### SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Chloramine T (Tosylchloramide trihydrate Sodium) or (N-Chloro-p-toluenesulfonamide trihydrate sodium salt or N-sodium-N-chloro-p-toluene sulfonamide trihydrate sodium salt or sodium p-toluenesulphonechloramide trihydrate.

**GENERAL USE:** In hydrotherapy, and cleaner applications.

**PRODUCT DESCRIPTION:** White crystalline powder/solid. Chlorine-like - weak odor.

<table>
<thead>
<tr>
<th>Manufacturers Name:</th>
<th>DATE PREPARED: 01/14/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>H&amp;S Chemical Co. Inc.</td>
<td>SUPERSEDES: 05/18/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, P.O. BOX)</th>
<th>TELEPHONE NUMBER FOR INFORMATION / customer service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1025 Mary Laidley Drive</td>
<td>1-859-356-8000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>CHEMTEL 24-HOUR EMERGENCY TELEPHONE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covington, KY 41017 USA</td>
<td>North America: 1-800-255-3924</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DISTRIBUTOR'S NAME</th>
<th>TELEPHONE NUMBER FOR INFORMATION / customer service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Applicable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, P.O. BOX)</th>
<th>DISTRIBUTOR EMERGENCY TELEPHONE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 2 - HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>% (by Weight)</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>Hazard Symbol</th>
<th>RISK PHRASES (Full Text Section 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Chloramine T Trihydrate or Tosylchloramide Trihydrate Sodium, or N-Chloro-p-toluenesulfonamide trihydrate sodium salt, or N-sodium-N-chloro-p-toluene sulfonamide trihydrate sodium salt, or sodium p-toluenesulphonechloramide trihydrate.</td>
<td>100%</td>
<td>7080-50-4</td>
<td>#N/R</td>
<td>+C: Corrosive, +Xn: Harmful</td>
<td>R-22, R-34, R-31, R-42</td>
</tr>
</tbody>
</table>

**Notes:** *This product is made with the Trihydrate form of Chloramine T which is not TSCA listed since hydrates are exempted from TSCA listing. Since the trihydrate form of this chemical is also #not referenced but the anhydrous form is referenced, the appropriate E.U. risk phrases and hazard symbols are for the anhydrous form which is expected to exhibit very similar hazards to the trihydrate form.*

### SECTION 3 - HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis, rapid heart rate, unconsciousness and possible death. Effects may be delayed.

**POTENTIAL HEALTH EFFECTS**

**INHALATION:**

Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. May cause systemic effects.

**SKIN:**

Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

**EYES:**

Causes eye burns. May cause chemical conjunctivitis and corneal damage.
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Chloramine T (Tosylchloramide Sodium) or (N-Chloro-p-toluenesulfonamide sodium salt or N-sodium-N-chloro-p-toluene sulfonamide trihydrate sodium salt or sodium p-toluenesulphonechloramide.

Date: 01/14/2008 Page 2 of 4

INGESTION:
May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. Methemoglobinemia is characterized by dizziness, drowsiness, headache, breath shortness, cyanosis with bluish skin, rapid heart rate and chocolate-brown colored blood. Overexposure may cause methemoglobinemia. May cause systemic effects.

CARCINOGENICITY
NTP? NO  IARC MONOGRAPHS? NO  OSHA REGULATED? NO
Cal. Prop. 65? NO

SECTION 4 - FIRST AID MEASURES

Use good personal hygiene practices. If skin contact should occur, material should be washed away with a mild soap and water. Wash hands and other exposed areas thoroughly before eating, drinking, smoking or using toilet facilities. Do not smoke, drink or eat in areas where this product is stored or handled.

