



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

SAFETY DATA SHEET

This material safety data sheet represents a family grouping of all metal mixes that are blended with the same flux known as NC-SMQ 230. A table is provided on pages 9 and 10 that list all metal groupings and their identification. To better serve all of our customers Indium Corporation has generated one MSDS, 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-SMQ230 FLUX VEHICLE

MSDS Number: MSDS-IN 640

Revised Date: 5 NOVEMBER 2009

Product Use: Industrial Use - No-clean solder paste consisting of a flux vehicle blended with 83-92 weight percent pre-alloyed metal powder.

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:

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
 IARC
 OSHA
 Not Listed

Carcinogen listed in

See Section 11

GHS:



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 may contain lead alloy powder, other metal alloy powders and organic chemicals. Harmful if swallowed. May cause burns to the digestive tract and systematic effects.

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

Skin Contact: May cause skin irritation. ANTIMONY and COBALT has been known to cause 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.

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.

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.

BISMUTH: May cause kidney damage.

COBALT: Inhalation of dust may cause pulmonary damage. Animal carcinogen and suspected human carcinogen.

IRON: Inhalation of large amounts of iron dust may result in iron pneumoconiosis. Chronic exposure to high levels on a daily basis can result in iron being deposited in body tissues and may result in liver cirrhosis and pancreas problems.

MANGANESE: Inhalation may cause metal fume fever and/or asthma.

WARNING: This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (State listed metal (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 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	-	-
SILVER	*	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	-	-		
COPPER	*	7440-50-8 (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	
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	-		

COBALT	*	7440-48-4/231-158-0			
		(US)	0.1	0.02	-
		(EU)	0.1	-	-
		(Canada)	-	0.05	0.1
		(Singapore)	0.02	-	-
IRON	*	7439-89-6/ 231-096-4	N.E.	N.E.	N.E.
LEAD	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	-
		(EU)	-	0.15	-
		(Canada)	-	0.05	-
		(Mexico)	N.E.	0.15	N.E.
		(Singapore)	0.15	-	-
		(China)	-	0.05(dust) 0.03(fume)	-
MANGANESE	0-1	7439-96-5	5(ceiling)	0.2	3 (fume)
		(EU)	-	1(fume)	3(fume)
		(Canada)	-	1(fume)	3(fume)
		(Singapore)	5(dust)	1(fume)	-
		(Mexico)	1(fume)	0.2	-
		(China)	-	0.15	-
ROSIN	3.0-6.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
PROPRIETARY	5-11		N.E.	N.E.	N.E.
PRODUCT DOES NOT CONTAIN ANY REPORTABLE EU SUBSTANCES OF VERY HIGH CONCERN (SVHC)					
N.E. = Not established * See alloy table					

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

- 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 the (exposure limits) are not exceeded.

Personal protection:

- Eyes:** Chemical safety glasses/goggles.
- 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.
- 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

- | | | | |
|--------------------------|---------------------------|------------------------------------|-------------------|
| 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: | <11,260 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 (29CFR 1910.1025 Lead)
 IARC: Yes - Lead
- 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 may cause potential harm to the developing fetus.

12. ECOLOGICAL INFORMATION

This section is subject to future development.

Product not tested.

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 under US DOT (United States Department of Transportation). Non hazardous under shipping requirements.

North American Emergency Guide Book 2004 – Not Classified

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.).

The information in this Material Safety Data Sheet meets the requirements of the EU under Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP 2) Regulation 6.

This product has been classified in accordance with the hazard criteria of the Commission Directive 91/155/EEC and EH40.

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.

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

This product has been classified using the Chinese Occupational Limit for Hazardous Agents in the Workplace, GBZ2-2002.

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)

SARA 313 Listing - 40 CFR 372.65

Silver CAS# 7440-22-4

Copper CAS# 7440-50-8

Antimony CAS# 7440-36-0

Cobalt CAS# 7440-48-4

Lead CAS# 7439-92-1

Manganese CAS# 7439-96-5

All ingredients are listed on the EPA TSCA Inventory.

Most of the ingredients are listed on the Canadian Domestic Substance List.

