SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH LEAD AND/OR TIN AND/OR SILVER AND ANTIMONY
SDS Number: SDS-IN 053
Revised Date: 5 APRIL 2018
Product Use: INDUSTRIAL USE - METAL ALLOY MIX CONSISTING OF ONLY LEAD AND/OR TIN AND/OR SILVER, ANTIMONY (MIXTURE). REVIEW ALLOY TABLE FOR MIXTURES AVAILABLE.

MANUFACTURER:

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

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

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

In China:
Indium Corporation (Suzhou), Co., Ltd.
No. 428 Xinglong Street
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

GHS

Lead containing products

Signal Word: Warning

Hazard statement(s)
H303  May be harmful if swallowed
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.

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 + P312  IF SWALLOWED: Call a POISON CENTER/doctor 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:
Acute toxicity, Oral (Category 4) (lead)
Carcinogenicity (Category 2) (lead)
Reproductive toxicity (Category 2) (lead)
Specific target organ toxicity-repeated exposure-Category 2 (lead)
Acute aquatic toxicity (Category 1) (lead)
Chronic aquatic toxicity (Category 1) (lead)

Review metal alloy table of mixtures.

GHS- Lead free products

No pictogram
No signal word

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 + P312  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
POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact with powered metal alloy or fume from molten metal may cause irritation. Severe eye damage may result from hot molten metal being splashed into the eyes. Wear safety glasses and face shield when working with molten metal, cutting or grinding.

Ingestion: Ingestion of dust may cause headache, nausea, abdominal pain, fatigue and pain in the legs, arms and joints. May be harmful if swallowed.

Inhalation: Inhalation of fume or dust may cause local irritation to the respiratory system. Inhalation of fume or dust may cause headache, nausea, abdominal pain, fatigue and pain in the legs, arms and joints. Normal handling of solid form has no inhalation issues.

Skin Contact: Normal handling of solid form should not cause any adverse health effects. Powder form may cause skin irritation. Hot molten metal may cause burns to the skin. Wear protective equipment when handling molten metal. Antimony may 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 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.

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, manufacturer, 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.

ALLOY TABLE: (LEAD/ANTIMONY)

<table>
<thead>
<tr>
<th>INDALLOY</th>
<th>%LEAD Pb</th>
<th>%ANTIMONY Sb</th>
<th>LIQUIDUS °C/°F</th>
<th>SOLIDUS °C/°F</th>
<th>DENSITY (gm/cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>143</td>
<td>90</td>
<td>10</td>
<td>260/500</td>
<td>252/486</td>
<td>10.60</td>
</tr>
<tr>
<td>157</td>
<td>95</td>
<td>5</td>
<td>295/563</td>
<td>252/486</td>
<td>10.96</td>
</tr>
<tr>
<td>168</td>
<td>98</td>
<td>2</td>
<td>320/608</td>
<td>300/572</td>
<td>11.19</td>
</tr>
<tr>
<td>169</td>
<td>98.5</td>
<td>1.5</td>
<td>322/612</td>
<td>310/590</td>
<td>11.23</td>
</tr>
</tbody>
</table>
### ALLOY TABLE: (TIN/ANTIMONY)

<table>
<thead>
<tr>
<th>INDALLOY</th>
<th>%TIN</th>
<th>%ANTIMONY</th>
<th>LIQUIDUS °C/°F</th>
<th>DENSITY (gm/cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td>99</td>
<td>1</td>
<td>235/455</td>
<td>7.27</td>
</tr>
<tr>
<td>131</td>
<td>97</td>
<td>3</td>
<td>238/460</td>
<td>7.26</td>
</tr>
<tr>
<td>133</td>
<td>95</td>
<td>5</td>
<td>240/464</td>
<td>7.25</td>
</tr>
<tr>
<td>264</td>
<td>91.5</td>
<td>8.5</td>
<td>248/478</td>
<td>7.28</td>
</tr>
</tbody>
</table>

