



## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

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

**SDS Number:** SDS-5172

**Revised Date:** 6 DECEMBER 2019

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Product Use:** Industrial Use (Mixture) - Solder paste consisting of a flux vehicle blended with 83-92 weight percent pre-alloyed metal powder used for soldering applications. Review alloy table for exact product identification. Note: this SDS covers various metal mixtures using the same flux. See alloy table.

See alloy table for listing of products included under this SDS.

#### 1.3 Details of the supplier of the safety data sheet

##### **MANUFACTURER/SUPPLIER/IMPORTER:**

###### **In America:**

The Indium Corporation of America®  
34 Robinson Rd., Clinton, New York 13323  
Technical & Safety Information: (315) 853-4900  
Safety & SDS Information: [nswarts@indium.com](mailto:nswarts@indium.com)  
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###### **In China:**

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###### **In Asia:**

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**1.4 Emergency telephone number****FOR CHEMICAL EMERGENCY ONLY PHONE \*:****CHEMTREC 24 hrs.****USA: 1 (800) 424-9300****Outside USA: +1 (703) 527-3887****In China: Emergency 86+ 4008417580****\* Used only for spill/leak/fire/exposure/accident****ALL OTHER INQUIRIES: TOLL FREE: +1-800-448-9240 Indium Corporation****2. HAZARDS IDENTIFICATION****PRIMARY ROUTES OF ENTRY:** Eye Inhalation Skin Ingestion**Carcinogen listed in**

NTP

IARC

OSHA

 Not Listed**2.1 Classification of substance or mixture: mixture****2.2 Label elements**

Labeling according to Regulation (EC) No 1272/2008

**Lead free product mixtures**

Signal Word: Warning

**Hazard statement(s)**

H317 May cause an allergic skin reaction  
 H319 Causes serious eye irritation  
 H335 May cause respiratory irritation

**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)

**Lead containing product mixtures**

Signal Word: Warning

Hazard statement(s)

H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H335	May cause respiratory irritation
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

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)

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)

**2.3 OTHER HAZARDS:****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 powders and organic chemicals. Irritating to digestive tract.

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

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

**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. Signs and symptoms of exposure – anemia. Possible carcinogenic to humans.

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

**INDIUM:** May cause damage to respiratory system if inhaled over long exposure.

**BISMUTH:** May cause kidney damage.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

#### 3.2 Mixture:

Components	% wt	CAS Registry #/ EINECS#	
TIN	*	7440-31-5/231-141-8	REACH registration 01-2119486474-28-0077
SILVER	*	7440-22-4/231-131-3	REACH Registration 01-2119555669-21-0093
ANTIMONY	*	7440-36-0/231-146-5	
COPPER	*	7440-50-8 /231-159-6	REACH Registration 01-2119480154-42-0208
INDIUM	*	7440-74-6/231-180-0	REACH Registration 01-2120756870-48-0015
LEAD	*	7439-92-1/231-100-4	Registered, number not currently available
BISMUTH	*	7440-69-9/231-177-4	
METHOXY POLYGLYCOL ETHER	3 - 7	9004-74-4	
ORGANIC ACIDS	0 – 4	68937-72-4	
ETHANOLAMINE	1- 5	141-43-5	

Product does not contain any listed REACH SVHC substances.

N.E. = Not established

\* See Alloy Table for breakdown of percentages of alloy mixtures

## 4. FIRST AID MEASURES

### 4.1 Description of 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.

### 4.2 Most important symptoms and effect, both acute and delayed:

Skin contact may cause irritation. Exposure to metal fumes may cause irritation to the respiratory system. Long term exposure by inhalation to metal fumes may cause illness such as metal fume fever. Target organs (antimony) – heart and respiratory system.

### 4.3 Indication of any immediate medical attention and special treatment needed:

No specific special treatment information is available on this mixture. Review data provided in this document to understand the hazards when working with the product. No other information is available at this time.

## 5. FIRE FIGHTING MEASURES

**5.1 Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Water, CO2, foam media.

### 5.2 Special hazards arising from the substance or mixture:

May produce toxic fumes of carbon monoxide if burning or metal oxide fumes.

