



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

SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product name - INDALLOY WITH INDIUM6.4R FLUX VEHICLE

SDS Number: SDS-6006SC

Revised Date: 27 APRIL 2017

1.2 Relevant identified uses of the substance or mixture and uses advised against

Product Use: Industrial Use (Mixture) - Solder paste consisting of a flux vehicle blended with 70 - 90 weight percent pre-alloyed metal powder used for soldering applications. Review alloy table for exact product identification. Note: this SDS covers various metal mixtures using the same flux.

See alloy table for listing of products included under this SDS.

1.3 Details of the supplier of the safety data sheet

MANUFACTURER/SUPPLIER/IMPORTER:

In America:

The Indium Corporation of America
34 Robinson Rd., Clinton, New York 13323
Technical & Safety Information: (315) 853-4900
Safety & SDS Information: nswarts@indium.com
Corporation web page: <http://www.indium.com>

In Europe:

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Kingston, Milton Keynes, UK, MK 10 OAG
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EU Contact: aday@indium.com

In China:

Indium Corporation (Suzhou) Co., Ltd.
 No. 428 Xinglong Street
 Suzhou Industrial Park
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 Information: (86) 512-6283-4900

In Asia:

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

1.4 Emergency telephone number

FOR CHEMICAL EMERGENCY ONLY PHONE *:

CHEMTREC 24 hrs.

USA: 1 (800) 424-9300

Outside USA: +1 (703) 527-3887

*** Used only for spill/leak/fire/exposure/accident**

ALL OTHER INQUIRIES: TOLL FREE: +1-800-448-9240 Indium Corporation

SECTION 2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****2.2 Label elements**

Labelling according to Regulation (EC) No. 1272/2008

Pictogram



applicable to lead containing

Signal Word: Warning

Hazard statement(s)

H303	May be harmful if swallowed (lead)
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H351	Suspected of causing cancer (lead)
H361	Suspected of damaging 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)
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.

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 min)

Classification:

- Eye Irritant (Category 2)
- Acute toxicity, Oral (Category 4) (lead)
- Carcinogenicity (Category 2) (lead)
- Reproductive toxicity (Category 2) (lead)
- Acute aquatic toxicity (Category 1) (lead)
- Chronic aquatic toxicity (Category 1) (lead)

PRIMARY ROUTES OF ENTRY:

- Eye
- Inhalation
- Skin
- Ingestion

Carcinogen listed in

- NTP
- IARC
- OSHA
- Not Listed

2.3 Other hazards

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 chemicals. Irritating to digestive tract. 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. Lead fumes, when applicable may be harmful.
- 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. Signs and symptoms of exposure – anemia. Possible carcinogenic to humans.
 - INDIUM: May cause damage to respiratory system if inhaled over long exposure

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.2 Mixture

Components	% wt	CAS Registry #/ EINECS#
TIN	*	7440-31-5/231-141-8
SILVER	*	7440-22-4/231-131-3
COPPER	*	7440-50-8 /231-159-6
LEAD	*	7439-92-1/231-100-4
BISMUTH	*	7440-69-9/231-177-4
ROSIN AMINES	1.5-4.5	61790-47-4/263-139-8
PROPRIETARY OTHER NON-HAZARDOUS INGREDIENTS	6.5-12.5	-

N.E. = Not established

Reference to other sections: See Section 16

* See Alloy Table for breakdown of percentages of alloy mixtures

Ingredients are all listed even though they may not been categorized as hazardous.

