

SAFETY DATA SHEET

M30816 - ANSI - EN



CHLORINE (LIQUEFIED GAS UNDER PRESSURE) (PESTICIDE)

SDS No.: M30816

SDS Revision Date: 03-Apr-2018

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, TX 75380-9050 1-800-752-5151
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Product Identifier:	CHLORINE, LIQUID (PESTICIDE)
Synonyms:	Chlorine; Chlorine - liquefied gas; Chlorine gas; Chlorine (Liquid or Gas)
Product Use:	water chlorination, water treatment chemicals, chemical synthesis, This material is a registered pesticide: EPA Registration Number 935-8
Uses Advised Against:	None identified; This is a pesticide product; do not use it in a pesticide application that is not included on its label
Note:	This product can be sold into Canada for drinking water and wastewater treatment uses.

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SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

EMERGENCY OVERVIEW:

Color: Green to yellow gas, amber liquid
Physical State: Gas
Appearance: Dissolved Gas
Odor: Irritating, Pungent

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: FATAL IF INHALED. CORROSIVE. CAUSES SEVERE SKIN BURNS AND SERIOUS EYE DAMAGE. CONTACT WITH LIQUID MAY CAUSE FROSTBITE TO EXPOSED TISSUE. ACUTE EXPOSURES CAN CAUSE DAMAGE TO RESPIRATORY SYSTEM. ACUTE EXPOSURE MAY CAUSE DELAYED PULMONARY EDEMA. CAUSES DAMAGE TO RESPIRATORY SYSTEM THROUGH PROLONGED, REPEATED EXPOSURE.

PHYSICAL HAZARDS: CONTAINS GAS UNDER PRESSURE, MAY EXPLODE IF HEATED. OXIDIZER. Hazardous gas under pressure. May ignite or explode on contact with combustible materials. May react explosively with organic materials. Corrosive to most metals in the presence of moisture.

ECOLOGICAL HAZARDS: VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS. This material is toxic to fish and aquatic organisms.

PRECAUTIONARY STATEMENTS: Do not breathe vapor or mist. Use respiratory protection as required. Do not get in eyes, on skin, or on clothing. Wear protective gloves, protective clothing, eye, and face protection. Wash thoroughly after handling. Store away from organic and combustible materials. Store in well-ventilated place. Keep container tightly closed.

ADDITIONAL HAZARD INFORMATION: Toxicity may be delayed, and may not be readily visible. Significant exposures must be referred for medical attention immediately. There is no specific antidote.

HAZARD CLASSIFICATION:

GHS: PHYSICAL HAZARDS:	Gas Under Pressure - Liquefied Oxidizing Gas
GHS: CONTACT HAZARD - SKIN:	Category 1A - Causes severe skin burns and eye damage
GHS: CONTACT HAZARD - EYE:	Category 1 - Causes serious eye damage
GHS: ACUTE TOXICITY - INHALATION:	Category 2 - Fatal if inhaled
GHS: TARGET ORGAN TOXICITY (SINGLE	Category 1 - Causes damage to: Respiratory and Nervous

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EXPOSURE):	System
GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):	Category 1 - Causes damage to respiratory system through prolonged or repeated exposure
HAZARDOUS TO AQUATIC ENVIRONMENT - ACUTE HAZARD:	Category 1 - Very toxic to aquatic life
HAZARDOUS TO AQUATIC ENVIRONMENT - CHRONIC HAZARD:	Category 1 - Very toxic to aquatic life with long lasting effects

UNKNOWN ACUTE TOXICITY: This product was tested as a whole. This information only pertains to untested mixtures.

