1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: WS3401 FLUX
SDS Number: SDS-4390
Product Use: INDUSTRIAL USE (MIXTURE) - LIQUID FLUX (WATER WASH)
Revised Date: 3 OCTOBER 2014

MANUFACTURER:

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

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

In Europe:
Indium Corporation of Europe
7 Newmarket Ct.
Kingston, Milton Keynes, UK, MK 10 OAG
Information: +44 [0] 1908 580400

In China:
Indium Corporation (Suzhou), Co., Ltd.
No. 428 Xinglong Street
Suzhou Industrial Park
Suchun Industrial Square
Unit No. 14-C
Jiangsu Province, China 215126
Information: (86) 512-6283-4900

In Asia:
Indium Corporation of America
Asia-Pacific Operations-Singapore
29 Kian Teck Avenue
Singapore 628908
Information: +65 6268-8678

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

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

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

GHS Classification:

- Signal Word: Danger

Hazard statement(s)
- H225  Highly Flammable liquid and vapor
- H315  Causes skin irritation
- H319  Causes serious eye irritation
- H335  May cause respiratory irritation
- H336  May cause drowsiness or dizziness

Precautionary statement(s)
- P210  Keep away from heat/sparks/open flames/hot surfaces – No smoking
- P233  Keep container tightly closed
- P240  Ground/Bond container and receiving equipment
- 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 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)

- Flammable Liquid- Category 2
- Eye irritation- Category 2A
- Skin irritation- Category 3

POTENTIAL HEALTH EFFECTS/EXPOSE:

Eye Contact:  Vapors may be irritating, liquid may damage eye tissue, and causes irritation to eyes.

Ingestion:  If swallowed may cause irritation or with overexposure persistent nausea, vomiting and abdominal pain.

Inhalation:  If inhaled may cause irritation to respiratory system. Vapor may cause headaches and or dizziness.

Skin Contact:  Prolonged direct contact may cause dryness and irritation.

Chronic:  Not established. No information available.

Signs and Symptoms of Exposure:  Central nervous system depression, prolonged or repeated exposure can cause: nausea, headache, vomiting, narcosis, drowsiness. Overexposure may cause mild, reversible liver effects.
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 #</th>
<th>PEL mg/m³</th>
<th>TLV-TWA mg/m³</th>
<th>TLV-STEL mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISOPROPANOL (PROPAN-2-OL)</td>
<td>38 - 45</td>
<td>67-63-0 (US)</td>
<td>980</td>
<td>983</td>
<td>1225</td>
</tr>
<tr>
<td>(IPA)</td>
<td>(Canada)</td>
<td>-</td>
<td>983</td>
<td>-</td>
<td>1228</td>
</tr>
<tr>
<td>(Singapore)</td>
<td>983</td>
<td></td>
<td>999</td>
<td>1250</td>
<td></td>
</tr>
<tr>
<td>(Mexico)</td>
<td>980</td>
<td></td>
<td>-</td>
<td>1230</td>
<td></td>
</tr>
<tr>
<td>(China)</td>
<td>-</td>
<td></td>
<td>350</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>FATTY ACIDS, C6-12</td>
<td>10-15</td>
<td>67762-36-1</td>
<td>N.E.</td>
<td>N.E.</td>
<td>N.E.</td>
</tr>
<tr>
<td>POLYGLYCOL ETHER</td>
<td>18-36</td>
<td>9038-95-3</td>
<td>N.E.</td>
<td>N.E.</td>
<td>N.E.</td>
</tr>
<tr>
<td>ALCOHOL C6-C12</td>
<td>4 – 34</td>
<td>68603-15-6</td>
<td>N.E.</td>
<td>N.E.</td>
<td>N.E.</td>
</tr>
</tbody>
</table>

Symbol: Xi, F
Risk Phrases: R36/37/38, R11, R67
N.E. = Not established
EU = European Exposure Limits

Product does not contain any EU REACH Substances of Very High Concern (SVHC)
Product does not contain any substances classified as carcinogens.

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: 71F (22C) Method: Closed Cup
**Auto-ignition Temperature:** Not Available

**Flammable Limits:** Not Available

**Extinguishing Media:** Dry chemical, Water or CO₂. Use extinguishers appropriate for the surrounding fire conditions.

**Special Fire Fighting Procedures:** Wear protective clothing and self-contained breathing apparatus. Use water to cool fire exposed containers. Flammable vapors may travel great distances to ignition source and flash back.

**6. ACCIDENTAL RELEASE MEASURES**

**Spill or Leak Procedures:** DO NOT allow material to enter sewer system or waterway. Wear personal protective equipment. Eliminate sources of ignition. Ventilate area in accordance with regulations. Adsorb spilt material. Or cover with absorbent material and then clean up. Do not throw into regular trash bins. Dispose of 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. Wear personal protective equipment. Ground containers. Keep away from sources of ignition.

**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. Keep away from heat and flame.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Engineering Controls:** Face velocity >2.1 cubic feet/minute in confined areas. Exhaust ventilation is advised to keep exposures as low as possible.

**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 where airborne concentrations are expected to be elevated. Confined areas may require additional protection.

