

**STOODY INDUSTRIAL AND WELDING SUPPLY, INC.**

**MATERIAL SAFETY DATA SHEET (MSDS)**

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME:** Chlorine

**CHEMICAL NAME:** Chlorine

**CHEMICAL FAMILY:** Halogen Gas

**FORMULA:** Cl<sub>2</sub>

**SYNONYMS:** RQ Chlorine

**NAME AND ADDRESS:**

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

3316 National Avenue

San Diego, CA 92113

**TELEPHONE:**

**Emergency Phone: (800) 633-8253 (24 hr.)**

**Routine information call: (619) 234-6750**

Weekdays 7:30 AM – 5:00 PM

**[USE]:** Manufacturing of inorganic and organic chemicals, Sanitation in industrial and municipal waters and sewage, Disinfectant for swimming pools, and for bleaching textiles.

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

INGREDIENT NAME /CAS NUMBER	PERCENTAGE	Exposure Limits (TWAs) In Air		
		OSHA PEL	ACGIH TLV	STEL*
Chlorine/ 7782-50-5	100%	.5 ppm 1.5 mg/m <sup>3</sup>	.5 ppm	1 ppm 3 mg/m <sup>3</sup>

**[LD<sub>50</sub>]:** None      **[LC<sub>50</sub>]:** None

\*ACGIH short term exposure limit (STEL)

**3. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW:**

**CAUTION:** Avoid breathing vapors and liquid contact with skin or eyes.  
 Use with sufficient ventilation to keep employee exposure below minimum limits.  
 Skin can become frozen contact with vessels containing liquid chlorine.  
 Contact lenses should not be worn when working with chlorine.  
 Self-contained breathing apparatus may be required for rescue workers

**POTENTIAL HEALTH EFFECTS INFORMATION:** The Immediately Dangerous to Life and Health (IDLH) Value is 25 ppm.

**ROUTES OF EXPOSURE:**

**INHALATION:** Major potential route of exposure. Exposure to chlorine gas may cause sever irritation of mucous membranes of the nose throat, and respiratory tract followed by severe coughing, burning, chest pain, vomiting, headache, anxiety, and feeling of suffocation. Severe breathing difficulties may occur which may be delayed in onset. Severe exposure may lead to pneumonitis and pulmonary edema and may be fatal. Repeated or prolonged exposure may result in reduced pulmonary capacity.

**EYE CONTACT:** Exposure to chlorine may cause severe eye damage. Direct contact of the eyes with liquid chlorine will produce serious eye burns even blindness.

**SKIN CONTACT:** Contact with liquid chlorine may cause serious burns , blistering and tissue destruction. Chlorine vapors can cause irritation, burning and blisters

**[SKIN ABSORPTION]:** Not probable

**[INGESTION]:** Chlorine is a gas at room temperature. Ingestion of liquid chlorine may result in severe irritation or ulceration of the mouth, throat and digestive tract which may be displayed by nausea, pain, vomiting, and , in severe cases, collapse, shock and death.

**CHRONIC EFFECTS:** Repeated or prolonged exposure to chlorine may cause corrosion of the teeth and skin irritation. Reportedly, a study of 600 diaphragm cell workers exposed to 0.006 to 1.42 ppm, showed no statistically significant increase in abnormal chest x-rays, ECG's or pulmonary function.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** Chlorine is a respiratory irritant. Persons with asthma, bronchitis, emphysema or other lung diseases, and chronic nose, sinus or throat conditions may be at increased risk from exposure.

