SAFETY DATA SHEET

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

1.1 Product Identifier

Product Name/Group: INDALLOY WITH RA-2 FLUX COATING

SDS Number: SDS- 44507 **Revised Date:** 16 APRIL 2020

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

Product Use: Industrial Use (Mixture) - Flux coated metal preform

See alloy table for listing of products included under this SDS. This SDS covers a variety of metal mixtures using one common flux coating.

1.3 Details of the supplier of the safety data sheet

MANUFACTURER/SUPPLIER/IMPORTER:

In America:
The Indium Corporation of America®
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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
*** 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 substance or mixture

Carcinogenicity (Category 2) (lead)
Reproductive toxicity (Category 2) (lead)
Skin sensitizer-Category 1B
Respiratory sensitizer-Category 1B
Eye irritation-Category 2A
Acute aquatic toxicity – Category 1 for lead containing products (H400)
Chronic aquatic toxicity – Category 1 for lead containing products (H410)

2.2 Label elements

Labeling according to Regulation (EC) No 1272/2008

Lead free products

Signal Word: Warning

Hazard statement(s)

H317	May cause an allergic ski reaction
H319	Causes serious eye irritation
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled

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)

H302	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
H360	May damage fertility or the unborn child
H373	May cause damage to organs(blood/kidneys/CNS) through prolonged or repeated exposure (Confirmed animal carcinogen with unknown relevance to humans)
H410	Very toxic to aquatic life with long lasting effects

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
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P305 + 351	IF IN EYES: Rinse continuously with water for several minutes (15 mins)

Supplemental Information:

EUH208	Contains rosin. May produce an allergic reaction
EUH201A	Warning! Contains lead Review listing.

PRIMARY ROUTES OF ENTRY: **Carcinogen listed in**

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

2.3 OTHER HAZARDS

POTENTIAL HEALTH EFFECTS:

Eye Contact: Irritating to the eyes and if not removed, may result in serious irritation. Contact with fume from molten metal may cause irritation.

Ingestion: This product contains metal alloys and organic chemicals. May cause irritation. May be harmful.

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Inhalation: Inhalation of fume or dust may cause local irritation to the respiratory system. Prolonged inhalation to rosin may cause irritation or asthma in certain persons

Skin Contact: Normal handling should not cause any adverse health effects 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: Over exposure may cause metal fume fever.

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 and muscle and joint pain and damage to the nervous system, blood system and kidneys.

Normal handling of solid metal is not harmful

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.2 Mixture:

Components	% wt	CAS Registry #/ EINECS#	
TIN	56.9 - 95.5	7440-31-5/231-141-8	no hazard statement
SILVER	0 -3.7	7440-22-4/231-131-3	no hazard statement
COPPER	0 - 0.69	7440-50-8 /231-159-6	no hazard statement
LEAD	0 - 38.8	7439-92-1/231-100-4	H302/351/361/373/410
ANTIMONY	0 - 0.347	7440-36-0/231-146-5	no hazard statement
ROSIN MIX	1.0 - 6.0	65997-05-9	H317/319/334

* See Alloy Table for breakdown of percentages of alloy mixtures for each Indalloy

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ALLOY TABLE

1-6% Flux

INDALLOY (metal)	RoHS 2/3 Compliance*	%SILVER Ag	%LEAD Pb	%COPPER Cu	%TIN Sn	%ANTIMONY Sb
121 (96.5Sn3.5Ag)	Yes	3.29-3.47	-	-	90.7-95.5	-
241 (SAC387) (95.5Sn/3.8Ag/0.7Cu)	Yes	3.6-3.7	-	0.66-0.69	90-94.5	
256 (SAC 305) (96.5Sn/3Ag/0.5Cu)	Yes	2.8-2.97	-		90.7-95.5	
Non Standard Mix (60.5Sn/Pb39.15/ 0.35Sb)	No	-	36.8-38.8	-	56.9-59.9	0.33-0.347

RoHS 2 = (2011/65/EU) RoHS 3- no 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. Inhalation of decomposed rosin fume may cause irritation or occupational asthma. Exposure to metal fumes may cause irritation to the respiratory system. If applicable, lead fume may be harmful.

4.3 Indication of any immediate medical attention and special treatment needed:
No specific special treatment information. 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. CO2, water

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 Firefighter's 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: Material has reclaim value. It however does contain metals 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: If molten allow to cool then place into metals reclaim container. If solid wire pieces pick up and place into container for reclaim or reuse.

