



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

## SAFETY DATA SHEET

This safety data sheet represents a family grouping of all metal mixes that are blended with the same flux known as NC-SMQ 90. 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.

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY WITH NC-SMQ90 FLUX VEHICLE

**SDS Number:** SDS-IN 458

**Revised Date:** 4 OCTOBER 2017

**Product Use:** Industrial use - No-clean solder paste consisting of a flux vehicle blended with an 82.5-92 % pre-alloyed metal powder. See alloy table for metal mixtures with the same flux.

#### MANUFACTURER:

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**2. HAZARDS IDENTIFICATION****PRIMARY ROUTES OF ENTRY:**

X Eye    X Inhalation    X Skin    X Ingestion    NTP

**CARCINOGEN LISTED IN:**

IARC    OSHA    X Not Listed  
See Section 11

GHS:

Lead free:



Signal Word: Warning

Hazard statement(s)

H317                    May cause an allergic skin reaction  
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)

Lead containing:



Signal Word: Warning

Hazard statement(s)

H303                    May be harmful if swallowed (lead)  
H317                    May cause an allergic skin reaction  
H334                    May cause allergy or asthma symptoms or breathing difficulties 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 effects (lead)  
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 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

Skin irritant- Category 2

Acute toxicity, oral- Category 5

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

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 alloys and organic chemicals. May be harmful if swallowed. May cause irritation.

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

**Skin Contact:** May cause skin irritation. Antimony/Rosin has been known to 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.

**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.

**WARNING:** **Applicable to the State of California - 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 or food stuff's.**

**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
		(Singapore)	2	-	-
		(Canada)	-	2	4
<b>LEAD</b>	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	-
		(EU)	-	0.15	-
		(Singapore)	0.15	-	-
		(Mexico)	-	0.15	-
		(China)	-	0.05(dust) 0.03(fume)	-
		(Canada)	0.05	0.05	-
<b>SILVER</b>	*	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	-	0.1	-
<b>INDIUM</b>	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	-	0.1	0.3
		(China)	-	0.1	0.3
		(Canada)	-	0.1	0.3
<b>BISMUTH</b>	*	7440-69-9 /231-177-4	N.E.	N.E.	N.E.

<b>ANTIMONY</b>	*	7440-36-0/231-146-5	(US)	0.5	0.5	-
			(EU)	0.5	-	-
			(Singapore)	0.5	-	-
			(Mexico)	-	0.5	-
			(China)	-	0.5	-
			(Canada)	N.E.	0.5	1.5
<b>COPPER</b>	*	7440-50-8/231-159-6	(US)	0.1 (fume)	0.2 (fume)	-
			(EU)	-	0.2 (fume)	-
			(Singapore)	0.2(fume)	1(dust)	-
			(China)	-	0.2(fume)	0.6
			(Mexico)	-	0.2	2
			(Canada)	-	0.2 (fume)	0.6 (fume)
<b>ROSIN</b>	3.0-4.0	65997-05-9	(US)	N.E.	N.E.	N.E.
			(EU)	0.05	N.E.	0.15 (sensitiser)
<b>CARBOXYLIC ACID</b>	2 – 10	68937-72-4		N.E.	N.E.	N.E.
<b>POLYGLYCOL ETHER</b>	2 – 6	9038-95-3		N.E.	N.E.	N.E.
N.E. = Not established      * See alloy table						

## ALLOY TABLE

### %Metal mix with flux

Indalloy (METAL)	%TIN Sn	%SILVER Ag	%LEAD Pb**	%ANTIMONY Sb	%BISMUTH Bi	%INDIUM In	%COPPER Cu	RoHS 2* Compliance
7 (In50/Pb50)	-	-	41.3-46	-	-	41.3-46	-	NO
97 (S43/Pb43/Bi14)	35.5-39.6	-	35.5-39.6	-	11.6-12.9	-	-	NO
104 (Sn62/Pb36/Ag2)	51.2-57.5	1.65-1.8	29.7-33.2	-	-	-	-	NO
106 (Sn63/Pb37)	52-58	-	30.5-34	-	-	-	-	NO
121 (Sn96.5/Ag 3.5)	79.6-88.8	2.8-3.2	-	-	-	-	-	YES