GHS SYMBOL: Gas cylinder, Oxidizer, Skull and Crossbones, Corrosive, Health hazards



GHS SIGNAL WORD: **DANGER**

GHS HAZARD STATEMENTS:**GHS - Physical Hazard Statement(s)**

- Contains gas under pressure; may explode if heated
- May cause or intensify fire; oxidizer

GHS - Health Hazard Statement(s)

- Fatal if inhaled
- Causes severe skin burns and eye damage
- Causes serious eye damage
- Causes damage to organs (Respiratory and Nervous Systems)
- Causes damage to respiratory system through prolonged or repeated exposure by inhalation

GHS - Precautionary Statement(s) - Prevention

- Do not breathe gas or vapors
- Wear protective gloves/protective clothing/eye protection/face protection
- In case of inadequate ventilation, wear respiratory protection
- Wash face, hands and any exposed skin thoroughly after handling
- Use only outdoors or in a well-ventilated area
- Do not eat, drink or smoke when using this product
- Keep away from clothing and other combustible materials
- Keep reduction valves free from grease and oil

GHS - Precautionary Statement(s) - Response

- IF INHALED: Remove person to fresh air and keep comfortable for breathing
- Immediately call a POISON CENTER or doctor/physician
- Specific treatment is urgent (see Section 4 of SDS or first aid information on this label)
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse skin with water/shower

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- Wash contaminated clothing before reuse
- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- IF exposed: Call a POISON CENTER or doctor/physician
- Get medical advice/attention if you feel unwell
- In case of fire: Stop leak if safe to do so

GHS - Precautionary Statement(s) - Storage

- Store in a secure manner
- Protect from sunlight
- Store in a well-ventilated place. Keep container tightly closed

GHS - Precautionary Statement(s) - Disposal

- Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Hazards Not Otherwise Classified (HNOC) - GHS

Direct contact with liquid may cause frostbite to exposed tissue (eyes, skin, etc.)

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent [%]	CAS Number
Chlorine	99.5 - 100	7782-50-5

SECTION 4. FIRST AID MEASURES

INHALATION: If inhalation of vapor or gas occurs and adverse effects result, remove to uncontaminated area. Evaluate ABC's (is Airway constricted, is Breathing occurring, and is blood Circulating) and treat symptomatically. Exposed individuals may benefit from humidified air and or humidified oxygen. GET MEDICAL ATTENTION IMMEDIATELY. Significant acute exposures may result in delayed pulmonary edema. There is no specific antidote, treat symptomatically.

SKIN CONTACT: Immediately flush contaminated areas with water. Exposure to liquid may cause frostbite burns. Remove contaminated clothing, jewelry and shoes. Do not attempt to remove frozen clothing from frostbitten areas. Wash contaminated areas with large amounts of water. Thoroughly clean and dry contaminated clothing and shoes before reuse. GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT: Immediately flush contaminated eyes with a directed stream of water for as long as possible. Remove contact lenses, if present, then continue rinsing. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION: Not a likely route of exposure. Contact with liquid may cause frostbite. If swallowed, GET MEDICAL ATTENTION IMMEDIATELY.

Most Important Symptoms/Effects (Acute and Delayed):

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Acute Symptoms/Effects:

Inhalation (Breathing): Respiratory System Effects: Inhalation exposure may cause irritation, redness of upper and lower airways, coughing, laryngeospasm and edema, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. The pulmonary edema may develop several hours after a severe acute exposure.

Skin: Skin Corrosion. Skin exposure to gas or liquid may cause redness, irritation, burning sensation, swelling, blister formation, first, second, or third degree burns.

Eye: Serious Eye Damage: Acute eye exposure to 3-6 ppm in air causes sensations of stinging and burning in some individuals, with associated eyelid spasm, redness, and watering. Exposure to eyes may cause irritation and burns to the eyelids, conjunctivitis, corneal edema, and corneal burn. Contact with liquid could cause frostbite and severe injury.

Ingestion (Swallowing): No known effects. Ingestion is not a likely route of exposure.

Delayed Symptoms/Effects:

- Repeated exposures in workers have been associated with decreases in pulmonary functions, decreases in diffusing capacity, reactive airways, and hyper-responsiveness to methacoline challenge
- Prolonged frequently repeated skin contact may cause allergic reactions in some individuals.

Medical Conditions Aggravated by Exposure: Pulmonary diseases such as hyperactive airways, restrictive and obstructive pulmonary diseases such as COPD, bronchitis, emphysema, interstitial pulmonary disease. Skin disorders that compromise the integrity of the skin. Eye disorders that decrease tear production or have reduced integrity.

Protection of First-Aiders: Stay out of areas where there is liquid or gaseous chlorine. Use personal protective equipment. Refer to Section 8 for specific personal protective equipment recommendations. Remove contaminated clothing and wash before reuse. Remove affected individuals from exposure. At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission.

