SDS - 4771 LF



# SAFETY DATA SHEET

User must review the contents of this (SDS) and determine what is applicable to their own country laws under Health and Safety and apply them as necessary. This (SDS) will not reference every countries Health and Safety Laws. It is the user's responsibility to determine what is applicable to them, including but not limited to review of any specific chemical lists and apply the requirements as necessary.

#### 1. PRODUCT AND COMPANY IDENTIFICATION

General Product Class Identifier: INDALLOY WITH INDIUM8.9HF (lead free) SOLDER PASTE

(View product table for individual product descriptions)

SDS Number: SDS-4771-LF Revised Date: 17 MAY 2022

Version 2.0

**Product Use:** Industrial Use Only -No-clean solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder used for solder applications. (mixture) See alloy table for metal combinations with the same flux

\*Review alloy table for all metal combinations using the same flux.

#### **MANUFACTURER:**

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Jiangsu Province, China 215126 Information: (86) 512-6283-4900

### 2. HAZARDS IDENTIFICATION

#### PRIMARY ROUTES OF ENTRY:

#### **CARCINOGEN LISTED IN:**

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

#### **GHS**

Classification:

Skin sensitizer (Category 1B)
Respiratory sensitizer (Category 1B)
Eye irritation (Category 2A)
Reproductive toxicity (Category 1B)





Signal Word: Danger Hazard statement(s):

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

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

H360FD May damage fertility; May damage the unborn child

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 feel unwell.

P302+P352 IF ON SKIN: Wash with plenty of soap and water

P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable

for breathing

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy

to do - continue rinsing.

#### **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:** Contains metal alloy powders and organic chemicals. May cause irritation or harm.

Inhalation: Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local

irritation to the respiratory system. Rosin fume may cause occupational asthma.

**Skin Contact:** May cause skin irritation. Rosin may cause dermatitis.

Chronic: 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. Chronic exposure to tin dusts

and fume may result in "stannosis" a mild form of pneumoconiosis.

BISMUTH: May cause kidney damage.

**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.

**ANTIMONY:** May be harmful if inhaled. May cause respiratory irritation.

**INDIUM:** May cause damage to respiratory system if inhaled over long exposure.

WARNING: This product can expose you to chemicals including [trace lead] which is known to the State of California to cause cancer, and birth defects or other reproductive harm. For more information go to <a href="https://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>

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

# 3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	% wt	CAS Registry #/EINECS#	PEL mg/m³	TLV-TWA mg/m³	TLV-STEL mg/m³
TIN	64 - 100	7440-31-5/231-141-8			
		(US)	2	2	-
		(EU)	-	2	4
		(Canada)	-	2	4
		(Singapore)	2	-	-
SILVER	0 - 5	7440-22-4/231-131-3			
		(US)	0.01	0.1	-
		(EU)	-	0.1	-
		(Canada)	N.E.	0.1	0.3
		(Singapore)	0.1	-	-
		(Mexico)	0.1	-	-
BISMUTH	0 – 6.0	7440-69-9/231-177-4	N.E.	N.E.	N.E.
COPPER	0 – 2.0	7440-50-8/231-159-6			
		(US)	0.1	0.2	-
		(EU)	-	0.2 (fume)	2(dust)
		(Canada)	-	0.2	0.6
		(Singapore)	0.2(fume)	1(dust)	-
		(Mexico)	0.2	-	2
		(China) Page 3 of 11	- -	1 (dust) 0.2(fume)	- -

ANTIMONY	0 - 9.5	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	4.0-6.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	-	0.15 (sensitiser)
POLYGLYCOL ETHER	2.5-4.0	9038-95-3	N.E.	N.E.	N.E.
CARBOXYLIC ACID	1.0-6.0	68937-72-4	N.E.	N.E.	N.E.
MANGANESE	0.05(dopent)	7439-96-5/231-105-1	N.E.	N.E.	N.E.
CESIUM	0.05(dopent)	7440-46-2/231-155-4	N.E.	N.E.	N.E.
INDIUM	0 – 19.0	7440-74-6/231-180-0 (US)	0.1	0.1	N.E.
		(EU)	N.E.	0.1	0.3
		(Canada)	N.E.	0.1	0.3
		( Mexico)	0.1	N.E.	0.3
		(Singapore)	0.1	N.E.	N.E.
		(China)	-	0.1	0.3
BIS(2-(2-METHOXYETHO (TETRAETHYLENE GLY)			N.E.	N.E.	N.E.

