



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

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH NC-SMQ92 FLUX VEHICLE

MSDS Number: MSDS-IN 479

Revised Date: 20 SEPTEMBER 2012

Product Use: Industrial Use (mixture) - No-clean solder paste consisting of a flux vehicle blended with an 83-92 % pre- alloyed metal powder.

MANUFACTURER:

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

XEye XInhalation XSkin XIngestion NTP

CARCINOGEN LISTED IN:

IARC OSHA XNot Listed

GHS:



lead

Signal Word: Warning

Hazard statement(s)

H302	Harmful if swallowed
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
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)
H360	May damage 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)
H400+H413	Very toxic to aquatic life, may cause long lasting harmful effects to aquatic life (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/vapours/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
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)

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 damage.

Ingestion: This product may contain lead alloy powder and organic chemicals. Harmful if swallowed. May cause systematic lead poisoning and burns to the digestive tract. Symptoms of lead poisoning include headache, nausea, abdominal pain, muscle and joint pain and damage to the nervous system, blood system and kidneys.

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 occupation asthma.

Skin Contact: May cause skin irritation. Antimony and 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:** This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm).
- 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.

Summary: Skin contact may cause irritation. Long term contact may cause dermatitis.
 Inhalation of decomposed rosin fume may cause irritation or occupational asthma.
 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.
 Exposure to lead fume may cause harm. Sign of overexposure is anemia.
 Signs or symptoms of over exposure to antimony is headache, vomiting, nausea or dizziness.
 Target organs (antimony) – heart and respiratory system.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #/EINECS
TIN	*	7440-31-5/231-141-8
LEAD	*	7439-92-1/231-100-4
SILVER	*	7440-22-4/231-131-3
INDIUM	*	7440-74-6/231-180-0
BISMUTH	*	7440-69-9/231-177-4

ANTIMONY	*	7440-36-0/231-146-5
COPPER	*	7440-50-8/231-159-6
ROSIN	3 - 4	65997-05-9
POLYGLYCOL ETHER	2 – 5	9038-95-3
PROPRIETARY	3 - 8	-

PRODUCT DOES NOT CONTAIN ANY REPORTABLE EU SUBSTANCES OF VERY HIGH CONCERN (SVHC)

Symbol: X_n Risk Phrases: R20/21/22, R36/37/38, R42/43 See Section 15 * See Alloy Table
 N.E. = Not established EU = European Union Occupational Exposure Limits

ALLOY TABLE

Metal mixed with flux

Indalloy	RoHS Compliance	%TIN Sn	%SILVER Ag	%LEAD Pb	%ANTIMONY Sb	%BISMUTH Bi	%INDIUM In	%COPPER Cu
7 (50In/50Pb)	No	-	-	41.5-46	-		41.5-46	-
97 (43Sn/43Pb/14Bi)	No	36.7-39.6	-	36.7-39.6	-	11.6-12.9	-	-
104 (Sn62/Pb36/2Ag)	No	51.9-57.5	1.2-1.8	29.9-33.2	-	-	-	-
106 (Sn63/Pb37)	No	52.3-58	-	30.7-34	-	-	-	-
109 (Sn60/Pb40)	No	49.8-55.2	-	33.2-36.8	-	-	-	-
121 (96.5Sn/3.5Ag)	Yes	80.1-88.8	2.9-3.2	-	-	-	-	-
127 60Pb/37Sn/3Ag)	No	30.7-34	2.5-2.8	49.8-55.2	-	-	-	-
132 (95Sn/5Ag)	Yes	78.9-87.4	4.2-4.6	-	-	-	-	-
133 (95Sn/5Sb)	Yes	78.9-87.4	-	-	4.2-4.6	-	-	-
205 (60In/40Pb)	No	-	-	33.2-36.8	-	-	49.8-55.2	-
228 (88Pb/10Sn/2Ag)	Yes +	8.3-9.2	1.7-1.8	73-81	-	-	-	-
233	Yes +	4.2-4.6	-	70.6-78.2	8.3-9.2	-	-	-

(85Pb/10Sb/5 Sn)								
240 (46Sn/46Pb/8 Bi)	No	38.2-42.3	-	38.2-42.3	-	6.6-7.4	-	-
241 (95.5Sn/3.8Ag /0.7Cu)	Yes	79.3-87.9	3.2-3.5	-	-	-	-	0.6-0.7
244 (99.3Sn/0.7Cu)	Yes	82.4-91.4	-	-	-	-	-	0.58-0.64
281 (58Bi/42Sn)	Yes	34.9-38.6	-	-	-	48.1-53.4	-	-
NS	No	50-56	0.08-0.09	32.8-36.4	-	-	-	-