For Compliance with EU Directive 2002/95/EC, Restriction on Hazardous Substances (RoHS) - See Alloy Table.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X_n

Risk Phrases:

- R42/43 May cause sensitization by inhalation or by skin contact
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed
R36/37/38 Irritating to eyes, respiratory system and skin
R61 May cause harm to the unborn child (lead)
R40 Limited evidence of carcinogenic effect (lead)
R48 Danger of serious damage to health by prolonged exposure (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
	Physical Hazard:	0

Revised Date: 5 NOVEMBER 2009

Prepared by: Nancy Swarts, Indium Corporation of America

Approved by: Nancy Swarts, Indium Corporation of America

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ALLOY TABLE**%Metal Content Blended with Flux**

METAL MIX	INDALLOY	TIN Sn	LEAD Pb	COPPER Cu	SILVER Ag	BISMUTH Bi	IRON Fe	COBALT Co	MANGANESE Mn	ANTIMONY Sb	RoHS*
Sn43/Pb43/ Bi14	97	35.7-39.6	35.7-39.6	-	-	11.6-12.9	-	-		-	NO
Sn96.5/Ag3 .5	121	80.1-88.8	-	-	2.9-3.2	-	-	-		-	YES
Sn100	128	83-92	-	-	-	-	-	-		-	YES
Sn95/Ag5	132	78.9-87.4	-	-	4.2-4.6	-	-	-		-	YES
Sn95/Sb5	133	78.9-87.4	-	-	-	-	-	-		4.2-4.6	YES
Sn90/Ag10	156	74.7-82.8	-	-	8.3-9.2	-	-	-		-	YES
Sn97/Cu3	160	80.5-89.2	-	2.5-2.8	-	-	-	-		-	YES
Sn65/Ag25/ Sb10	209	54.0-59.8	-	-	20.8-23.0	-	-	-		8.3-9.2	YES
Sn93.6/Ag 4.7/Cu1.7	232	77.7-86.1	-	1.4-1.6	3.9-4.3	-	-	-		-	YES
Sn95.5/Ag 3.8/Cu0.7	241	79.3-87.9	-	0.6-0.7	3.2-3.5	-	-	-		-	YES
Sn99/Cu1	243	82.2-91.1	-	0.83-0.92	-	-	-	-		-	YES
Sn99.3/Cu 0.7	244	82.4-91.4	-	.58-.64	-	-	-	-		-	YES
Sn95.5/Ag4 /Cu0.5	246	79.3-87.9	-	0.42-0.46	3.3-3.7	-	-	-		-	YES
Sn91.8/Bi 4.8/Ag3.4	249	76.2-84.5	-	-	2.8-3.1	4.0-4.4	-	-		-	YES
Sn95.5/Ag 3.9/Cu0.6	252	79.3-87.9	-	0.50-0.55	3.2-3.6	-	-	-		-	YES
Sn96.5/Ag3 /Cu0.5	256	80.1-88.8	-	0.41-0.46	2.5-2.8	-	-	-		-	YES
Sn60/Bi40	281	34.9-38.6	-	-	-	48.1-53.4	-	-		-	YES

METAL MIX	INDALLOY	TIN Sn	LEAD Pb	COPPER Cu	SILVER Ag	BISMUTH Bi	IRON Fe	COBALT Co	Manganese Mn	ANTIMONY Sb	RoHS*
98.3Sn/1Ag /0.5Cu/0.2 Mn	NS	81.5-90	-	0.42-0.46	0.83-0.92	-	-	-		-	YES
	NS	79.5-88	-	0.4 – 0.46	3.1-3.4	-	-	-		-	YES
	NS	79.3-87.9	-	0.6-0.64	3-3.3	-	-	-		-	YES
	NS	79.7-88.3	-	0.25-0.28	3.1-3.4	-	-	-		-	YES
	NS	79.2-87.8	-	0.7-0.8	3.1-3.4	-	-	-		-	YES
	NS	79.2-87.8	-	0.58-0.64	3.1-3.4	-	0.17-0.18	-		-	YES
	NS	79.2-87.8	-	0.50-0.55	3.1-3.4	-	-	0.25-0.28		-	YES
	NS	78.4-86.9	-	1.2-1.3	3.4-3.8	-	-	-		-	YES
	NS	79.7-88.3	-	-	3.3-3.7	-	-	-		-	YES
	NS	78.9-85.5	-	-	3.3-3.7	-	-	-		0.83-0.92	YES
	NS	78.0-86.5	-	0.83-0.92	3.3-3.7	-	-	-		0.83-0.92	YES
	NS	76.4-84.7	-	1.4-1.6	3.9-4.3	-	-	-		1.2-1.4	YES

NS= Non Standard Alloy Mix

*RoHS Restriction of Hazardous Substances (Review directive for applicable exemptions)

http://europa.eu.int/comm/environment/waste/weee_index.tm

<http://www.pbfree.com>