



## INDIUM CORPORATION OF AMERICA®\EUROPE®\ASIA-PACIFIC® INDIUM CORPORATION (SUZHOU)®

This 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 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.

### SAFETY DATA SHEET

#### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH NC-SMQ80 FLUX VEHICLE

**SDS Number:** SDS-IN 450

**Revised Date:** 17 JUNE 2016

**Product Use:** Industrial Use - No-clean solder paste consisting of a flux vehicle blended with a pre-alloyed metal powder. Alloy contained is 83 – 92% in product.

#### MANUFACTURER:

##### In America:

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

##### 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:

Indium Corporation of America  
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

### Carcinogen listed in

IARC      OSHA      ⊕Not Listed  
\*See Section 11

### POTENTIAL HEALTH EFFECTS:

#### GHS:



for product containing lead

Signal Word: Warning

#### Hazard statement(s)

H302	Harmful if swallowed (lead)
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H332	Harmful if inhaled
H351	Suspected of causing cancer (lead)
H361	Suspected of damaging 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)
H410	Very toxic to aquatic life with long lasting harmful effects (lead)
H412	Harmful to aquatic life with long lasting effects (lead free product)
EUH201A	Warning! Contains lead (applicable only to the products listed that contain 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 attention/advice 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:

Specific target organ toxicity- repeated exposure – Category 2  
Carcinogenicity (Category 2) (lead)  
Reproductive toxicity (Category 2 ) (lead)

Skin sensitization – Category1B  
 Respiratory sensitization- Category1B  
 Acute toxicity, inhalation- Category 4  
 Acute aquatic toxicity – Category 1 for lead containing products  
 Chronic aquatic toxicity – Category 1 for lead containing products

- 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:** Contains metal alloy and organic chemicals. May cause irritation and may cause harm if swallowed.
- Inhalation:** Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local irritation to the respiratory system. Rosin exposure may cause occupational asthma.
- Skin Contact:** May cause skin irritation. Rosin may cause dermatitis.
- Chronic:**  
 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.  
 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.  
 BISMUTH: May cause kidney damage.  
 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). (lead)
- 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>
TIN	*	7440-31-5/231-141-8			

			(US)	2	2	-
			(EU)	-	2	4
			(Canada)	-	2	4
			(Singapore)	2	-	-
<b>LEAD</b>	*	7439-92-1/231-100-4				
			(US)	0.05	0.05	-
			(EU)	-	0.15	-
			(Canada)	0.05	0.05	-
			(Mexico)	0.15	-	-
			(Singapore)	0.15	-	-
			(China)	-	0.05(dust)	-
					0.03(fume)	-
<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>INDIUM</b>	*	7440-74-6/231-180-0				
			(US)	0.1	0.1	-
			(EU)	-	0.1	0.3
			(Canada)	-	0.1	0.3
			(Mexico)	0.1	-	0.3
			(Singapore)	0.1	-	-
			(China)	-	0.1	0.3
<b>NICKEL</b>	*	7440-02-0				
			(US)	1	0.015	-
			(Canada)	-	1	2
			(Singapore)	1	-	-
			(Mexico)	1	-	-
<b>BISMUTH</b>	*	7440-69-9/231-177-4		N.E.	N.E.	N.E.

<b>ROSIN</b>	4.0 - 5.0	8052-10-6	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
<b>POLYGLYCOL ETHER</b>	2.8 – 6.0	9038-95-3	N.E.	N.E.	N.E.
<b>NON HAZARDOUS ACTIVATORS</b>	1.2 - 7.0	-	N.E.	N.E.	N.E.

N.E. = Not established      EU = European Union Occupational Exposure Limits      \* See Alloy Table

**ALLOY TABLE**

**% Metal mix with flux – ALLOY 83-92%**

Indalloy (metal)	RoHS 2 Compliance*	%TIN Sn	%SILVER Ag	%LEAD Pb	%BISMUTH Bi	%INDIUM In	Ag coated Ni powder
<b>1</b> (50In/50Sn)	Yes	41.5-46.0	-	-	-	41.5-46.0	-
<b>1E</b> (52In/48Sn)	Yes	39.8-44.2	-	-	-	43.2-47.8	-
<b>2</b> (80In/15Pb/5Ag)	No	-	4.2-4.6	12.5-13.8	-	66.4-73.6	-
<b>3</b> (90In/10Ag)	Yes	-	8.3-9.2	-	-	74.7-82.8	-
<b>4</b> (100In)	Yes	-	-	-	-	83.0-92.0	-
<b>5</b> (37.5Pb/37.5Sn/25In)	No	31.1-34.5	-	31.1-34.5	-	20.8-23.0	-
<b>7</b> (50In/50Pb)	No	-	-	41.5-46.0	-	41.5-46.0	-
<b>9</b> (70Sn/18Pb/12In)	No	58.1-64.4	-	14.9-16.6	-	10.0-11.0	-
<b>10</b> (75Pb/25In)	No	-	-	62.3-69.0	-	20.8-23.0	-
<b>11</b> (95Pb/5In)	Yes	-	-	78.9-87.4	-	4.2-4.6	-
<b>40</b> (50Bi/31Pb/19Sn)	No	15.8-17.5	-	25.7-28.5	41.5-46.0	-	-
<b>42</b> (46Bi/34Sn/20Pb)	No	28.0-31.3	-	17.0-18.4	38.0-42.3	-	-
<b>53</b> (67Bi/33In)	Yes	-	-	-	54.9-61.6	27.1-30.4	-
<b>70</b> (40In/40Sn/20Pb)	No	32.8-36.8	-	16.4-18.4	-	32.8-36.8	-