Notes to Physician: Symptomatic individuals without hypoxia may benefit from humidified air. Delayed pulmonary edema may occur in the context of severe and symptomatic airway exposure. There is no specific antidote. Treat symptoms with supportive care. Follow normal parameters for airway, breathing, and circulation. Probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5. FIRE-FIGHTING MEASURES

Fire Hazard: Chlorine is not combustible, but it enhances the combustion of other substances. Most combustibles will burn in this material producing irritating, corrosive, and/or toxic gases. In water, chlorine is a strong acid, corrosive, and an oxidizer. Run-off from fire control may cause pollution. If the situation allows, control and properly dispose of run-off (effluent).

Explosive properties: May ignite or explode on contact with combustible materials. May react explosively with organic materials. Pressurized containers may explode when exposed to high temperatures.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire

Fire Fighting: Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Avoid inhalation of material or combustion by-products. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Do not direct water at the source of the leak or at

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safety devices; icing may occur. Flame impingement on steel chlorine container can result in over pressurization or iron/chlorine fire causing rupture of the container. Do not get water inside containers. Move containers from the fire area if it is possible to do so without risk to personnel. Damaged cylinders should be handled only by specialists trained and properly protected by PPE as described in Section 8. For large fires and fires involving tanks or tank cars, fight the fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after the fire is out. Do not direct water at the source of the leak, because chlorine and water react to form acids and the leak will get worse. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tanks. Always stay away from tanks engulfed in fire, withdraw from the area and let the fire burn.

Component	Immediately Dangerous to Life/ Health (IDLH)
Chlorine 7782-50-5	10 ppm IDLH

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not applicable

Upper Flammability Level (air): Not applicable

Flash point: Not flammable

Auto-ignition Temperature: Not determined

GHS: PHYSICAL HAZARDS:

- Gas Under Pressure - Liquefied
- Oxidizing Gas

SECTION 6. ACCIDENTAL RELEASE MEASURES**Personal Precautions:**

Evacuate unprotected personnel upwind or crosswind for at least 100 feet (800 feet for large spills) out of danger area. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Vapors tend to accumulate in low areas. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling and Storage, for additional precautionary measures.

Environmental Precautions:

Keep out of water supplies and sewers. See Section 12 for additional ecological information. Call supplier, CHLOREP team, or CHEMTREC when help is needed. Releases should be reported, if required, to appropriate agencies.

Methods and Materials for Containment and Cleaning Up:

Remove sources of ignition. Stop leak if possible without personal risk. 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 predetermined emergency plan. Do not apply water directly to a leak. Reacts with water to form corrosive, acidic solution (hydrochloric acid). Call supplier, CHLOREP team, or CHEMTREC when help is needed.

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SECTION 7. HANDLING AND STORAGE

General: Do not attempt to store, handle or use without complete review of The Chlorine Institute Chlorine Manual (Phone: (703) 894-4140).

Precautions for Safe Handling:

Use only approved materials of construction and lubricants. Chlorine should only be used in sealed systems. Do not breathe vapours or spray mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Liquefied gas under pressure. Piping and equipment must be thoroughly cleaned of organics and moisture before use. Corrosive to most metals in the presence of moisture. Liquid lines must have suitable expansion chambers between block valves due to the high coefficient of expansion.

Safe Storage Conditions:

Store and handle in accordance with all current regulations and standards. Keep container tightly closed. Store in a well-ventilated area. Protect from sunlight. Do not apply heat. Keep away from heat, sparks and open flames. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet). Avoid contact with water or moisture. Reacts with water to form a corrosive, acidic solution. The vapor is heavier than air. Most vapors that are heavier than air will spread along ground and collect in low or confined areas (drains, basements, tanks). Store away from basements, pits or other confined spaces. Make daily inspections for leaks. Protect from physical damage.

Incompatibilities/ Materials to Avoid:

ammonia, elemental metals, metal hydrides, carbides, nitrides, oxides, phosphides, sulfides, easily oxidized materials, organic materials, (e.g., petrochemicals, oils, greases), unstable and reactive compounds

GHS: PHYSICAL HAZARDS:

- Gas Under Pressure - Liquefied
- Oxidizing Gas

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**REGULATORY EXPOSURE LIMIT(S):**

As listed below.

