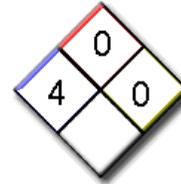


**THATCHER COMPANY MATERIAL SAFETY DATA SHEET****PRODUCT: CHLORINE**

Page 1 of 4

MSDS Date: March 3, 2003  
Emergency Contact: 1-800-424-9300**SECTION I****PRODUCT NAME:** Chlorine**CHEMICAL NAME:** Cl<sub>2</sub>**DOT SHIPPING INFORMATION:**Chlorine, 2.3, UN 1017  
Poison - Inhalation Hazard Zone B,  
Marine Pollutant RQ = 10 lbs

49CFR §171.4(c) exempts non-bulk Chlorine from marine pollutant requirements when transported by motor vehicle, rail or aircraft.

49CFR §172.322(d)(3) exempts use of marine pollutant mark when transported by motor vehicle, rail or aircraft.

**SECTION II - HAZARDOUS INGREDIENTS**

This material contains no ingredients which are known by Thatcher Company to be hazardous unless listed below.

HAZARDOUS MATERIAL	CAS NUMBER	w/w %	EXPOSURE LIMITS IN AIR
Chlorine	7782-50-5	100	PEL = 1.0 ppm (STEL) TLV = 0.5 ppm (TWA) = 1.0 ppm (STEL)

The specific identity of some ingredients may be withheld for confidential business purposes. However, all known potential health effects from exposure to these ingredients are being addressed.

This product is subject to EPCRA Section 313 (40 CFR Part 372) reporting requirements

**SECTION III - PHYSICAL DATA****BOILING POINT (F):** -34.°C @ 1 atm**SPECIFIC GRAVITY:** 1.067 @ 0°C**VAPOR PRESSURE (mm Hg):** 4910 @ 20°C**% VOLATILE, BY VOLUME:** 100 %**VAPOR DENSITY (air = 1):** 2.49 @ 0°C 1 atm**EVAPORATION RATE:** Not available**SOLUBILITY IN WATER:** (% by weight) 0.78 @ 20 0°C, 1 atm**APPEARANCE AND ODOR:** Greenish-yellow gas, or, clear amber-colored liquid with a pungent, irritating odor.**SECTION IV - FIRE AND EXPLOSION DATA****FLASH POINT:** Not available**FLAMMABLE LIMITS:** Lel: Not available Uel: Not available**EXTINGUISHING MEDIA:**

None for chlorine itself. Use extinguishing media appropriate for surrounding fire.

**SPECIAL FIRE-FIGHTING PROCEDURES:**

Use water spray to cool intact, fire exposed containers (1 ton tanks will release chlorine when a fusible metal safety plug melts @ 70-74°C). If possible, have specially trained personnel remove intact cylinders from fire area.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Chlorine will support the burning of most combustible materials, just as oxygen does. Flammable gases and vapors can form explosive mixtures with chlorine. Fire-fighters must use full protective clothing (butyl coated nylon or equivalent), and self-contained breathing apparatus (SCBA), when fighting fires in which chlorine is involved.

**SECTION V - REACTIVITY DATA**

**STABILITY:** Stable

**HAZARDOUS POLYMERIZATION:** Will not occur

**CONDITIONS OR MATERIALS TO AVOID:**

Intense local heat (above 215°C). Avoid spraying water on chlorine leaks in steel vessels. Avoid contact with reducing agents and combustible materials. Avoid toxic and corrosive materials. Wet chlorine (150 ppm water) corrosively attacks most common metals. Handling chlorine requires special materials technology.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Chlorine is a chemical element and cannot decompose, but will react with water to produce hydrochloric and hypochlorous acid. Chlorine will also combine with CO and SO<sub>2</sub> to form phosgene and sulfuryl chloride, respectively.

**SECTION VI - HEALTH HAZARD DATA**

**NFPA HAZARDOUS RATING:** Health = 4    Flammability = 0    Reactivity = 0

**Carcinogenic Listing:**    NTP: No ingredients listed in this section.

IARC MONOGRAPHS: No ingredients listed in this section.

OSHA 29 CFR 1910: No ingredients listed in this section.

**ENTRY ROUTES & EFFECTS OF OVEREXPOSURE:**

**Contact:**    *Skin:* Gas can cause local irritation and burns. Liquid can cause irritation, burning and blisters. *Eyes:* Liquid is severely irritating to eyes. Gas levels of >1 ppm, will produce redness, tearing, and irritation.

