



SAFETY DATA SHEET

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

1.1 Product Identifier: INDALLOY WITH INDIUM6.3 FLUX VEHICLE

SDS Number: SDS-4664

Revised Date: 6 AUGUST 2018

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 83-92 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>

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In Asia:

Indium Corporation of America
Asia-Pacific Operations-Singapore
29 Kian Teck Avenue
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1.4 Emergency telephone number

FOR CHEMICAL EMERGENCY ONLY PHONE *:
CHEMTREC 24 hrs.
USA: 1 (800) 424-9300
Outside USA: +1 (703) 527-3887
In China: Emergency 86+ 4008417580
*** Used only for spill/leak/fire/exposure/accident**

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

Section 2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

Eye Inhalation Skin Ingestion NTP IARC OSHA Not Listed

Carcinogen listed in

2.1 Classification: mixture

2.2 Label elements

GHS

Lead free products



Signal Word: Warning

Hazard statement(s)

H316 Causes mild skin irritation
 H318 Causes serious eye damage

Precautionary statement(s)

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+ P364 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 local/state and federal regulations. Recycle when possible.

Lead containing products



Signal Word: Warning

Hazard statement(s)

H303 May be harmful if swallowed
 H316 Causes mild skin irritation
 H318 Causes serious eye damage

H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure
H410	Very toxic to aquatic life with long lasting effects
<u>Precautionary statement(s)</u>	
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+ P364	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 local/state and federal regulations. Recycle when possible.

Classification:

Carcinogen- Category 2
 Reproductive toxicity- Category 2
 Specific organ toxicity-repeated exposure- Category 2
 Acute aquatic toxicity- Category 1
 Chronic aquatic toxicity- Category 1
 Acute toxicity, serious eye damage- Category 1
 Acute toxicity skin irritant- Category 3
 Acute toxicity, oral- Category 5

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/damage.

Ingestion: This product contains metal alloy powders and organic chemicals. May be harmful if swallowed.

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. Rosin may cause skin sensitization.

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.

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.

BISMUTH: May cause kidney damage.

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
LEAD	*	7439-92-1/231-100-4
BISMUTH	*	7440-69-9/231-177-4
ALKYLCARBOXYLIC ACID AMIDE	5-8	67700-97-4
CARBOXYLIC ACIDS (C4-11)	2-4	68937-72-4
ETHANOL, 2-AMINO REACTION PRODUCTS WITH AMMONIA	1.0-5.0	68910-05-4

N.E. = Not established

* See Alloy Table for breakdown of percentages of alloy mixtures

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ALLOY TABLE

Metal alloy mixed with flux

ALLOY MIXTURE	% TIN Sn	%SILVER Ag	%BISMUTH Bi	%LEAD Pb	RoHS 2/3 Compliance*
Indalloy 97 (43Sn/43Pb/14Bi)	35.7-40	-	11.6-12.9	35.7-40	No
Indalloy 100 (62.6Sn 37Pb 0.4Ag)	51.9 – 57.6	.33-.37	-	30.7-34.0	No
Indalloy 104 (Sn62/Pb36/Ag2)	51.5-57	1.7-1.8	-	29.9-33	No
Indalloy 106 (Sn63/Pb37)	52.3-58	-	-	30.7-34	No
109 (Sn60/Pb40)	49.8-55.2	-	-	33.2-36.8	No
Indalloy 281 (58Bi/42Sn)	34.9 – 38.6	-	48 – 53.4	-	Yes
Indalloy 282 (57Bi/42Sn/1Ag)	34.9 – 38.6	0.83 – 0.92	47 – 52	-	Yes

RoHS 2 = Restriction of Hazardous Substances (review applicable exemptions related to lead containing materials) (2011/65/EU)

RoHS 3 = products do not contain any listed phthalates

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. Exposure to metal fumes may cause irritation to the respiratory system. Long term exposure by inhalation to metal fumes may cause illness such as metal fume fever. Exposure to lead fume may cause harm. Sign of overexposure is anemia. Signs or symptoms of over exposure to antimony is headache, vomiting, nausea or dizziness. Target organs (antimony) – heart and respiratory system.

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.

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 Fire fighters must wear approved self-contained breathing apparatus and full protective clothing.

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.

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.

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.

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>TWA</u>	<u>STEL</u>
		<u>CAS#/EINECS#</u>	mg/m3	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	-

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.
ALKYLCARBOXYLIC ACID AMIDE	5-8	67700-97-4	N.E.	N.E.
CARBOXYLIC ACIDS (C4-11)	2-4	68937-72-4	N.E.	N.E.
ETHANOL, 2-AMINO REACTION PRODUCTS WITH AMMONIA	1.0-5.0	68910-05-4	N.E.	N.E.

N.E. = Not established

STEL = short term exposure limits

TWA = 8hr. worker time weighted average

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 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. Follow standard lead work practices, if applicable.

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 applicable.	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
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		

9.2 Other Information: Above data for the whole mixture.

Section 10. STABILITY AND REACTIVITY

10.1 <u>Reactivity:</u>	Stable.
10.2 <u>Chemical Stability:</u>	Stable
10.3 <u>Possibility of Hazardous Reactions:</u>	Not established
10.4 <u>Conditions To Avoid:</u>	None known
10.5 <u>Incompatible Materials:</u>	Avoid contact with acids, bases or oxidizing agents.
10.6 <u>Hazardous Decomposition</u>	Harmful organic fumes and toxic oxide fumes may form at elevated temperatures, metal oxide fumes.
10.7 <u>Hazardous Polymerization:</u>	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		
<u>Repeated dose toxicity:</u>	Not established		
<u>Carcinogenicity:</u>	Not established		

Likely Routes of Entry: eyes (irritation/harm) /skin (irritation) /inhalation (irritation/) 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.

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: Yes - Lead and lead compounds are listed as possible carcinogens. (International Agency for Research on Cancer).

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

Bismuth – 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.

Section 12. ECOLOGICAL INFORMATION

This section is subject to future development. 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.

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): some of the product mixtures are RoHS compliant because they are lead free. Product mixtures do not contain any PBB or PBDT brominated compounds.

RoHS – Note that some of the product mixtures do contain lead and are therefore not complaint with RoHS. Users should review their particular use for any applicable exemptions that may apply. Review alloy table for products.

Section 14. TRANSPORT INFORMATION

Transport in accordance with applicable international 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.

- 14.1 UN Number:** 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
- 14.6 Special precautions for user:** None
- 14.7 Transport in bulk:** Not applicable

Section 15. REGULATORY INFORMATION**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.

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:** 6 AUGUST 2018
- 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.