<http://www.indium.com>

ALLOY TABLE

% Metal (70-90) mix with flux

INDALLOY (METAL MIX)	%TIN Sn	%SILVER Ag	%LEAD Pb	%COPPER Cu	%BISMUTH Bi	%INDIUM In	^RoHS 2 Compliance
19 (51In/32.5Bi/16.5Sn)	11.6-14.9	-	-	-	22.8-29.3	35.7-46	Yes
100 (62.6Sn/37Pb/0.4Ag)	43.8-56	0.28-0.36	25.9-33	-	-		No
104 (62Sn/36Pb/2Ag)	43-56	1.4-1.8	25-32	-	-		No
106 (63Sn/37Pb)	44-56.7	-	25.9-33	-	-		No
109 (60Sn/40Pb)	42-54	-	28-36	-	-	-	No
256 (SAC305) (96.5Sn/3Ag/0.5Cu)	67.6-86.9	2.1-2.7	-	0.35-0.45	-	-	Yes
Sn 992 (99.2Sn/0.5Cu/0.3Bi/ 0.05Co)	69-89	-	-	0.35-0.45	0.21-0.27	-	Yes

RoHS 2 = (2011/65/EU)

SECTION 4. FIRST AID MEASURES**4.1 Description of 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.

4.2 Most important symptoms and effect, both acute and delayed:

Skin contact may cause irritation. Long term contact may cause dermatitis.
 Inhalation of decomposed rosin fume may cause irritation or occupational asthma.
 Exposure to metal fumes may cause irritation to the respiratory system.
 Exposure can cause eye irritation especially during fuming.
 When applicable use standard lead work practices to avoid exposure. Over exposure to lead may cause harm.

4.3 Indication of any immediate medical attention and special treatment needed:

No specific special treatment information is available on this mixture. Review data provided in this document to understand the hazards when working with the product. No other information is available at this time. When in doubt always seek medical advice, especially when over exposed to lead fumes..

SECTION 5. FIRE FIGHTING MEASURES

- 5.1 Extinguishing Media:** Use extinguishers appropriate for the surrounding fire conditions. Water, CO₂, foam media.
- 5.2 Special hazards arising from the substance or mixture:** May produce toxic fumes of carbon monoxide if burning or metal oxide fumes.
- 5.3 Advice for Firefighters** Firefighters must wear approved self-contained breathing apparatus and full protective clothing.
- 5.4 Further information** Material product is not flammable. No other information is available.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Keep away from the spill. Remove sources of ignition. Keep exhaust ventilation system running. In the event of a fire evacuate area.

For emergency responders:

Wear safety glasses, gloves when cleaning up any spill. Other equipment may be necessary based on the immediate area and other chemicals unrelated to the product that may be in use. Adequate ventilation should be available. Keep unnecessary personnel away from area during clean up.

6.2 Environmental Precautions: Dispose contaminated cloth rags or paper towels following all applicable governmental regulations. Material may have reclaim value. Material is non - hazardous. It however does contain metals

and organic chemicals which may not be suited for release to any body of water including drains. Lead containing material should follow proper regulatory requirements.

6.3 Methods and material for containment and cleaning up:

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.

6.4 Reference to other sections: See Section 8 for exposure levels. See Section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions For Safe Handling: 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. Do not eat, drink or smoke when handling this product. Utilize exhaust ventilation when heating product. Emissions may contain metal fumes, rosin and organic compounds. When applicable follow standard lead work practices.

7.2 Conditions for Safe Storage, including any incompatibilities:

Storage Precautions: Store product in tightly capped original containers in a cool, dry area. Refer to product label and product data sheet for specific storage temperature requirements. Rotate stock to ensure use before expiration date.

7.3 Specific End Use(s): Soldering applications.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

		<u>CAS#/EINECS#</u>	<u>TWA</u> mg/m3	<u>STEL</u> mg/m3
TIN	*	7440-31-5/231-141-8		
		(UK)	2	4
		(Belgium)	2	-
		(Germany)	2	-
		(Netherlands)	2	-
		(Spain)	2	-
		(Poland)	2	-
SILVER	*	7440-22-4/231-131-3		
		(UK)	0.1	0.3
		(Belgium)	0.1	-
		(France)	0.1	-
		(Germany)	0.1	-
		(Netherlands)	0.1	-
		(Spain)	0.1	-
	(Poland)	0.05	-	
COPPER	*	7440-50-8 /231-159-6		
		(UK)	0.2 (fume)	0.6(fume)
		(France)	2	0.2(fume)
		(Belgium)	1	-
			0.2(fume)	
		(Spain)	1	-
			0.2(fume)	
		(Portugal)	1	0.2(fume)
		(Netherlands)	0.1	-
		(Finland)	1	-
		0.1		
	(Denmark)	1	-	
		0.1		

