To better serve all of our customers 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.

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: **INDALLOY WITH RMA-F FLUX VEHICLE**

SDS Number: SDS-IN 354-A **Revised Date:** 14 MARCH 2018

Product Use: Industrial use (mixture) - Rosin-based mildly activated solder paste consisting of a flux vehicle blended with a 83-92 % pre-alloyed metal powder.

MANUFACTURER:

In America:
The Indium Corporation of America®
34 Robinson Rd., Clinton, New York 13323
Information: (315) 853-4900
nswarts@indium.com

EMERGENCY PHONE:
CHEMTREC 24 hrs.
USA: 1 (800) 424-9300
Outside USA: +1 (703) 527-3887

In Europe:
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

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

2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

⊗Eye ⊗Inhalation ⊗Skin ⊗Ingestion

Carcinogen listed in

NTP IARC OSHA ⊗Not Listed

See Section 11

GHS:

Lead free

Signal Word: Warning

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
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 + 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

Signal Word: Warning

Hazard statement(s)

H303	May be harmful if swallowed
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
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
EUH201A	Warning! Contains 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 + 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)

Classification:

Classification:
Specific target organ toxicity- repeated exposure – Category 2
Carcinogenicity (Category 2) (lead)
Reproductive toxicity (Category 2) (lead)
Serious eye irritation- Category 2A
Skin sensitization – Category1B
Respiratory sensitization- Category1B
Acute toxicity, inhalation- Category 4
Acute aquatic toxicity – Category 1 for lead containing products
Chronic aquatic toxicity – Category 1 for lead containing products
For product containing lead the Acute and Chronic Classification is (Category 2)

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: This product may contain lead alloy powder and organic chemicals. Harmful if swallowed. May cause systematic lead poisoning and burns to the digestive tract. Symptoms of lead poisoning include headache, nausea, abdominal pain, muscle and joint pain and damage to the nervous system, blood system and kidneys.

Inhalation: Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local irritation to the respiratory system.

Skin Contact: May cause skin irritation. ANTIMONY has been known to cause dermatitis.

Chronic: 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.

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.

BISMUTH: May cause kidney damage.

INDIUM : May cause damage to respiratory system.

 WARNING: This product can expose you to lead which is known to the State of California to cause cancer, and 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	-	-
LEAD	+	7439-92-1/231-100-4				
			(US)	0.05	0.05	-
			(EU)	-	0.15	-
			(Canada)	0.05	0.05	-
			(Singapore)	0.15	-	-
			(Mexico)	-	0.15	-
			(China)	-	0.05(dust) 0.03 (fume)	-
SILVER	+	7440-22-4/231-131-3				
			(US)	0.01	0.1	-
			(EU)	-	0.1	-
			(Canada)	-	0.1	0.3
			(Singapore)	0.1	-	-

		(Mexico)	-	0.1	-
GOLD	+	7440-57-5	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
		(Singapore)	0.5	-	-
		(Mexico)	-	0.5	-
		(China)	-	0.5	-
GERMANIUM	+	7440-56-4	N.E.	N.E.	N.E.
BISMUTH	+	7440-69-9/231-177-4	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
ROSIN	3.5-8.0	65997-05-9 (US)	N.E.	N.E.	N.E.
		(EU)	0.05	N.E.	0.15 (sensitiser)
POLYGLYCOL ETHER	3 – 7.5	9038-95-3	N.E.	N.E.	N.E
PROPRIETARY	1 - 2	-	N.E.	N.E.	N.E.

