MATERIAL SAFETY DATA SHEET
Chem International, Inc.

1. Chemical Product and Company Identification

Product Name ............................................. Oleyl Diamine
Chemical Name ........................................... N-Oleyl-1,3-diaminopropane
Product Description ................................. Oleyl Diamine
Cas # ........................................................... 7173-62-8

Chem International, Inc. Emergency Telephone Numbers
P.O. Box 5501 Transportation: CHEMTREC 1-800-424-9300
Greenville, SC 29606 (703-527-3387 Outside United States)

Information: Chem International, Inc. – 864-458-7868

2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS#</th>
<th>Percentage by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Oleyl-1,3-diaminopropane</td>
<td>7173-62-8</td>
<td>98 min</td>
</tr>
<tr>
<td>Oleylamine</td>
<td>112-90-3</td>
<td>2 max</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Physical State: Liquid

Color: White

Odor: Ammoniacal

Emergency Overview: CAUTION! MAY CAUSE EYE AND SKIN IRRITATION. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Possible Carcinogenic Effects:
N-Oleyl-1,3-diaminopropane: IARC, NTP, OSHA, ACGIH: Not listed.
Amines, Oleyl alkyl: IARC, NTP, OSHA, ACGIH: Not listed.

Routes of Entry:
Absorbed through skin. Dermal contact. Eye contact.

4. First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. Cold water may be used. Get medical attention.
Skin Contact:
In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Medical Conditions Aggravated by Overexposure:
Repeated or prolonged exposure is not known to aggravate medical condition.

5. Fire Fighting Measures

Flammability of the Product: May be combustible at high temperature

Flash Point: <149°C

Test Method: Pensky-Martens Closed Cup

Products of Combustion: These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂)

Fire Fighting Media & Instructions:
- SMALL FIRE: Use DRY chemical powder.
- LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Protective Clothing (Fire): Be sure to use an approved/certified respirator or equivalent.

Special Remarks on Fire Hazards: N-Oleyl-1,3-diaminopropane: Treat as an oil fire.

6. Accidental Release Measures

Small Spill and Leak:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill and Leak:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

7. Handling and Storage

Handling:
Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area.
8. Exposure Controls/Personal Protection

**Engineering Controls:**
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protective Equipment:**

- **Eyes** – Splash goggles
- **Body** – Lab coat
- **Respiratory** – Respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
- **Hands** – Gloves
- **Feet** – Not applicable

**Personal Protection in case of a Large Spill:**
Splash goggles, full suit, respirator, boots, gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient. Consult a specialist BEFORE handling this product.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>Ammoniacal</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in cold water</td>
</tr>
<tr>
<td>pH</td>
<td>Basic</td>
</tr>
<tr>
<td>Vapor pressure (mmHg)</td>
<td>&lt;0.04kpa(&lt;0.1mmHg)(at20°C)</td>
</tr>
<tr>
<td>Density</td>
<td>0.841 g/cm³</td>
</tr>
<tr>
<td>Boiling point (°F/°C)</td>
<td>~300°C</td>
</tr>
<tr>
<td>Evaporation rate Weighted average:</td>
<td>0.9 compared to Butyl acetate</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point</td>
<td>12°C</td>
</tr>
<tr>
<td>Pour point</td>
<td>18°C</td>
</tr>
<tr>
<td>Dispersion properties</td>
<td>Not available</td>
</tr>
<tr>
<td>Physical Chemical comments</td>
<td>Viscosity = 19cp @ 25°C; 17cp @ 30°C; 14cp @ 35°C</td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

- **Stability and Reactivity:** This product is stable.
- **Incompatibility with Various Substances:** Reactive with OXIDIZING AGENTS, acids
- **Hazardous polymerization:** Will not occur.
### 11. Toxicological Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Test</th>
<th>Result</th>
<th>Route</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Oleyl-1,3-diaminopropane</td>
<td>LD50</td>
<td>253mg/kg</td>
<td>Oral</td>
<td>Rat</td>
</tr>
<tr>
<td>Amines, oleyl alkyl</td>
<td>LD50</td>
<td>1950mg/kg</td>
<td>Oral</td>
<td>Rat</td>
</tr>
</tbody>
</table>

**Special Remarks on Toxicity to Animals:** N-Oleyl-1,3-diaminopropane: Sub-chronic, NOEL (rat) = 670 ppm Amines, oleyl alkyl: INHALATION > 0.033 mg/L 1 hour/s, Rat; highest concentration tested

**Chronic Effects on Humans:** MUTAGENIC EFFECTS: Non-mutagenic for bacteria and/or yeast. [Amines, oleyl alkyl].

**Special Remarks on Chronic Effects on Humans:** Oleylamine: Chromosomal (DNA) abnormalities will not occur in CHO mammalian cell assay, the In Vivo Cytogenetics Assay in mice, the CHO/HGPRT mammalian cell assay and the Mouse Lymphoma Assay.