		(Austria)	1	4
			0.1(fume)	0.4
		(Switzerland)	0.1	0.2
		(Norway)	1	0.1
		(Ireland)	1	2
			0.2 (fume)	
		(Poland)	0.2	-
LEAD	*	7439-92-1/231-100-4		
		(UK)	0.15	-
		(France)	0.1	-
		(Spain)	0.15	-
		(Italy)	0.15	-
		(Portugal)	0.05	-
		(Finland)	0.1	-
		(Denmark)	0.05	-
		(Austria)	0.1	0.4
		(Switzerland)	0.1	0.8
		(Poland)	0.05	-
		(Norway)	0.05	-
		(Ireland)	0.15	-
BISMUTH	*	7440-69-9/231-177-4		
		(UK)	N.E.	N.E.
ROSIN AMINES	1.5-4.5	61790-47-4/263-139-8		
PROPRIETARY OTHER NON-HAZARDOUS INGREDIENTS	6.5-12.5	-	N.E.	N.E.
N.E. = Not established TWA = time weighted average STEL = short term exposure limit				
8.2 Exposure Controls				

Engineering Controls: Use only with production equipment (such as stencil printers and re-flow furnaces) with adequate exhaust ventilation and other safety features specifically designed for use with solder paste. Control concentration of all components with established exposure limits so they are not exceeded. Use exhaust ventilation when heating product. Air emission control equipment may be necessary based on the local governmental requirements for contaminants entering the atmosphere. Emissions may contain metal fume, rosin and organic compounds.

Personal protection:

Eyes: Chemical safety glasses/goggles. Face shield for splash hazards.

Respiratory: An approved or EU compliant CE 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. Recommend a nitrile disposable or other chemical glove.

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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance:	Grey colored solid paste	Boiling Point/Range:	Not determined
Odor:	Mild characteristic odor.	Melting Point/Freezing Point:	Not applicable
Odor Threshold:	Not established	Evaporation Rate:	Not applicable
Specific Gravity:	Not established	pH:	Not applicable
Vapour Pressure:	Not applicable.	Solubility in Water:	Insoluble (paste)
Vapour Density:	(air=1) Not applicable.	Partition coefficient:	Not established
Relative Density:	Not established	Flammability:	Not applicable, not flammable
Flash Point:	Not applicable	Method:	Not applicable
Auto-ignition Temperature:	Not applicable	Flammable Limits:	Limits not established
UEL/LEL Limits:	Not applicable	Decomposition Temp:	Not applicable
Viscosity:	Not established	Explosive properties:	Not applicable
Oxidizing Properties:	Not established		

Other Information: Above data for the whole mixture.

SECTION 10. STABILITY AND REACTIVITY

- 10.1 Reactivity:** Stable.
- 10.2 Chemical Stability:** Stable
- 10.3 Possibility of Hazardous Reactions:** Not established
- 10.4 Conditions To Avoid:** None known
- 10.5 Incompatible Materials:** Avoid contact with acids, bases or oxidizing agents.
- 10.6 Hazardous Decomposition / Combustion:** Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. Metal oxide fumes.
- Hazardous Polymerization:** Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION**11.1 Information on toxicological effects:**

<u>Acute toxicity:</u>	Not established	<u>Mutagenicity:</u>	Not established
<u>Irritation:</u>	Not established	<u>Toxicity for Reproduction:</u>	Not Established
<u>Corrosivity:</u>	Not applicable	<u>Absence of specific data:</u>	None available (not tested)
<u>Sensitization:</u>	Not available		

Repeated dose toxicity: Not established

Carcinogenicity: Not established

Likely Routes of Entry: eyes (irritation) /skin (irritation or sensitization) /inhalation (irritation/may be harmful) ingestion (may be harmful)

Interactive effects: None known

11.2 Symptoms related to the physical, chemical and toxicological characteristics:

May cause irritation by skin and inhalation. Inhalation of lead fume may be harmful. May cause lead poisoning or harm to the unborn child, when applicable for lead containing products.