### ALLOY TABLE: (TIN/LEAD/ANTIMONY/SILVER)

<table>
<thead>
<tr>
<th>INDALLOY</th>
<th>%TIN</th>
<th>%LEAD</th>
<th>%ANTIMONY</th>
<th>%SILVER</th>
<th>LIQUIDUS °C/°F</th>
<th>DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>119</td>
<td>50</td>
<td>49.5</td>
<td>0.5</td>
<td>-</td>
<td>216/421</td>
<td>8.85</td>
</tr>
<tr>
<td>126</td>
<td>40</td>
<td>58</td>
<td>2</td>
<td>-</td>
<td>231/448</td>
<td>9.17</td>
</tr>
<tr>
<td>134</td>
<td>35</td>
<td>63.2</td>
<td>1.8</td>
<td>-</td>
<td>243/469</td>
<td>9.39</td>
</tr>
<tr>
<td>138</td>
<td>30</td>
<td>68.4</td>
<td>1.6</td>
<td>-</td>
<td>250/482</td>
<td>9.63</td>
</tr>
<tr>
<td>144</td>
<td>25</td>
<td>73.7</td>
<td>1.3</td>
<td>-</td>
<td>263/505</td>
<td>9.88</td>
</tr>
<tr>
<td>152</td>
<td>5</td>
<td>92</td>
<td>3</td>
<td>-</td>
<td>285/545</td>
<td>10.82</td>
</tr>
<tr>
<td>233</td>
<td>5</td>
<td>85</td>
<td>10</td>
<td>-</td>
<td>255/491</td>
<td>10.36</td>
</tr>
<tr>
<td>236</td>
<td>5</td>
<td>83</td>
<td>10</td>
<td>2</td>
<td>247/477</td>
<td>10.35</td>
</tr>
<tr>
<td>NS</td>
<td>5</td>
<td>92.5</td>
<td>0.5</td>
<td>2</td>
<td>-</td>
<td>10.99</td>
</tr>
<tr>
<td>NS</td>
<td>10</td>
<td>75</td>
<td>15</td>
<td>-</td>
<td>-</td>
<td>9.76</td>
</tr>
<tr>
<td>NS</td>
<td>10</td>
<td>80</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>10.07</td>
</tr>
<tr>
<td>NS</td>
<td>25</td>
<td>74.65</td>
<td>0.35</td>
<td>-</td>
<td>-</td>
<td>9.94</td>
</tr>
</tbody>
</table>

NS = NON STANDARD ALLOY MIX

### ALLOY TABLE: (LEAD/ANTIMONY/SILVER)
<table>
<thead>
<tr>
<th>INDALLOY</th>
<th>%LEAD</th>
<th>%ANTIMONY</th>
<th>%SILVER</th>
<th>-</th>
<th>LIQUIDUS °C/°F</th>
<th>DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>92.5</td>
<td>5</td>
<td>2.5</td>
<td>-</td>
<td>-</td>
<td>10.94</td>
</tr>
</tbody>
</table>

**ALLOY TABLE: (LEAD/ANTIMONY/TIN)**

<table>
<thead>
<tr>
<th>INDALLOY</th>
<th>%LEAD</th>
<th>%ANTIMONY</th>
<th>%TIN</th>
<th>DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>36.65</td>
<td>0.35</td>
<td>63</td>
<td>8.38</td>
</tr>
<tr>
<td>NS</td>
<td>52.3</td>
<td>2.7</td>
<td>45</td>
<td>8.93</td>
</tr>
<tr>
<td>NS</td>
<td>69</td>
<td>0.5</td>
<td>30.5</td>
<td>9.67</td>
</tr>
</tbody>
</table>