INHALATION: Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

EYES: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

SKIN: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

SECTION 5 - FIRE FIGHTING MEASURES

GENERAL HAZARDS: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

EXTINGUISHING MEDIA: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

FIRE FIGHTING PROCEDURES: Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis, rapid heart rate, unconsciousness and possible death. Effects may be delayed.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Clean up spills immediately, using the appropriate protective equipment. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Flush spill area with water. Provide ventilation.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Use with adequate ventilation. Avoid contact with skin and eyes. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid ingestion and inhalation. Do not ingest or inhale. Discard contaminated shoes. Store in a cool, dry place. Keep container closed when not in use. Keep away from water. Keep containers tightly closed.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>NIOSH</th>
<th>ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramine T or Tosylchloramide Sodium or N-Chloro-p-toluenesulfonamide sodium salt or N-sodium-N-chloro-p-toluene sulfonamide trihydrate sodium salt or sodium p-toluenesulphonechloramide.</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
**PERSONAL PROTECTION**

**RESPIRATORY PROTECTION:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**PROTECTIVE GLOVES:** Wear appropriate protective gloves to prevent skin exposure.

**EYE PROTECTION:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**OTHER PROTECTIVE CLOTHING OR EQUIPMENT:** Clothing: Wear appropriate protective clothing to prevent skin exposure. An apron is recommended.

**WORK / HYGIENIC PRACTICES:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Use with adequate ventilation. Avoid contact with skin and eyes. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid ingestion and inhalation. Do not ingest or inhale. Discard contaminated shoes.

**SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance and Odor</td>
<td>White to yellow solid. Chlorine-like - weak odor.</td>
</tr>
<tr>
<td>pH</td>
<td>7-9 (1 gram /400g water)</td>
</tr>
<tr>
<td>Boiling Point / Boiling Range</td>
<td>NA</td>
</tr>
<tr>
<td>Flash Point</td>
<td>192 ° C</td>
</tr>
<tr>
<td>Flammable Limits LEL:</td>
<td>Unknown</td>
</tr>
<tr>
<td>Flammable Limits UEL:</td>
<td>NA</td>
</tr>
<tr>
<td>AutoIgnition Temperature</td>
<td>Unknown</td>
</tr>
<tr>
<td>Specific Gravity (WATER =1)</td>
<td>1.43 g/cm3 (20 C)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>150 g/L (25 C)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>NA</td>
</tr>
<tr>
<td>Vapour Density (Air = 1)</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate (WATER = 1)</td>
<td>NA</td>
</tr>
</tbody>
</table>

**SECTION 10 - STABILITY AND REACTIVITY**

**STABILITY** Stable X

**CONDITIONS TO AVOID:** Contact with strong oxidizing agents, acids, ammonia

**INCOMPATIBILITY (MATERIALS TO AVOID):** Strong oxidizing agents, acids ammonia.

**HAZARDOUS DECOMPOSITION OR BYPRODUCTS:** Sulfur dioxide, carbon monoxide, oxides of nitrogen, carbon dioxide, chlorine fumes.

**HAZARDOUS POLYMERIZATION occur.** Will not

**CONDITIONS TO AVOID:** Contact with strong oxidizing agents, acids, ammonia

**SECTION 11 - TOXICOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>LD50 of Ingredient (Specify Species and Route)</th>
<th>LC50 of Ingredient (Specify Species)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramine T or Tosylchloramide Sodium or N-Chloro-p-toluenesulfonamide sodium salt or N-sodium-N-chloro-p-toluene sulfonamide trihydrate sodium salt or sodium p-toluenesulphonechloramide.</td>
<td>127-65-1 204-854-7</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION 12 - ECOLOGICAL INFORMATION**

Do not allow product to reach ground water, watercourse or sewage system. Danger to drinking water if even small quantities leak into ground water. Do not allow material to be released to the environment without proper governmental permits. Environmental fate: Unknown

