

Sample Material Safety Data Sheet (MSDS)

MSDS NUMBER: M4734
MSDS DATE: 12-13-91
PRODUCT NAME: LIQUID CHLORINE
24 HOUR EMERGENCY PHONE: 1-800-733-3665

I. PRODUCT IDENTIFICATION

HMIS HAZARD RATINGS

HEALTH HAZARD 3 FIRE HAZARD 0 REACTIVITY 1
Based on the National Paint & Coatings Associations HMIS rating system.

SARA/TITLE III HAZARD CATEGORIES (See Section X)

Immediate (ACUTE) Health: YES Reactive Hazard: NO
Delayed (Chronic) Health: NO Sudden Release of Pressure: YES
Fire Hazard: YES

MANUFACTURER'S: Occidental Chemical Corporation
NAME AND: Customer Service Occidental Tower Telephone:
ADDRESS: P.O. Box 809050, Dallas, Texas 75380 (1-800-752-5151)

CHEMICAL NAME: Chlorine CASE NUMBER: 7782-50-5
SYNONYMS/Common Names: Chlorine Gas CHEMICAL FORMULA: C12
DOT PROPER SHIPPING NAME: Chlorine DOT HAZARD CLASS: 2.3
DOT I.D. NUMBER: UN1017 DOT HAZARDOUS SUBSTANCE: RQ = 10 lbs.
ADDITIONAL DESCRIPTION REQUIREMENT: Poison Inhalation Hazard, Hazard Zone 8

II. HEALTH HAZARD INFORMATION

EMERGENCY AND FIRST AID PROCEDURES

EYES: IMMEDIATELY flush eyes with plenty of water for at least 15 minutes holding lids apart to ensure flushing of entire eye surface. Washing eyes within several seconds is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN: Treat for inhalation first. Remove contaminated clothing under safety shower. Flush exposed skin with water. Wash with soap and water. If irritation is present after washing, GET MEDICAL ATTENTION.

INHALATION: Remove to fresh air. Administer oxygen until victim breathes easily. Keep warm and at rest. In mild cases, give milk to relieve irritation. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

INGESTION: NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk.) If vomiting occurs spontaneously, keep airway clear and give more water. SEEK MEDICAL ATTENTION IMMEDIATELY.
ROUTES OF EXPOSURE

INHALATION: May cause severe irritation to respiratory tract followed by coughing, burning, chest pain, vomiting, headache, anxiety and feeling of suffocation. Severe exposure may cause pneumonitis and pulmonary edema. Repeated exposure to chlorine may result in reduced pulmonary capacity and dental erosion.

SKIN: Contact with liquid chlorine may cause burns, blistering and tissue destruction.

EYE CONTACT: Liquid and/or high concentration of chlorine gas in contact with the eyes will cause extreme irritation and/or burns.

INGESTION: Unlikely to occur.

EFFECTS OF OVEREXPOSURE

ACUTE: Liquid contact with skin or eyes may cause burns. Vapors may cause severe irritation to skin, eyes, and respiratory tract. Inhalation of large concentrations may cause pneumonitis and pulmonary edema.

CHRONIC: There are no known chronic effects from exposure to chlorine vapors at or below the accepted occupational limits for exposure. Repeated exposure to chlorine above the TLV may result in reduced pulmonary capacity and dental erosion.

TOXICOLOGY DATA: Chlorine gas is a primary irritant of the respiratory tract.

Severe exposure to vapor can be fatal. Exposure to liquid can cause burns on contact. Prompt treatment is important to minimize effects.

The hazard at different concentrations is reported to be as follows:

0.2-0.5 ppm	=	No toxic, long term effect
1-3 ppm	=	Definite odor; irritation of eyes and nose
5-8 ppm	=	Throat, eye, and mucous membrane irritation
30 ppm	=	Intense coughing fits
34-51 ppm	=	Lethal in 1 to 1.5 hours exposure
40-60 ppm	=	Exposure for 30-60 minutes without effective respiration may cause bronchitis, pulmonary edema or bronchopneumonia
100 ppm	=	May be lethal after 50 minutes of exposure (estimated)
430 ppm	=	Lowest concentration known to cause lethality after 30 minutes of exposure
1000 ppm	=	May be fatal with a few deep breaths

NOTES TO PHYSICIAN: Treatment is symptomatic. Because there is no known antidote for chlorine gas inhalation, effective and immediate relief of symptoms is the primary goal. Steroid therapy, if given early, has been reported effective in preventing pulmonary edema.