N.E. = Not established

# 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

SDS - 4771 LF INDALLOY WITH INDIUM8.9HF (lead free)

Flash Point: Not established. Method: Not established.

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.

Material may have reclaim value.

### 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 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.

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# 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:Grey colored paste.Boiling Point:Not applicable.Odor:Mild characteristic odor.Melting Point:Not applicable

Specific Gravity: 1 g/cc (flux) pH: 4 -8 (flux)

Vapor Pressure: Not applicable. Solubility in Water: Insoluble (paste)

Vapor Density: (air=1) Not applicable.

### **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 allowed depressions.

elevated temperatures.

Hazardous Polymerization: Will not occur.

### 11. TOXICOLOGICAL INFORMATION

Carcinogenicity Listing: NTP: No (National Toxicity Program)

OSHA: No (US Occupational Safety & Health Administration)
IARC: No (International Agency for Research on Cancer)

**LD50:** Not established. **LC50:** Not established.

**Other:** Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma.

Copper - LD50 - intraperitoneal mouse 3.5 mg/kg.

Silver – LD50 oral – rat > 5,000 mg/kg Antimony - LD50 oral – rat 7,000 mg/kg

Contains a substance that may damage fertility or the unborn child.

Tetraethylene glycol dimethyl ether – LD50 Oral- rat-female-3,640-4160 mg/kg

LD50 dermal rat, male>6,900mg/kg

#### 12. ECOLOGICAL INFORMATION

Product not tested.

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

Antimony – Toxicity to fish – mortality NOEC (sheepshead minnow) 6.2 mg/l - 96h. Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

### 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 (US Department of Transportation).

Not hazardous under shipping regulations. (ground/air/ocean) (USDOT/IATA/IMDG)

UN - none

North American Emergency Guide Book - Not applicable

Marine Pollutant- no.

### 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 including [trace lead] which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="https://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>

SARA 313 Listing - 40 CFR 372.65 Silver Copper

All ingredients 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:

D2B - Materials Causing Other Toxic Effects (skin irritation/skin sensitization)

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

#### EU:

For compliance with EU Directive 2011/65/EU, Restriction of Hazardous Substances (RoHS), see Alloy Table.

Product contains a REACH Substance of Very High Concern (SVHC)- Tetraethylene glycol dimethyl ether (CAS# 143-24-8).

#### Japan:

Poisonous and Deleterious Substance Control Law (PDSCL): No ingredients are listed.

Fire Service Law (FSL): Not regulated/not dangerous.

Industrial Safety and Health Law (ISHL): ingredients are listed

PRTR and Promotion of Chemical Management law, Class I Substance: Not applicable.

Waste Disposal and Public Cleaning Law: Specific Harmful Industrial Wastes: Some contents of the family grouping may contain lead within the solder paste. Review alloy table and product label/ purchased and used.

Class II Designated Chemical Substances: No ingredients are listed.

Ingredients are listed on the Japanese Inventory Chemical Substance List/Industrial Safety and Health Law Substance List.

Review SDS and apply regulations where applicable.

#### 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). (GHS)

#### In China:

Decree No. 591: Regulations on the Control over Safety of Hazardous Chemicals GB 30000.2-29-2013, Rules for classification and labeling of chemicals. (GHS) GB/T 16483-2008, GB/T 17517-2013

This product has been classified using the Chinese Occupational Limit for Hazardous Agents in the Workplace, GBZ2.1-2019.

All ingredients are listed on the China Chemical Inventory.

