

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 16295

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PRODUCT NAME: CHLORINE, LIQUID

Effective Date: 07/16/90 Date Printed: 07/18/90

MSDS:001122

1. INGREDIENTS: (% w/w, unless otherwise noted)

Chlorine

CAS# 007782-50-5 99.9%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: -29.3F (-34C)

VAP PRESS: 82 psig @ 68F, 20C

VAP DENSITY: 2.49 @ 32F, 0C

SOL. IN WATER: 0.73g/100g H₂O @ 20C

SP. GRAVITY: 1.47 @ 32F, 0C; 53.2 psia

APPEARANCE: Amber color; liquified gas under pressure;
vaporizes to greenish - yellow gas.

ODOR: Pungent odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: None

METHOD USED: Not applicable

FLAMMABLE LIMITS

LFL: Not applicable

UFL: Not applicable

EXTINGUISHING MEDIA: Chlorine will react or cause reducing

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3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

materials to burn without oxygen. Water is effective only as a cooling media to reduce the reaction rate, however, water should not be applied directly to the chlorine leak. Where practical attempts should be made to reduce the available reactants through the isolation of the reaction from the chemical supply. This should be attempted only by properly trained personnel using prescribed protective equipment.

FIRE & EXPLOSION HAZARDS: May react to cause fire and/or explosion upon contact with many organic compounds, ammonia, hydrogen, or many metals, and with all metals, including steel, at elevated temperatures.

FIRE-FIGHTING EQUIPMENT: A positive pressure self-contained breathing apparatus for respiratory protection and protective clothing.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Avoid proximity to flammable materials including chemicals.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Many organic compounds, ammonia, hydrogen, moist or hot steel, and many metals. May react explosively with some organics under confinement.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

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5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Move unprotected personnel cross-wind to a clear area. Do not use water directly on a chlorine leak. A fog nozzle may be used to absorb gas. The leak should be isolated or controlled by trained personnel using prescribed protective equipment.

DISPOSAL METHOD: Prior to disposal, the active chlorine must be reduced or destroyed. Chlorine may be absorbed in dilute solutions of caustic (NaOH), soda ash (Na₂CO₃), or hydrated lime (Ca(OH)₂). Caustic and soda ash solutions should contain approximately 3 pounds per gallon, lime 1 pound per gallon, for 1 pound chlorine. Local, municipal or state authorities should be contacted for disposal of resultant product.

6. HEALTH HAZARD DATA:

EYE: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness.

SKIN CONTACT: Short single exposure may cause severe skin burns.

SKIN ABSORPTION: The dermal LD₅₀ has not been determined.

INGESTION: Ingestion is unlikely due to physical state.

INHALATION: A single brief (minutes) inhalation exposure to easily attainable concentrations may cause serious adverse effects, even death. Excessive exposure may cause severe irritation to upper respiratory tract and lungs and may cause lung injury. The LC₅₀ for mice was 137 ppm and for rats 293 ppm for 1 hour.

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6. HEALTH HAZARD DATA: (CONTINUED)

SYSTEMIC & OTHER EFFECTS: Excessive exposure may cause liver, lung and kidney effects, severe irritation to upper respiratory tract and lungs, and lung injury. Excessive exposure to chlorine gas has been known to also cause erosion of tooth enamel. No evidence has been found that chlorine is a carcinogen. Limited data suggests that chlorine is not teratogenic but may be slightly embryotoxic when administered at high doses in drinking water to pregnant rats. In animal studies, has been shown not to interfere with reproduction. Results of mutagenicity tests in animals have been negative. Has been shown to have mutagenic activity in bacteria.

7. FIRST AID:

EYES: Immediate and continuous irrigation with flowing water for at least 30 minutes is imperative. Prompt medical consultation is essential.

SKIN: Wash off in flowing water or shower. Remove contaminated clothing immediately and launder before reuse.

INGESTION: No adverse effects anticipated by this route of exposure due to gaseous state.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: If burn is present, treat as any thermal burn, after decontamination. Excellent warning properties force rapid escape from chlorine gas; thus most inhalations are mild to moderate. If escape is not possible, exposure to high

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7. FIRST AID: (CONTINUED)

concentrations for a very short time can result in dyspnea, hemoptysis and cyanosis with later complications being tracheobronchopneumonitis and pulmonary edema. Oxygen, intermittent positive pressure breathing and aerosolized bronchodilators are of therapeutic value in the light to moderate inhalation. A severe inhalation should be hospitalized and treated as a respiratory emergency. Any chlorine inhalation in an individual with compromised pulmonary function (COPD) should be regarded as a severe inhalation and a respiratory emergency.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): Chlorine: ACGIH TLV is 1 ppm TWA, 3 ppm STEL; OSHA PEL is 0.5 ppm TWA, 1 ppm STEL.

VENTILATION: Control airborne concentrations below the exposure guideline. Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Lethal concentrations may exist in areas with poor ventilation.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation. Safety shower should be located in immediate work area. Remove contaminated clothing immediately and launder before reuse.

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8. HANDLING PRECAUTIONS: (CONTINUED)

EYE PROTECTION: Use chemical goggles. If vapor exposure causes eye irritation, use a positive pressure full-face respirator. Eye wash fountain should be located in immediate work area.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: No attempt should be made to handle or store chlorine without a complete review of the Chlorine Manual, available from the Chlorine Institute, Inc., 2001 L Street N.W., Washington, DC 20036.

MSDS STATUS: Revised section 9 and regsheets.

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REGULATORY INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U.S. REGULATIONS

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SARA 313 INFORMATION: This product contains the following substances 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:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
CHLORINE	007782-50-5	100 %

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard

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REGULATORY INFORMATION: (CONTINUED)

A delayed health hazard
A sudden release of pressure hazard
A reactive hazard

CANADIAN REGULATIONS

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The Workplace Hazardous Materials Information System (W.H.M.I.S.)
Classification for this product is:

A
C
E

The Transportation of Dangerous Goods Act (T.D.G.A.) classification for
this product is:

Chlorine/Class 2.4/UN 1017/ERP2-0011

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