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

This material safety data sheet represents a family grouping of all metal mixes that are blended with the same flux. A table is provided at the end of this document that lists all metal groupings. To better serve all of our customers and reduce the paperwork burden, the 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 RMA-SMQ 51 A/C/AC OR INDALLOY WITH NC-SMQ 51 S/C/SC
FLUX VEHICLE (Specific metal grouping with flux is noted at the end of this document.)

MSDS Number: MSDS-IN 282

Revised Date: 4 NOVEMBER 2009

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

MANUFACTURER:

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

⊕Eye ⊕Inhalation ⊕Skin ⊕Ingestion NTP

Carcinogen listed in

IARC OSHA ⊕Not Listed
(See Section 11)

GHS:



Warning Word: Warning (lead free with rosin)

Warning Word: Danger (lead with rosin)

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.

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

Skin Contact: May cause 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). Applicable in California.

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 solder in making joints or fittings of any private or public water supply system. Keep out of the reach of children. Not intended for household use.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	%	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)	N.E.	0.15	-
		(Canada)	0.05	0.05	-
		(China)	-	0.05(dust) 0.03(fume)	-
		(Mexico)	-	0.15	-
(Singapore)	0.15	-	-		
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	-	-
INDIUM	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Canada)	-	0.1	0.3
		(China)	-	0.1	0.3

		(Mexico)	-	0.1	0.3
		(Singapore)	0.1	-	-
GOLD	*	7440-57-5/231-165-9	N.E.	N.E.	N.E.
GERMANIUM	*	7440-56-4/231-164-3	N.E.	N.E.	N.E.
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
		(China)	-	0.5	-
		(Mexico)	-	0.5	-
		(Singapore)	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(fume)	2
		(China)	-	0.2	0.6
		(Singapore)	0.2(fume)	1(dust)	-
ZINC	*	7440-66-6/231-175-3	N.E.	N.E.	N.E.
ROSIN	5.0-6.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	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, R42/43 *See alloy table at the end of document
N.E. = Not established

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 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 permissible exposure levels are not exceeded. Protect workers from potential exposures.
- 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 hot plate instead of a ventilated re-flow furnace) where airborne concentrations are expected to exceed exposure limits. Lead containing products require that ventilation be provided to ensure workers are protected from potential exposures.
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:	5 - 8
Vapor Pressure:	Not applicable.	Solubility in Water:	Insoluble (paste)
Vapor Density:	(air=1) Not applicable.	Volatile Organics:	<132,700 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	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

This section is subject to future development. Product has not been 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 for shipping.

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.).

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 Mexican regulations, NOM-018-STPS-2000 and NOM-010-STPS-1999.

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 –skin irritation

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 using the Chinese Occupational Exposure Limit of Hazardous Agents in the Workplace, GBZ2-2002.

For compliance with EU directive 2002/95/EC, Restriction of Hazardous Substances (RoHS) see alloy table.

California PROP 65 Safe Drinking Water Standard: WARNING: Applicable in California

This product contains a chemical(s) known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (lead)

USEPA -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

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

All ingredients are listed on the EPA TSCA Inventory. None of the ingredients are listed on the export notice Section 12(b).

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 (lead)
R36/37/38 Irritating to eyes, respiratory system and skin
R42/43 May cause sensitization by inhalation and skin contact
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: 4 NOVEMBER 2009

Prepared by: Nancy Swarts, Indium Corporation of America

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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.