### Philippines:

Product does not contain any substance that is listed under CPECs (Controlled Precursor and Essential Chemicals. Product does not contain any substances listed under the Dangerous Drugs Board (DDB).

#### **16. OTHER INFORMATION**

HMIS Hazard Rating: Health: 1

Fire: 1
Reactivity: 0

Revised Date: 17 MAY 2022

**Prepared by:** Piumi Liyanage, Indium Corporation of America **Approved by:** Piumi Liyanage, 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. The Indium Corporation does not recommend, manufacture, market or endorse any of its products for human consumption.

# **ALLOY TABLE (DATA)**

# %Metal Mix in Flux

	ı	1	/0	IVICIAI IVII	X IN FIUX	ı	ı	T	T
Indalloy	%	%	%	%	%	%	%	%	RoHS 2/3*
Mixture	Tin	Silver	Copper	Indium	Bismuth	Antimony	Cesium	Manganese	Compliance
(%Metal)	Sn	Ag	Cu	In	Bi	Sb	Ce	Mn	
121	80.1-	2.9-3.2	Ou	111	ы	Ob	06	17111	YES
		2.9-3.2	_	-	-	-	-	-	163
(96.5Sn/3.5Ag	88.8								
128	100	_	_	-	-	-	-	_	YES
	100	-	_	-	-	-	-	-	123
(100Sn)	70.0.0	4040							\/F0
132	78.9-8 7	4.2-4.6	-	-	-	-	-	-	YES
(95Sn/5Ag)									
133	78.9-8 7	-	-	-		4.2-4.6	-	-	YES
(95Sn/5Sb)	,								
156	74.7-	8.3-9.2	-	-	-	-	-	-	YES
(90Sn/10Ag)	82.8								
227	64-71	2.3-2.6	-	16.6-	-	-	-	-	YES
(77.2Sn/20In/				18.4					
2.8Ag)									
241	79.2-	3.2-3.5	0.58-	-	-	-	-	-	YES
(SAC 387)	87.9		0.64						
(95.5Sn/3.8Ag /0.7Cu)									
244	82-91.	-	0.58-	-	-	-	-	-	YES
(99.3Sn/0.7C u)	3		0.64						
246	79.2-	3.3-3.7	0.42-	-	_	-	-	_	YES
(SAC 405)	87.9		0.46						
(95.5Sn/4Ag/0 .5Cu)	0.10		00						
254	72-80	2.6-2.85	_	8.3-9.2	_				YES
(86.9Sn/10In/	72-00	2.0-2.00	-	0.3-9.2	-	-	-	-	123
3.1Ag)									
256	80.1-	2.5-2.8	0.42-	-	-	-	-	-	YES
(SAC 305)	88.8		0.46						
(96.5Sn/3Ag/0 .5Cu)									
Modified	80-88.	2.5-2.8	0.42-	-	-	-	-	0.042-0.046	YES
256	7		0.46					doped	
(SAC 305)									
(96.45Sn/3Ag/ 0.5Cu +doped 0.05 Mn)									
Modified	80-88.	2.5-2.8	0.42-	-	-	-	0.042-	-	YES
256	7		0.46				0.046		
(SAC 305)									
(96.45Sn/3Ag/									
0.5Cu +0.05 Cs)									

