



## 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 12.8HF

(View product table for individual product descriptions)

**SDS Number:** SDS-6680

**Revised Date:** 13 AUGUST 2018

**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) See alloy table for metal combinations with the same flux. Review alloy table for all metal combinations with the same flux.

#### MANUFACTURER:

##### In America:

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**2. HAZARDS IDENTIFICATION**

**PRIMARY ROUTES OF ENTRY:**

- Eye
- Inhalation
- Skin
- Ingestion

**CARCINOGEN LISTED IN:**

- NTP
- IARC
- OSHA
- Not Listed

**GHS**

**Lead free products**



Signal Word: Warning

Hazard statement(s):

- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- 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 feel unwell.
- P302 + P352 IF ON SKIN: Wash with plenty of soap and water
- P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
- P305 + P351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

**Lead 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
- 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
- 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 feel unwell.

P302 +P352 IF ON SKIN: Wash with plenty of soap and water  
 P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing  
 P305 +P351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

**Classification:**

Carcinogenicity (Category 2) (lead)

Reproductive toxicity (Category 2 ) (lead)

Skin sensitizer-Category 1B

Respiratory sensitizer-Category 1B

Eye irritation-Category 2A

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:** Contains metal alloy powders and organic chemicals. May cause irritation or harm.

**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 can expose you to chemicals including [trace amounts of lead] which is known to the State of California to cause cancer, and can cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

**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	-	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.
<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>NICKEL</b>	*	7440-02-0			
		(US)	1	0.015	N.E.

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

<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 (flux)	<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	
	<b>IARC:</b> Yes	Lead and lead compounds are listed as possible carcinogens.

<b>LD50:</b>	Not established.	<b>LC50:</b>	Not established.
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**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 international regulations and requirements. Not regulated (US Department of Transportation).

Not hazardous under shipping regulations. (ground/air/ocean)

UN – none

Not regulation under IATA.

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.).



**WARNING:** This product can expose you to chemicals including [trace amounts of lead] which is known to the State of California to cause cancer, and can cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

SARA 313 Listing - 40 CFR 372.65  
Silver Copper Lead

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

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: 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-2015 and NOM-010-STPS-2014.



For compliance with EU Directive 2011/65/EU, Restriction of Hazardous Substances (RoHS), see Alloy Table.

Japan:

Poisonous and Deleterious Substance Control Law (PDSCL): 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.

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.

All ingredients are listed on the China Chemical Inventory.

## 16. OTHER INFORMATION

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

**Revised Date:** 13 AUGUST 2018

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

**ALLOY TABLE (DATA)****%Metal Mix in Flux**

Indalloy Mixture (%Metal)	% TIN Sn	% SILVER Ag	% COPPER Cu	% LEAD Pb	% Indium In	% ANTIMONY Sb	% CESIUM Ce	% MANGANESE Mn	% COBALT Co	% BISMUTH Bi	% Nickel Ni	RoHS 2/3* Compliance
100 (62.6Sn/37Pb/0.4Ag)	52-57.6	0.3-0.37	-	30.7-34	-	-	-	-	-	-	-	NO
104 (62Sn/36Pb/2Ag)	51.5-57	1.2-1.8	-	29.9-33	-	-	-	-	-	-	-	NO
106 (Sn63/Pb37)	52-58	-	-	30.7-34	-	-	-	-	-	-	-	NO
121 (96.5Sn/3.5Ag)	80.1-88.8	2.9-3.2	-	-	-	-	-	-	-	-	-	YES
122 (95Sn/5Pb)	78.9-87	-	-	4.2-4.6	-	-	-	-	-	-	-	NO
132 (95Sn/5Ag)	78.9-87	4.2-4.6	-	-	-	-	-	-	-	-	-	YES
133 (95Sn/5Sb)	78.9-87	-	-	-	-	4.2-4.6	-	-	-	-	-	YES
156 (90Sn/10Ag)	74.7-82.8	8.3-9.2	-	-	-	-	-	-	-	-	-	YES
227 (77.2Sn/20In/2.8Ag)	64-71	2.3-2.6	-	-	16.6-18.4	-	-	-	-	-	-	YES
241 (SAC 387) (95.5Sn/3.8Ag/0.7Cu)	79.2-87.9	3.2-3.5	0.58-0.64	-	-	-	-	-	-	-	-	YES
244 (99.3Sn/0.7Cu)	82-91.3	-	0.58-0.64	-	-	-	-	-	-	-	-	YES
246 (95.5Sn/4Ag/0.5Cu)	79.2-87.9	3.3-3.7	0.42-0.46	-	-	-	-	-	-	-	-	YES

<b>Indalloy Mixture (%Metal)</b>	<b>% TIN Sn</b>	<b>% SILVER Ag</b>	<b>% COPPER Cu</b>	<b>% LEAD Pb</b>	<b>% Indium In</b>	<b>% ANTIMONY Sb</b>	<b>% CESIUM Ce</b>	<b>% MANGANESE Mn</b>	<b>% COBALT Co</b>	<b>% BISMUTH Bi</b>	<b>% Nickel Ni</b>	<b>RoHS 2/3* Compliance</b>
<b>254 (86.9Sn/10In /3.1Ag)</b>	72-80	2.6-2.85	-	-	8.3-9.2	-	-	-	-	-	-	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

Indalloy Mixture (%Metal)	% TIN Sn	% SILVER Ag	% COPPER Cu	% LEAD Pb	% Indium In	% ANTIMONY Sb	% CESIUM Ce	% MANGANESE Mn	% COBALT Co	% BISMUTH	% Nickel Ni	RoHS 2/3* Compliance
<b>258 (SAC105) (98.5Sn/1Ag /0.5Cu)</b>	81.8-90.6	0.83-0.92	0.42-0.46	-	-	-	-	-	-	-	-	YES
<b>259 (90Sn/10Sb)</b>	74.7-82.8	-	-	-	-	8.3-9.2	-	-	-	-	-	YES
<b>268 (SACm® 0510) (98.5Sn/0.5Ag/1Cu/0.05Mn)</b>	81.7-90.6	0.42-0.46	0.83-0.92	-	-	-	-	0.042-0.046 doped	-	-	-	YES
<b>270 (90.95Sn/3.8Ag/0.7Cu/3Bi/1.4Sb/0.15Ni)</b>	75.5-83.7	3.2-3.5	0.58-0.46	-	-	1.16-1.2	-	-	-	2.49-2.76	0.12-0.138	YES
<b>272 (90Sn/3.8Ag /1.2Cu/1.5Bi/ 3.5Sb)</b>	74.7-82.8	3.2-3.5	1-1.1	-	-	2.9-3.2	-	-	-	1.2-1.4	-	YES
<b>276 (90.6Sn/3.2Ag/0.7Cu/5.5Sb)</b>	75.2-83.4	2.7-2.9	0.58-0.64	-	-	4.6-5.1	-	-	-	-	-	YES
<b>NS (98.5Sn/1Ag /0.5Cu)</b>	81.8-90.6	0.83-0.92	0.42-0.46	-	-	-	-	-	-	-	-	YES
<b>NS (98.3Sn/1.2Ag/0.5Cu +0.05 Ni)</b>	81.6-90	0.1-1.1	0.42-0.46	-	-	-	-	-	-	-	0.05	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**

**\*RoHS 2 = Restriction of Hazardous Substances (2011/65/EU)**

**\*RoHS 3 = products do not contain any listed phthalates**