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:
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In China:
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Suchun Industrial Square
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Jiangsu Province, China 215126
Information: (86) 512-6283-4900

http://www.indium.com
2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

- Eye
- Inhalation
- Skin
- Ingestion

Carcinogen listed in

- NTP
- IARC
- OSHA
- Not Listed

GHS:

Lead free products:

![Warning]

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
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:

![Warning]

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
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:
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
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>
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<th>Components</th>
<th>% wt</th>
<th>CAS Registry #/EINECS#</th>
<th>PEL $\text{mg/m}^3$</th>
<th>TLV-TWA $\text{mg/m}^3$</th>
<th>TLV-STEL $\text{mg/m}^3$</th>
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<td>7440-69-9</td>
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<td>N.E.</td>
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</table>
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.
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/CO₂/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
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

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<th>%Ag</th>
<th>%Sb</th>
<th>%Cu</th>
<th>%In</th>
<th>%Bi</th>
<th>%Pb</th>
<th>%Au</th>
<th>%Co</th>
<th>%Mn</th>
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<td>%COPPER Cu</td>
<td>%INDIUM In</td>
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<td>259 (Sn90/Sb10)</td>
<td>74.7-82.8</td>
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<td>8.3-9.2</td>
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<td>264 Sn91.5/Sb8.5</td>
<td>75.9-84.2</td>
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<td>7.1-7.8</td>
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<td>268 (SACM0510) (98.5Sn/0.5Ag/1Cu)</td>
<td>81.8-90.6</td>
<td>0.42-0.46</td>
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<td>0.83-0.92</td>
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<td>282 (Bi57/Sn42/Ag1)</td>
<td>34.9-38.6</td>
<td>0.83-0.92</td>
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<td>47.3-52.4</td>
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<td>Sn992</td>
<td>82-91</td>
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<td>0.42-0.46</td>
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<td>0.25-0.28</td>
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<td>0.042-0.046</td>
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<tr>
<td>Non Standard (Sn96/Ag4)</td>
<td>79.7-88.3</td>
<td>3.3-3.7</td>
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</tbody>
</table>

\*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.