SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH INDIUM 8.9HFC FLUX
SDS Number: SDS-7215
Revised Date: 8 OCTOBER 2018
Product Use: Industrial Use (mixture) - solder paste consisting of a flux vehicle blended with 85-90 weight percent pre-alloyed metal powder. See alloy table.

MANUFACTURER:

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

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Asia-Pacific Operations-Singapore
29 Kian Teck Avenue
Singapore 628908
Information: +65 6268-8678
2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:
- Eye
- Inhalation
- Skin
- Ingestion

Carcinogen listed in:
- NTP
- IARC
- OSHA
- Not Listed

GHS:
- Lead free products

Signal Word: Warning
Hazard statement(s)
- H317  May cause an allergic skin reaction
- 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
- H334  May cause allergy or asthma symptoms or breathing difficulties if inhaled
- 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 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
Sensitization, skin- Category1B
Sensitization, respiratory- Category 1B
Specific target organ toxicity- repeated exposure – Category 2
Carcinogenicity (Category 2) (lead)
Reproductive toxicity (Category 2 ) (lead)
Acute toxicity, inhalation- Category 4
Acute aquatic toxicity – Category 1 for lead containing products
Chronic aquatic toxicity – Category 1 for lead containing products

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 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. Inhalation of rosin fume may cause occupational asthma.

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

COPPER: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, and 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.

WARNING: This product can expose you to chemicals including [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

<table>
<thead>
<tr>
<th>Components</th>
<th>% wt</th>
<th>CAS Registry #/ EINECS#</th>
<th>PEL mg/m³</th>
<th>TLV-TWA mg/m³</th>
<th>TLV-STEL mg/m³</th>
</tr>
</thead>
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<tr>
<td>TIN</td>
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<td>7440-31-5/231-141-8</td>
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<td></td>
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<tr>
<td></td>
<td>(US)</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td></td>
</tr>
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<td></td>
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<td>2</td>
<td>4</td>
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<td>4</td>
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<td>(Singapore)</td>
<td>2</td>
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<td>(US)</td>
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<td>0.1</td>
<td>-</td>
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<td>(EU)</td>
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<td>0.2 (fume)</td>
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<td>(Singapore)</td>
<td>0.2(fume)</td>
<td>1(dust)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Mexico)</td>
<td>0.2</td>
<td>-</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(China)</td>
<td>-</td>
<td>0.2(fume)</td>
<td>0.6(fume)</td>
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</tr>
<tr>
<td>LEAD</td>
<td>*</td>
<td>7439-92-1/231-100-4</td>
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<tr>
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<td>(US)</td>
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<tr>
<td></td>
<td>(EU)</td>
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<td></td>
<td>(Canada)</td>
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</tr>
<tr>
<td></td>
<td>(Singapore)</td>
<td>0.15</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
(Mexico) N.E. 0.15 -
(China) - 0.05(dust) -

ROSIN
N.E. N.E. N.E.

POLYGLYCOL ETHER
3.0 – 5.0 9038-95-3 N.E. N.E. N.E.

PROPRIETARY ACTIVATORS 1.0 – 4.0 - N.E. N.E. N.E.

N.E. = Not established * See alloy table.

ALLOY TABLE

85-90% alloy in mix.

<table>
<thead>
<tr>
<th>Indalloy (metal mixture)</th>
<th>%tin Sn</th>
<th>%silver Ag</th>
<th>%lead Pb</th>
<th>%copper Cu</th>
<th>RoHS 2/3+ Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>106 (Sn63Pb37)</td>
<td>53.6-56.7</td>
<td>-</td>
<td>31.5-33</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>256 (SAC305)</td>
<td>82-86.9</td>
<td>2.6-2.7</td>
<td>-</td>
<td>0.43-0.45</td>
<td>Yes</td>
</tr>
<tr>
<td>(96.5Sn3Ag0.5Cu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+Product does not contain any RoHS phthalates.

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.
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.

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 such as (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 any permissible exposure limits 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 not recommended.
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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Grey colored paste.</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild characteristic odor.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1 g/cc (flux)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>(air=1) Not applicable.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>4 – 8 (flux)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble (paste)</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Stable.</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Not established.</td>
</tr>
<tr>
<td>Incompatible Materials</td>
<td>Avoid contact with acids, bases or oxidizing agents.</td>
</tr>
<tr>
<td>Hazardous Decomposition</td>
<td>Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur.</td>
</tr>
</tbody>
</table>

### 11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Carcinogenicity</th>
<th>NTP: Reasonably anticipated to be a human carcinogen (lead)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OSHA: 29 CFR 1910.1025 (lead)</td>
</tr>
<tr>
<td></td>
<td>IARC: Yes 2B: Group 2B. Possibly carcinogenic to humans (lead)</td>
</tr>
<tr>
<td>LD50</td>
<td>Not established.</td>
</tr>
<tr>
<td>LC50</td>
<td>Not established.</td>
</tr>
<tr>
<td>Other</td>
<td>Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma.</td>
</tr>
</tbody>
</table>

Lead can cause potential harm to the developing fetus.

RTECS: OF7525000 (lead)

Lead
- reproductive toxicity – rat – inhalation
- reproductive toxicity – rat – oral
- reproductive toxicity – mouse-oral

Teratogenicity
- Developmental toxicity – rat- inhalation
- Developmental toxicity- rat- oral
- Suspected human reproductive toxicant

GHS- Specific target organ toxicity- repeated exposure
- May cause damage to organs through prolonged or repeated exposure

Lead- OSHA Hazards- carcinogen/target organ effect/harmful by ingestion/teratogen.

### 12. ECOLOGICAL INFORMATION

Product not tested.
Lead:
Toxicity to fish:
Rainbow trout- 1.19mg/l-96h
LC50 micropterus dolomieui- 2.2 mg/l-96h
Mortality NOEC-salvelinus fontinalis-1.7 mg/l-10d
Toxicity to algae
Mortality EC50-skeletonema costatum-7.94mg/l-10d
An environmental hazard cannot be excluded in the event of unprofessional handling, use and or disposal of this product.
Applicable products: Contains a substance (lead) that is very toxic to aquatic life with long lasting effects.

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 under US DOT (United States Department of Transportation/IATA/IMDG).

Solder Paste: Non - hazardous under shipping requirements, all shipping modes.

UN – none 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 [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

SARA 313 Listing - 40 CFR 372.65
Silver  Copper  Lead

All ingredients are listed on the EPA TSCA Inventory.
EPA Genetic Toxicology Program – Lead CAS# 7439-92-1

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 – irritation/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 the Mexican guidelines, NOM-018-STPS-2015 and NOM-010-STPS-2014.

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, GBZ2-2007.

16. OTHER INFORMATION

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

Revised Date: 8 OCTOBER 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.