ALLOY TABLE

Indalloy MetalAlloyMix	%Sn Tin	%Pb Lead	%Ag Silver	%In Indium	%Bi Bismuth	%Sb Antimony	%Cu Copper	%Zn Zinc	%Au Gold	%Ge Germanium	RoHS Compliance
9 (Sn70/Pb18/In12)	58.1-64.4	14.9-16.6	-	10-11	-	-	-	-	-	-	NO
10 (Pb75/In25)	-	63.3-69	-	20.8-23	-	-	-	-	-	-	NO
42 Bi46/Sn34/Pb20)	28-31.3	17-18.4	-	-	38-42.3	-	-	-	-	-	NO
97 Sn43/Pb43/Bi14)	35.7-39.6	35.7-39.6	-	-	11.6-12.9	-	-	-	-	-	NO
100 (Sn62.6/Pb37/ Ag0.4)	52.0-57.6	30.7-34.0	.33-.37	-	-	-	-	-	-	-	NO
104 (Sn62/Pb36/Ag2)	51.9-57.5	29.9-33.2	1.2-1.8	-	-	-	-	-	-	-	NO
106 (Sn63/Pb37)	52.3-58	30.7-34	-	-	-	-	-	-	-	-	NO
109 (Sn60/Pb40)	49.8-55.2	33.2-36.8	-	-	-	-	-	-	-	-	NO
111 (Pb55.5/Sn40.5/ Bi4)	33.6-37.3	46-51	-	-	3.3-3.7	-	-	-	-	-	NO
116 (Sn50/Pb50)	41.5-46	41.5-46	-	-	-	-	-	-	-	-	NO
118 (Sn90/Pb10)	74.7-82.8	8.3-9.2	-	-	-	-	-	-	-	-	NO
121 Sn96.5/Ag3.5)	80.1-88.8	-	2.9-3.2	-	-	-	-	-	-	-	YES
122 (Sn95/Pb5)	78.9-87.4	4.2-4.6	-	-	-	-	-	-	-	-	NO
127 Pb60/Sn37/Ag3)	30.7-34	49.8-55.2	2.5-2.8	-	-	-	-	-	-	-	NO
128 (Sn100)	83-92	-	-	-	-	-	-	-	-	-	YES
129 (Sn99/Sb1)	82.2-91.1	-	-	-	-	083-0.92	-	-	-	-	YES

Indalloy MetalAlloyMix	%Sn	%Pb	%Ag	%In	%Bi	%Sb	%Cu	%Zn	%Au	%Ge	RoHS Compliance
130 (Pb60/Sn40)	33.2-36.8	49.8-55.2	-	-	-	-	-	-	-	-	NO
131 (Sn97/Sb3)	80.5-89.2	-	-	-	-	2.5-2.8	-	-	-	-	YES
132 (Sn95/Ag5)	78.9-87.4	-	4.2-4.6	-	-	-	-	-	-	-	YES
133 (Sn95/Sb5)	78.9-87.4	-	-	-	-	4.2-4.6	-	-	-	-	YES
141 (Pb70/Sn30)	24.9-27.6	58.1-64.4	-	-	-	-	-	-	-	-	NO
143 (Pb90/Sb10)	-	74.7-82.8	-	-	-	8.3-9.2	-	-	-	-	YES
145 Pb75/Sn25)	20.8-23	62.3-69	-	--	-	-	-	-	-	-	NO
149 (Pb80/Sn20)	16.6-18.4	66.4-73.6	-	-	-	-	-	-	-	-	NO
150 (Pb81/In19)	-	67.2-74.5	-	15.8-17.5	-	-	-	-	-	-	NO
151 (Pb92.5/Sn5/ Ag2.5)	4.2-4.6	76.8-85	2-2.3	-	-	-	-	-	-	-	YES
152 (Pb92/Sn5/Sb3)	4.2-4.6	76.4-85.6	-	-	-	2.5-2.8	-	-	-	-	YES
155 (Pb90/Ag5/Sn5)	4.2-4.6	74.7-82.8	4-4.6	-	-	-	-	-	-	-	YES
159 (Pb90/Sn10)	8.3-9.2	74.7-82.8	-	-	-	-	-	-	-	-	YES
160 (Sn97/Cu3)	80.5-89.2	-	-	-	-	-	2.5-2.8	-	-	-	YES
161 (Pb97.5/Ag2.5)	-	80.9-89.7	2-2.3	-	-	-	-	-	-	-	YES
163 (Pb95.5/Ag2.5/ Sn2)	1.7- 1.9	79.3-87.9	2.1-2.3	-	-	-	-	-	-	-	YES

