SAFETY DATA SHEET

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.

1. PRODUCT AND COMPANY IDENTIFICATION

   General Product Class Identifier: INDALLOY 228 WITH INDIUM3.2HF

   SDS Number: SDS-5172-L   Revised Date: 21 APRIL 2020

   Revised Date: 21 APRIL 2020

   Revision 1.1

   Product Use: Industrial Use- water- wash solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder used for solder applications.

MANUFACTURER:

   In America:
   The Indium Corporation of America®.
   34 Robinson Rd., Clinton, NY  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 China: Emergency 86+ 4008417580

   In Europe:
   The 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

   www.indium.com
2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:                  CARCINOGEN LISTED IN:
⊗ Eye                                     NTP                              OSHA  ⊗ Not Listed
⊗ Inhalation                               ⊗                                      ⊗          ⊗          ⊗
⊗ Skin                                     ⊗                                      ⊗          ⊗          ⊗
⊗ Ingestion                                ⊗                                      ⊗          ⊗          ⊗

GHS

Signal Word: Danger
Hazard statement(s)
H317  May cause an allergic skin reaction
H319  Causes serious eye irritation
H335  May cause respiratory irritation
H360FD May damage fertility or the unborn child
H362  May cause harm to breast-fed children
H372  Causes damage to organs through prolonged or repeated exposure

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)

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

Specific target organ toxicity, single exposure; respiratory tract irritation – Category 3

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:    May cause irritation. May be harmful (lead containing).

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.

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.

**LEAD:** Prolonged exposure to vapors or fumes at higher temperatures may cause respiratory irritation and systematic lead poisoning.

**WARNING:** This product can expose you to chemicals including [trace levels of ethylene oxide, 1,4 dioxane, propylene oxide and lead] which are known to the State of California to cause cancer and [trace levels of ethylene oxide and lead] which are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

**WARNING:** This product may contain lead. Lead may be harmful to your health. US Federal law prohibits the use of leaded solders in making of joints in any private or public potable (drinking) water supply system. Keep out of the reach of children.

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

### 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>
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<tr>
<td><strong>TIN</strong></td>
<td>8.3 – 9.2</td>
<td>7440-31-5/231-141-8</td>
<td></td>
<td>2</td>
<td>-</td>
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<tr>
<td></td>
<td>(US) 2</td>
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<tr>
<td></td>
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<td>2</td>
<td>4</td>
<td></td>
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<tr>
<td></td>
<td>(Singapore) 2</td>
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<td>-</td>
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<td><strong>SILVER</strong></td>
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<tr>
<td></td>
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<td>-</td>
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<tr>
<td></td>
<td>(Canada) N.E.</td>
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<td>(Singapore) 0.1</td>
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<td>(Mexico) 0.1</td>
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<tr>
<td><strong>LEAD</strong></td>
<td>73 – 80.9</td>
<td>7439-92-1/231-100-4</td>
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<td>(Canada) 0.05</td>
<td>0.05</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</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.

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 (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 exposure levels are not exceeded. Use ventilation.

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, 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

<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</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

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: Yes – (National Toxicity Program) (lead- RAHC-reasonably anticipated to be a human carcinogen)
- OSHA: Yes – (US Occupational Safety & Health Administration) (lead)
- IARC: Yes – Lead and lead compounds are listed as possible carcinogens (International Agency for Research on Cancer). Group 2B

LD50: Not established. LC50: Not established.

Lead – Suspected human reproductive toxicant. May cause damage to organs through prolonged or repeated exposure. Reproductive toxicity – rat – inhalation, oral/ effects on newborn.

Silver – LD50 oral – rat > 5,000 mg/kg
Tin – LD 50 oral-rat >2000 mg/kg

Refer to NIOSH - Registry of Toxic Effects of Chemical Substances: RTECS# VM3500000 (silver), XP7320000 (tin), OF7525000 (lead)

12. ECOLOGICAL INFORMATION

Product not tested.

Lead – Toxicity to fish – mortality LOEC – rainbow trout – 1.19 mg/l – 96h

Silver- Toxicity to fish: semi static test LC 50 (fathead minnow) 0.0021 mg/l- 96h. (Remarks – Ecotox Database). Skin (rabbit) – result – no skin irritation. Eye (rabbit) – result – no eye irritation.

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, all 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 [trace levels of ethylene oxide, 1,4 dioxane, propylene oxide and lead] which are known to the State of California to cause cancer and [trace levels of ethylene oxide and lead] which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

SARA 313 Listing - 40 CFR 372.65
Silver  Lead

RoHS 2/3 Compliance: Yes, with Exemption (7a)

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).

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.

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 Limit for Hazardous Agents in the Workplace, GBZ2-2007.

All ingredients are listed on the Korean Existing Chemical Inventory.

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: 21 APRIL 2020
Prepared by: Nancy Swarts, Indium Corporation of America
Approved by: Nancy Swarts, Indium Corporation of America
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