N.E. = Not established + See alloy table

ALLOY TABLE

Indalloy	%TIN	%SILVER	%LEAD	%ANTIMONY	%INDIUM	%GOLD	%GERMANIUM	%BISMUTH	RoHS* Compliance
1 (50In/50Sn)	41.5-46.0	-	-	-	41.5-46.0	-	-	-	YES
1E (52In/48Sn)	39.8-44.2	-	-	-	43.2-47.8	-	-	-	YES
2 80In/15Pb/5Ag)	-	4.2-4.6	12.5-13.8	-	66.4-73.6	-	-	-	NO
3 (90In/10Ag)	-	8.3-9.2	-	-	74.7-82.8	-	-	-	YES
4 (100In)	-	-		-	83.0-92.0	-	-	-	YES
7 50In/50Pb)	-	-	41.5-46.0	-	41.5-46.0	-	-	-	NO
9 (70Sn/18Pb/12In)	58.1-64.4	-	14.9-16.6	-	10-11	-	-	-	NO
10 (75Pb/25In)	-	-	63.3-69.0	-	20.8-23.0	-	-	-	NO
11 (95Pb/5In)	-	-	78.9-87.4	-	4.2-4.6	-	-	-	YES
42 (46Bi/34Sn/20Pb)	28.2-31.3	-	16.6-18.4	-	-	-	-	38.2-42.3	NO
53 (67Bi/33In)	-	-	-	-	27.4-30.4	-	-	55.6-61.6	YES
70 (40In/40Sn/20Pb)	33.2-36.8	-	16.6-18.4	-	33.2-36.8	-	-	-	NO
97 (43Sn/43Pb/14Bi)	36.7-39.6	-	36.7-39.6	-	-	-	-	11.6-12.9	NO
104/Sn62 (62.5Sn/36.1Pb/1.4Ag)	51.9-57.5	1.2-1.8	29.9-33.2	-	-	-	-	-	NO
106/Sn63 (63Sn/37Pb)	52.3-58.0	-	30.7-34.0	-	-	-	-	-	NO
109 (60Sn/40Pb)	49.8-55.2	-	33.2-36.8	-	-	-	-	-	NO

116 (50Sn/50Pb)	41.5-46.0	-	41.5-46.0	-	-	-	-	-	NO
118 (90Sn/10Pb)	74.7-82.8	-	8.3-9.2	-	-	-	-	-	NO
121 (96.5Sn/3.5Ag)	80.1-88.8	1.2-1.8	-	-	-	-	-	-	YES
122 (95Sn/5Pb)	78.9-87.4	-	4.2-4.6	-	-	-	-	-	NO
123 (97.5Sn/2.5Ag)	80.9-89.7	2.1-2.3	-	-	-	-	-	-	YES
127 (60Pb/37Sn/3Ag)	30.7-34.0	2.5-2.8	49.8-55.2	-	-	-	-	-	NO
130 (60Pb/40Sn)	33.2-36.8	-	49.8-55.2	-	-	-	-	-	NO
132 (95Sn/5Ag)	78.9-87.4	4.2-4.6	-	-	-	-	-	-	YES
133 (95Sn/5Sb)	78.9-87.4	-	-	4.2-4.6	-	-	-	-	YES
141 (70Pb/30Sn)	24.9-27.6	-	58.1-64.4	-	-	-	-	-	NO
143 (90Pb/10Sb)	-	-	74.4-82.8	8.3-9.2	-	-	-	-	YES
145 (75Pb/25Sn)	20.8-23.0	-	62.3-69.0	-	-	-	-	-	NO
149 (80Pb/20Sn)	16.6-18.4	-	66.4-73.6	-	-	-	-	-	NO
150 (81Pb/19In)	-	-	67.2-74.5	-	15.8-17.5	-	-	-	NO
151 (92.5Pb/5Sn/2.5Ag)	4.2-4.6	2.0-2.3	76.8-85.0	-	-	-	-	-	YES
Indalloy	**%TIN**	**%SILVER**	**%LEAD**	**%ANTIMONY**	**%INDIUM**	**%GOLD**	**%GERMANIUM**	**%BISMUTH**	**RoHS* Compliance**
155 (90Pb/5Ag/5Sn)	4.2-4.6	4.2-4.6	74.7-82.8	-	-	-	-	-	YES
159 (90Pb/10Sn)	8.3-9.2	-	74.7-82.8	-	-	-	-	-	YES
161 (97.5Pb/2.5Ag)	-	2.1-2.3	80.9-89.7	-	-	-	-	-	YES
164 (92.5Pb/5I	-	2.1-2.3	76.8-85.1	-	4.2-4.6	-	-	-	YES

