



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 INDIUM3.2 FLUX VEHICLE

SDS Number: SDS- 4145

Revised Date: 3 DECEMBER 2018

Product Use: Industrial Use - Water wash solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder. (mixture) Review metal alloy table for listing of mixtures with the same flux.

MANUFACTURER:

In America:

The Indium Corporation of America®.

34 Robinson Rd., Clinton, NY 13323

Information: (315) 853-4900

nswarts@indium.com

In Europe:

The Indium Corporation of America® (European Operations)

7 Newmarket Ct

Kingston, Milton Keynes, UK, MK 10 OAG

Information: +44 [0] 1908 580400

In Asia:

Indium Corporation of America

Asia-Pacific Operations-Singapore

29 Kian Teck Avenue

Singapore 628908

Information: +65 6268-8678

EMERGENCY PHONE:

CHEMTREC 24 hrs.

USA: 1 (800) 424-9300

Outside USA: +1 (703) 527-3887

In China: Emergency 86+ 4008417580

In China:

Indium Corporation (Suzhou), Co., Ltd.

No. 428 Xinglong Street

Suzhou Industrial Park

Suchun Industrial Square

Unit No. 14-C

Jiangsu Province, China 215126

Information: (86) 512-6283-4900

<http://www.indium.com>

2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

⊗ Eye ⊗ Inhalation ⊗ Skin ⊗ Ingestion NTP IARC OSHA ⊗ Not Listed

Carcinogen listed in

GHS:

Lead free products:



Signal Word: Warning

Hazard statement(s)

- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H335 May cause respiratory irritation

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 + 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)

Lead containing products:



Signal Word: Warning

Hazard statement(s)

- H303 May be harmful if swallowed
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H335 May cause respiratory irritation
- 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 harmful effects
- EUH201A Warning! Contains 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
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- P305 + 351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

Classification:

Carcinogenicity (Category 2) (lead)

Reproductive toxicity (Category 2) (lead)

Eye Irritant (Category 2)

Sensitization, skin (Category 1B)

Sensitization, respiratory (Category 1B)

Acute aquatic toxicity – Category 1 for lead containing products (H400)

Chronic aquatic toxicity – Category 1 for lead containing products (H410)

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 serious eye irritation.

Ingestion: This product contains metal alloy powder 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 mucous membranes and the upper respiratory tract.

Skin Contact: May cause skin irritation. Contact with **Antimony** may cause irritation or dermatitis.

Chronic: **TIN:** Has been shown to increase incidence of sarcoma in animal tests.

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.

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. Kidney and liver damage from injection of indium compounds has been reported based on limited animal testing. Target organs: teeth and gums

BISMUTH: May cause kidney damage.



WARNING: This product can expose you to chemicals such as [lead, trace amounts of propylene oxide, ethylene oxide, 1,4 dioxane] which are known to the State of California to cause cancer and [lead and ethylene oxide] which can cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

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 making joints or fittings in any private or public water supply system. Keep out of the reach of children.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #/EINECS#	PEL mg/m³	TLV-TWA mg/m³	TLV-STEL mg/m³
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	0.01	N.E.
		(EU)	-	0.1	-
		(Canada)	-	0.1	0.3
		(Mexico)	-	0.1	-
		(Singapore)	0.1	-	-
COPPER	*	7440-50-8/231-159-6 (US)	0.1	0.2	-
		(EU)	-	0.2	2
		(Canada)	-	0.2	0.6
		(Singapore)	0.2	1(dust)	-
		(Mexico)	-	0.2	2
		(China)	-	0.2(fume)	0.6
			-	1(dust)	2.5
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	-
BISMUTH	*	7440-69-9	N.E.	N.E.	N.E.
INDIUM	*	7440-74-6/231-180-0			
		(US)	0.1	0.1	-
		(EU)	-	0.1	0.3
		(Canada)	-	0.1	0.3
		(Singapore)	0.1	-	-