III. IMPORTANT COMPONENTS

CASE NUMBER / NAME

7782505 Chlorine

EXPOSURE LIMITS	PERCENTAGE
PEL = 0.5 ppm: 1.5 mg/m ³ TWA	VOL ND
STEL = 1 ppm: 3 mg/m ³ WT	100
TLV = 0.5 ppm: 1.5 mg/m ³ TWA	
STEL = 1 ppm: 3 mg/m ³	

COMMON NAMES:

Listed On (List Legend Below):

01 02 13 16 18

See Section II

All components of this product that are required to be on the TSCA. Inventory are listed on the inventory.

Not listed as carcinogen - IARX, NTP OSHA

LIST LEGEND

1	SARA EXTR HAZ SUB. SECTION 302	2	SARA TOXIC CHEM. SECTION 313
13	PA ENVIRONMENTAL HAZ SUBSTANCE	16	NJ WORKPLACE HAZ SUBSTANCE LST
18	NY HAZARDOUS SUBSTANCES		

IV. FIRE AND EXPLOSION DATA

FLASH POINT: N/A AUTOIGNITION TEMPERATURE: NA

FLAMMABLE LIMITS IN AIR. % BY VOLUME - UPPER: Nonflammable

LOWER: Nonflammable

EXTINGUISHING MEDIA:

Use water to keep fire-exposed containers cool. If it is necessary to stop the flow of gas, use water spray to direct escaping gas away from persons effecting the shut-off. Wear full protective clothing. Use extinguishing media as appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

In case of fire, chlorine containers should be removed from fire zone immediately. Tank cars or barges should be disconnected and pulled out of the danger area. If no chlorine is escaping, water should be applied to cool containers that cannot be moved. All unauthorized persons should be kept at a safe distance. Fire fighters must use self-contained breathing apparatus, eye protection and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Chlorine gas or liquid, it nonexplosive and nonflammable. However, like oxygen, it is capable of supporting combustion of certain substances. Reacts explosively, or forms explosive compounds, with many chemicals, such as acetylene, turpentine, ether, ammonia gas, hydrogen, and finely divided metals.

V. SPECIAL PROTECTION

VENTILATION REQUIREMENTS:

Provide general and local exhaust ventilation to meet OSHA Ceiling exposure limit of 1 ppm. Provide venting for low-lying areas. Use closed systems when possible.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY:

Use a NIOSH/MSHA approved respirator following manufacturer's recommendations where gas leaks may occur. Use supplied air respirator in positive pressure mode following ANSI Z117.1-1977 for tank and confined space entry.

EYE:

Face shield and chemical goggles should be worn.

GLOVES:

Impervious gloves should be worn. Natural rubber or latex have been used. Contaminated gloves should be discarded.

OTHER CLOTHING AND EQUIPMENT:

Standard work clothing. Wash contaminated clothing with soap and water and dry before reuse. Emergency shower and eyewash facility should be in close proximity.

VI. PHYSICAL DATA

BOILING POINT @ 760 mm Hg. -34°C (-28.3°F)

FREEZING POINT: -101°C (-150°F)

VAPOR PRESSURE: 2748mm Hg @ 0°C

SPECIFIC GRAVITY (H₂O=1): 1.4 @ 15.4°C

SOLUBILITY IN H₂O % BY WT: 0.7 % @ 20°C

VAPOR DENSITY (Air=1): 2.5

APPEARANCE AND ODOR: Amber color liquid. Greenish-yellow gas.

Pungent irritating odor.

pH: 0.7% solution has pH 5.5

% VOLATILES BY VOL: 100%

VII. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:

Chlorine is stable. Avoid the release of chlorine to the atmosphere. Do not place chlorine containers near heat or fire. Never use water on the source of a chlorine leak. Water spray may be used to direct the flow of escaping chlorine gas.

INCOMPATIBILITY:

Reducing agents, combustible materials. Keep away from materials such as acetylene, turpentine and other hydrocarbons, ammonia, hydrogen, ether, powdered metal, sulfur and aluminum. Reacts with hydrogen sulfide and water forming hydrochloric acid. Combines with carbon monoxide and sulfur dioxide forming phosgene and sulfuryl chlorine. Moist chlorine is highly corrosive to most metals. Chlorine reaction to some organic compounds can be explosive. Strong oxidizer.