SDS - 4771 LF			INDALLOY WITH INDIUM8.9HF (lead free)							
Indalloy Mixture	% Tin	% Silver	% Copper	% Indium	% Bismuth	% Antimony	% Cesium	% Manganese	RoHS 2/3* Compliance	
(%Metal)	Sn	Ag	Cu	In	Bi	Sb	Ce	Mn		
258 (SAC105) (98.5Sn/1Ag/0 .5Cu)	81.8- 90.6	0.83-0.92	0.42- 0.46	-	-	-	-	-	YES	
<b>259</b> (90Sn/10Sb)	74.7- 82.8	-	-	-	-	8.3-9.2	-	-	YES	
<b>264</b> (91.5Sn/8.5Sb	75.9- 84.2	-	-	-	-	7.06-7.82	-	-	YES	
268 (SACm ® 0510) (98.5Sn/0.5Ag /1Cu/0.05Mn)	81.7- 90.6	0.42-0.46	0.83- 0.92	-	-	-	-	0.042-0.046 doped	YES	
270 (90.95Sn/3.8A G/0.7Cu/3Bi/1 .4Sb/0.15Ni)	75.5- 83.7	3.2-3.5	0.58- 0.46	-	-	1.16-1.2	-	-	YES	
272 (90Sn/3.8Ag/1 .2Cu/1.5Bi/3.5 Sb)	74.7- 82.8	3.2-3.5	1-1.1	-	-	2.9-3.2	-	-	YES	
276 (90.6Sn/3.2A G/0.7Cu/5.5S b)	75.2- 83.4	2.7-2.9	0.58- 0.64	-	-	4.6-5.1	-	-	YES	
277 (89Sn/3.8Ag/0 .7Cu/3.5Sb/0. 5Bi/2.5In)	73.9- 81.9	3.2-3.5	0.58- 0.64	2.08- 2.3	-	2.9-3.2	-	-	YES	
279 (89.3Sn/3.8Ag /0.9Cu/5.5Sb/ 0.5In)	74-82	3.2-3.5	0.7-0.8	0.42- 0.46	-	4.6-5.1	-	-	YES	
<b>302</b> (91.25Sn/2.25 Ag/0.5Cu/6.0 Bi)	87.3 – 95.2	2.0 – 2.4	0.4 – 0.6	-	5.4 – 6.6	-	-	-	YES	
284 (89.7Sn/3.4Ag /3.2Bi/3.0Sb/0 .7Cu)	74.5- 82.5	2.8-3.1	0.58- 0.64	-	5.4 – 6.6	2.5-2.8	-	-	YES	
845-27-3 (80-90Sn/2-5 Ag/0.1-2Cu/3- 8Sb/3-6Bi/0.1- 2In/0.1-1Ni)	66-82. 8	1.7-4.6	0.08- 1.8	0.08- 4.6	-	2.5-7.4	-	-	YES	
291 (99.24 Sn/0.7Cu/0.05 Ni/0.01Ge)	82.4- 91.3	-	0.58- 0.64	-	-	-	-	-	YES	
292	66-82. 8	1.7-4.6	0.08- 1.8	0.1-2.0	-	3.1-8.0	-	-	YES	

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SDS - 4//1 LF						INDAL	LOY WITH IN	DIUM8.9HF (lead fre	ee)
Indalloy Mixture (%Metal)	% <b>Tin</b> Sn	% <b>Silver</b> Ag	% Copper Cu	% <b>Indium</b> In	% Bismuth Bi	% Antimony Sb	% <b>Cesium</b> Ce	% <b>Manganese</b> Mn	RoHS 2/3* Compliance
845-27-5 (80-90Sn/2-5 Ag/0.1-2Cu/3- 8Sb/3-6Bi/0.1- 1Ni)	66-82. 8	1.7-4.6	0.08- 1.8	-	-	2.5-7.4	-	-	YES
<b>NS</b> (98.5Sn/1Ag/0 .5Cu)	81.8- 90.6	0.83-0.92	0.42- 0.46	1	1	-	1	1	YES
<b>NS</b> (98.3Sn/1.2Ag /0.5Cu +0.05 Ni)	81.6-9 0	0.1-1.1	0.42- 0.46	1	1	-	1	1	YES
<b>NS</b> (99Sn/0.3Ag/0 .7 Cu)	82-91. 1	0.25-0.28	0.58- 0.6	1	1	-	1	-	YES
NS (99.2Sn/0.5C u/0.3Bi/doped 0.05Co)	82.3- 91.3	-	0.42- 0.46	-	-	-	-	-	YES

**NS = Non - standard alloy mixture** 

<sup>\*</sup>RoHS 2 = Restriction of Hazardous Substances (2011/65/EU)

<sup>\*</sup>RoHS 3 = Products do not contain any listed phthalates