**OTHER EFFECTS OF OVEREXPOSURE:** Severe exposure may lead to pneumonitis and pulmonary edema and may be fatal

**CARCINOGENICITY:** Carcinogenic lists, NO; IARC Monograph, NO; NTP, NO; OSHA Regulated, YES.

**4. FIRST AID MEASURES**

**INHALATION:** If a person breaths in large amounts of chlorine, move the exposed person to fresh air at once. If breathing has stopped, perform artifical respiration. Keep the affected person warm and at rest. In mild cases, give milk to relieve throat irritation. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

**EYE CONTACT:** If liquid chlorine or high concentrations of chlorine gas get into the eyes, flush eyes immediately with a direct stream of water for at least 15 minutes while forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Do not attempt

**STOODY INDUSTRIAL AND WELDING SUPPLY, INC.**

chemical neutralization of any kind. GET MEDICAL ATTENTION IMMEDIATELY. Contact lenses should not be worn when working with chlorine.

**SKIN CONTACT:** If liquid chlorine or high concentrations of chlorine gas get on the skin, immediately flush the contaminated skin with water for at least 15 minutes. If liquid chlorine or high concentrations of chlorine gas penetrate through the clothing, remove clothing under a safety shower and continue to wash the skin for at least 15 minutes. If irritation is present after washing, GET MEDICAL ATTENTION. Do not apply greases unless ordered by a physician.

**INGESTION:** Give small amounts of water or ice. GET MEDICAL ATTENTION IMMEDIATELY.

**NOTES TO PHYSICIAN:** No known antidote. Treatment for inhalation is symptomatic and supportive. Keep patient at rest until respiratory symptoms subside. Sedation for apprehension or restlessness may be considered as well as diuretics and antibiotics to alleviate edema and protect against secondary infection. Administer oxygen under exhalation pressure not exceeding 4 cm water for 15 minutes each hour until symptoms subside (except in presence of impending or existing cardiovascular failure).

**5. FIRE FIGHTING MEASURES**

**FLASH POINT:** Non-flammable

**AUTOIGNITION:** Not applicable

**FLAMMABLE LIMITS IN AIR BY VOLUME:**

**LOWER:** Not applicable

**UPPER:** Not applicable

**EXTINGUISHING MEDIA:** Use extinguishing media as appropriate for materials in the surrounding fire.

**SPECIAL FIRE FIGHTING INSTRUCTIONS:** Firefighters MUST use self contained breathing equipment, eye protection and full protective clothing when fighting fires in which chlorine is involved. Use water to keep fire-exposed containers cool and continue until well after fire is out. If it is necessary to stop the flow of gas, use water spray to direct escaping gas away from men effecting the shut-off.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Noncombustible in air.

**HAZARDOUS COMBUSTION PRODUCTS:** Many metals ignite in presence of chlorine – for example, steel at about 485° F may react to cause fire and/or explosion upon contact with turpentine, ether, ammonia, hydrocarbons, certain metal hydrides, carbides, nitrides, oxides, sulfides, phosphides, easily oxidized materials, organic materials or other flammables.

**GENERAL HAZARDS:** Chlorine is a powerful oxidizing agent which reacts violently with a variety of substances over a broad range of conditions including reducing agents and combustible materials.

**[SENSITIVITY TO STATIC DISCHARGE]:** None

**[SENSITIVITY TO MECHANICAL IMPACT]:** None

**6. ACCIDENTAL RELEASE MEASURES**

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** [ Spills may need to be reported to the National Response Center (800/424-8802) DOT Reportable Quantity (RQ) is 10 (ten) pounds]

In event of leak or spill, keep upwind, notify safety personnel, provide ventilation, wear full protective equipment and shut off supply at source. Keep combustibles (wood, paper, oil, etc.) away from spill material. Use water spray to reduce vapor but DO NOT apply water to point leak or spill area. Exclude from area all except specially trained, assigned personnel with approved equipment and clothing. Uncontrolled leaks may require evacuation of surrounding area. Keep material out of water and sewers. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair the leak or allow the cylinder to empty through a reducing agent, such as caustic soda, soda ash, or hydrated lime solutions. Isolate area until gas has dispersed.

**7. HANDLING AND STORAGE**

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store chlorine containers in well ventilated areas of low fire potential, away from incompatible materials and away from sources of heat and ignition. Protect containers from weather and physical damage.

