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 58. A table is provided on page 4 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.

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: **INDALLOY WITH NC-SMQ 58 FLUX VEHICLE**

MSDS Number: MSDS-IN 963 **Revised Date:** 11 OCTOBER 2006

Product Use: Rosin-based mildly activated solder paste consisting of a flux vehicle blended with 83-92 weight percent of pre-alloyed metal powder.

MANUFACTURER:

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

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 Asia:
Asia-Pacific Operations-Singapore
29 Kian Teck Avenue
Singapore 628908
Information: +65 6268-8678

In China:
Indium Corporation (Suzhou) Co., Ltd
428 Xinglong Street
Suzhou Industrial Park
Suchun Industrial Square
Unit No. 14-C
Jiangsu Province, China 2151126
Information: (86) 512-6283-4900

2. COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS Registry #	PEL mg/m³	TLV-TWA mg/m³	TLV-STEL mg/m³
TIN	7440-31-5 (US)	2	2	-
	(EU)	-	2	4
	(Singapore)	2	-	-
	(Canada)	-	2	4
LEAD	7439-92-1(US)	0.05	0.05	-
	(EU)	-	0.15	-
	(Canada)	0.05	0.05	-
	(Singapore)	0.15	-	-
	(Mexico)	-	0.15	-
	(China)	0.05(dust)	0.03fume)	-
SILVER	7440-22-4 (US)	0.01	0.1	-
	(EU)	-	0.1	-
	(Canada)	-	0.1	0.3
	(Singapore)	0.1	-	-
	(Mexico)	-	0.1	-
INDIUM	7440-74-6 (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
GOLD	7440-57-5	N.E.	N.E.	N.E.
GERMANIUM	7440-56-4	N.E.	N.E.	N.E.

BISMUTH		7440-69-9 (US)	N.E.	N.E.	N.E.
ANTIMONY		7440-36-0 (US)	0.5	0.5	-
		(EU)	0.5	-	-
		(Canada)	-	0.5	1.5
		(Singapore)	0.5	-	-
		(Mexico)	-	0.5	-
		(China)	-	0.5	-
COPPER		7440-50-8 (US)	0.1 (fume)	0.2 (fume)	-
		(EU)	-	0.2 (fume)	-
		(Canada)	-	0.2 (fume)	0.6 (fume)
		(Singapore)	0.2(fume)	1(dust)	-
		(Mexico)	-	0.2(fume)	2
ZINC		7440-66-6	N.E.	N.E.	N.E.
ROSIN	5.0-6.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	-	0.15 (sensitiser)
PROPRIETARY	3.0-11.0		N.E.	N.E.	N.E.

Symbol: X_n Risk Phrases: R20/21/22, R36/37/38, R42

N.E. = Not established

ALLOY TABLE

Indalloy	%Sn	%Pb	%Ag	%In	%Bi	%Sb	%Cu	%Zn	%Au	%Ge
	Tin	Lead	Silver	Indium	Bismuth	Antimony	Copper	Zinc	Gold	Germanium
9	58.1-64.4	14.9-16.6	-	10-11	-	-	-	-	-	-
10	-	63.3-69	-	20.8-23	-	-	-	-	-	-
42	28-31.3	17-18.4	-	-	38-42.3	-	-	-	-	-
97	35.7-39.6	35.7-39.6	-	-	11.6-12.9	-	-	-	-	-
100	52.0-57.6	30.7-34.0	.33-.37	-	-	-	-	-	-	-
104 (Sn62)	51.9-57.5	29.9-33.2	1.2-1.8	-	-	-	-	-	-	-
106 (Sn63)	52.3-58	30.7-34	-	-	-	-	-	-	-	-
109	49.8-55.2	33.2-36.8	-	-	-	-	-	-	-	-
111	33.6-37.3	46-51	-	-	3.3-3.7	-	-	-	-	-
116	41.5-46	41.5-46	-	-	-	-	-	-	-	-
118	74.7-82.8	8.3-9.2	-	-	-	-	-	-	-	-
121	80.1-88.8	-	2.9-3.2	-	-	-	-	-	-	-
122	78.9-87.4	4.2-4.6	-	-	-	-	-	-	-	-
127	30.7-34	49.8-55.2	2.5-2.8	-	-	-	-	-	-	-
128	83-92	-	-	-	-	-	-	-	-	-
129	82.2-91.1	-	-	-	-	083-0.92	-	-	-	-
130	33.2-36.8	49.8-55.2	-	-	-	-	-	-	-	-
131	80.5-89.2	-	-	-	-	2.5-2.8	-	-	-	-
132	78.9-87.4	-	4.2-4.6	-	-	-	-	-	-	-
133	78.9-87.4	-	-	-	-	4.2-4.6	-	-	-	-
141	24.9-27.6	58.1-64.4	-	-	-	-	-	-	-	-
143	-	74.7-82.8	-	-	-	8.3-9.2	-	-	-	-
145	20.8-23	62.3-69	-	--	-	-	-	-	-	-
149	16.6-18.4	66.4-73.6	-	-	-	-	-	-	-	-
151	4.2-4.6	76.8-85	2-2.3	-	-	-	-	-	-	-
152	4.2-4.6	76.4-85.6	-	-	-	2.5-2.8	-	-	-	-
155	4.2-4.6	74.7-82.8	4-4.6	-	-	-	-	-	-	-
159	8.3-9.2	74.7-82.8	-	-	-	-	-	-	-	-
161	-	80.9-89.7	2-2.3	-	-	-	-	-	-	-
164	-	76.8-85.1	2.1-2.3	4.2-4.6	-	-	-	-	-	-
165	0.8-0.9	80.9-89.7	1.2-1.4	-	-	-	-	-	-	-
171	4.2-4.6	78.9-87.4	-	-	-	-	-	-	-	-
175	-	78.9-87.4	4.2-4.6	-	-	-	-	-	-	-
182	16.6-18.4	-	-	-	-	-	-	-	66.4-73.6	-
183	-	-	-	-	-	-	-	-	73-81	10-11
201	75.5-83.7	-	-	-	-	-	-	7.5-8.3	-	-
206	-	49.8-55.2	-	33.2-36.8	-	-	-	-	-	-
209	54-59.8	-	20.8-23	-	-	8.3-9.2	-	-	-	-