**Skin:** Compatible chemical resistant gloves. Use gloves such as nitrile, which are compatible with alcohols.

**Other:** Lab coat, eye-wash fountain in work area. Avoid the use of contact lenses in high fume/splash areas.

**Work/Hygienic Practices:** Maintain good housekeeping. Clean up spills immediately. 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><strong>Appearance:</strong></td>
<td>Liquid flux</td>
</tr>
<tr>
<td><strong>Odor:</strong></td>
<td>Alcohol odor.</td>
</tr>
<tr>
<td><strong>Specific Gravity:</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Boiling Point:</strong></td>
<td>&gt;89C (does not vaporize)</td>
</tr>
<tr>
<td><strong>Evaporation Rate:</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>pH:</strong></td>
<td>Not applicable (no pH value) (not corrosive)</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

**General:** Stable.

**Conditions to Avoid:** Direct heat, open flames and storage in aluminum.

**Incompatible Materials:** Combustible materials, oxidizing materials

**Hazardous Decomposition / Combustion:** Carbon dioxide/carbon monoxide.

**Hazardous Polymerization:** Will not occur.

11. TOXICOLOGICAL INFORMATION

**Carcinogenicity:**
- National Toxicity Program (NTP): No
- Occupational Safety & Health Administration (OSHA): No
- International Agency for Research on Cancer (IARC): No

**LD50:** Not established.

**LC50:** Not established.

Product mixture not tested.

Isopropyl alcohol –
RTECS: NT8050000

Signs and Symptoms of Exposure: Central nervous system depression, prolonged or repeated exposure can cause: nausea, headache, vomiting, narcosis, drowsiness. Overexposure may cause mild, reversible liver effects.

Specific target organ toxicity: May cause drowsiness or dizziness.

LD50 Oral – rat- 5,045 mg/kg
Inhalation LD50 – rat- 8h- 16000 ppm
Dermal LD50 – rabbit – 12,800 mg/kg
Skin corrosion- rabbit- mild skin irritant
Serious eye irritant/eye damage- eyes-rabbit – eye irritation- 24h

Polyglycol ether –
RTECS: MD0911000
LD50-oral-rat-12,792 mg/kg
LD50-dermal-rabbit >20,800 mg/kg

Product not classified as a carcinogen. Product does not contain any carcinogenic substances.

12. ECOLOGICAL INFORMATION

Product mixture not tested.

Isopropyl alcohol –
Toxicity to fish: LC50-pimephales promelas (fathead minnow) – 9,640 mg/l – 96h
Toxicity to algae: EC50 – desmodesmus subspicatus (green algae) > 2,000 mg/l – 72h
Product is not classified as harmful to the environment.

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Dispose of in accordance with all Federal, State and Local environmental regulations. Flammable materials are considered hazardous waste. Contact a permitted environmental waste disposer.
In Europe follow the Special Waste Regulations.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

Shipping Name: UN 1219, Isopropanol, 3, PG II (mixture)

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.).

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

Canadian WHMIS: Class B Division 2 Flammable, D2B Toxic Material Causing Other toxic effects (eye irritation in animals).

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

SARA 313 Listing - 40 CFR 372.65: none

All ingredients are listed on the EPA TSCA Inventory.
All ingredients are listed on the Korean Inventory of Existing Chemicals (KECL)
Ingredients are listed on the following countries chemical lists:
EU/Canada (DSL)/China
This product has been classified under the Mexican regulations NOM-018-STPS-2000 and NOM-010-STPS-1999.
This product has been classified using the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2002.

Taiwan:
This product contains a substance listed as a harmful material: isopropyl alcohol, a substance listed in the Regulations of Labeling and Hazard Communication of Dangerous and Harmful Materials under Attachment II. This is so specified under the Taiwan Regulations for Governing Prevention of Organic Solvent Toxication.

This product does not contain any other listed or known listed hazardous material found in Attachment II of the Regulations for Governing Prevention of Organic Solvent Toxication.

This product contains a substance, isopropyl alcohol a flammable liquid, classified as a Hazardous Material under Attachment I in Article 2. Paragraph 1, Item 1, of the Regulations of Labeling and Hazardous Communication of Dangerous and Harmful Materials.

This product does not contain any substances classified as Taiwan Precursor chemicals.

This product does not contain any other substances found on either the first or second stage listings of chemical substances found in the Regulations of Labeling and Hazard Communication of Dangerous and Harmful Materials.

This msds was developed following the guidelines of GHS and the Taiwan National Standard 15030 which has adopted those principles.

This product does not contain any Taiwan listed toxic classified substances.

Product does not contain any listed EU REACH Substances of Very High Concern.

EC Classification, Packaging and Labeling Requirements:
Symbol and Hazard Classification of Product
Xi,F

Risk Phrases:
R36/37/38 Irritating to eyes, respiratory system and skin
R 11  Highly Flammable
R67  Vapors may cause drowsiness and dizziness

Safety Phrases:
S16  Keep away from sources of ignition - "No Smoking"
S20/21  When using do not eat, drink or smoke
S23  Do not breathe fumes
S24/25  Avoid contact with skin and eyes
S28  After contact with skin wash immediately with plenty of soap and water
S36/37/39  Wear suitable protective clothing, gloves and eye/face protection
S7  Keep container tightly closed
16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>HMIS Hazard Rating:</th>
<th>Health:</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fire:</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Reactivity:</td>
<td>0</td>
</tr>
</tbody>
</table>

Revised Date: 3 OCTOBER 2014

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 use 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.