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

SECTION 7. HANDLING AND STORAGE

7.1 Precautions For Safe Handling: Keep containers tightly closed when not in use. Use only with production equipment specifically designed for the task. Wear appropriate personal protective equipment when working or handling. 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

				TWA	STEL
		CAS#/EINECS#		mg/m3	mg/m3
TIN	56.9-95.5	7440-31-5/231-141-8			
			(UK)	2	4
			(Belgium)	2	-
			(Germany)	2	-
			(Netherlands)	2	-
			(Spain)	2	-
SILVER	0 -3.7	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	-
COPPER	0-0.69	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)	
LEAD	0 - 38.8	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	-
ROSIN MIX	1.0-6.0	65997-05-9			
		(EU)	0.05	N.E.	0.15 (sensitiser)

(TWA) = time weighted average (STEL) = short term exposure level N.E. = Not established

8.2 Exposure Controls

Engineering Controls: Use only with production equipment with adequate exhaust ventilation and other safety features specifically designed for use with wire. 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 contaminates entering the atmosphere. Emissions may contain metal fume, rosin.

Personal Protective Equipment:

Follow requirements for proper equipment as outlined under 2016/425**.**

Eye/face protection:

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection:

Handle with CEN approved disposable nitrile gloves (minimum layer thickness: 5 mil), EN 374 Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Use EN 407 approved thermal (hot) gloves for any handling of molten metal.

Body Protection:

The type of protective equipment must be selected according to the concentration and amount of any other substances used at the specific workplace. Handling of flux coated parts requires the use of gloves, eye protection and may require additional protection such as lab coat.

Respiratory protection:

Where risk assessment shows respirators are appropriate use a particle respirator type P100 (US) or half face respirator with multi-gas cartridges or type P3 (EN 143) respirator cartridges as a backup to engineering controls.

Work/Hygienic:

Maintain good housekeeping. Clean up spills immediately. Wash hands thoroughly with soap and water immediately upon leaving the work area and before eating. Refrain from eating or smoking in work areas. When applicable in US, review, OSHA lead worker requirements. Certain work practice and medical monitoring may be required.

Control of environmental exposure:

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties of the whole mixture:

Appearance:	Metal - solid	**Boiling Point/Range:**	No data available*
Odor:	Odorless	**Melting Point:**	No data available*

Odor Threshold:	No data available*	**Evaporation Rate:**	No data available*
Specific Gravity:	No data available*	**pH:**	No data available- metal
Vapour Pressure:	1 mmHg @973C.	**Solubility in Water:**	Insoluble
Vapour Density:	(air=1) No data available*	**Partition coefficient:**	No data available*
Relative Density:	No data available*	**Flammability:**	No data available*
Flash Point:	Solid metal	**Method:**	Not applicable to metal
Auto-ignition Temperature:	Not applicable to metal	**Flammable Limits:**	Not applicable to metal
UEL/LEL Limits:	Not applicable to metal	**Decomposition Temp:**	No data available*
Viscosity:	Not applicable to metal	**Explosive properties:**	Not applicable to metal
Oxidizing Properties:	No data available*		

*Indium Corporation has not conducted any testing in order to acquire this data

9.2 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:

Acute toxicity:	Not established	**Mutagencity:**	Not established
Irritation:	Not established	**Toxicity for Reproduction:**	Not Established
Corrosivity:	Not applicable	**Absence of specific data:**	None available (not tested)
Sensitization:	Not available		

Repeated dose toxicity: Not established

Carcinogenicity: Not established

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

Interactive effects: None known

Symptoms related to the physical, chemical and toxicological characteristics:

May cause irritation or sensitization by skin and inhalation, especially during heating.

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

Exposure to rosin fume has been known to cause occupational asthma.

If applicable, lead exposure may be harmful. Lead may affect the central nervous system, kidneys, blood and reproductive system. See alloy table.

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)

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.

Antimony – LD50 – Oral (rat) 7000 mg/kg

Tin – LD 50 oral-rat >2000 mg/kg

Registry of Toxic Effects of Chemical Substances: RTECS# VM3500000 (silver), XP7320000 (tin), GL7900000 (fume/copper), CC4025000 (antimony), OF7525000 (lead)

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 daphia and other aquatic invertibrates 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. Fresh fish: 0.44 mg/l LC50 96h/ 1.32 mg/l LC50 96h/water Flea: 600 ug/l EC50 = 48h

Lead is harmful to aquatic life with long lasting effects.

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.

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): RoHS 2 (2011/65/EU) compliant. Review alloy table for products.

SECTION 14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.
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
Special precautions for user: None

Transport in bulk: Not applicable

SECTION 15. REGULATORY INFORMATION

This safety data sheet complies with the requirements of Regulation (EC) N0. 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 February, 2020 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 1005/2009.

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: 16 APRIL 2020
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 2020/171 as of amendments February 6, 2020 regarding 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.