		(Mexico)	0.1	-	0.3
		(China)	0.1	-	0.3
GOLD	*	7440-57-5	N.E.	N.E.	N.E.
LEAD	*	7439-92-1/231-100-4 (US)	0.05	0.05	-
		(EU)	-	0.15	-
		(Canada)	-	0.05	-
		(Singapore)	0.15	-	-
		(Mexico)	-	0.15	-
		(China)	-	0.05(dust)	-
			-	0.03(fume)	-
MANGANESE	*	7439-96-5/231-105-1	N.E.	N.E.	N.E.
CARBOXYLIC ACID (C1-5)	3.4-6.7	68937-68-8	N.E.	N.E.	N.E.
TRIALKYLAMINE (C6-C12)	1.6-3.3	68038-01-7	N.E.	N.E.	N.E.
POLYGLYCOL ETHER	3.0-7.0	9038-95-3	N.E.	N.E.	N.E.

N.E. = Not established EU = European Union Occupational Exposure Limits

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. Paste is not flammable

Auto-ignition Temperature: Not established.

Flammable Limits: Limits not established.

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. Wear proper personal protective equipment during clean up.

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.

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.

Other: Lab coat, eyewash 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:	Soluble
Vapor Density:	(air=1) Not applicable.	Odor Threshold:	No information
Evaporation rate:	Not applicable	Partition coefficient: n-octanol/water:	Not applicable
Decomposition temp:	Not established	Viscosity:	Consult Product data sheet and Product Certificate of Analysis
Flammability:	Not flammable	Flashpoint:	Not flammable

Auto-ignition Temp: 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	Harmful toxic oxide fumes may form at elevated temperatures. CO/CO ₂ /HBr
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity:	NTP: Yes (Lead)
	OSHA: 29CFR1910.1025
	IARC: Yes Lead and lead compounds are listed as possible carcinogens.
	Other: Lead can cause potential harm to the developing fetus.

Lead – Suspected human reproductive toxicant. May cause damage to organs through prolonged or repeated exposure. Reproductive toxicity – rat –inhalation, oral/ effects on newborn. Contains <0.2% of a substance that may cause cancer.

12. ECOLOGICAL INFORMATION

Product not tested.

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 international regulations and requirements. Not regulated (Department of Transportation).

Non- hazardous under shipping regulations, all modes (ground/IATA/IMDG)

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.).



WARNING: This product can expose you to chemicals such as [lead, trace amounts of propylene oxide, ethylene oxide, 1,4 dioxane] which are known to the State of California to cause cancer and [lead] which can cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

SARA 313 Listing - 40 CFR 372.65

Silver CAS# 7440-22-4

Copper CAS# 7440-50-8

Antimony CAS# 7440-36-0

Lead CAS# 7439-92-1

All ingredients in this product are listed on the EPA TSCA Inventory.

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)



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 regulations NOM-018-STPS-2015 and NOM-010-STPS-2014.

Regulatory Information China:

GB/T 16483-2008, GB/T 17519-2013, Safety Data Sheets for Chemical Products

GB 30000.2-29-2013, Rules for classification and labeling of chemicals (GHS)

Decree No. 591: Regulations on the Control Over Safety of Hazardous Chemicals.

This product has been classified using the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2007.

Malaysia:

This product has been classified in accordance with: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS).

16. OTHER INFORMATION

HMIS Hazard Rating: **Health:** 2
 Fire: 1
 Reactivity: 0

Revised Date: 3 DECEMBER 2018

Prepared by: Nancy Swarts, Indium Corporation of America

Approved by: Nancy Swarts, Indium Corporation of America

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.

Note: This SDS 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.