n/2.5Ag)									
165 (97.5Pb/1.5Ag/1Sn)	0.8-0.9	1.2-1.4	80.9-89.7	-	-	-	-	-	YES
171 (95Pb/5Sn)	4.2-4.6	-	78.9-87.4	-	-	-	-		YES
175 (95Pb/5Ag)	-	4.2-4.6	78.9-87.4	-	-	-	-	-	YES
182 (80Au/20Sn)	16.6-18.4	-	-	-	-	66.4-73.6	-	-	YES
183 (88Au/12Ge)	-	-	-	-	-	73.0-81.0	10.0-11.0	-	YES
204 (70In/30Pb)	-	--	24.9-27.6	-	58.1-64.4	-	-	-	NO
205 (60In/40Pb)	-	-	33.2-36.8	-	49.8-55.2	-	-	-	NO
206 (60Pb/40In)	-	-	49.8-55.2	-	33.2-36.8	-	-	-	NO
209 (65Sn/25Ag/10Sb)	54.0-59.8	20.8-23.0	-	8.3-9.2	-	-	-	-	YES
227 (77.2Sn/20In/2.8Ag)	64.0-71.0	2.3-2.6	-	-	16.6-18.4	-	-	-	YES
228 (88Pb/10Sn/2Ag)	8.3-9.2	1.7-1.8	73.0-81.0	-	-	-	-	-	YES
230 (54Sn/26Pb/20In Dopant Cu	44.8-49.7	-	21.6-23.9	-	16.6-18.4	-	-	-	NO
233 (85Pb/10Sb/5Sn)	4.2-4.6	-	70.6-78.2	8.3-9.2	-	-	-	-	YES
240 (46Sn/46Pb/8Bi)	38.2-42.3	-	38.2-42.3	-	-	-	-	6.6-7.4	NO
255 (55.5Bi/44.5Pb)	-	-	36.9-40.9	-	-	-	-	46.1-51.1	NO
281 (58Bi/42Sn)	34.9-38.6	-	-	-	-	-	-	48.1-53.4	YES
281- 338 (60Sn/40Bi)	49.8-55.2	-	-	-	-	-	-	33.2-36.8	YES
290 (97In/3Ag)	-	2.5-2.8	-	-	80.5-89.2	-	-	-	YES
NS	41.5-46.0	-	39.0-43.2	-	-	-	-	2.5-2.8	NO

(50Sn/47Pb/3Bi)									
NS (93.5Pb/5Sn/1.5Ag)	4.2-4.6	1.2-1.4	77.6-86.0	-	-	-	-	-	YES
NS (67Pb/33In)	-	-	55.6-61.6	-	27.4-30.4	-	-	-	NO

NS = Non Standard Alloy

***RoHS = Restriction of Hazardous Substances EU Directive 2011/65/EU (review applicable exemptions)**

4. FIRST AID MEASURES

Eye Contact: Hold eyelids apart and flush eyes with tepid plenty of 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 of contaminated cloth rags or paper towels following all Federal, State and Local 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

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 authority 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. Latex gloves are not recommended for use.

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.

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.		

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. Contains <0.3% of substances that are suspected of causing cancer, suspected of causing genetic defects and may cause harm to breast fed children.

Reviewing epidemiological studies the IARC concluded in inadequate evidence for the carcinogenicity of lead and lead compounds in humans and sufficient evidence for the carcinogenicity of inorganic lead compounds in animals. According to the IARC, the lead and lead compounds tested for carcinogenicity in animals are almost soluble salts that were selected on

the basis of ease of administration. Metallic lead, lead oxide and lead tetra alkyls have not been tested adequately. The final evaluation was thus that lead and inorganic lead compounds are possibly carcinogenic to humans.

RTECS#: OF7525000 (lead) NL1050000 (indium) VM3500000 (silver) XP7320000 (tin) CC4025000 (antimony)

12. ECOLOGICAL INFORMATION

Contains substances that are harmful to the 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.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated under US DOT (United States Department of Transportation). Non hazardous under shipping.

UN - none

15. REGULATORY INFORMATION

The information in this Material 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.).

SARA 313 Listing - 40 CFR 372.65

Lead CAS# 7439-92-1 Silver CAS# 7440-22-4 Antimony CAS# 7440-36-0

Polyglycol Ether (1 – 4.5%)

EPA Genetic Toxicology Program – Lead CAS# 7439-92-1

All ingredients are listed on the EPA TSCA Inventory.

WARNING: This product can expose you to lead which is known to the State of California to cause cancer, and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

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)

D2B Materials Causing Other Toxic Effects –irritant

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: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS).

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.

16. OTHER INFORMATION

HMIS Hazard Rating:	**Health:**	2
	Fire:	1
	Physical Hazard:	0
Revised Date:	14 MARCH 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.