Indalloy		%Sn	%Pb	%Ag	%In	%Bi	%Sb	%Cu	%Zn	%Au	%Ge	RoHS Compliance
Metal Alloy Mix												
164 (Pb92.5/In5/Ag2.5)		-	76.8-85.1	2.1-2.3	4.2-4.6	-	-	-	-	-	-	YES
165 (Pb97.5/Ag1.5/ Sn1)		0.8-0.9	80.9-89.7	1.2-1.4	-	-	-	-	-	-	-	YES
171 (Pb95/Sn5)		4.2-4.6	78.9-87.4	-	-	-	-	-	-	-	-	YES
175 (Pb95/Ag5)		-	78.9-87.4	4.2-4.6	-	-	-	-	-	-	-	YES
182 (Au80/Sn20)		16.6- 18.4	-	-	-	-	-	-	-	66.4-73.6	-	YES
183 (Au88/Ge12)		-	-	-	-	-	-	-	-	73-81	10-11	YES
201 (Sn91/Zn9)		75.5- 83.7	-	-	-	-	-	-	7.5-8.3	-	-	YES
206 (Pb60/In40)		-	49.8-55.2	-	33.2-36.8	-	-	-	-	-	-	NO
209 (Sn65/Ag25/Sb10)		54-59.8	-	20.8-23	-	-	8.3-9.2	-	-	-	-	YES
227 (Sn77.2/In20/ Ag2.8)		64-71	-	2.3-2.6	16.6-18.4	-	-	-	-	-	-	YES
228 (Pb88/Sn10/Ag2)		8.3-9.2	73-81	1.7-1.8	-	-	-	-	-	-	-	YES
233 (Pb85/Sb10/Sn5)		4.2-4.6	70.6-78.2	-	-	-	8.3-9.2	-	-	-	-	YES
236 (Pb83/Sb10/Sn5/ Ag2)		4.2-4.6	68.9-76.4	1.7-1.8	-	-	8.3-9.2	-	-	-	-	NO
238 (Sn90/Au10)		74.7- 82.8	-	-	-	-	-	-	-	8.3-9.2	-	YES

Indalloy Metal Alloy Mix	%Sn	%Pb	%Ag	%In	%Bi	%Sb	%Cu	%Zn	%Au	%Ge	RoHS Compliance
240 (Sn46/Pb46/Bi8)	38.2-42.3	38.2-42.3	-	-	6.6-7.4	-	-	-	-	-	NO
241 (Sn95.5/Ag3.8/ Cu0.7)	79-87.9	-	3.2-3.5	-	-	-	0.58-0.64	-	-	-	YES
244 (Sn99.3/Cu0.7)	82.4-91.4	-	-	-	-	-	0.58-0.64	-	-	-	YES
249 (Sn91.8/Bi4.8/ Ag3.4)	76.2-84.5	-	2.8-3.1	-	4-4.4	-	-	-	-	-	YES
255 (Bi55.5/Pb44.5)	-	36.9-40.9	-	-	46-51	-	-	-	-	-	NO
256 (96.5Sn/3Ag/ 0.5Cu)	80-88.8	-	2.5-2.8	-	-	-	0.42-0.46	-	-	-	YES
281 (Bi58/Sn42)	34.9-38.6	-	-	-	48.1-53.4	-	-	-	-	-	YES
281-338 (Sn60/Bi40)	49.8-55.2	-	-	-	33.2-36.8	-	-	-	-	-	YES
NS (Sn25/Au75)	20.8-23	-	-	-	-	-	-	-	62-69	-	YES
NS (Sn30/Au70)	24.9-27.6	-	-	-	-	-	-	-	58-64.4	-	YES
NS (Sn5/Pb93.5/Ag1.5)	4.2-4.6	77.6-86	1.2-1.4	-	-	-	-	-	-	-	YES
NS (Sn15/Pb82.5/ Ag2.55)	12.5-13.8	68.5-75.9	2.1-2.3	-	-	-	-	-	-	-	NO
NS (Sn20/Pb77/Ag3)	16.6-18.4	63.9-70.8	2.5-2.8	-	-	-	-	-	-	-	NO
NS (Sn96/Ag4)	79.7-88.3	-	3.3-3.7	-	-	-	-	-	-	-	YES
NS (Sn3.5/Pb84.5/ Sb12)	2.9-3.2	70.1-78.2	-	-	-	9.5-10.6	-	-	-	-	YES

NS = Non Standard Alloy Mix

RoHS = Restriction of Hazardous Substances. Please review any applicable exemptions that may apply. This information is provided as information only. It is the responsibility of the customer to determine compliance with their particular specifications and restrictions.

<http://www.pbfree.com>

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