**PRECAUTIONS TO BE TAKEN IN HANDLING:** Use a suitable hand truck for cylinder movement. Never attempt to lift a cylinder by its valve protection cap. Never apply flame or localized heat directly to any part of the cylinder. High temperature may cause damage to cylinder and/or premature failure of pressure relief device which will result in venting of cylinder contents. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

**OTHER PRECAUTIONS:** Provide special training to workers handling chlorine. Regularly test and inspect piping and containment used for chlorine service.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**ENGINEERING CONTROLS:**

**VENTILATION:** Provide general and local exhaust ventilation to meet TLV of 0.5 ppm. Provide suitable venting for low lying areas. Use enclosed, isolated processing and handling whenever possible.

**RESPIRATORY PROTECTION (SPECIFY TYPE):**

**General Use:** Not normally needed, if controls are adequate (gas concentration is below 1 ppm). Minimum respiratory protection required with gas concentration above 1 ppm but less than 25 ppm: a chemical cartridge respirator with a full facepiece and cartridge(s); a gas mask with a chin-style or a front- or back-mounted canister; any supplied-air respirator with a full facepiece, helmet, or hood; any self-contained breathing apparatus with full facepiece.

**STOODY INDUSTRIAL AND WELDING SUPPLY, INC.**

**Emergency Use:** In gas greater than 25 ppm, a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode must be used. Only NIOSH-approved or MSHA-approved equipment providing protection against chlorine should be used.

**PROTECTIVE CLOTHING:** Employees should be required to use impervious clothing, rubber or neoprene gloves, face shields (eight-inch minimum) and other appropriate protective clothing necessary to prevent any possibility of skin contact with liquid chlorine, and to prevent the skin from becoming frozen from contact vessels containing liquid chlorine.

**EYE PROTECTION:** Employees should be required to use splash-proof safety goggles where there is any possibility of liquid chlorine contacting the eyes. Contact lenses must not be worn when working around chlorine.

**OTHER PROTECTIVE EQUIPMENT:** Impervious boots in case of spillage or leakage, or if there is the probability of repeated or prolonged contact with liquid product. Safety shoes are recommended when handling cylinders.

Eyewash stations and safety showers must be available in the immediate work areas.

**WORK/HYGIENIC PRACTICES:** Avoid contact with skin and avoid breathing vapors. Do not eat, drink, or smoke in work area. Wash hands before eating, drinking, or using restroom.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**MOLECULAR WEIGHT:** 70.914

**LIQUID DENSITY:** Not applicable

**BOILING POINT (1 ATM):** -34°C (-29.3°F)

**SPECIFIC GRAVITY (Water =1):** 1.41 @ 20°C (68°F)

**FREEZING POINT/MELTING POINT:** -101°C (-149.8°F)

**VAPOR PRESSURE (mm Hg AT 20° C; 68° F):** 85 psig

**VAPOR DENSITY (Air = 1):** 2.49 @ 0°C (32°F)

**EVAPORATION RATE (CCl<sub>2</sub>=1):** Not applicable

**SOLUBILITY IN WATER:** (g/100g) 0.7 @ 20°C (68°F)

**% VOLATILE (BY VOLUME):** 100%

**EXPANSION RATIO:** Not applicable.

**[pH]:** Not applicable

**APPEARANCE, ODOR AND STATE:** Greenish-yellow gas or a clear, amber colored liquid with a suffocating, pungent, irritating odor, a compressed gas

**[COEFFICIENT OF WATER/OIL DISTRIBUTION]:** Not applicable

**[ODOR THRESHOLD]:** between 0.02 and 0.2 ppm

**10. STABILITY AND REACTIVITY**

**STABILITY:** Stable

**CONDITIONS TO AVOID:** The presence of moisture in gaseous and liquid chlorine increases corrosive attack on most common metals..

**INCOMPATIBILITY (Materials to Avoid):** Chlorine should be kept away from materials such as acetylene, turpentine, other hydrocarbons, ammonias, hydrogen, ether, powdered metals, sulfur, and aluminum. Chlorine reacts with hydrogen sulfide and water forming hydrochloric acid. It combines with carbon monoxide and sulfur dioxide to form phosgene and sulfuryl chloride, respectively, which are toxic and corrosive substances.