**Acute Effects Skin:** Corrosive to the skin.

**Acute Effects Eyes:** Corrosive to the eye.

### 12. Ecological Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Species</th>
<th>Period</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Oleyl-1,3-diaminopropane</td>
<td>Fish (LC50)</td>
<td>96 hours</td>
<td>0.01mg/l</td>
</tr>
<tr>
<td></td>
<td>Daphnia (EC50)</td>
<td>72 hours</td>
<td>0.11mg/l</td>
</tr>
<tr>
<td></td>
<td>Algae (LC50)</td>
<td>72 hours</td>
<td>0.011mg/l</td>
</tr>
<tr>
<td>Amines, Oleyl alkyl</td>
<td>Fish (LC50)</td>
<td>96 hours</td>
<td>0.11mg/l</td>
</tr>
</tbody>
</table>

**Biodegradability and Ecotoxicity Remarks:**
N-Oleyl-1,3-diaminopropane: 24% @ 28 days CBT; 55% 112 days CBT
Amines, Oleyl alkyl: 44% @ 28 days; CBT 72% @ 42 days CBT

**Products of Degradation:**
These products are carbon oxides (CO, CO$_2$) and water, nitrogen oxides (NO, NO$_2$).

### 13. Disposal Considerations

**Waste information:** Waste must be disposed of in accordance with federal, state and local environmental control regulations.
14. Transport Information

<table>
<thead>
<tr>
<th>Regulatory Information</th>
<th>UN number</th>
<th>Proper Shipping Name</th>
<th>Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT classification</td>
<td>UN 2735</td>
<td>Amines, liquid, corrosive, n.o.s. (Fatty Diamine)</td>
<td>8</td>
<td>III</td>
</tr>
<tr>
<td>TDG classification</td>
<td>UN 2735</td>
<td>Amines, liquid, corrosive, n.o.s. (Fatty Diamine)</td>
<td>8</td>
<td>III</td>
</tr>
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<td>IMDG class</td>
<td>UN 2735</td>
<td>Amines, liquid, corrosive, n.o.s. (Fatty Diamine)</td>
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<td>III</td>
</tr>
<tr>
<td>Iata-dgr class</td>
<td>UN 2735</td>
<td>Amines, liquid, corrosive, n.o.s. (Fatty Diamine)</td>
<td>8</td>
<td>III</td>
</tr>
</tbody>
</table>

15. Regulatory Information

**HCS Classification:** Corrosive material

**U.S. Federal Regulations:**
- TSCA: All intentionally present components are listed on the TSCA inventory.
- DSL: All intentionally present components are listed on the DSL.
- CERCLA: Hazardous substances: No products were found.
- SARA 302/304/311/312 extremely hazardous substances: No products were found.
- SARA 302/304 emergency planning and notification: No products were found.
- SARA 302/304/311/312 hazardous chemicals: No products were found.
- SARA 311/312 MSDS distribution – chemical inventory – hazard identification: No products were found.
- SARA 313 Form R Reporting Requirements: No products were found.
- SARA 313 Supplier Notification: No products were found.

**State Regulations:** No products were found.
- California prop. 65: No products were found.

**WHMIS (Canada):**
- Class D-1B: Material causing immediate and serious toxic effects (TOXIC).
- Class D-2B: Material causing other toxic effects (TOXIC).
- CEPA DSL: N-Tallow-1,3-diaminopropane; oleylamine

**European Union:**

<table>
<thead>
<tr>
<th>Component</th>
<th>EC Number</th>
<th>EC Status</th>
<th>EC Annex</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Oleyl-1,3-diaminopropane</td>
<td>230-528-9</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Amines, oleyl alkyl</td>
<td>204-015-5</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>

**Other International Lists:**
- Australia (NICNAS): 1,3-Propanediamine, N-Oleyl-1,3-diaminopropane
- China: N-Oleyl-1,3-diaminopropane; oleylamine
- Japan (MITI): oleylamine; N-Oleyl-1,3-diaminopropane
- Korea (TCCL): N-Oleyl-1,3-diaminopropane; oleylamine
Philippines (RA6969): N-Oleyl-1,3-diaminopropane oleylamine

16. Other Information

**MSDS Revision Status:**

- MSDS Date ................. : June 8, 2010
- Last Revision Date ....... : January 30, 2012
- Reason for Revision..... : Date Revision Only