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Chlorine 7782-50-5	-----	-----	1 ppm 3 mg/m ³

- OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit
- OSHA Ceiling values indicate the exposure limit which at no time shall be exceeded. Instantaneous monitoring is the preferred method to determine compliance with OSHA Ceiling values. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time during the working day [29CFR1910.1000(a)(1)]

NON-REGULATORY EXPOSURE LIMIT(S):

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As listed below.

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Chlorine	0.1 ppm	0.4 ppm	-----	-----	0.5 ppm 1.5 mg/m ³	1 ppm 3 mg/m ³	-----

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

ENGINEERING CONTROLS: Do not use in poorly ventilated or confined spaces. Use closed systems when possible. Provide local exhaust ventilation where vapor or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear safety glasses with side-shields. Wear chemical safety goggles with a face shield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear appropriate chemical resistant clothing. When responding to accidental release of unknown concentrations, wear one-piece, total encapsulating suit of Butyl coated nylon or equivalent.

Hand Protection: Wear chemical resistant, insulated gloves such as Perfect Fit NL-56(TM) or Best 6781R(TM). Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types:

Perfect Fit NL-56(TM), Best 6781R(TM), Best Nitri Solve 727(TM), Tychem 10000 (TM)

Respiratory Protection: Where vapor concentration exceeds or is likely to exceed applicable exposure limits, a NIOSH approved respirator is required. When an air purifying respirator is not adequate for spills and/or emergencies of unknown concentrations, an approved self-contained breathing apparatus operated in the pressure demand mode is required. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Chlorine 7782-50-5	10 ppm IDLH

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Gas
Appearance: Dissolved Gas

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Color:	Green to yellow gas, amber liquid
Odor:	Irritating, Pungent
Odor Threshold [ppm]:	0.31 ppm (approximate).
Molecular Weight:	70.91
Molecular Formula:	Cl ₂
Boiling Point/Range:	-29.27 °F (-34.04 °C)
Freezing Point/Range:	-150 °F (-101 °C).
Melting Point/Range:	Not applicable
Vapor Pressure:	5830 mmHg @ 25 °C
Vapor Density (air=1):	2.4
Relative Density/Specific Gravity (water=1):	1.4 @ 15.6 °C
Density:	11.7 lbs/gal @ 15.6 °C
Water Solubility:	0.7% @ 20 C
pH:	Not applicable
Volatility:	100%
Evaporation Rate (ether=1):	No data available
Partition Coefficient (n-octanol/water):	No data available
Flash point:	Not flammable
Flammability (solid, gas):	No data available
Lower Flammability Level (air):	Not applicable
Upper Flammability Level (air):	Not applicable
Auto-ignition Temperature:	Not determined
Viscosity:	No data available

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Oxidizer.

Possibility of Hazardous Reactions: Dry material is highly reactive with titanium and tin. Reacts with most metals at high temperatures or in the presence of moisture. Avoid contact with water. Reacts with water to form corrosive, acidic solution (hydrochloric acid). May react explosively with organic materials.

Conditions to Avoid:

- (e.g., static discharge, shock, or vibration) -
- No information available

Incompatibilities/ Materials to Avoid: ammonia; elemental metals; metal hydrides; carbides; nitrides; oxides; phosphides; sulfides; easily oxidized materials; organic materials; (e.g., petrochemicals, oils, greases); unstable and reactive compounds

Hazardous Decomposition Products: None known

Hazardous Polymerization: Will not occur.

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SECTION 11. TOXICOLOGICAL INFORMATION**TOXICITY DATA:**

Component	LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
Chlorine 7782-50-5	No information available	No information available	293 ppm (1 hr - Rat)

POTENTIAL HEALTH EFFECTS:

Eye contact:	Causes serious eye damage. Liquid exposure may cause frostbite.
Skin contact:	Causes skin burns. Liquid exposure may cause frostbite.
Inhalation:	May cause irritation (possibly severe), chemical burns, and pulmonary edema. Significant exposures may be fatal.
Ingestion:	Not a likely route of exposure. Ingestion of product may cause irritation and burns to the contacted tissue.