ALLOY TABLE

Metal alloy mix with flux

INDALLOY Metal Product Mixture	%TIN Sn	%SILVER Ag	%ANTIMO NY Sb	%COPPER Cu	% INDIUM In	%BISMUTH Bi	%LEAD Pb	%GOLD Au	% COBALT Co	%MANG ANESE Mn	RoHS 2/3* Compliance (2011/65/EU)
106 (Sn63/Pb37)	52.3-58	-	-	-	-	-	30.7-34	-	-	-	NO
121 (Sn96.5/Ag3.5)	80-88.8	2.9-3.2	-	-	-	-	-	-	-	-	YES
128 (100Sn)	83-92	-	-	-	-	-	-	-	-	-	YES
131 (97Sn/3Sb)	80.5-89	-	2.49-2.76	-	-	-	-	-	-	-	YES
133 (Sn95/Sb5)	78.9-87.4	-	4.2-4.6	-	-	-	-	-	-	-	YES
182 (Au80/Sn20)	16.6-18.4	-	-	-	-	-	-	66.4-73.6	-	-	YES
209 (Sn65/Ag25/Sb10)	54-59.8	20.8-23.0	8.3-9.2	-	-	-	-	-	-	-	YES
228 (Pb88/Sn10/Ag2)	8.3-9.2	1.7-1.8	-	-	-	-	73-80.9	-	-	-	Yes with exemption
241 (SAC387) (Sn95.5/Ag3.8/Cu0.7)	79.3-87.9	3.2-3.5	-	0.58-0.64	-	-	-	-	-	-	YES
244 (99.3Sn/0.7Cu)	82.4 – 91.3	-	-	0.58 – 0.64	-	-	-	-	-	-	YES
246 (Sn95.5/Ag4/Cu0.5)	79.3-87.9	3.3-3.7	-	0.42-0.46	-	-	-	-	-	-	YES
249 (Sn91.8/Bi4.8/Ag3.4)	76.2-84.5	2.8-3.1	-	-	-	4.0-4.4	-	-	-	-	YES

INDALLOY Metal Product Mixture	%TIN Sn	%SILVER Ag	%ANTIMO NY Sb	%COPPER Cu	% INDIUM In	%BISMUTH Bi	%LEAD Pb	%GOLD Au	% COBALT Co	%MANG ANESE Mn	RoHS 2/3* Compliance (2011/65/EU)
252 (Sn95.5/Ag3.9/Cu0.6)	79.3- 87.9	3.2-3.6	-	0.50- 0.55	-	-	-	-	-	-	YES
254 (86.9Sn/10In/3.1Ag)	72-80	2.6-2.9	-	-	8.3- 9.2	-	-	-	-	-	YES
256 (SAC 305) (Sn96.5/Ag3.0/Cu0.5)	80.1- 88.8	2.5-2.8	-	0.42- 0.46	-	-	-	-	-	-	YES
258 (Sn98.5/Ag1/Cu0.5)	81.8- 90.6	0.83- 0.92	-	0.42- 0.46	-	-	-	-	-	-	YES
259 (Sn90/Sb10)	74.7- 82.8	-	8.3-9.2	-	-	-	-	-	-	-	YES
264 Sn91.5/Sb8.5	75.9- 84.2	-	7.1-7.8	-	-	-	-	-	-	-	YES
268 (SACM0510) (98.5Sn/0.5Ag/1Cu) Doped 0.05Mn	81.8- 90.6	0.42- 0.46	-	0.83- 0.92	-	-	-	-	-	0.05	YES
282 (Bi57/Sn42/Ag1)	34.9- 38.6	0.83- 0.92	-	-	-	47.3-52.4	-	-	-	-	YES
Sn 992	82-91	-	-	0.42- 0.46	-	0.25-0.28	-	-	0.042- 0.046	-	YES
Non Standard (Sn96/Ag4)	79.7- 88.3	3.3-3.7	-	-	-	-	-	-	-	-	YES

*RoHS 2 = Restriction of Hazardous Substances

*RoHS 3 – products do not contain any listed phthalates

Solder related products are not directly related to the regulations. It is the customer's responsibility to ensure compliance. Review any applicable exemptions that may apply.