**5.3 Advice for Firefighters** Fire fighters must wear approved self-contained breathing apparatus and full protective clothing. Material product is not flammable. No other information is available.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures:

#### **For non-emergency personnel:**

Keep away from the spill. Remove sources of ignition. Keep exhaust ventilation system running. In the event of a fire evacuate area.

#### **For emergency responders:**

Wear safety glasses, gloves when cleaning up any spill. Other equipment may be necessary based on the immediate area and other chemicals unrelated to the product that may be in use. Adequate ventilation should be available. Keep unnecessary personnel away from area during clean up. Avoid direct skin exposure to material.

**6.2 Environmental Precautions:** Dispose contaminated cloth rags or paper towels following all applicable governmental regulations. Material may have reclaim value. Material is non - hazardous. It however does contain metals and organic chemicals which may not be suited for release to any body of water including drains. Some products may contain antimony which are hazardous to the aquatic life.

### **Methods and material for containment and cleaning up:**

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.

**6.3 Reference to other sections:** See Section 8 for exposure levels.

## 7. HANDLING AND STORAGE

**7.1 Precautions For Safe Handling** 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. Do not eat, drink or smoke when handling this product. Utilize exhaust ventilation when heating product. Emissions may contain metal fumes, rosin and organic compounds.

**7.2 Conditions for Safe Storage, including any incompatibilities:**

**Storage Precautions:** Store product in tightly capped original containers in a cool, dry area. Refer to product label and product data sheet for specific storage temperature requirements. Rotate stock to ensure use before expiration date.

**7.3 Specific End Use(s):** Soldering applications

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control Parameters:

			<u>TWA</u>	<u>STEL</u>
		<u>CAS#/EINECS#</u>	mg/m <sup>3</sup>	mg/m <sup>3</sup>
TIN	*	7440-31-5/231-141-8		
		(UK)	2	4
		(Belgium)	2	-
		(Germany)	2	-
		(Netherlands)	2	-
		(Spain)	2	-
		(Poland)	2	-
SILVER	*	7440-22-4/231-131-3		
		(UK)	0.1	0.3
		(Belgium)	0.1	-
		(France)	0.1	-
		(Germany)	0.1	-
		(Netherlands)	0.1	-
		(Spain)	0.1	-
	(Poland)	0.05	-	

<b>ANTIMONY</b>	*	7440-36-0/231-146-5		
		(UK)	0.5	-
		(France)	0.5	-
		(Belgium)	0.5	-
		(Spain)	0.5	-
		(Portugal)	0.5	-
		(The Netherlands)	0.5	-
		(Finland)	0.5	-
		(Denmark)	0.5	-
		(Austria)	0.5	5
		(Switzerland)	0.5	-
		(Poland)	0.5	-
		(Norway)	0.5	-
		(Ireland)	0.5	-
<b>COPPER</b>	*	7440-50-8 /231-159-6		
		(UK)	0.2 (fume)	-
		(France)	2	0.2(fume)
		(Belgium)	1	-
			0.2(fume)	
		(Spain)	1	-
			0.2(fume)	
		(Portugal)	1	0.2(fume)
		(Netherlands)	0.1	-
		(Finland)	1	-
			0.1	
		(Denmark)	1	-
			0.1	
		(Austria)	1	4
			0.1(fume)	0.4
		(Switzerland)	0.1	0.2
		(Norway)	1	0.1
		(Ireland)	1	2
			0.2 (fume)	
		(Poland)	0.2	-

<b>LEAD</b>	*	7439-92-1/231-100-4		
		(UK)	0.15	-
		(France)	0.1	-
		(Spain)	0.15	-
		(Italy)	0.15	-
		(Portugal)	0.05	-
		(Finland)	0.1	-
		(Denmark)	0.05	-
		(Austria)	0.1	0.4
		(Switzerland)	0.1	0.8
		(Poland)	0.05	-
		(Norway)	0.05	-
		(Ireland)	0.15	-
<b>INDIUM</b>	*	7440-74-6/231-180-0		
		(UK)	0.1	0.3
		(Belgium)	0.1	-
		(Spain)	0.1	-
		(Portugal)	0.1	-
		(Finland)	0.1	-
		(Denmark)	0.1	-
		(Austria)	0.1	0.2
		(Switzerland)	0.1	-
		(Norway)	0.1	-
		(Ireland)	0.1	0.3
<b>METHOXY POLYGLYCOL ETHER</b>	3- 7	9004-74-4	N.E.	N.E.
<b>ORGANIC ACIDS</b>	0-4	68937-72-4	N.E.	N.E.
<b>ETHANOLAMINE</b>	1-5	141-43-5	N.E.	N.E.