HAZARDOUS DECOMPOSITION PRODUCTS:

None.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:

None.

VIII. HANDLING AND STORAGE

HANDLING AND STORAGE PRECAUTIONS:

Store chlorine containers in a well ventilated area of low fire potential and away from incompatible materials (acetylene, turpentine, other hydrocarbons, ammonia, hydrogen, ether, powdered metals, sulfur, aluminum, reducing agents and combustible materials). Keep away from heat and source of ignition. Protect container from weather and physical damage. Follow safety procedures for containers of compressed gases. Provide special training to workers handling chlorine. Regularly test and inspect piping and containment used for chlorine service. Liquid levels should be less than 85% of tank or cylinder capacity.

IX. ENVIRONMENTAL PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

If a material is spilled or released to the atmosphere, keep up-wind, provide ventilation, wear full protective equipment and shut off supply at source. Exclude non-essential personnel. Contain liquids and prevent discharges to streams or sewer systems; and control or stop the loss of volatile materials to the atmosphere. Large leaks may require environmental consideration and possible evacuation. Do not apply water to leak.

Spills or releases should be reported, if required, to the appropriate local, state and federal agencies.

NEUTRALIZING CHEMICALS:

Chlorine can be absorbed into an alkaline solution, i.e., caustic soda (NaOH), caustic potash (KOH), lime, etc.

WASTE DISPOSAL METHOD:

Move leaking container to isolated area. Position to release gas, not liquid. Absorb in alkaline solution of caustic soda, soda ash or hydrated lime.

Dispose in accordance with all federal, state, and local health and pollution regulations. Depending upon the particular situation involved, special equipment may be required. Consult your chlorine supplier.

X. ADDITIONAL INFORMATION

Spills of chlorine of 10 or more pounds must be reported to the National Response center, 1-800-424-8802.

Chlorine is contained on a list as required under Sec 101(14) of CERCLA, which includes substances designated pursuant to SEC 311 of the Clean Water Act, Hazardous Wastes under SEC 3001 of RCRA, Toxic Pollutants under SEC 307 of the Clean Water Act, Hazardous Air Pollutants under Sec 112 of the Clear Air Act, Imminently hazardous Chemicals under Sec 7 of TSCA. Chlorine is designated a hazardous substance by 29 CFR Sec 1910, Subpart Z. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) is applicable if chlorine is used as a pesticide or in water or sewer treatment applications.

OSHA Standard 29CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, materials safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

To aid our customers in complying with regulatory requirements, SARA Title III hazard categories for this product are indicated in Section I. If the word "YES" appears next to any category, this product may be reportable by you under the requirements of 40 CFR part 370. Please consult those regulations for details.

This product contains a toxic chemical or chemicals subject to the reporting requirements of SECTION 313 of TITLE III of the SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 and 40 CFR PART 372. (See Section III, List Legend 02).

XI. PREPARATION INFORMATION

For additional Non-Emergency health, safety, or environmental information, telephone (716) 286-3081, or write to:

Occidental Chemical Corporation
Product Stewardship Department
Suite 400
360 Rainbow Boulevard South
Niagara Falls, NY 14302

For Emergencies: 24 HOUR EMERGENCY PHONE: 1-800-733-3665

This MSDS replaces MSDS Number: M4734 dated 09/05/91.

WARNING LABEL INFORMATION

EPA approved label 9/87

CHLORINE

LIQUEFIED GAS

UNDER PRESSURE

NON-FLAMMABLE

ACTIVE INGREDIENT

Chlorine 99.5%

INERT INGREDIENTS 0.5%

DANGER POISON

HAZARDOUS LIQUID AND GAS UNDER PRESSURE MAY CAUSE CHEMICAL PNEUMONIA AND EVEN DEATH

IN HIGH CONCENTRATIONS MAY CAUSE SEVERE IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT

LIQUID MAY BURN EYES AND SKIN CAN REACT EXPLOSIVELY WITH ORGANIC PRODUCTS

PRECAUTIONARY STATEMENTS

HAZARD TO HUMAN AND DOMESTIC ANIMALS May be fatal if inhaled. Do not breath air containing this gas. Do not get in eyes, on skin, on clothing. Corrosive to handle or use until manufacturer's Material Safety Data Sheet has been read and understood. Wear face shield, goggles and rubber gloves when handling. Use NIOSH/MSHA approved respirator and local exhaust ventilation where vapor may be generated.

