



# UNIVAR

**Univar USA Inc.**  
**17425 NE Union Hill Road**  
**Redmond, WA 98052**  
**(425) 889-3400**

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

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The Version Date and Number for this MSDS is : 02/21/2008 - #002

PRODUCT NAME: CHLORINE  
MSDS NUMBER: PZ73602  
DATE ISSUED: 10/25/2007  
SUPERSEDES: NEW  
ISSUED BY: 008812

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## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: CHLORINE  
SYNONYMS: Chlorine; Cl2

Distributed by:  
Univar USA Inc.  
17425 NE Union Hill Road  
Redmond, WA 98052  
425-889-3400

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Material/CAS Number	Percent
Chlorine	99.9
7782-50-5	

Note: Balance is inert ingredients.

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW:

DANGER! Poison. Corrosive - Causes severe burns. May be fatal if inhaled.

Environmental Hazard -- This product is toxic to fish. Keep out of lakes, streams, ponds, or other waters.

Precautions: Personnel near or handling chlorine should at all times, carry a NIOSH approved chemical cartridge type escape respirator and be trained in its use. Avoid breathing gas. Use with adequate ventilation. Ventilation must be sufficient to limit employee exposure at or below permissible limits. Avoid contact with eyes, skin, and clothing. At high concentrations, chlorine is corrosive to eyes, skin, and mucous membranes.

#### 4. FIRST AID MEASURES

INHALATION: Immediately remove the exposed person upwind from contaminated area. Contact a poison control center, emergency room or physician as soon as possible as further treatment will be necessary. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen if equipment and trained personnel are available. If exposed person is breathing, place in a comfortable position. Keep exposed person warm and at rest until medical assistance becomes available. Effects may be delayed. Rest is recommended after exposure.

EYE/SKIN CONTACT: EYE: Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. Contact a poison control center, emergency room or physician right away as further treatment will be necessary. SKIN: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

INGESTION: This route of exposure is not applicable.

#### NOTES TO PHYSICIAN:

Excellent warning properties force rapid escape from chlorine gas. Exposure to high concentrations for a short time can result in acute respiratory failure with later complications being tracheobronchopneumonitis and pulmonary edema. A person with a severe inhalation exposure should be hospitalized and treated as a respiratory emergency. Any chlorine exposure in an individual with compromised pulmonary function (COPD) should be regarded as a severe inhalation and as a respiratory emergency.

#### 5. FIRE-FIGHTING MEASURES

FLASH POINT: Non-Flammable

EXTINGUISHING MEDIA: Not applicable.

SPECIAL FIREFIGHTING PROCEDURES: Fire-fighters must wear NIOSH approved, pressure demand, self-contained breathing apparatus with full face piece for possible exposure to hazardous gases. Chlorine containers should be immediately removed from the vicinity of a fire. If they cannot be removed, notify firefighters and spray water to cool containers. Do not spray water on leaking containers. Chlorine will support combustion. It reacts readily with hydrocarbons, alcohols, ethers, and some metals, possibly with explosive violence. It will react with (burn) steel containers at temperatures above 450 deg F.

## 6. ACCIDENTAL RELEASE MEASURES

### ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Immediately evacuate all personnel by first moving at right angles to the wind direction until clear of the exposure area. Only trained personnel wearing NIOSH approved, self-contained breathing apparatus or full facepiece airline respirators with auxiliary SCBA's operated in the pressure/demand mode should be permitted to enter area. Never put water on a chlorine leak. To locate leak use commercial ammonia water (26 be) in a squeeze bottle or a cloth tied to a stick and dipped in ammonia water. When ammonia water is held near (but not on) a chlorine leak or is sprayed into the air near a chlorine leak, a white fog of ammonia chloride forms. Care should be taken to avoid spraying ammonia water on copper fittings. Personnel wearing full facepiece, self-contained breathing apparatus should position themselves up-wind so escaping chlorine moves away from them. For leaks in cylinders and ton containers, rotate cylinder so gas escapes instead of liquid. If possible, remove to an isolated spot. Emergency capping kits for cylinders, ton containers, tank cars, and tank trucks include step-by-step instructions and tools.