N.E. = Not established  
TWA = time weighted average      STEL = short term exposure limit

**\* See alloy table for listing of metal mixtures.**



**8.2 Exposure Controls:**

**Engineering Controls:** Use only with production equipment (such as stencil printers and re-flow furnaces) with adequate exhaust ventilation and other safety features specifically designed for use with solder paste. Control concentration of all components with established exposure limits so they are not exceeded. Use exhaust ventilation when heating product. Air emission control equipment may be necessary based on the local governmental requirements for contaminants entering the atmosphere. Emissions may contain metal fume such as lead and antimony and organic compounds.

**Personal protection:**

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

**Respiratory:** An approved or EU compliant CE 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. Recommend a nitrile disposable or other chemical glove.

**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. Follow standard lead work practices, if applicable.

**9. PHYSICAL AND CHEMICAL PROPERTIES****9.1 Information on basic physical and chemical properties:**

<b>Appearance:</b>	Grey colored solid paste	<b>Boiling Point/Range:</b>	Not determined
<b>Odor:</b>	Mild characteristic odor.	<b>Melting Point/Freezing Point:</b>	Not applicable
<b>Odor Threshold:</b>	Not established	<b>Evaporation Rate:</b>	Not applicable
<b>Specific Gravity:</b>	Not established	<b>pH:</b>	Not available
<b>Vapour Pressure:</b>	Not applicable.	<b>Solubility in Water:</b>	Insoluble (paste)
<b>Vapour Density:</b>	(air=1) Not applicable.	<b>Partition coefficient:</b>	Not established
<b>Relative Density:</b>	Not established	<b>Flammability:</b>	Not applicable
<b>Flash Point:</b>	Not applicable	<b>Method:</b>	Not applicable
<b>Auto-ignition Temperature:</b>	Not applicable	<b>Flammable Limits:</b>	Limits not established
<b>UEL/LEL Limits:</b>	Not applicable	<b>Decomposition Temp:</b>	Not applicable
<b>Viscosity:</b>	Not established	<b>Explosive properties:</b>	Not applicable
<b>Oxidizing Properties:</b>	Not established		

**9.2 Other Information:** Above data for the whole mixture.

**10. STABILITY AND REACTIVITY**

**10.1 Reactivity:** Stable.

**10.2 Chemical Stability:** Stable

**10.3 Possibility of Hazardous Reactions:** Not established

**10.4 Conditions To Avoid:** None known

**10.5 Incompatible Materials:** Avoid contact with acids, bases or oxidizing agents.

**10.6 Hazardous Decomposition and Combustion** Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. Metal oxide fumes.

**10.7 Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects:

**Acute toxicity:** Not established

**Irritation:** Not established

**Corrosivity:** Not applicable

**Sensitization:** Not available

**Repeated dose toxicity:** Not established

**Carcinogenicity:** Not established

**Likely Routes of Entry:** eyes (irritation) /skin (irritation or sensitization) /inhalation (irritation)

**Interactive effects:** None known

**Mutagenicity:** Not established

**Toxicity for Reproduction:** Not Established

**Absence of specific data:** None available (not tested)

### 11.2 Symptoms related to the physical, chemical and toxicological characteristics:

May cause irritation by skin and inhalation.

### 11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure:

None known.

**Mixture verses substance information:** None known

### Other Information:

**Carcinogenicity:** NTP: No (National Toxicity Program)

**Listing** OSHA: No (US Occupational Safety & Health Administration)

IARC: Yes - Lead and lead compounds are listed as possible carcinogens. (International Agency for Research on Cancer).

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 mixtures not tested.

**12.1 Toxicity:** No information available

**12.2 Persistence and degradability:** No information available

**12.3 Bioaccumulative potential:** No information available

**12.4 Mobility in soil:** No information available

**12.5 Results of PBT and vPvB assessments:** No data is available

**12.6 Other adverse effects:** No information is available for mixture. Avoid release to environment.

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

### 13. DISPOSAL CONSIDERATION

**13.1 Waste treatment method:** Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with environmental regulations. Containerize material and classify according to applicable regulations. No pre-treatment on site is recommended. Do not dispose of down any drain or waterway. Utilize the same personal protective equipment as the user when handling for disposal. Do not dispose of in regular trash.