ENVIRONMENTAL HAZARDS

The product is toxic to fish. Do not discharge into lakes, streams, ponds or public waters unless in accordance with an NPDES permit. For guidance, contact regional Environmental Protection Agency office.

CHEMICAL-PHYSICAL HAZARDS

Chlorine is a non-flammable gas, liquefied, under pressure. Do not heat container. Avoid contact with organic products to prevent explosive reaction. Corrosive to most metals in presence of moisture.

STATEMENT OF PRACTICAL TREATMENT

(FIRST AID)

FOR EYES: Immediately flush eyes with plenty of water for at least 15 minutes holding eyelids apart to ensure flushing of entire eye surface. Washing eyes within several seconds after exposure is essential to achieve maximum effectiveness. **SEEK MEDICAL ATTENTION IMMEDIATELY.**

SKIN: Treat for inhalation first. Remove contaminated clothing under safety shower. Flush exposed skin with water. Wash with soap and water. If irritation is present after washing, **GET MEDICAL ATTENTION.**

INHALATION: Remove to fresh air. Administer oxygen until victim breathes easily. Keep warm and at rest. In mild cases, give milk to relieve irritation. **DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.**

INGESTION: **NEVER** give anything by mouth to an unconscious person. If swallowed, **DO NOT INDUCE VOMITING.** Give large quantities of water. (If available, give several glasses of milk.) If vomiting occurs spontaneously, keep airway clear and give more water. **SEEK MEDICAL ATTENTION IMMEDIATELY.**

DIRECTION FOR USE - GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with the labeling.

USE AS A DISINFECTANT, by experienced personnel only, in municipal water supplies, sewage and waste management plants, in accordance with applicable local, state and federal regulations.

USE IN MANUFACTURING PROCESSES, by trained personnel only, in production of bleach, plastics, chlorinated solvents, refrigerants, etc. and intermediates for products containing no chlorine. Proper training in safety and use of protective equipment are essential. Well designed and maintained handling and processing facilities are required.

STORAGE AND DISPOSAL

HANDLING AND STORAGE: Provide special training to workers handling chlorine. Do not place chlorine containers near heat or fire. Handling and storage of chlorine containers should be in accordance with all local, state, and federal regulations. Regularly test and inspect piping and containment used for chlorine service. Liquid levels should be 85% of tank or cylinder capacity.

IN THE EVENT OF FIRE: Remove chlorine containers from fire zone immediately. Use water to keep containers cool which cannot be moved, but do not use water on the source of a chlorine leak. Use water spray to direct chlorine away from persons effecting shut-off. Wear full protective clothing and self-contained breathing apparatus.

DISPOSAL: Vent waste chlorine gas into scrubber using dilute alkali solution. Dispose of resultant hypochlorate in accordance with local, state and federal regulations. Return empty chlorine tank cars and cargo tanks containing residual gas and/or liquid to supplier in compliance with applicable DOT regulations.

FOR ASSISTANCE IN CHEMICAL EMERGENCY, CALL CHEMTREC 800-424-9300

Spills of 10 pounds or more must be reported to the NATIONAL RESPONSE CENTER 1-800-424-8802.

UN 1017CAS No. 7782-50-5

HMIS HAZARD RATING NFPA FIRE HAZARD RATING

HEALTH	3	HEALTH	3
FLAMMABILITY	0	FLAMMABILITY	0
REACTIVITY	1	REACTIVITY	0

APPROXIMATE NET CONTENTS: 55 or 90 TONS

EPA REG. NO. 935-8

EPA EST. NO.	AL-001	EPA EST. NO.	NY-001
EPA EST. NO.	AL-002	EPA EST. NO.	TX-001
EPA EST. NO.	DE-001	EPA EST. NO.	TX-002
EPA EST. NO.	LA-001	EPA EST. NO.	TX-003
EPA EST. NO.	LA-002	EPA EST. NO.	WA-001

OCCIDENTAL CHEMICAL CORPORATION, OxyChem
Electrochemicals & Specialty Products
Dallas, Texas 75380

LABEL 090987M4734