	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>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>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>ROSIN</b>	4.0-6.0	65997-05-9	(US)	N.E.	N.E.	N.E.
			(EU)	0.05	-	0.15 (sensitiser)
<b>POLYGLYCOL ETHER</b>	3.0-5.0	9038-95-3		N.E.	N.E.	N.E.
<b>BISMUTH</b>	*	7440-69-9		N.E.	N.E.	N.E.
<b>PROPRIETARY</b>	1.0-6.0	68937-72-4		N.E.	N.E.	N.E.
<b>MANGANESE</b>	0.05(dopent)	7439-96-5		N.E.	N.E.	N.E.
<b>CESIUM</b>	0.05(dopent)	7440-46-2		N.E.	N.E.	N.E.

<b>COBALT</b>	0.05(dopent)	7440-48-4	N.E.	N.E.	N.E.
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**PRODUCT DOES NOT CONTAIN ANY EU REACH LISTED SUBSTANCES OF VERY HIGH CONCERN (SVHC)**

Symbol: X<sub>n</sub> Risk Phrases: R20/21/22, R36/37/38, R42/43 See Section 15 for more information  
 N.E. = Not established \* 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. 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 (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.

### 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:** 1 g/cc (flux)

**pH:** 4 -8 (flux)

**Vapor Pressure:** Not applicable.

**Solubility in Water:** Insoluble (paste)

**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 / 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  
 Antimony - LD50 oral – rat 7,000 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.

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.

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

## 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 (US Department of Transportation). Not hazardous under shipping regulations.

UN – none

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.).

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



Canadian WHMIS:

D2B – Materials Causing Other Toxic Effects (skin irritation/skin sensitization)

## 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 Mexican regulations 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.

For compliance with EU Directive 2002/95/EC, Restriction of Hazardous Substances (RoHS), see Alloy Table.

California PROP 65(Safe Drinking Water Standard): WARNING:

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

SARA 313 Listing - 40 CFR 372.65

Silver Copper Lead

All ingredients are listed on the EPA TSCA Inventory.

**Japan:**

Poisonous and Deleterious Substance Control Law (PDSCCL): No ingredients are listed.

Fire Service Law (FSL): Not regulated/not dangerous.

Industrial Safety and Health Law (ISHL): ingredients are listed

PRTR and Promotion of Chemical Management law, Class I Substance: Not applicable.

Waste Disposal and Public Cleaning Law: Specific Harmful Industrial Wastes: Some contents of the family grouping may contain lead within the solder paste. Review alloy table and product label/ purchased and used.

Class II Designated Chemical Substances: No ingredients are listed.

Ingredients are listed on the Japanese Inventory Chemical Substance List/Industrial Safety and Health Law Substance List.

Review SDS and apply regulations where applicable.

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

All ingredients are listed on the China Chemical Inventory.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X<sub>n</sub>

**Risk Phrases:**

R20/21/22 Harmful by inhalation, by skin contact and if swallowed

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

R42/43 May cause sensitization by inhalation and skin contact

R33 Danger of cumulative effects (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)

R51/53 Toxic to aquatic organisms and may cause long-term effects in the aquatic environment (antimony)

R61 May cause harm to the unborn child (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
S7	Keep container tightly closed

**16. OTHER INFORMATION**

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

**Revised Date:** 21 APRIL 2014

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

**Approved by:** Nancy Swarts, 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>% LEAD Pb</b>	<b>% ANTIMONY Sb</b>	<b>% CESIUM Ce</b>	<b>% MANGANESE Mn</b>	<b>% COBALT Co</b>	<b>% BISMUTH Bi</b>	<b>RoHS2 * Compliance</b>
<b>100 (62.6Sn/37Pb/ 0.4Ag)</b>	52-57.6	0.3-0.37	-	30.7-34	-	-	-	-	-	NO
<b>104 (62Sn/36Pb/2 Ag)</b>	51.5-57	1.2-1.8	-	29.9-33	-	-	-	-	-	NO
<b>106 (Sn63/Pb37)</b>	52-58	-	-	30.7-34	-	-	-	-	-	NO
<b>121 (96.5Sn/3.5Ag )</b>	80.1-88.8	2.9-3.2	-	-	-	-	-	-	-	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>246 (95.5Sn/4Ag/0 .5Cu)</b>	79.2-87.9	3.3-3.7	0.42-0.46	-	-	-	-	-	-	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>Modified 256 (SAC 305) (96.45Sn/3Ag/ 0.5Cu +doped 0.05 Mn)</b>	80-88.7	2.5-2.8	0.42-0.46	-	-	-	0.042-0.046 doped	-	-	YES

<b>Modified 256 (SAC 305) (96.45Sn/3Ag/0.5Cu +0.05 Cs)</b>	80-88.7	2.5-2.8	0.42-0.46	-	-	0.042-0.046	-	-	-	YES
<b>Indalloy Mixture (%Metal)</b>	<b>% TIN Sn</b>	<b>% SILVER Ag</b>	<b>% COPPER Cu</b>	<b>% LEAD Pb</b>	<b>% ANTIMONY Sb</b>	<b>% CESIUM Ce</b>	<b>% MANGANESE Mn</b>	<b>% COBALT Co</b>	<b>% BISMUTH</b>	<b>RoHS* Compliance</b>
<b>259 (90Sn/10Sb)</b>	74.7-82.8	-	-	-	8.3-9.2	-	-	-	-	YES
<b>SAC268 (96.55Sn/2.6Ag/0.8Cu/0.05Mn)</b>	80.1-88.8	2.2-2.4	0.66-0.74	-	-	-	0.042-0.046 doped	-	-	YES
<b>SAC268 (96.55Sn/2.6Ag/0.8Cu/0.05Cs)</b>	80.1-88.8	2.2-2.4	0.66-0.74	-	-	0.042-0.046 doped	-	-	-	YES
<b>NS (98.5Sn/1Ag/0.5Cu)</b>	81.8-90.6	0.83-0.92	0.42-0.46	-	-	-	-	-	-	YES
<b>NS (99Sn/0.3Ag/0.7 Cu)</b>	82-91.1	0.25-0.28	0.58-0.6	-	-	-	-	-	-	YES
<b>NS 99.2Sn/0.5Cu/0.3Bi/doped0.05Co</b>	82.3-91.3	-	0.42-0.46	-	-	-	-	0.042-0.046 doped	0.25-0.28	YES

**NS = Non standard alloy mixture**

**\*RoHS2 = Restriction of Hazardous Substances-(2011/65/EU)**