# SAFETY DATA SHEET

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Identifier:** INDALLOY FLUX 3  
**MSDS Number:** MSDS-IN LF003  
**Revised Date:** 24 APRIL 2013

**Product Use:** Industrial Use - Paste Flux for soldering applications.

### MANUFACTURER:

#### In America:
The Indium Corporation of America  
1676 Lincoln Ave., Utica NY 13502  
Information: (315) 853-4900  
nswarts@indium.com

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Kingston, Milton Keynes, UK, MK 10 OAG  
Information: +44 [0] 1908 580400

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Singapore 628908  
Information: +65 6268-8678

**EMERGENCY PHONE:**  
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Outside USA: +1 (703) 527-3887

### In China:
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Suzhou Industrial Park  
Suchun Industrial Square  
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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:

Signal Word: Danger

Hazard Statement(s)

- H301 Toxic if swallowed
- H312 Harmful in contact with skin
- H314 Causes severe skin burns and eye damage
- H333 May be harmful if inhaled
- H402 Harmful to aquatic life

Precautionary statement(s)

- 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 Take off contaminated clothing and wash before reuse
- 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 (15mins)
- P310 Immediately call a POISON CENTER or doctor/physician

POTENTIAL HEALTH EFFECTS:

Eye Contact:
Irritating to the eyes and if not removed promptly, may result in serious eye injury. Do not allow material to come in contact with the eyes. Causes burns with direct contact.

Ingestion:
Harmful if swallowed. Symptoms may include salivation, nausea, vomiting, diarrhea and abdominal pain.

Inhalation:
Heated vapor concentrations may be harmful if inhaled. Severe irritant to respiratory tract. May cause chills, labored breathing, fevers, un-productive cough. The fluoride ion may cause hypocalcemia (calcium deficiency in the blood). Inflammation and necrosis of the mucous membranes may occur.

Skin Contact:
May cause severe irritation. Causes burns with direct contact. Thermal decomposition of this product may result in the release of hydrogen fluoride. This substance may be absorbed through the skin, causing burns. May cause dermatitis.

Chronic:
Eyes: Prolonged contact might cause more severe burns.
Skin: Prolonged contact might cause more severe
Ingestion: May cause osseous fluorosis (increased radiographic density of the bones). May cause kidney damage, asthma and symptoms resembling rheumatism.
Inhalation: Not determined
Target organ: Chronic ingestion may cause kidney damage. May aggravate an existing dermatitis.
Long term over exposure to inorganic tin compound can cause a benign dust-induced lung condition, called Stannosis. Usually this condition does not interfere with normal lung function.

EMERGENCY OVERVIEW: DANGER: Harmful is swallowed. Causes severe burns. Avoid physical contact with eyes, mucous membranes and skin. CONTAINS FLUORIDES AND ZINC CHLORIDES. Do not take internally. Soldering may produce fumes and gases. Prolonged or repeated over-exposure by skin contact may cause dermatitis. Use adequate ventilation. KEEP OUT OF THE REACH OF CHILDREN.

NOTE: The Indium Corporation does not recommend, manufacture, market or endorse any of it's product's 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>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Chloride</td>
<td>5 -10</td>
<td>7646-85-7/231-592-0</td>
<td>1</td>
<td>1(fume)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(EU)</td>
<td></td>
<td>1(fume)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Canada)</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Singapore)</td>
<td>1(fume)</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(China)</td>
<td>-</td>
<td>1(fume)</td>
<td>2</td>
</tr>
<tr>
<td>Organic Fluorides</td>
<td>5 -10</td>
<td>1341-49-7/215-676-4</td>
<td>2.5</td>
<td>2.5</td>
<td>N.E.</td>
</tr>
<tr>
<td>(Tin (II) Chloride dehydrate)</td>
<td></td>
<td>10025-69-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>65</td>
<td>141-43-5/205-483-3</td>
<td>6</td>
<td>2ppm</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(EU)</td>
<td>-</td>
<td>7.6</td>
<td>15</td>
</tr>
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<td></td>
<td></td>
<td>(Canada)</td>
<td>-</td>
<td>7.5</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Singapore)</td>
<td>7.5</td>
<td>-</td>
<td>15</td>
</tr>
</tbody>
</table>

PRODUCT DOES NOT CONTAIN ANY EU SUBSTANCES AS OF VERY CONCERN (SVHC) PRODUCT IS COMPLIANT WITH RoHS

Risk Phrases: R25, R20/21,R34,R51/53
N.E. = Not established    EU = European Union Occupational Exposure Limits

4. FIRST AID MEASURES

Eye Contact: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Seek medical attention quickly.