11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Exposure to lead fume, if applicable, may cause harm by inhalation and ingestion. Chronic exposures to lead fume, if applicable, can cause potential harm to the developing fetus. Lead exposure can be toxic.

Mixture verses substance information: None known

Other Information:

Carcinogenicity: **NTP:** No (National Toxicity Program)

Listing **OSHA:** No (US Occupational Safety & Health Administration)

IARC: No (International Agency for Research on Cancer)

Copper - LD50 – intraperitoneal mouse 3.5 mg/kg.

Silver – LD50 oral – rat > 5,000 mg/kg

Lead – Suspected human reproductive toxicant. May cause damage to organs through prolonged or repeated exposure. Reproductive toxicity – rat –inhalation, oral/ effects on newborn.

Bismuth – LD50 oral-rat 5,000 mg/kg

SECTION 12. ECOLOGICAL INFORMATION

Product mixtures not tested.

- 12.1 Toxicity:** No information available
- 12.2 Persistence and degradability:** No information available
- 12.3 Bioaccumulative potential:** No information available
- 12.4 Mobility in soil:** No information available
- 12.5 Results of PBT and vPvB assessments:** No data is available
- 12.6 Other adverse effects:** No information is available for mixture. Avoid release to 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

SECTION 13. DISPOSAL CONSIDERATION

13.1 Waste treatment method: Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with environmental regulations. Containerize material and classify according to applicable regulations. No pre-treatment on site is recommended. Do not dispose of down any drain or waterway. Utilize the same personal protective equipment as the user when handling for disposal.

RoHS (Restriction of Hazardous Substances): product mixtures are RoHS compliant because they are lead free. Product mixtures do not contain any PBB or PBDT brominated compounds. (2011/65/EU)
Review alloy table for products.

SECTION 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

Solder Paste is non - hazardous.

Not regulated/non - hazardous under US DOT (United States Department of Transportation).

Not regulated/non - hazardous under international shipping requirements, all modes..

- 14.1 UN name** None
- 14.2 UN proper shipping name:** None
- 14.3 Transport hazard class(s):** None
- 14.4 Packing group:** None
- 14.5 Environmental hazards:** None

Special precautions for user: None

Transport in bulk: Not applicable

Marine pollutant: No

SECTION 15. REGULATORY INFORMATION

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

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.).

All ingredients are listed on the USEPA TSCA Inventory.

All ingredients are listed on EINECS. Note Rosin was recently listed under the No Longer Polymer List, Notification of New Chemical Substances in Accordance with Directive 67/548/EEC.

Safety data sheet was developed using EC 1907/2006 amended as of 20 May 2010 EU No 453/2010 and information as stated under regulation EC No 1272/2008 CLP Regulation.

GHS = Global Harmonized System

CLP= Classification, labeling and packaging

Product does not contain any substances ozone depleting substances and therefore not subject to EC 2037/2000.

15.2 Chemical safety assessment: None performed for mixture.

SECTION 16. OTHER INFORMATION

NOTE: The Indium Corporation does not recommend, manufacture, market or endorse any of its products for human consumption.

Revised Date: 27 APRIL 2017

Prepared by: Nancy Swarts, The Indium Corporation of America, nswarts@indium.com

Approved by: Nancy Swarts, The Indium Corporation of America

Changes provided on this SDS were based on the requirements of EU No. 453/2010 of May 20, 2010 regarding amendments to EC No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

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.