Material Safety Data Sheet
p-Toluenesulfonyl chloride

Section 1 - Chemical Product and Company Identification

MSDS Name: p-Toluencesulfonyl chloride
Synonyms: Toluene-4-sulfonyl chloride; Tosyl chloride.

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-59-9</td>
<td>p-Toluencesulfonyl chloride</td>
<td>&gt;99</td>
<td>202-684-8</td>
</tr>
</tbody>
</table>

Section 3 - Hazards Identification

**EMERGENCY OVERVIEW**

Appearance: white crystalline powder.

**Danger!** Causes eye and skin burns. Causes digestive and respiratory tract burns. Contact with water liberates toxic gas.

**Target Organs:** Respiratory system, gastrointestinal system, eyes, skin.

**Potential Health Effects**

**Eye:** Causes eye burns. Lachrymator (substance which increases the flow of tears).

**Skin:** Causes skin burns. This material is a vesicant, that is, it will induce blistering.

**Ingestion:** Causes gastrointestinal tract burns.

**Inhalation:** May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract.

**Chronic:** Chronic exposure may cause effects similar to those of acute exposure. Repeated exposure to low concentrations of HCl vapor or mist may cause bleeding of nose and gums. Chronic bronchitis and gastritis have also been reported. Only one case of contact dermatitis reported.

Section 4 - First Aid Measures
**Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

**Skin:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

**Ingestion:** If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

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

**Notes to Physician:** Treat symptomatically and supportively.

---

**Section 5 - Fire Fighting Measures**

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

**Extinguishing Media:** Use carbon dioxide or dry chemical. DO NOT USE WATER OR FOAM.

**Flash Point:** 128 deg C (262.40 deg F)

**Autoignition Temperature:** Not available.

**Explosion Limits, Lower:** Not available.

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 3; Flammability: 1; Instability: 1; Special Hazard: -W-

---

**Section 6 - Accidental Release Measures**

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not get water on spilled substances or inside containers.

---

**Section 7 - Handling and Storage**

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Do not allow contact with water.

**Storage:** Keep container closed when not in use. Store in a cool, dry, well-ventilated
area away from incompatible substances. Keep away from water. Corrosives area. Do not store in metal containers.

Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

**Exposure Limits**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-Toluenesulfonyl chloride</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

**Personal Protective Equipment**

**Eyes:** Wear chemical splash goggles.

**Skin:** Wear appropriate gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

Section 9 - Physical and Chemical Properties

**Physical State:** Crystalline powder

**Appearance:** white

**Odor:** characteristic odor

**pH:** Not available.

**Vapor Pressure:** 0.5 mm Hg @ 75 deg C

**Vapor Density:** Not available.

**Evaporation Rate:** Not available.

**Viscosity:** Not available.

**Boiling Point:** 146 deg C @ 15 mmHg

**Freezing/Melting Point:** 67 deg C

**Decomposition Temperature:** > 220 deg C

**Solubility:** Reacts.

**Specific Gravity/Density:** 1.49 g/cm3

**Molecular Formula:** C7H7ClO2S

**Molecular Weight:** 190.64

Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures. Reacts with water to form corresponding acid. Material hydrolyzes in contact with moisture/water releasing toxic and corrosive fumes of hydrogen chloride and aqueous hydrochloric acid.
Conditions to Avoid: Dust generation, contact with water.
Incompatibilities with Other Materials: Water, strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide, sulfur oxides (SOx), including sulfur oxide and sulfur dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#: CAS# 98-59-9 unlisted.
LD50/LC50: Not available.
Carcinogenicity: CAS# 98-59-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

<table>
<thead>
<tr>
<th>IATA</th>
<th>Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CORROSIVE SOLIDS, WATER-</td>
</tr>
</tbody>
</table>
Name: REACTIVE, N.O.S.
Hazard Class: 8
UN Number: UN3096
Packing Group: II

Section 15 - Regulatory Information

Hazard Symbols:
C
Risk Phrases:
R 29 Contact with water liberates toxic gas.
R 34 Causes burns.

Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Section 16 - Additional Information

MSDS Creation Date: 12/02/1997
Revision #3 Date: 5/20/2005

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall INDO GULF GROUP be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if INDO GULF GROUP has been advised of the possibility of such damages.