Ingestion: If patient is conscious, ONLY induce vomiting as directed by trained personnel and ONLY administer soluble calcium in any form as an internal antidote, as directed by a physician. NEVER give
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: >200 F (93 C)  Method: Not available
Auto-ignition Temperature: Not established.
Flammable Limits: Limits not established, not flammable.
Extinguishing Media: Use extinguishers appropriate for the surrounding fire conditions. Dry chemical, foam or carbon dioxide. Water spray to cool.

Special Fire Fighting Procedures: Firefighters must wear NIOSH approved self-contained breathing apparatus (SCBA) and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Wear a respirator and appropriate Personal Protective (See Exposure Controls/Personal Protective Section). Absorb with clay, sand or sawdust, then place in a chemical waste container. Dispose of following all Federal, State and Local regulations. In the EU refer to the Special Waste Regulations. Do not allow product to enter sewage systems or ground water.

7. HANDLING AND STORAGE

Handling Precautions: Keep containers tightly closed when not in use. Use care to avoid spills. Avoid breathing vapors from heated material. Avoid contact with eyes, skin and clothing. Use with adequate ventilation.

Storage Precautions: Store product in tightly capped original containers in a cool, dry area. Keep away from heat and flame. Store away from incompatible materials. Empty containers may be hazardous as they contain product residue.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Good general exhaust ventilation should be sufficient to control airborne levels.

Personal Protection:

Eyes: Chemical safety glasses/goggles. Face shield for splash hazards.

Respirator: An authority approved or compliant marked air-purifying respirator with a dust/mist/organic cartridge is recommended under certain circumstances where airborne concentrations are expected to be elevated. Additional protection may be required so that 30 ppm of monoethanolamine is not exceeded.

Skin: Compatible chemical resistant rubber gloves. Protective outer garment, apron, sleeves as appropriate.

Other: Eyewash fountain/shower in work area. Avoid the use of contact lenses in high fume/splash areas.
Work/Hygienic Practices:
Maintain good housekeeping. Clean up spills immediately. 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>Honey colored viscous liquid</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>&gt;200 F (93 C)</td>
</tr>
<tr>
<td>Odor</td>
<td>Ammonia-like</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.33</td>
</tr>
<tr>
<td>pH</td>
<td>8</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>(air=1) Not applicable</td>
</tr>
<tr>
<td>VOC</td>
<td>0 lbs per gallon</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

General: Stable.
Conditions to Avoid: None known
Incompatible Materials: Strong oxidizers, sodium nitrite
Hazardous Decomposition: Thermal decomposition of this product may result in the release of hydrogen fluoride. Other products of combustion may include ammonia and carbon monoxide.
Combustion: Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity:
- NTP: No
- OSHA: No
- IARC: No

LD50: Monoethanolamine 1,720mg/kg (rat) oral  
Stannous chloride 604 (mouse) LD50
LC50: Monoethanolamine 1,210 mg/m3 inhalation 4 hrs

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12. ECOLOGICAL INFORMATION

Product not tested.

Zinc chloride is very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. If flux is released into the aquatic environment, it is expected to have toxic effects on aquatic plants, fish and invertebrates.

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Dispose of in accordance with all Federal, State and Local environmental regulations. In Europe follow the Special Waste Regulations. Do not discharge to sewers, on the ground or into any body of water.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

Ground: UN1760, Corrosive Liquid N.O.S., 8, PG III (monoethanolamine, organic fluorides)

IATA: May be carried under the provisions for dangerous goods in limited quantities.

ADR/RID: When packaged in quantities less than 6kg this material can be shipped in Limited Quantities: Label outer package with UN1760.

IMDG: UN1760, Corrosive Liquid, N.O.S., 8, PG III (monoethanolamine, organic fluorides)

15. REGULATORY INFORMATION

The information in this Material 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.).

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).

Canadian WHMIS: D-1B Class E corrosive
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 using the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2002.

California Prop 65 - none
SARA 313 Listing - 40 CFR 372.65 - None

All ingredients are listed on the EPA TSCA Inventory, Canadian Domestic Substances List and EINECS.

EC Classification, Packaging and Labeling Requirements:
Symbol and Hazard Classification of Product Xn, C, N

Risk Phrases:
R25  Toxic if swallowed
R20/21 Harmful by inhalation and in contact with skin
R34  Causes burns
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Safety Phrases:
S20/21 When using do not eat, drink or smoke
S23  Do not breathe fumes/gas/vapor/spray
S24/25 Avoid contact with skin and eyes
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection
S28  After contact with skin wash immediately with plenty of soap and water
S60  This material and its container must be disposed of as hazardous waste
S61  Avoid release to the environment.

16. OTHER INFORMATION

HMIS Hazard Rating: Health: 3
Fire: 1
Reactivity: 0

Revised Date: 24 APRIL 2013
Prepared by: Nancy Swarts, Indium Corporation of America
Approved by: Nancy Swarts, Indium Corporation of America

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