**REACTIVITY:**

- A) **HAZARDOUS DECOMPOSITION PRODUCTS:** Chlorine does not decompose but reacts violently to form Hydrochloric Acid and other potentially toxic and/or corrosive substances. Chlorine is stable in steel containers at room temperatures when dry. Intense local heat on steel walls can cause the steel to react and glow in presence of chlorine.
- B) **HAZARDOUS POLYMERIZATION:** Will not occur.

**11. TOXICOLOGICAL INFORMATION**

**[IRRITANCY OF MATERIAL]:** Not established

**[SENSITIZATION TO MATERIAL]:** Not established

**[REPRODUCTIVE EFFECTS]:** Not established

**[TERATOGENICITY]:** Not established

**[MUTAGENICITY]:** Not established

**[SYNERGISTIC MATERIALS]:** Not established

**12. ECOLOGICAL INFORMATION**

Not established

**13. DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:** Chlorine gas will disperse to the atmosphere leaving no residue. When possible, move leaking container to an isolated area. Position to release gas, not liquid. One volume of liquid chlorine is equivalent to about 460 volumes of gas.

**STOODY INDUSTRIAL AND WELDING SUPPLY, INC.**

Absorb in alkaline solution of caustic soda, soda ash, or hydrated lime. Liquid or solid residue must be disposed of in a permitted waste management facility. Consult Federal, State or local disposal authorities for approved procedures.

<b>14. TRANSPORT INFORMATION</b>
----------------------------------

**DOT/IMO SHIPPING NAME:** RQ CHLORINE**HAZARD CLASS:** 2.3 (Poison Gas)**IDENTIFICATION NUMBER:** UN 1017**[PIN]:** 1017**PRODUCT RQ:** 10 pounds**SHIPPING LABEL(s):** CL. 2.3 Poison Gas, CL. 8 Corrosive**PLACARD (When required):** CL. 2.3 Poison Gas, CL. 8 Corrosive

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure position, in a well ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged.

<b>15. REGULATORY INFORMATION</b>
-----------------------------------

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. **Users of this product are responsible of their own regulatory compliance on a federal, state [provincial], and local level.**

**U.S. FEDERAL REGULATIONS:****EPA - ENVIRONMENTAL PROTECTION AGENCY****CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):**SARA:** Superfund Amendment and Reauthorization Act**SECTION 302/304:** Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).

Extremely Hazardous Substances: Chlorine      Threshold Planning Quantity (TPQ): 10 pounds

**SECTIONS 311/312:** Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370).**SECTION 313:** Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

This product contains the following toxic chemical(s) subject to reporting: CAS# 7782-50-5, Chlorine, 99.5% by weight.

**40 CFR PART 68:** Risk Management Programs for Chemical Accidental Release Prevention. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.**TSCA:** Toxic Substance Control Act**OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION****29 CFR Part 1910.119:** Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals, listed on Appendix A of the standard.

<b>16. OTHER INFORMATION</b>
------------------------------

**EMERGENCY RESPONSE GUIDE # 124****SPECIAL PRECAUTIONS:**

Shipment of compressed gas containers which have not been filled with the owner's consent is a violation of Federal law (49 CFR Part 173.301(b)).

**MIXTURES:** When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

**OTHER INFORMATION:****NFPA RATINGS:**

HEALTH: = 3

REACTIVITY: = 0 (OXIDIZER)

FLAMMABILITY: = 0

SPECIAL: = -

**STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:****THREADED:** CGA 660**PIN-INDEXED YOKE:** Not applicable**ULTRA HIGH INTEGRITY:** Not applicableUse the proper CGA connections, DO NOT USE ADAPTERS

Further information can be found in pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

**[PREPARED BY]:** Stody Industrial and Welding Supply, Inc.