## 7. HANDLING AND STORAGE

### PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORAGE:

Store in well-maintained, fireproof area away from other containers. Keep away from heat and moisture. Heating could melt plugs on cylinders and ton tanks and cause safety valves on tank cars to vent, causing leaks. Moisture (more than 150 ppm or water) and chlorine can form hydrochloric and hypochlorous acids, which are corrosive. Never, place a leaking container in water or spray leaking container with water. Make sure piping is dry and free of contamination of any type before admitting chlorine. Use only dry, oil-free air (-40 deg F dew point minimum) or oil-free nitrogen for purging, testing for leaks, or padding. Never tamper with fusible plugs or safety devices on containers; never manifold containers from liquid valves. This product is toxic to fish. Keep out of lakes, streams, ponds, or other waters. Do not contaminate water by cleaning of equipment or disposal of wastes.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Limits:

8-hour Time Weighted Average (TWA); 15-minute Short-Term Exposure Limit (STEL)

OSHA: The OSHA exposure limit(s) for chlorine: 0.5 ppm TWA. 1 ppm STEL. (1989 Vacated PEL's) 1 ppm ceiling.

ACGIH: The ACGIH exposure limit(s) for chlorine: 0.5 ppm TWA. 1 ppm STEL.

ONTARIO: The Ontario Exposure limit(s) for Chlorine: 0.5 ppm TWAEV 1 ppm STEV (Short Term Exposure Value)

RESPIRATORY PROTECTION: Use NIOSH approved acid gas cartridge or canister respirator for routine work purposes when concentrations are above the permissible exposure limits. Use full facepiece respirators when concentrations are irritating to the eyes. A cartridge-type escape respirator should be carried at all times when handling chlorine for escape only in case of a spill or leak. Re-enter area only with NIOSH approved, self-contained

breathing apparatus with full facepiece.

VENTILATION: Use local exhaust or general room/dilution ventilation sufficient to maintain employee exposure below permissible exposure limits.

EYE AND FACE PROTECTION: Splashproof goggles.

PROTECTIVE GLOVES: Butyl rubber. Neoprene.

OTHER PROTECTIVE EQUIPMENT: Boots, aprons, or chemical suits should be used when necessary to prevent skin contact.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	-29.31 deg F (-34 deg C)
Vapor Density (Air=1):	2.67 @ 70 deg F
Specific Gravity (Water=1):	1.468 liquid @ 0/4 deg C
pH:	Acidic
FREEZING/MELTING POINT:	-101 deg C
SOLUBILITY (wt.% in water):	0.73 @ 20 deg C
Bulk Density (kg/M3):	3.2 grams/liter
VOLUME % VOLATILE:	100
VAPOR PRESSURE:	4996 mm Hg @ 68 deg F
Evaporation Rate:	NA
HEAT OF SOLUTION:	Unknown
Physical State:	Gas under atmosphere conditions or liquid under pressure.
Odor:	Pungent, irritating.
COLOR:	Greenish-yellow gas or amber liquid

## 10. STABILITY AND REACTIVITY

Stability: Stable.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITY (CONDITIONS/MATERIALS TO AVOID): Excessive heat. Contamination. Organic materials (such as hydrocarbons, alcohols, and ethers). Ammonia. Hydrogen. Amines.

HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS: None known.

## 11. TOXICOLOGICAL INFORMATION

ACUTE INHALATION LC50: 293 ppm (rat) (1 hour) Moderate toxicity.

CARCINOGENICITY STATUS: This product is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

MEDICAL CONDITIONS AGGRAVATED: Asthma, respiratory and cardiovascular disease.

EFFECTS OF OVEREXPOSURE:

ACUTE:

Ingestion: Not applicable for gas. Liquid could produce severe burns and injury on contact.

Eye/Skin: Liquid and concentrated gas could produce severe burns and injury on contact. Chlorine gas can cause a stinging or burning sensation to the eyes at concentrations as low as 3-6 ppm.

Inhalation: Lethal concentration for rabbits, cats, and guinea pigs based on 30-60 minute exposure = 0.4-0.9 mg/L air (280-630 ppm). Inhalation can cause coughing, sneezing, shortness of breath, sensation of tightness in the chest, as well as severe restlessness or anxiety, nausea, and vomiting. The nose and throat may become irritated; a stinging and burning sensation may be experienced. Immediate fatalities can occur as a result of suffocation. Delayed fatalities can occur as a result of pulmonary edema (fluid in the lungs). For this reason, rest and immediate attention after inhalation is important. Persons with known cardiovascular or lung problems should not risk chlorine exposure.

