



**Disclaimer - This safety data sheet (SDS) 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 used globally.**

## SAFETY DATA SHEET

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH INDIUM 5.9HFF FLUX VEHICLE

**SDS Number:** SDS-6311

**Revised Date:** 5 SEPTEMBER 2018

**Product Use:** Industrial Use (mixture) - solder paste consisting of a flux vehicle blended with 83-92 weight percent pre-alloyed metal powder.

#### MANUFACTURER:

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## 2. HAZARDS IDENTIFICATION

GHS:

Lead free:



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 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)
P501	Dispose of content via approved waste handling or recycle if possible.

Lead containing



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
EUH201A	Warning! Contains lead Review listing.
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 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)  
 P501 Dispose of content via approved waste handling or recycle if possible.

Classification:

Eye Irritant (Category 2)  
 Carcinogenicity (Category 2) (lead)  
 Reproductive toxicity (Category 2) (lead)  
 Acute aquatic toxicity (Category 1) (lead)  
 Chronic aquatic toxicity (Category 1) (lead)

**PRIMARY ROUTES OF ENTRY:**

⊕Eye    ⊕Inhalation    ⊕Skin    ⊕Ingestion    NTP    IARC    OSHA    ⊕Not Listed  
 See Section 11

**Carcinogen listed in**

**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. May be harmful.

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

**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.

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.



**WARNING:** This product can expose you to chemicals including [lead] which is known to the State of California to cause cancer, and 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>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>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)	-	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>BISMUTH</b>	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
<b>ROSIN</b>	3.0-6.0	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>PROPRIETARY ACTIVATORS NON HAZARDOUS</b>	1.0-6.0	-	N.E.	N.E.	N.E.

N.E. = Not established

Product complies with \*RoHS 2 Restriction of Hazardous Substances (review directive for applicable exemptions)

\* See Alloy Table

### 4. FIRST AID MEASURES

<b>Eye Contact:</b>	Hold eyelids apart and flush eyes with plenty of tepid 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

**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 personal protective equipment.

## 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 any permissible exposure limits are not exceeded. Exhaust ventilation is recommended when heating this product. Protect operators from potential lead fumes.

### Personal protection:

**Eyes:** Chemical safety glasses/goggles. Face shield for any 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. Latex gloves are not recommended.

**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 (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	29CFR1910.1025
	<b>IARC:</b> Yes	Lead and lead compounds are listed as possible carcinogens
<b>LD50:</b>	Not established.	<b>LC50:</b> Not established.
<b>Other:</b>	Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma.	

**12. ECOLOGICAL INFORMATION**

Product not tested.

An environmental hazard cannot be excluded in the event of mismanagement or unprofessional handling or disposal of this product.

Lead is very toxic to the aquatic environment with long lasting effects.

**13. DISPOSAL CONSIDERATION**

<b>Waste Disposal Method:</b>	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.
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**14. TRANSPORT INFORMATION**

Transport in accordance with applicable regulations and requirements.

Not regulated under US DOT (United States Department of Transportation).

Not regulated under IATA.

Non - hazardous under shipping requirements.

North American Emergency Guide Book – Product Not Classified

UN – none

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

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

SARA 313 Listing - 40 CFR 372.65

Silver Copper Lead 3.5% Proprietary glycol ether

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: Class D 2 Materials causing other toxic effects (skin and eye irritant/skin sensitizer)  
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 guidelines, NOM-018-STPS-2015 and NOM-010-STPS-2014.

Regulatory Information China:

GB/T 16483-2008, GB/T 17519-2013, Safety Data Sheets for Chemical Products

GB 30000.2-29-2013, Rules for classification and labeling of chemicals (GHS)

Decree No. 591: Regulations on the Control Over Safety of Hazardous Chemicals.

This product has been classified using the Chinese Occupational Limit for Hazardous Agents in the Workplace, GBZ2-2007.

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).



**ALLOY TABLE**

%Metal mix with flux

<b>INDALLOY (METAL MIX)</b>	<b>%COPPER Cu</b>	<b>%TIN Sn</b>	<b>%SILVER Ag</b>	<b>%BISMUTH Bi</b>	<b>%LEAD Pb</b>	<b>*RoHS 2 Compliance</b>
<b>100</b> (62.6Sn/37Pb/0.4Ag)	-	<b>52-57.6</b>	<b>0.33-0.37</b>	-	<b>30.7-34</b>	<b>No</b>
<b>104</b> (62Sn/36Pb/2Ag)	-	<b>51.5-57</b>	<b>1.7-1.8</b>	-	<b>29.9-33</b>	<b>No</b>
<b>106</b> (63Sn/37Pb)	-	<b>52-57</b>	-	-	<b>30.7-34</b>	<b>No</b>
<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>246</b> (SAC 405) (95.5Sn/4Ag/0.5Cu)	<b>0.42-0.46</b>	<b>79.3-87.9</b>	<b>3.3-3.7</b>	-	-	<b>Yes</b>
<b>256</b> (SAC 305) (96.5Sn/3Ag/0.5Cu)	<b>0.45-0.46</b>	<b>85.9-88.8</b>	<b>2.67-2.76</b>	-	-	<b>Yes</b>
<b>256</b> (SAC305) (96.5Sn/3Ag/0.5Cu doped with 0.19% Ce)	<b>0.45-0.46</b>	<b>85.9-88.8</b>	<b>2.67-2.76</b>	-	-	<b>Yes</b>
<b>258</b> <b>(SAC105)</b> <b>(98.5Sn/1Ag/0.5Cu)</b>	<b>0.45-0.46</b>	<b>81.8-90.6</b>	<b>0.83-0.92</b>			<b>Yes</b>
<b>260</b> <b>SACm 510</b> (98.5Sn/1Ag/0.5Cu/ Doped 0.05Mn)	<b>0.42-0.46</b>	<b>81.8-90.6</b>	<b>0.83-0.92</b>	-	-	<b>Yes</b>
<b>263</b> (99Sn/0.3Ag/0.7Cu)	<b>0.58-0.64</b>	<b>82-91</b>	<b>0.25-0.28</b>	-	-	<b>Yes</b>
<b>Non Standard Mix</b> (90.5Sn/7.5Bi/2Ag)	-	<b>75-83</b>	<b>1.7-1.8</b>	<b>6.2-6.9</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (94.25Sn/3Bi/2Ag/0.7 5Cu)	<b>0.62-0.69</b>	<b>78.2-86.71</b>	<b>1.7-1.8</b>	<b>2.5-2.8</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (92.3Sn/7Bi/0.7Cu)	<b>0.58-0.64</b>	<b>76.6-84.9</b>	-	<b>5.8-6.4</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (91.3Sn/7Bi/1Ag/0.7 Cu)	<b>0.58-0.64</b>	<b>75.8-84</b>	<b>0.83-0.92</b>	<b>5.8-6.4</b>	-	<b>Yes</b>
<b>Non Standard Mix</b> (75.5Sn/24Bi/0.5Cu)	<b>0.42-0.46</b>	<b>62.7-69.5</b>	-	<b>19.9-22</b>	-	<b>Yes</b>

Non Standard = special or custom blend of metal alloys

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

Some 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.

Other products contain lead. Review any exemption to determine if they apply.

## 16. OTHER INFORMATION

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

**Revised Date:** 5 SEPTEMBER 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.

**Note: This SDS 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.**