NS = Non Standard Alloy

RoHS (Restriction of Hazardous Substances) EU Directive 2002/95/EC

Yes + Complies with RoHS only if using the lead exemption for high melting leads >85%

4. FIRST AID MEASURES

- Eye Contact:** Hold eyelids apart and flush eyes with plenty of 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

Components	% wt	CAS Registry #/EINECS	PEL mg/m ³	TLV-TWA mg/m ³	TLV-STEL mg/m ³
TIN	*	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
LEAD	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	N.E.
		(EU)	-	0.15	-
		(Canada)	0.05	0.05	-
		(Mexico)	0.15	-	-
		(Singapore)	0.15	-	-
		(China)	-	0.05(dust) 0.03(fume)	-
SILVER	*	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	N.E.	0.1	0.3
		(Mexico)	0.1	-	-
		(Singapore)	0.1	-	-
INDIUM	*	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
BISMUTH	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
ANTIMONY	*	7440-36-0/231-146-5			
		(US)	0.5	0.5	-
		(EU)	0.5	-	-
		(Canada)	-	0.5	1.5
		(Mexico)	0.5	-	-
		(Singapore)	0.5	-	-
		(China)	-	0.5	-
COPPER	*	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	-	2
		(Singapore)	0.2(fume)	1(dust)	-
		(China)	-	1	2.5(dust)
				0.2	0.6(fume)
ROSIN	3 - 4	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
POLYGLYCOL ETHER	2 – 5	9038-95-3	N.E.	N.E.	N.E.
PROPRIETARY	3 - 8	-	N.E.	N.E.	N.E.

PRODUCT DOES NOT CONTAIN ANY REPORTABLE EU SUBSTANCES OF VERY HIGH CONCERN (SVHC)

Symbol: X_n Risk Phrases: R20/21/22, R36/37/38, R42/43 (See Section 15) * See Alloy Table
 N.E. = Not established EU = European Union Occupational Exposure Limits

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 they're exposure levels are not exceeded. Use ventilation.

Personal protection:

Eyes: Chemical safety glasses/goggles. Face shield for 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.

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

Appearance: Grey colored paste.

Boiling Point: Not applicable.

Odor: Mild characteristic odor.

Melting Point: Not applicable

Specific Gravity: Not applicable.

pH: Not applicable

Vapor Pressure: Not applicable.

Solubility in Water: Insoluble (paste)

Vapor Density: (air=1) Not applicable.

Volatile Organic Compounds: <140,000 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 / Combustion: Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity: NTP: No

OSHA: No

IARC: Yes

Lead and lead compounds are listed as possible carcinogens.

LD50: Not established.

LC50: Not established.

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

This section is subject to future development. Product not tested.

Biodegradability: Data not established.

Aquatic Toxicity: Data not established.

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

Avoid release to 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. Do not reuse empty containers. Do not discharge product to body of water or drain. Avoid release to environment.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated (US Department of Transportation).

Non hazardous under the shipping regulations.

North American Emergency Guide Book – Not applicable

15. REGULATORY INFORMATION

The information in this Material 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).



Canadian WHMIS:

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

D2B Materials Causing Other Toxic Effects -irritant

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: WARNING:

This product contains a chemical 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

This product has been classified in accordance with Mexican regulations NOM-018-STPS-2000 and NOM-010-STPS-1999.

This product has been classified under the Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2002 in China.

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

All ingredients are listed on the EPA TSCA Inventory.

All ingredients are listed on the Canadian Domestic Substance List.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X_n

Risk Phrases:

- R20/21/22 Harmful by inhalation, in contact with skin and if swallowed
- R36/37/38 Irritating to eyes, respiratory system and skin
- R42/43 May cause sensitization by inhalation and by skin contact
- R33 Danger of cumulative effects (lead)
- R40 Limited evidence of carcinogenic effect (lead)
- R48 Danger of serious damage to health by prolonged exposure (lead)
- R50/53 Very Toxic to aquatic environment and may cause long-term adverse effects in the aquatic environment(lead)
- R61 May cause harm to the unborn child (lead)

Safety Phrases:

- S20/21 When using do not eat, drink or smoke
- S22 Do not breathe dust
- S23 Do not breathe fumes
- S24/25 Avoid contact with skin and eyes
- S27 Take off immediately all contaminated clothing
- S28 After contact with skin wash immediately with plenty of soap and water
- S36/37/39 Wear suitable protective clothing, gloves and eye/face protection
- S62 If swallowed, do not induce vomiting seek medical advice immediately and show container or label
- S7 Keep container tightly closed

16. OTHER INFORMATION

HMIS Hazard Rating:

Health:	2
Fire:	1
Reactivity:	0

Revised Date: 20 SEPTEMBER 2012

Prepared by: Nancy Swarts, Indium Corporation of America

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