SIGNS AND SYMPTOMS OF EXPOSURE:

Listed below.

Inhalation (Breathing): Respiratory System Effects: Inhalation exposure may cause irritation, redness of upper and lower airways, coughing, laryngeospasm and edema, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. The pulmonary edema may develop several hours after a severe acute exposure.

Skin: Skin Corrosion. Skin exposure to gas or liquid may cause redness, irritation, burning sensation, swelling, blister formation, first, second, or third degree burns.

Eye: Serious Eye Damage: Acute eye exposure to 3-6 ppm in air causes sensations of stinging and burning in some individuals, with associated eyelid spasm, redness, and watering. Exposure to eyes may cause irritation and burns to the eyelids, conjunctivitis, corneal edema, and corneal burn. Contact with liquid could cause frostbite and severe injury.

Ingestion (Swallowing): No known effects. Ingestion is not a likely route of exposure.

ACUTE TOXICITY:

- This material is corrosive to the skin, eyes, and respiratory tract. Breathing this material is harmful and can causedeath. Harmful effects include burns and permanent damage to the airways, including the nose, throat, and lungs.
- The extent of injury following chlorine exposure depends upon concentration and duration of exposure as well aswater content of the tissue involved.
- Estimated effects are as follows:
 - 0.2 - 0.4 ppm odor detection (some tolerance develops)

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- 1 - 3 ppm mild mucous membrane irritation (can be tolerated ~ 1 hour)
- 5 - 15 ppm moderate irritation of upper respiratory tract
- 30 ppm immediate chest pain, vomiting, dyspnea, cough
- 40 - 60 ppm toxic pneumonitis and pulmonary edema
- 430 ppm lethal over 30 minutes
- 1000 ppm fatal within a few minutes

• Its action in the respiratory tract is due to its strong oxidizing capability; it forms both hypochlorous acid and hypochloric acid on contact with moist mucous membranes. Symptoms of pulmonary congestion and edema may develop after a latency period of several hours following severe acute exposure to chlorine

CHRONIC TOXICITY:

Prolonged frequently repeated skin contact may cause allergic reactions in some individuals. Repeat exposures in workers have been associated with decreases in pulmonary functions, decreases in diffusing capacity, reactive airways, and hyper-responsiveness to methacholine challenge. Long term overexposure may produce upper airway changes leading to an increased prevalence of colds, shortness of breath, and reactive airway dysfunction syndrome.

ADDITIONAL DATA: Odor does not provide an adequate warning of exposure. In workers exposed to chlorine for a 2 to 5 year period, all had some degree of olfactory impairment. Sensory irritation tolerance developed in rats when they were pretreated with 1 ppm chlorine.

GHS HEALTH HAZARDS:

Listed below.

GHS: ACUTE TOXICITY - INHALATION: Category 2 - Fatal if inhaled.

GHS: CONTACT HAZARD - EYE: Category 1 - Causes serious eye damage

GHS: CONTACT HAZARD - SKIN: Category 1 - Causes severe skin burns and eye damage.

Skin Absorbent / Dermal Route: Yes.

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):

Category 1 - Causes damage to: Respiratory and Nervous System

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure):

Category 1 - Respiratory System (Lungs)

MUTAGENIC DATA:

Not classified as a mutagen per GHS criteria. This material has tested positive in one or more in vitro mutagenicity studies.

OTHER HAZARDS:

Direct contact with liquid may cause frostbite to exposed tissue (eyes, skin, etc.).

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

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Aquatic Toxicity:

This material is highly toxic to fish and aquatic organisms

Fish Toxicity:

LC50 Fathead minnow: 0.07 to 0.15 (96 hour)

LC50 Bluegill: 0.44 mg/l (96 hour)

Invertebrate Toxicity:

LC50 Daphnia: 30 to 150 ug/L (48 hour)

FATE AND TRANSPORT:

BIODEGRADATION: This material is an element and not subject to biodegradation.

PERSISTENCE: The atmospheric half-life and lifetime of this material due to photolysis is estimated at 10 and 14 minutes, respectively. The half-life of free residual material in fresh water has been estimated at 1.3 to 5 hours.