**SECTION 13 - DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:** Ensure that collection, transport, treatment, and disposal of waste product, containers and rinsate complies with all applicable laws and regulations. It is the responsibility of the product user or owner to determine at the time of disposal, whether the product is regulated as a hazardous waste.
<table>
<thead>
<tr>
<th><strong>HAZARD SYMBOLS:</strong></th>
<th><strong>PRODUCT NAME:</strong> Chloramine T (Tosylchloramide Sodium) or (N-Chloro-p-toluene sulfonamide sodium salt or N-sodium-N-chloro-p-toluene sulfonamide trihydrate sodium salt or sodium p-toluenesulphonamide chloride).</th>
</tr>
</thead>
</table>
| **SECTION 14 - TRANSPORT INFORMATION** | **DOT HAZARD CLASS / Pack Group:** 8, PG III  
**REFERENCE:** 49 CFR  
**UN / NA IDENTIFICATION NUMBER:** UN 3263  
**LABEL:** Corrosive Solid  
**HAZARD SYMBOLS:**  
- +C: Corrosive  
- +R22: Harmful if swallowed.  
- +R31: Contact with acids liberates toxic gas.  
- +R34: Causes Burns  
- +R42: May cause sensitization by inhalation.  
- +Xn: Harmful  
#See notes Section 2  
**IATA HAZARD CLASS / Pack Group:** 8, PG III  
**IMDG HAZARD CLASS:** 8  
**RID/ADR Dangerous Goods Code:** NA  
**PROPER SHIPPING NAME:** Corrosive Solid, Basic, Organic N.O.S. (Sodium p-Toluenesulfonchloramide)  
**RID / ADR Dangerous Goods Code:** NA  
**UN TDG Class / Pack Group:** UN 3263, 8, PG III  
**Note:** Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 - 177, IMDG, IATA, EU, United Nations TDG, and WHMIS (Canada). TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping. |
| **SECTION 15 - REGULATORY INFORMATION** | **TSCA (USA - Toxic Substance Control Act):** Listed  
**SARA TITLE III (USA - Superfund Amendments and Reauthorization Act):** No reporting requirement.  
**313 REPORTABLE INGREDIENTS:** None  
**CERCLA (USA - Comprehensive Response Compensation and Liability Act):** No RQ Listed  
**California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986:** Not listed  
**CPR (Canadian Controlled Products Regulations):** Not listed  
**IDL (Canadian Ingredient Disclosure List):** Not listed  
**DSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List):** Not listed  
**EINECS (European Inventory of Existing Commercial Chemical Substances):** Listed  
**WGK Water Quality Index:** Unknown  
**S1/2: Keep locked up and out of the reach of children.**  
**S7: Keep container tightly closed.**  
**S22: Do not breathe dust.**  
**S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.**  
**S40: In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).**  
**S45: In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).**  
**See Notes Section 2**  
**See Notes Section 2**  
**See Notes Section 2**  
**See Notes Section 2**  
**See Notes Section 2**  
**See Notes Section 2**  
**See Notes Section 2**  
**See Notes Section 2**  
<table>
<thead>
<tr>
<th><strong>RISK PHRASES:</strong></th>
<th><strong>SYMBOL(S) REQUIRED FOR EU LABEL</strong></th>
<th><strong>SAFETY PHRASES:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>+R22: Harmful if swallowed.</td>
<td></td>
<td>+C: Corrosive</td>
</tr>
<tr>
<td>+R31: Contact with acids liberates toxic gas.</td>
<td></td>
<td>+R22: Harmful if swallowed.</td>
</tr>
<tr>
<td>+R34: Causes Burns</td>
<td></td>
<td>+R31: Contact with acids liberates toxic gas.</td>
</tr>
<tr>
<td>+R42: May cause sensitization by inhalation.</td>
<td></td>
<td>+R34: Causes Burns</td>
</tr>
<tr>
<td>#See notes Section 2</td>
<td></td>
<td>#See notes Section 2</td>
</tr>
</tbody>
</table>
| **SECTION 16 - OTHER INFORMATION** | **HEALTH:** 2  
**FLAMMABILITY:** 0  
**REACTIVITY:** 1  
**PERSONAL PROTECTIVE EQUIPMENT:** F  
**HMIS HAZARD RATINGS** | **0 = INsignificant**  
**1 = SLIGHT**  
**2 = MODERATE**  
**3 = HIGH**  
**4 = EXTREME** |
| **REVISION SUMMARY:** | **Revision 01/14/2008 includes E.U. hazards information and supersedes previous 05/18/2007 issue.** |
| **MSDS Prepared by:** | **ChemTel Inc.**  
**1305 North Florida Avenue**  
**Tampa, Florida USA 33602-2902**  
**Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573**  
**Website:** www.chemtelinc.com | **The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.** |