<b>128</b> <b>(100 Sn)</b>	82.5-92	-	-	-	-	-	-	YES
<b>133</b> <b>(Sn95/Sb5)</b>	78.4-87.4	-	-	4.1-4.6	-	-	-	YES
<b>151</b> <b>(Pb92.5/Sn 5/Ag2.5)</b>	4.1-4.6	2.1-2.3	76.3-85.1	-	-	-	-	YES
<b>161</b> <b>(Pb97.5/Ag 2.5)</b>	-	2.1-2.3	80-89.7	-	-	-	-	YES
<b>171</b> <b>(Pb95/Sn5)</b>	4.1-4.6	-	78-87.4	-	-	-	-	YES
<b>227</b> <b>(Sn77.2/In2 0/Ag2.8)</b>	63.7-71	2.3-2.6	-	-	-	16.5-18.4	-	YES
<b>228</b> <b>(Pb88/Sn10 /Ag2)</b>	8.25-9.2	1.65-1.8	72.6-81	-	-	-	-	YES
<b>241</b> <b>(SAC387)</b> <b>(Sn95.5/Ag 3.8/Cu0.7)</b>	78.8-87.9	3.1-3.5	-	-	-	-	0.58-0.64	YES
<b>Indalloy</b> <b>(METAL)</b>	<b>%TIN</b> <b>Sn</b>	<b>%SILVER</b> <b>Ag</b>	<b>%LEAD</b> <b>Pb**</b>	<b>%ANTIMONY</b> <b>Sb</b>	<b>%BISMUTH</b> <b>Bi</b>	<b>%INDIUM</b> <b>In</b>	<b>%COPPER</b> <b>Cu</b>	<b>RoHS 2*</b> <b>Compliance</b>
<b>244</b> <b>(Sn99.3/ Cu0.7)</b>	81.9-91.4	-	-	-	-	-	0.58-0.64	YES
<b>246</b> <b>(Sn95.5/Ag 4.0/Cu0.5)</b>	78.8-87.9	3.3-3.7	-	-	-	-	0.41-0.46	YES
<b>249</b> <b>(91.8Sn/4. 8Bi/3.4Ag)</b>	75.7 – 84.5	2.8 – 3.1	-	-	4 – 4.4	-	-	YES
<b>252</b> <b>(Sn95.5/Ag 3.9/Cu0.6)</b>	78.8-87.9	3.2-3.6	-	-	-	-	0.5-0.6	YES
<b>256</b> <b>(SAC305)</b> <b>(Sn96.5/Ag 3/Cu0.5)</b>	79.6-88.8	2.5-2.8	-	-	-	-	0.41-0.46	YES
<b>258</b> <b>(Sn98.5/ Ag1/Cu0.5)</b>	81.2-90.6	0.825-0.92	-	-	-	-	0.41-0.46	YES
<b>281</b> <b>(Bi58/Sn42)</b>	34.7-38.6	-	-	-	47.8-53.4	-	-	YES
<b>NS Non-Std</b> <b>(91.5Sn 8.5Sb)</b>	75.5-84.2	-	-	7.0-7.8	-	-	-	YES

RoHS 2= Restriction of Hazardous Substances (\*\*REVIEW APPLICABLE EXEMPTIONS) (2011/65/EU)  
[http://europa.eu.int/comm/environment/waste/weee\\_index.tm](http://europa.eu.int/comm/environment/waste/weee_index.tm)

#### 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.

#### 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 (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 permissible 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. Latex disposable not recommended.

**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. Follow proper lead work practices when applicable.

## 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>	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.	<b>Volatile Organics:</b>	<149,000 ug/kg

## 10. STABILITY AND REACTIVITY

**General:** Stable.

**Conditions to Avoid:** Not established.

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

**Hazardous Decomposition:** Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.

**Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Carcinogenicity:** **NTP:** No (National Toxicology Program)  
**OSHA:** No (Occupational Safety and Health Administration) 29CFR1910.1025  
**IARC:** Yes (International Agency on Research for Cancer) Lead and lead compounds are listed as possible carcinogens.  
 Product is not listed as a carcinogen.

**LD50:** Not established. **LC50:** Not established.

**Other:** Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma.

Copper - LD50 – intraperitoneal mouse 3.5 mg/kg.

Silver – LD50 oral – rat > 5,000 mg/kg

Bismuth – 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.

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

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.

## 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 (Department of Transportation).

Not hazardous under all shipping regulations.

UN – none

Non-hazardous- ground/IATA/IMDG

## 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.).

Applicable to California Only - 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

Lead CAS# 7439-92-1

Silver CAS# 7440-22-4

Antimony CAS# 7440-36-0

Copper CAS# 7440-50-8

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:



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

D2B Materials Causing Other Toxic Effects –irritant

All ingredients are listed on the Canadian Domestic Substance List.

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.

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

## 16. OTHER INFORMATION

**HMIS Hazard Rating:**

<b>Health:</b>	2
<b>Fire:</b>	1
<b>Reactivity:</b>	0

**Revised Date:** 4 OCTOBER 2017

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

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

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