**Inhalation:**    Chlorine is irritating to the nose, throat and respiratory tract. Symptoms of over-exposure can include coughing (minor to intense), shortness of breath, chest pain, nausea, vomiting and dizziness. Pulmonary edema and chemical pneumonia can develop hours after exposure. High concentrations above 25 ppm, may cause unconsciousness and death.

**Ingestion:**    Unlikely route of exposure since chlorine is a gas at room temperature. Liquid will burn mouth, esophagus and stomach.

**STATEMENT OF PRACTICAL TREATMENT:**

**Contact:**    *Skin:* Wash exposed area thoroughly with water. Remove contaminated clothing while under safety shower. Get immediate medical attention. *Eyes:* Flush eyes with cool running water (holding eyelids open) for at least 15 minutes. Get immediate medical attention.



- Inhalation:** Remove to fresh air and get immediate medical attention. Restore breathing when required. Have trained person administer oxygen. Keep person warm and at rest. For mild cases, give milk to relieve throat irritation.
- Ingestion:** If conscious, give large quantities of water or milk. **Induce** vomiting and get immediate medical attention.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:**

Asthma, bronchitis, emphysema and other lung diseases, and chronic nasal, sinus or throat conditions.

**SECTION VII - SPECIAL PRECAUTIONS****HANDLING AND STORAGE PRECAUTIONS:**

Avoid contact with skin and inhalation of gas. Store chlorine containers in a well-ventilated area, away from incompatible materials, and away from sources of heat or ignition. Store in a cool, dry area. Provide special training to workers handling chlorine. Keep piping clean and dry. Liquid chlorine lines must have suitable expansion chambers between block valves due to high coefficient of expansion. Establish written emergency plan and special training where chlorine is used. Regularly inspect and test piping and containers used for chlorine service. Liquid levels should be less than 85% of tank or cylinder capacity.

**STEPS TO BE TAKEN IF MATERIAL SPILLS OR LEAKS:**

Notify safety personnel. Evacuate area, moving unprotected personnel upwind or crosswind out of danger area. Wear one-piece, total encapsulating suit of Butyl-coated nylon or equivalent, with self-contained breathing apparatus, isolate leak to whatever extent possible. If a chlorine container is leaking, try to position it so that gas rather than liquid leaks; apply emergency kit device if possible. For other than minor leaks, immediately implement pre-determined emergency plan. Chlorine spills of 10 or more pounds must be reported.

**WASTE DISPOSAL METHOD:**

Bubble through a large volume of 15% aqueous NaOH or other alkali. Suitably dispose of resulting solution following local, state and federal regulations.

**SECTION VIII - SPECIAL PROTECTION INFORMATION****RESPIRATORY PROTECTION:**

Canister (acid-gas type) for low concentrations; self-contained breathing apparatus for emergencies.

**VENTILATION:**

**Local exhaust:** Provide local exhaust as needed to meet exposure limits. **General:** Provide general ventilation in processing and storage areas as needed to meet exposure limits. **Special:** Provide suitable venting for low-lying areas. **Other:** Self-contained breathing equipment (SCBA) must be available for emergency and non-routine situations.

**EYE PROTECTION:**

Chemical safety goggles.

**SKIN PROTECTION:**

Impervious gloves during normal operations.

**OTHER PROTECTIVE EQUIPMENT:**

Full protective equipment to prevent exposure to liquid or gas. Heavy leather shoes during normal operations. Eye wash stations and safety showers must be available.



THATCHER COMPANY MATERIAL SAFETY DATA SHEET

PRODUCT: CHLORINE

Page 4 of 4

---

**ACGIH** = American Conference of Governmental Industrial Hygienists

**CL** = Ceiling Level

**IARC** = International Agency for Research on Cancer: Monographs

**OSHA** = Occupational Safety and Health Administration

**N/A** = Not Applicable

**NTP** = National Toxicology Program: Annual Report on Carcinogens

**PEL** = Permissible Exposure Level (OSHA)

**TLV** = Threshold Limit Value (ACGIH)

**TWA** = Time Weighted Average over 8 Hours

**STEL** = Short Term Exposure Limit (ACGIH)

**ND** = Not Determined

This information is, to the best of our knowledge, accurate but may not be complete. THATCHER COMPANY furnishes this information in good faith, but without warranty, representation or guarantee of its accuracy, completeness, or reliability.