<b>97</b> (43Sn/43Pb/14Bi)	No	36.7-39.6	-	36.7-39.6	11.6-12.9	-	-
<b>150</b> (81Pb/19In)	No	-	-	67.2-74.5	-	15.8-17.5	-
<b>164</b> (92.5Pb/5In/2.5Ag)	Yes	-	2.1-2.3	76.8-85.1	-	4.2-4.6	-
<b>174</b> (57Bi/26In/17Sn)	Yes	14.1-15.6	-	-	47.3-52.4	21.6-23.9	-
<b>Indalloy (metal)</b>	<b>RoHS 2 Compliance*</b>	<b>%TIN Sn</b>	<b>%SILVER Ag</b>	<b>%LEAD Pb</b>	<b>%BISMUTH Bi</b>	<b>%INDIUM In</b>	<b>Ag coated Ni powder</b>
<b>204</b> (70In/30Pb)	No	-	-	24.9-27.6	-	58.1-64.4	-
<b>205</b> (60In/40Pb)	no	-	-	33.2-36.8	-	49.8-55.2	-
<b>206</b> (60Pb/40In)	No	-	-	49.8-55.2	-	33.2-36.8	-
<b>227</b> (77.2Sn/20In/2.8Ag)	Yes	64.1-71.0	2.3-2.6	-	-	16.6-18.4	-
<b>227</b> with 2% Ag coated Ni powder (77.2Sn/20In/2.8Ag)	Yes	67	2.4	-	-	17.4	2
<b>230</b> (54Sn/26Pb/20In)	No	44.8-49.7	-	21.6-23.9	-	16.6-18.4	-
<b>249</b> (91.8Sn/4.8Bi/3.4Ag)	Yes	76.2-84.5	2.8-3.1	-	4.0-4.4	-	-
<b>254</b> (86.9Sn/10In/3.1Ag)	Yes	72.1-79.9	2.6-2.9	-	-	8.3-9.2	-
<b>281</b> (58Bi/42Sn)	Yes	34.9-38.6	-	-	48.1-53.4	-	-
<b>290</b> (97In/3Ag)	Yes	-	2.5-2.8	-	-	80.5-89.2	-
NON STANDARD ALLOY (88Sn/10In/2Ag)	Yes	73-81	1.7-1.8	-	-	8.3-9.2	-
NON STANDARD ALLOY (75In/25Pb)	No	-	-	20.8-23	-	62.3-69	-

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

#### 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 flammable rated >200F ( >93C)
<b>Auto-ignition Temperature:</b>	Not established.
<b>Flammable Limits:</b>	NA
<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 of contaminated cloth rags or paper towels following all Federal, State and Local regulations.
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## 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

<b>Engineering Controls:</b>	Use only with production equipment (such as 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 the exposure levels are not exceeded.
<b>Personal protection:</b>	
<b>Eyes:</b>	Chemical safety glasses/goggles. Face shield for splash hazards.

<b>Respirator:</b>	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.
<b>Skin:</b>	Compatible chemical resistant gloves.
<b>Other:</b>	Lab coat, eye-wash fountain in work area. Avoid the use of contact lenses in high fume areas.
<b>Work/Hygienic Practices:</b>	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 available
<b>Specific Gravity:</b>	Not applicable.	<b>pH:</b>	Not applicable
<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.

Solder paste is not classified under any agency {NTP/OSHA/IARC}. Proprietary ingredients are not listed as carcinogens.

**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.

## 12. ECOLOGICAL INFORMATION

Product not tested.

Avoid release to 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. Fresh fish: 0.44 mg/l LC50 96h/ 1.32 mg/l LC50 96h/water Flea: 600 ug/l EC50 = 48h



Contains other substance that is harmful to aquatic life with long lasting effects.

### 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. Avoid release to environment.

### 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated under US DOT (United States Department of Transportation). Not hazardous under UN shipping regulations.

UN – none

Not regulated under IATA.

North American Emergency Guide Book – Not classified

### 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).

WHMIS: D2B –Materials Causing Other Toxic Effects (irritant or sensitizer)

WHMIS: D2A-Materials Causing Other Toxic Effects-Very Toxic Material (Chronic) (lead)



This product has been classified in accordance with the Mexican regulations: NOM-018-STPS-2015 and NOM – 010-STPS-2014.

This product has been classified in accordance with the guidelines set by the Dept of Industrial Health of the Republic of Singapore.

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). (Lead CAS# 7439-92-1)

SARA 313 Listing - 40 CFR 372.65

Lead CAS# 7439-92-1 Silver CAS# 7440-22-4

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: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS).

**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.

All ingredients are listed on the Canadian Domestic Substance List.

All ingredients are listed on the Philippines Chemical Inventory (PICCS)/China Inventory of Chemicals/Korean Inventory of Chemicals.

## 16. OTHER INFORMATION

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

**Revised Date:** 17 JUNE 2016

**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.