



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

SAFETY DATA SHEET

This safety data sheet represents a family grouping of all metal mixes that are blended with the same flux. A table is provided that lists all metal groupings. To better serve all of our customers and reduce the paperwork burden Indium Corporation has generated one SDS, 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 INDIUM8.9 FLUX VEHICLE

SDS Number: SDS-4550

Revised Date: 17 MARCH 2015

Product Use: Industrial Use (mixture) - Solder paste consisting of a flux vehicle blended with 88.25 - 92 weight percent pre-alloyed metal powder for soldering applications.

MANUFACTURER:

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

Eye
 Inhalation
 Skin
 Ingestion
 NTP
 IARC
 OSHA
 Not Listed

Carcinogen listed in

GHS general information:



use lead containing products only

Signal Word: Warning

Hazard statement(s)

- H303 May be harmful if swallowed
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 May cause respiratory irritation
- H351 Suspected of causing cancer (lead)
- H361 Suspected of damaging fertility or the unborn child (lead containing product)
- H373 May cause damage to organs through prolonged or repeated exposure (applicable to lead containing product)
- H410 Very toxic to aquatic life with long lasting harmful effects (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 + P314 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)
- P501 Dispose of in accordance with applicable regulations. Recycle if possible.

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 severe eye irritation.
- Ingestion:** This product contains metal alloy powders and organic chemicals. May cause irritation, if swallowed. May cause burns to the digestive tract and systematic effects. May be harmful.
- Inhalation:** Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local irritation to the respiratory system. May be harmful if inhaled.
- Skin Contact:** May cause skin irritation or 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.

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.

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.

INDIUM: May cause damage to respiratory system.

Warning: Applicable in California: This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). (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 joints and fittings of any private or public water supply system. Keep out of the reach of children. Not for household use.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #/ EINECS#
TIN	*	7440-31-5/231-141-8
SILVER	*	7440-22-4/231-131-3
COPPER	*	7440-50-8
LEAD	*	7439-92-1
INDIUM	*	7440-74-6/231-180-0
BISMUTH	*	7440-69-9
ANTIMONY	*	7440-36-0
ROSIN	4.0-8.0	65997-05-9
PROPRIETARY ACTIVATORS	1.0-5.0	-

POLYGLYCOL ETHER 3.0-6.0 9038-95-3

N.E. = Not established

* See Alloy Table

RoHS2 (2011/65/EU) Restriction of Hazardous Substances, check any exemptions that may apply. Some products contain lead which may not comply. Otherwise products comply.

4. FIRST AID MEASURES

- Eye Contact:** Hold eyelids apart and flush eyes with plenty of tepid 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. Not flammable.
- 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	-	-
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	
LEAD	*	7439-92-1 (US)	0.05	0.05	-
		(EU)	-	0.15	-

		(Canada)	-	0.05	-
		(Singapore)	0.15	-	-
		(Mexico)	-	0.15	-
		(China)	-	0.05(dust)	-
			-	0.03(fume)	-
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	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)	N.E.	0.5	-
		(Singapore)	0.5	-	-
		(China)	-	0.5	-
ROSIN	4.0-8.0	65997-05-9	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
PROPRIETARY ACTIVATORS	1.0-5.0		N.E.	N.E.	N.E.
POLYGLYCOL ETHER	3.0-6.0	9038-95-3	N.E.	N.E.	N.E.

N.E. = Not established

* See Alloy Table

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 permissible exposure limits are not exceeded. Use proper exhaust ventilation. Keep exposures to as low as possible.

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. Suggest a nitrile type disposable to keep control direct skin contact. Other chemical gloves may be worn. Latex not recommended.
- 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. When applicable follow proper lead work practices.

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. | Flash Point: | Not applicable, not flammable |

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

Product not tested.

An environmental hazard cannot be excluded in the event of unprofessional handling. Some ingredients contained are harmful to the environment.

Copper – Toxicity to daphnia and other aquatic invertebrates mortality NOEC – Daphnia 0.004 mg/l – 24h.

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

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 all shipping requirements.

Not regulated under IATA.

North American Emergency Guide Book 2004 – Not Classified

Marine Pollutant: No

UN – none.

15. REGULATORY INFORMATION

The information in this 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: D2B –Materials Causing Other Toxic Effects (irritant or sensitizer)
D2A-Materials Causing Other Toxic Effects-Very Toxic Material (Chronic) (lead)



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 Copper Lead Antimony

All ingredients are listed on the EPA TSCA Inventory.

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

EC Classification, Packaging and Labeling Requirements:

Symbol and Hazard Classification of Product

Risk Phrases:

- R42/43 May cause sensitization by inhalation or by skin contact
- R36/37/38 Irritating to eyes, respiratory system and skin
- R20/21/22 Harmful by inhalation, in contact with skin and if swallowed (lead)
- 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 organisms and may cause long-term 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
	Physical Hazard:	0
Revised Date:	17 MARCH 2015	
Prepared by:	Nancy Swarts, Indium Corporation of America	
Approved by:	Nancy Swarts, Indium Corporation of America	

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Note: This MSDS may be translated into an international language. If there is any misinterpretation or misunderstanding of any words or phrases that may occur within any translation the ENGLISH language shall always prevail.