227	64-71	-	2.3-2.6	16.6-18.4	-	-	-	-	-	-
228	8.3-9.2	73-81	1.7-1.8	-	-	-	-	-	-	-
233	4.2-4.6	70.6-78.2	-	-	-	8.3-9.2	-	-	-	-
236	4.2-4.6	68.9-76.4	1.7-1.8	-	-	8.3-9.2	-	-	-	-
238	74.7-82.8	-	-	-	-	-	-	-	8.3-9.2	-
240	38.2-42.3	38.2-42.3	-	-	6.6-7.4	-	-	-	-	-
241	79-87.9	-	3.2-3.5	-	-	-	0.58-0.64	-	-	-
244	82.4-91.4	-	-	-	-	-	0.58-0.64	-	-	-
249	76.2-84.5	-	2.8-3.1	-	4-4.4	-	-	-	-	-
Indalloy	%Sn	%Pb	%Ag	%In	%Bi	%Sb	%Cu	%Zn	%Au	%Ge
255	-	36.9-40.9	-	-	46-51	-	-	-	-	-
281	34.9-38.6	-	-	-	48.1-53.4	-	-	-	-	-
281-338	49.8-55.2	-	-	-	33.2-36.8	-	-	-	-	-
NS	20.8-23	-	-	-	-	-	-	-	62-69	-
NS	24.9-27.6	-	-	-	-	-	--	-	58-64.4	-
NS	4.2-4.6	77.6-86	1.2-1.4	-	-	-	-	-	-	-
NS	12.5-13.8	68.5-75.9	2.1-2.3	-	-	-	-	-	-	-
NS	16.6-18.4	63.9-70.8	2.5-2.8	-	-	-	-	-	-	-
NS	79.7-88.3	-	3.3-3.7	-	-	-	-	-	-	-

NS = Non Standard

3. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY: **Carcinogen listed in**

⊕Eye ⊕✔Inhalation ⊕Skin ⊕Ingestion NTP ⊕IARC OSHA Not Listed

POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact with material at room temperature or fume from material at typical reflow 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.

Inhalation: Vapors or fumes from this material at typical reflow temperatures over 100°C may cause local irritation to the respiratory system.

Skin Contact: May cause mild skin irritation. ANTIMONY 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.

ZINC: Fresh fume inhaled may cause a disease known as "brass founders", throat dryness, cough, weakness, generalized aching, fever, nausea and vomiting.

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.**

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 extinguisher 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 reflow furnaces) with adequate ventilation and other safety features specifically designed for use with solder paste. Control concentration of all components so that they're TLVs are not exceeded.

Personal protection:

Eyes: Chemical safety glasses/goggles.

Respirator: A NIOSH approved or EU compliant CE marked air-purifying respirator with a fume/organic chemical cartridge is recommended under certain circumstances (i.e. when reflowing manually on a hot plate instead of a ventilated reflow furnace) where airborne concentrations are expected to 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
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.

Biodegradability: Data not established.

Aquatic Toxicity: Data not established.

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).

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) Regulations 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).

WHMIS: D2A-Materials Causing Other Toxic Effects-Very Toxic Material (Chronic). Otherwise may not be classified.

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).

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	Zinc CAS# 7440-66-6	

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

All ingredients are listed on the EPA TSCA Inventory.

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	May cause sensitization by inhalation

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

Federal law prohibits the use of leaded solders in the making of joints and fittings in any private or public potable (drinking) water system.

16. OTHER INFORMATION

HMIS Hazard Rating:	**Health:**	2
	Fire:	1
	Reactivity:	0
Revised Date:	11 October 2006	
Prepared by:	Nancy Swarts, Indium Corporation of America	
Approved by:	Nancy Swarts, Indium Corporation of America	

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