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited toxicity to terrestrial organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:

Use or process if possible. Chlorine may be absorbed into an alkaline solution such as caustic soda, soda ash or hydrated lime. Dispose in accordance with all applicable regulations.

Container Management:

Return empty chlorine tankcars and cargo tanks containing residual gas and/or liquid to supplier in compliance with applicable DOT regulations. See product label for container disposal information.

SECTION 14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1017

PROPER SHIPPING NAME: Chlorine

HAZARD CLASS/ DIVISION: 2.3 (5.1, 8)

LABELING REQUIREMENTS: 2.3, 5.1, 8

MARINE POLLUTANT: Chlorine

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RQ (lbs.): RQ 10 Lbs. (Chlorine)

ADDITIONAL INFORMATION: Toxic-Inhalation Hazard Zone B.**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:*** **NOTE:** Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code.

UN NUMBER: UN1017
 SHIPPING NAME: Chlorine
 CLASS OR DIVISION: 2.3, 5.1, 8
 LABELING REQUIREMENTS: 2.3, 5.1, 8
 OTHER INFORMATION: Emergency Response Assistance Plan (ERAP) may be required

MARITIME TRANSPORT (IMO / IMDG) Regulated* **NOTE:** Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code.

UN NUMBER: UN1017
 PROPER SHIPPING NAME: Chlorine
 LABELING REQUIREMENTS: 2.3, 5.1, 8, Environmental hazard
 MARINE POLLUTANT: Chlorine

AIR TRANSPORT (ICAO / IATA) Regulated**SECTION 15. REGULATORY INFORMATION****U.S. REGULATIONS****OSHA REGULATORY STATUS:**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	U.S. DOT Hazardous Substances/ RQs	CERCLA Hazardous Substances / RQs	CERCLA Section 302 EHS EPCRA RQs	Section 302 Threshold Planning Quantity (TPQs)
Chlorine 7782-50-5	10 lbs(RQ)	10 lb(final RQ)	10 lb(EPCRA RQ)	100 lb TPQ

SARA EHS Chemical (40 CFR 355.30)

If a release is reportable under EPCRA, notify the state emergency response commission and local emergency planning committee. If the TPQ is met, facilities are subject to reporting requirements under EPCRA Sections 311 and 312.

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):

Acute Health Hazard, Fire Hazard, Sudden Release of Pressure, Chronic Health Hazard, Extremely Hazardous

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SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):

Physical Hazard - Gas Under Pressure
 Physical Hazard - Oxidizer (liquid, solid or gas)
 Health Hazard - Acute Toxin (any route of exposure)
 Health Hazard - Skin Corrosion or Irritation
 Health Hazard - Serious eye damage or eye irritation
 Health Hazard - Specific Target Organ Toxicity (STOT) Single Exposure (SE)
 Health Hazard - Specific Target Organ Toxicity (STOT) Repeat Exposure (RE)

EPCRA SECTION 313 (40 CFR 372.65):

The following chemicals are listed in 40 CFR 372.65 and may be subject to Community Right-to Know Reporting requirements

Component	SARA 313 - Emission Reporting	SARA 313 PBT
Chlorine	1.0% (de minimis concentration)	Not Listed

DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):

This product is regulated under the U.S. Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) as follows:

Component	DHS - Security Issues	DHS-Sabotage Screening Threshold Qty.	DHS-Sabotage Min. Conc.	DHS-Theft Screening Threshold Qty.	DHS-Theft Min. Conc.	DHS-Release Screening Threshold Qty.	DHS-Release Min. Conc.	CWC Toxic Chemicals:
Chlorine 7782-50-5	Release - Toxic; Theft - Weapons of Mass Effect	Not Listed	Not Listed	500 lb STQ	9.77 % Minimum Concentration	2500 lb STQ	1.0% Minimum Concentration	

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):

CHLORINE: 1500 LBS TQ

Component	EPA RMP Toxic or Flammable TPQ	PSM - Highly Hazardous Substances	Flash Point
Chlorine	Toxic (2500 lb threshold quantity)	1500 lb TQ	

FIFRA REGULATIONS: Registered pesticide under 40 CFR 152.10, Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), EPA Reg. No. 935-8 (Chlorine Liquefied Gas)