Studies have been conducted exposing human volunteers to airborne concentrations of chlorine between 0.5 and 2 ppm for up to 8 hours. In these studies, eight-hour exposures to 1 ppm produced transient changes in pulmonary function and increased subjective irritation. Eight-hour exposures at 0.5 ppm produced no significant change in pulmonary function and less severe subjective irritation.

CHRONIC: Repeated exposures can result in a loss of ability to detect the odor of chlorine. Long term exposures may cause damage to teeth and inflammation or ulceration of the nasal passages.

A study was conducted on diaphragm cell workers at 25 plants manufacturing chlorine in North America where exposures ranged from 0.006 ppm to 1.42 ppm with a mean of 0.146 ppm. The study found that these chlorine workers were not affected in any measurable way by years of exposure to low levels of chlorine. There was no higher incidence of abnormal chest x-rays, abnormal EKG's or pulmonary function among these workers.

## 12 . ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL INFORMATION:

Highly toxic to aquatic life. 0.4 mg/I (Bluegill) 96-hour TLM LC50. Cold water fish (trout) - LC50 = 660 microgram/liter or 0.006-0.060 mg/L of total residue chlorine at different life stages and for different species. Warm water fish - LC50 = 0.09 - 0.3 mg/I of total residue chlorine.

### ENVIRONMENTAL FATE:

No data at this time.

## 13 . DISPOSAL CONSIDERATIONS

### DISPOSAL METHOD:

Waste material must be disposed of in accordance with federal, state, provincial, and local environmental control regulations.

## 14 . TRANSPORT INFORMATION

Proper Shipping Name: Chlorine  
Hazard Class: 2.3 (Poison Gas--Inhalation Hazard--Zone B)  
Subsidiary Risk: 8 (Corrosive).  
UN Number: UN1017  
Packing Group: Not Applicable

USA-RQ, Hazardous Substance and Quantity: 10 lbs./4.5 kg. (chlorine)  
Marine Pollutant: Regular  
Additional Information: This material is Forbidden for Air Transport.

## 15 . REGULATORY INFORMATION

USA TSCA: All components of this product are listed on the TSCA Inventory.

EU EINECS: All components in this product are listed on EINECS.

CANADA DOMESTIC SUBSTANCES LIST (DSL): This product and/or all of its components are listed on the Canadian DSL.

AUSTRALIA AICS: All components of this product are listed on AICS.

KOREA ECL: All components in this product are listed on the Korean Existing Chemicals Inventory (KECI).

JAPAN MITI (ENCS): All components of this product are listed on MITI.

PHILIPPINES PICCS: All of the components in this product are listed on the Philippines Inventory of Chemicals and Chemical Substances (PICCS).

CHINA IECSC: All components of this product are listed on the Inventory of Existing Chemical Substances in China (IECSC) or otherwise exempt.

### SARA TITLE III:

SARA (311, 312) Hazard Class:

Acute Health Hazard. Reactive Hazard. Sudden Release of Pressure.

### SARA (313) Chemicals:

This product contains toxic chemical(s) listed below which is(are) subject to the reporting requirement of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

CHLORINE//7782-50-5

### SARA Extremely Hazardous Substance:

The following materials are listed as Extremely Hazardous Substances in 40 CFR Part 355: CAS:7782-50-5//Chemical Name: CHLORINE///TPQ: 100 lbs.

### CERCLA Hazardous Substance:

The following materials are listed as CERCLA Hazardous Substances in Table 302.4 of 40 CFR Part 302: Chlorine (7782-50-5) RQ = 10 lbs./4.54 kg.

CANADA REGULATIONS (WHMIS): Class A - Compressed Gas. Class D1A - Very Toxic Materials. Class E - Corrosive Material.

### FIFRA:

This product is registered with EPA as a pesticide.

16. OTHER INFORMATION

Other Information:

NSF Drinking Water Treatment Chemicals Listing - PPG chlorine is certified for maximum use at 30 mg/L under NSF/ANSI Standard 60.

For Additional Information:

Contact: MSDS Coordinator - Univar USA

During business hours, Pacific Time - (425) 889-3400

NOTICE

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END OF MSDS