NS = Non Standard Mix

### 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>
<tbody>
<tr>
<td>LEAD</td>
<td>*</td>
<td>7439-92-1/231-100-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(US) 0.05</td>
<td>0.05</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(EU) -</td>
<td>0.15</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Canada) -</td>
<td>0.05</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Singapore) 0.15</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Mexico) -</td>
<td>0.15</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(China) -</td>
<td>0.05(dust)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>0.03(fume)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ANTIMONY</td>
<td>*</td>
<td>7440-36-0/231-146-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(US) 0.5</td>
<td>0.5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(EU) 0.5</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Canada) -</td>
<td>0.5</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Singapore) 0.5</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Mexico) -</td>
<td>0.5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(China) -</td>
<td>0.5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TIN</td>
<td>*</td>
<td>7440-31-5/231-141-8</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. Massive metal is not flammable; however dust or powder may be 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: Contain spill. If molten, cool to allow metal to solidify. If a solid metal, wear gloves, pick up and return to process. If dust, wear recommended personal protective equipment. DO NOT SWEEP. Use a vacuum, place in barrels and return to process if applicable. Otherwise, dispose of following all Federal, State and Local regulations. In the EU refer to the Special Waste Regulations. Metal may have reclaim value.

7. HANDLING AND STORAGE
Handling: Only dry metals should be added to molten bath. If working with molten metals, or exposed to fume or dust, use appropriate personal protective equipment.

Storage Precautions: Store product in a cool, dry area away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Local exhaust ventilation is recommended to control any air contaminants. Control concentration of all components so that their exposure levels are not exceeded.

Personal protection:
Eyes: Chemical safety glasses/goggles and face shield with molten metal.
Respirator: An authority approved or compliant marked air-purifying respirator with a fume/dust chemical cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated.
Skin: Gloves-leather or impervious (vinyl) type. Heat resistant gloves if handling hot metal. Safety type boots. Personal protective equipment is recommended when working with molten metal to avoid burns.
Other: Lab coat or other clothing/skin protection, safety shower and 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. Good personal hygiene is essential.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Silver grey solid metal or powder form
Odor: Odorless
Specific Gravity: See Tables
Vapor Pressure: Not applicable.
Vapor Density: (air=1) Not applicable.

Boiling Point: Not applicable.
Melting Point: See Tables
pH: Not applicable
Solubility in Water: Insoluble

10. STABILITY AND REACTIVITY

General: Stable.
Conditions to Avoid: Not established.
Incompatible Materials: Avoid contact with mineral acids.
Hazardous Decomposition / Combustion: Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity: National Toxicity Program (NTP): No
Occupational Safety & Health Administration (OSHA): No
U.N. International Agency for Research on Cancer (IARC): Yes

Lead and Lead compounds are listed as possible carcinogens.
LD50: Not established  LC50: Not established

Other: Chronic Toxicity: Lead can cause potential harm to the developing fetus.
Irritancy of Product: Not established  Mutagenicity: Not established
Sensitization to Product: Not established  Teratogenicity: Not established
Reproductive Toxicity: No specific data is available  Synergistic Products: Not established

Tin: RTECS XP 7320000  Lead: RTECS OF 7525000  Antimony: RTECS CC 4025000

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

Environmental: Lead: If this is released or deposited on soil it generally will remain in the top 2-5 cm of soil. Leaching is not a factor under normal conditions.

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.
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 regulations and requirements. Not regulated under US DOT (United States
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: Lead Antimony Silver Copper

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

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).

Canadian WHMIS: D2A - Materials Causing Other Toxic Effects - Very Toxic Material (Chronic).

This product has been classified in accordance with the guidelines set by the Dept of Industrial Health of the Republic of Singapore.

Ingredients are listed on the Canadian Domestic Substance List.
Ingredients are listed on the Philippines, Korean, EU, Japanese and China Chemical Inventories.

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

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 Mexican regulations NOM-018-STPS-2015 and NOM-010-STPS-2014.

16. OTHER INFORMATION

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

Revised Date: 5 APRIL 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. The Indium Corporation does not recommend, manufacturer, market or endorse any of its products for human consumption.