FIFRA LABELING REQUIREMENTS: - This chemical is a pesticide product registered by the United States Environmental Protection Agency (EPA) and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

- FIFRA Signal Word - DANGER - POISON
- FIFRA Symbol - Skull and Crossbones
- Fatal if inhaled
- Liquid causes severe burns
- Fatal if inhaled or absorbed through skin
- Corrosive
- Causes irreversible eye damage and skin burns
- Prolonged frequently repeated skin contact may cause allergic reactions in some individuals
- This product is toxic to fish and aquatic organisms
- Chlorine is a non-flammable gas, liquefied, under pressure

CHLORINE (LIQUEFIED GAS UNDER PRESSURE) (PESTICIDE)

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- Corrosive to most metals in the presence of moisture

EPA'S CLEAN WATER AND CLEAN AIR ACTS:

Component	Clean Water Act - Priority Pollutants	CAA - ODS CLASS 1 AND CLASS 2	CAA - Volatile Organic Compounds (VOCs) in SOCM1	CAA - HON Rule - Organic HAPs	CAA - Hazard Air Pollutants	CAA - Urban HAPs List (Integrated Urban Strategy)	SNAP - Substitutes for ODS	EPA RMP Toxic or Flammable TPQ
Chlorine 7782-50-5 (99.5 - 100)	Not Listed	Not Listed	Not Listed	Not Listed	Present	Not Listed	Not Listed	Toxic (2500 lb threshold quantity)

NATIONAL INVENTORY STATUS

Component	TSCA Inventory	TSCA 12(b)	TSCA - Section 4	TSCA - Section 5	TSCA - Section 6	TSCA - Section 8	TSCA - 8(a) PAIR	TSCA - 8(d) IUR	TSCA - 8(a) CAIR
7782-50-5	Listed	Not Listed	Not listed	Not Listed	Not listed	Not listed	Not listed	Not listed	Not listed

U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA): All components are listed or exempt.**TSCA 12(b):** This product is not subject to export notification.**Canadian Chemical Inventory:** All components of this product are listed on either the DSL or the NDSL.

Component	DSL	NDSL
Chlorine 7782-50-5	Listed	Not Listed

STATE REGULATIONS

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List
Chlorine 7782-50-5	Not Listed	Not Listed	Not Listed	Listed	0367	Not Listed

Component	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List	Rhode Island Right to Know Hazardous Substance List
Chlorine 7782-50-5	Listed	Listed	Not Listed	Present	Listed

CANADIAN REGULATIONS

• This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations

Component	Canada - CEPA - Schedule I - List of Toxic Substances	Canada - NPRI	Canada - CEPA - 2010 Greenhouse Gases (GHG) Subject to Mandatory Reporting	Canadian Chemical Inventory:	NDSL:
Chlorine	Not listed	Part 1, Group 1 Substance	Not Listed	Listed	Not Listed

WHMIS - Classifications of Substances:

CHLORINE (LIQUEFIED GAS UNDER PRESSURE) (PESTICIDE)

SDS No.: M30816

SDS Revision Date: 03-Apr-2018

- A - Compressed Gas
- C - Oxidizing Material
- D1A - Poisonous and Infectious Material; Materials causing immediate and serious toxic effects - Very toxic material
- E - Corrosive material

WHMIS Hazard Class:

- A Compressed gases
- C Oxidizing materials
- D1A Very toxic materials
- E Corrosive material

SECTION 16. OTHER INFORMATION

Prepared by: Occidental Chemical Corporation - HES&S Product Stewardship Department

Rev. Date: 03-Apr-2018

Reason for Revision:

- Exposure Level has changed. SEE SECTION 8
- Added Department of Homeland Security Anti-Terrorism Information: SEE SECTION 15
- Added LOLI tables such as EPA'S Clean Water / Air Act, TSCA status, DHS, PSM, EPCRA, CERCLA, Federal Canadian: SEE SECTION 15
- Added SARA Hazard Categories Aligned with GHS (2018): SEE SECTION 15

IMPORTANT:

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OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, 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 Safety Data Sheet available to your employees.

End of Safety Data Sheet