**RoHS (Restriction of Hazardous Substances):** Product mixtures do not contain any PBB or PBDT brominated compounds.

### 14. TRANSPORT INFORMATION

Transport in accordance with applicable international regulations and requirements.

Solder Paste is non - hazardous.

Not regulated/non - hazardous under US DOT (United States Department of Transportation).

Not regulated/non - hazardous under international shipping requirements, all modes.

**14.1 UN Number:** None

**14.2 UN proper shipping name:** None

**14.3 Transport hazard class(s):** None

**14.4 Packing group:** None

**14.5 Environmental hazards:** None

**14.6 Special precautions for user:** None

**14.7 Transport in bulk:** Not applicable

### 15. REGULATORY INFORMATION

#### **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:**

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.).

All ingredients are listed on the USEPA TSCA Inventory.

All ingredients are listed on EINECS.

Safety data sheet was developed using EC 1907/2006 amended as of 20 May 2010 EU No 453/2010 and information as stated under regulation EC No 1272/2008 CLP Regulation.

GHS = Global Harmonized System

CLP= Classification, labeling and packaging

Product does not contain any substances ozone depleting substances and therefore not subject to EC 2037/2000.

**15.2 Chemical safety assessment:** None performed for mixture.

**16. OTHER INFORMATION**

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

**Revised Date:** 6 DECEMBER 2019

**Prepared by:** Nancy Swarts, The Indium Corporation of America, nswarts@indium.com

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

Changes provided on this SDS were based on the requirements of EU No. 453/2010 of May 20, 2010 regarding amendments to EC No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

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.

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

Indalloy Mixture (%Metal)	%TIN Sn	%SILVER Ag	%COPPER Cu	%BISMUTH Bi	%ANTIMONY Sb	%LEAD Pb	%INDIUM In	RoHS 2/3* Compliance (2011/65/EU)
<b>121</b> (96.5Sn/3.5Ag)	80-88.8	2.9-3.2	-	-	-	-	-	YES
<b>128</b> <b>100Sn</b>	83-92	-	-	-	-	-	-	YES
<b>133</b> (95Sn/5Sb)	78.9-87	-	-	-	4.2-4.6	-	-	YES
<b>228</b> (88Pb/10Sn/2Ag)	8.3-9.2	1.7-1.84	-	-	-	73-80.9	-	YES with exemption
<b>241</b> (SAC 387) 95.5Sn/3.8Ag/0.7Cu)	79.2-87.9	3.2-3.5	0.58-0.64	-	-	-	-	YES
<b>244</b> <b>99.3Sn/0.7Cu</b>	82.4-91.4	-	0.58-0.64	-	-	-	-	YES
<b>254</b> (86.9Sn/10In/3.1Ag)	72-80	2.6-2.9	-	-	-	-	8.3-9.2	YES
<b>256</b> (SAC 305) (96.5Sn/3Ag/0.5Cu)	80.1-88.8	2.5-2.8	0.42-0.46	-	-	-	-	YES

<b>Indalloy Mixture (%Metal)</b>	<b>%TIN Sn</b>	<b>%SILVER Ag</b>	<b>%COPPER Cu</b>	<b>%BISMUTH Bi</b>	<b>%ANTIMONY Sb</b>	<b>%LEAD Pb</b>	<b>%INDIUM In</b>	<b>RoHS 2/3* Compliance (2011/65/EU)</b>
<b>259 (Sn90/Sb10)</b>	74.7-82.8	-	-	-	8.3-9.2	-	-	YES
<b>263 (SAC0307) (99Sn/0.3Ag/0.7Cu)</b>	82-91	0.25-0.28	0.58-0.64	-	-	-	-	YES
<b>276 (90.6Sn/5.5Sb/Ag3.2/Cu0.7)</b>	75.2-83.4	2.66-2.9	0.58-0.64	-	4.6-5.1	-	-	YES
<b>281 (Bi58/Sn42)</b>	34.9-38.6	-	-	48-53	-	-	-	YES

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

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