MATERIAL
SAFETY
DATA SHEET

PRODUCT NAME	CAS#
Chlorine	7782-50-5
TRADE NAME AND SYNONYMS	**DOT I.D. NO.**
Chlorine	UN 1017
CHEMICAL NAME AND SYNONYMS	**DOT HAZARD CLASS**
Chlorine	Division 2.3 (Poison Gas)
ISSUE DATE AND REVISIONS	**FORMULA**
Revised March 2007	Cl_2

HEALTH HAZARD DATA

EMERGENCY OVERVIEW

Chlorine is a greenish-yellow, toxic, nonflammable, oxidizing gas with a pungent, suffocating odor. It is irritating to the mucous membranes.

SYMPTOMS OF EXPOSURE

Inhalation: Initial symptoms are irritation of the eyes, nose and throat becoming steadily worse, suffocating and painful. The irritation extends to the chest causing a cough reflex, which may be violent and painful and may include the discharge of blood or vomiting with eventual collapse. Other symptoms may include headache, general discomfort and anxiety.

Skin Contact: May cause severe irritation and possible ulceration from chemical burns.

Eye Contact: Cause painful burns and ulceration with inflammation of the conjunctiva, corneal opacity, iris atrophy and possible lens injury.

TOXICOLOGICAL PROPERTIES

PEL/TLV	0.5 ppm
LC_{50}	293 ppm
STEL	1 ppm
IDLH	30 ppm

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CHORINE. RESCUERS SHOULD BE EQUIPPED WITH ADEQUATE PERSONAL PROTECTIVE APPARATUS.

Inhalation: Remove patients to fresh air. Give artificial respiration if not breathing. Qualified personnel may give oxygen if breathing is difficult.
Skin Contact: Remove contaminated clothing and flush affected area with water.
Eye Contact: PERSONS WITH POTENTIAL EXPOSURE TO CHLORINE SHOULD NOT WEAR CONTACT LENSES. Immediately flush eyes with copious quantities of water and continue flushing for at least 15 minutes.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

High reactivity with organic and inorganic compounds may cause explosions and can cause or aggravate fires. Most hazardous reactions are with oxygen fluoride, oxygen difluoride, fluorine, ammonia, phosphorous and arsenic.

PHYSICAL DATA

BOILING POINT -33.97 °C	**CRITICAL TEMPERATURE** 144°C
MOLECULAR WEIGHT 70.906	**CRITICAL PRESSURE** 77.1 bar abs
SOLUBILITY IN WATER 0.7%@20 °C	**DENSITY, GAS (21.1 °C, 1 atm)** 2.98g/ml
EVAPORATION RATE N/A	**SPECIFIC GRAVITY (AIR=1)** 2.473 at 70°F
APPEARANCE AND ODOR Greenish-yellow gas with a pungent, suffocating odor. Amber colored liquid.	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	***AUTO IGNITION TEMPERATURE*** N/A	**FLAMMABLE LIMITS % BY VOLUME** LEL N/A UEL N/A

EXTINGUISHING MEDIA

Nonflammable gas. Use water to keep fire exposed cylinders cool. Shut-off cylinder when leaking. Wear full protective clothing including self-contained breathing apparatus.

SPECIAL FIRE FIGHTING PROCEDURES

In case of fire, move cylinders out of affected area immediately.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Most combustible materials burn in Chlorine as they do in oxygen. Reacts explosively or forms explosive compounds with many chemicals likes acetylene, turpenine, ether, ammonia gas, hydrogen, and finely divided metals. Under intense heat and/or flame, the cylinder can rupture.

REACTIVITY DATA

STABILITY		**CONDITIONS TO AVOID**
Unstable		N/A
Stable	X	

INCOMPATIBILITY (Materials to avoid)

Hydrocarbons, ammonia, ether, acetylene, reducing agents, combustible materials, strong oxidizer.

HAZARDOUS POLYMERIZATION		**HAZARDOUS THERMAL DECOMPOSITION PRODUCTS**
May Occur		None.
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Wear Self-Contained Breathing Apparatus and protective clothing.

WASTE DISPOSAL METHOD

Waste disposal must be in accordance with appropriate Federal, State, and local regulations. For emergency disposal assistance, contact HSG for specific advice.

SPECIAL PROTECTION INFORMATION

RESPIRTORY PROTECTION (Specify type)	
Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.	
VENTILATION	**SPECIAL**
Hood with forced ventilation.	N/A
MECHANICAL (Gen.)	**OTHER**
N/A	N/A
LOCAL EXHAUST	
To prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 18 molar percent.	
PROTECTIVE GLOVES	
PVC, Teflon®, or Kel-F®	
EYE PROTECTION	
Safety goggles or glasses	
OTHER PROTECTIVE EQUIPMENT	
Safety shoes, safety shower, eyewash “fountain” and protective clothing.	

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Chlorine DOT Shipping Label: Poison Gas and Corrosive	DOT Hazard Class: Division 2.3 I.D. No.: UN 1017
SPECIAL HANDLING RECOMMENDATIONS	
Use only in well-ventilated areas. Valve protection caps must remain in place unless cylinder is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure-reducing regulator when connecting cylinder to lower pressure piping or system. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.	
SPECIAL STORAGE RECOMMENDATIONS	
Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130^{o}F (54^{o}C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.	

OTHER RECOMMENDATIONS OR PRECAUTIONS

Because of chlorine’s extreme toxicity; local, state, and ferderal agencies recommend that a continuous monitoring analytical system with alarm be installed to monitor the atmosphere wherever chlorine is being handled or used. Compressed gas cylinders should not refilled except by qualified producers of compressed gases.

Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.