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ALLOY TABLE

%Metal mixed with flux (88.25-92% metal)

INDALLOY (METAL)	%COPPER Cu	%TIN Sn	%SILVER Ag	%ANTIMONY Sb	%LEAD Pb	%BISMUTH Bi	%INDIUM In	^RoHS 2 Compliance
100 (62.6Sn/37Pb/ 0.4Ag)	-	55-57.6	0.35-0.37	-	32.7-34	-	-	No
106 (63Sn/36Pb)	-	55.5-58	-		32.7-33	-	-	No
121 (96.5Sn/3.5Ag)	-	85.2-88.8	3.1-3.2	-	-	--	-	Yes
129 (99Sn/1Sb)	-	87.4-91.1	-	0.88-0.92	-	-	-	Yes
132 (95Sn/5Ag)	-	83.8-97.4	4.4-4.6	-	-	-	-	Yes
133 (95Sn/5Sb)	-	83.8-97.4	-	4.4-4.6	-	-	-	Yes
150 (81Pb/19In)	-	-	-	-	71.5-74.5	-	16.8-17.5	No
209 (65Sn/25Ag/10 Sb)	-	57.4-60	22-23	-	-	-	-	Yes
241 (SAC387) (95.5Sn/3.8Ag/ 0.7Cu)	0.6-0.64	84.3-87.9	3.4-3.5	-	-	-	-	Yes

INDALLOY (METAL)	%COPPER Cu	%TIN Sn	%SILVER Ag	%ANTIMONY Sb	%LEAD Pb	%BISMUTH Bi	%INDIUM In	RoHS 2 Compliance (2011/65/EU)
243 (99Sn/1Cu)	0.88-0.92	87-91.1	-	-	-	-	-	Yes
244 (99.3Sn/0.70Cu)	0.6-0.64	87.6-91.4	-	-	-	-	-	Yes
246 (SAC405) (95.5Sn/4Ag/0.5Cu)	0.44-0.46	84.3-87.9	3.5-3.7	-	-	-	-	Yes
256 (SAC 305) (96.5Sn/3Ag/0.5Cu)	0.44-0.46	85-88.8	2.6-2.8	-	-	-	-	Yes
258 (SAC 105) (98.5Sn/1.0Ag/0.5Cu)	0.44-0.46	86.9-90.6	0.88-0.92	-	-	-	-	Yes
259 (90Sn/10Sb)	-	79.4-82.8	-	8.8-9.2	-	-	-	Yes
Other Non Standard Mix								
SACM (98.5Sn/0.5Ag/1Cu + 0.05% Mn)	0.8825-0.92	86.9-90.6	0.44-0.46	-	-	-	-	Yes
(86.24Bi/3.73Sn/10.03Ag)	-	3.3-3.4	8.85-9.2	-	-	76-79	-	Yes
(91.65Bi/2.82Sn/5.53Ag)	-	2.49-2.6	4.9-5.1	-	-	80.9-84.3	-	Yes

INDALLOY (METAL)	%COPPER Cu	%TIN Sn	%SILVER Ag	%ANTIMONY Sb	%LEAD Pb	%BISMUTH Bi	%INDIUM In	RoHS 2 Compliance (2011/65/EU)
Composition 1 Mix (95.6Sn/2.9Ag/ 0.5Cu/1Pb)	0.44-0.46	84-88	2.6-2.7	-	0.88-0.92	-	-	Yes
Composition 2 Mix (92Sn/2.6Ag/5 Pb/0.4Cu)	0.35-0.37	81-84.6	2.3-2.4	-	4.4-4.6	-	-	No
Composition 3 Mix (78.4Sn/1.4Ag/ 20Pb/0.2Cu)	0.177-0.18	69-72	1.2-1.3	-	17.7-18	-	-	No
Sn91.25/2.25 Ag/0.5Cu/6Bi	0.44-0.46	80.5-84	1.99-2.07	-	-	5.3-5.5	-	Yes
Sn91.3/1Ag/ 0.7Cu/7Bi	0.62-0.64	80.6-84	0.88-0.92	-	-	6.2-6.4	-	Yes
Sn92.3/0.7C u/7Bi	0.62-0.63	81.5-84.9	-	-	-	6.2-6.4	-	Yes
Sn94.25/2Ag /0.75Cu/3Bi	0.66-0.69	83-86.7	1.8-1.84	-	-	2.65-2.76	-	Yes
Sn98.5/0.8A g/0.7Cu	0.62-0.63	86.9-90.6	0.71-0.74	-	-	-	-	Yes