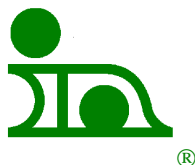


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INDIUM CORPORATION OF AMERICA®\EUROPE®\ASIA-PACIFIC® INDIUM CORPORATION (SUZHOU)®

This material safety data sheet represents a family grouping of all metal mixes that are blended with the same flux known as NC-SMQ 81. A table is provided that lists all metal groupings. 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.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH NC-SMQ81 FLUX VEHICLE

MSDS Number: MSDS-IN 635

Revised Date: 18 JUNE 2013

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

MANUFACTURER:

In America:

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nswarts@indium.com

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

XEye

XInhalation

XSkin

XIngestion

NTP

IARC

OSHA

XNot Listed*

*See Section 11

Carcinogen listed in

GHS:



lead containing products

Signal Word: Warning

Hazard statement(s)

H303	May be harmful if swallowed
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H333	May be 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)
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 + P312	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)

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 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. Otherwise 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. Inhalation of indium may cause additional respiratory issues.
Skin Contact:	May cause skin irritation of dermatitis.
Chronic:	<p>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.</p> <p>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.</p> <p>TIN: Has been shown to increase incidence of sarcoma in animal tests.</p> <p>BISMUTH: May cause kidney damage.</p> <p>INDIUM: May cause damage to respiratory or kidney system. May be harmful if inhaled.</p>
WARNING:	This product may contain 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.

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	-	-
LEAD	*	7439-92-1/231-100-4			
		(US)	0.05	0.05	-
		(EU)	-	0.15	-

		(Canada)	0.05	0.05	-
		(Singapore)	0.15	-	-
		(Mexico)	-	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)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	-	0.1	-
BISMUTH	*	7440-69-9/231-177-4	N.E.	N.E.	N.E.
INDIUM	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Canada)	-	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	-	0.1	0.3
		(China)	-	0.1	0.3
ROSIN	4.5-5.5	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
PROPRIETARY	2.5-12.5		N.E.	N.E.	N.E.

DOES NOT CONTAIN ANY EU REACH LISTED SUBSTANCES OF VERY HIGH CONCERN (SVHC)

Symbol: X_n

N.E. = Not established

* SEE ALLOY TABLE

Risk Phrases: R20/21/22, R36/37/38, R42/43 See Section 15

EU = European Union Occupational Exposure Limits

ALLOY TABLE

%Metal mix with flux

Indalloy (metal)	*RoHS Compliance	%TIN Sn	%SILVER Ag	%LEAD Pb	%BISMUTH Bi	%INDIUM In
41 (50Bi/28Pb/22Sn)	No	18.3-20.2	-	23.2-25.8	41.5-46.0	-
42 (46Bi/34Sn/20Pb)	No	28.2-31.3	-	16.6-18.4	38.2-42.3	-
53 (67Bi/33In)	Yes	-	-	-	55.6-61.6	27.4-30.4
97 (43Sn/43Pb/14Bi)	No	36.7-39.6	-	36.7-39.6	11.6-12.9	-
106 (Sn63/Pb37)	No	52.3-58.0	-	30.7-34.0	-	-
128 (100Sn)	Yes	83.0-92.0	-	-	-	-
249 (91.8Sn/4.8Bi/3.4Ag)	Yes	76.2-84.5	2.8-3.1	-	4.0-4.4	-
255 (55.5Bi/44.5Pb)	No	-	-	36.9-40.9	46.1-51.1	-
281 (58Bi/42Sn)	Yes	34.9-38.6	-	-	48.1-53.4	-
282 (57Bi/42Sn/1Ag)	Yes	34.9-38.6	0.83-0.92	-	47.3-52.4	-
281- 338 (60Sn/40Bi)	Yes	49.8-55.2	-	-	33.2-36.8	-
NS (57Sn/42Bi/1Ag)	Yes	47.3-52.4	0.83-0.92	-	34.9-38.6	-
NS (57Bi/42Sn/1Ag/0.02Pb)	No	34.9-38.6	0.83-0.92	0.017-0.018	47.3-52.4	-
NS (57Bi/42Sn/1Ag)	No	34.9-38.6	0.83-0.92	-	47.3-52.4	-
NS* (99.2Sn/0.38)	No	82.7-91.7	-	0.31-0.34	-	-
NS* (98.9Sn/1.1Pb)	No	82.1-91.0	-	0.9-1.02	-	-
NS* (96.6Sn/3.4Pb)	No	80.2-88.9	-	2.76-3.06	-	-

NS* (90Sn/10Pb)	No	74.7-82.8	-	8.3-9.2	-	-
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NS = Non Standard Alloy

* product is doped with Indalloy 128 and Indalloy 106

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 of 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 they're 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.
- 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. | | |

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 29CFR1910.1025
 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

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 material under shipping modes.

UN- none

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.

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

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

California PROP 65 (Safe Drinking Water Standard): 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

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

All ingredients are listed on the EPA TSCA Inventory.

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

X_n Irritant**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 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)
R61	May cause harm to the unborn child (lead)
R50/53	Very toxic to aquatic organisms and may cause long-term effects in the aquatic environment (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: 13 JUNE 2013**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.