



Material Safety Data Sheet

1. Product and Company Identification

Product name : **Chlorine**

Chemical formula : CL₂

Synonyms : Chlorine Molecular; Diatomic Chlorine; Dichlorine; Molecular Chlorine; UN 1017

Company : Med Tech Gases, inc.
20 Hall Street
Medford, MA 02155

Telephone : 800-FINE-GAS

Emergency : 800-424-9300

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Chlorine	7782-50-5	100%

3. Hazards Identification

Emergency Overview

Harmful if inhaled, respiratory tract burns, skin burns, eye burns.
Containers may rupture or explode if exposed to heat. May ignite combustibles.

Potential Health Effects

Inhalation : Burns, vomiting, chest pain, difficulty breathing, dizziness, headache, hyperactivity, emotional disturbances, bluish skin color, lung congestion, lung damage, death. May cause burns, lack of sense of smell, tooth decay, difficulty breathing, lung damage in long term exposure.

Eye contact : Burns, frostbite.

Skin contact : Burns, frostbite.

Ingestion : Ingestion of a gas is unlikely.

Chronic Health Hazard : None.

4. First Aid Measures

General advice : None.

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Skin contact : Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

Ingestion : If a large amount is swallowed, get medical attention.

Inhalation : If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Note to physicians : For inhalation, consider oxygen.
Avoid gastric lavage or emesis.

5. Fire-Fighting Measures

Suitable extinguishing media : Water.
Large fires: Flood with fine water spray.
Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents.

Specific hazards : Oxidizer. May ignite or explode on contact with combustible materials.
Containers may rupture or explode if exposed to heat.

Fire fighting : Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible, then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. For small fires, contain and let burn. Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuation radius: 800 meters (1/2 mile).

Protective equipment and precautions for firefighters : Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

6. Accidental Release Measures

Air release : Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

Soil release : Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).

Water release : Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Absorb with activated carbon. Collect spilled material using mechanical equipment.

Occupational spill/release : Stop leak if possible without personal risk. Avoid contact with combustible materials. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed space before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. Handling and Storage

Handling

Subject to handling regulations: U.S. OSHA 29 CFR 1910.119.

Storage

Store in accordance with all current regulations and standards. Protect from physical damage. Keep separated from incompatible substances. Store outside or in a detached building. NFPA 430 Code for the Storage of Liquid and Solid Oxidizing Materials. Store in a cool, dry place. Store in a well-ventilated area. Protect from sunlight. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B).

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH	:	0.5 ppm TWA 1 ppm STEL
OSHA (final)	:	1 ppm Ceiling; 3 mg/m ³ Ceiling
OSHA (vacated)	:	1 ppm STEL; 3 mg/m ³ STEL 0.5 ppm TWA; 1.5 mg/m ³ TWA
NIOSH	:	0.5 ppm Ceiling 15 min; 1.45 mg/m ³ Ceiling 15 min

IDLH

10 ppm

Engineering measures/Ventilation

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits. Ensure adequate ventilation.

Personal protective equipment

Respiratory protection	:	The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 5 ppm – Any air-purifying half-mask respirator equipped with cartridge(s) providing protection against the compound of concern. Any supplied-air respirator. 10 ppm – Any supplied-air respirator operated in a continuous-flow mode. Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern. Any supplied-air respirator with a full facepiece and a canister providing protection against the compound of concern. Any air-purifying full-face respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. Any self-contained breathing apparatus with a full facepiece. Any supplied-air respirator with a full facepiece. Emergency or planned entry into unknown concentrations or IDLH conditions – Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Escape – Any air-purifying full-face respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. Any appropriate escape-type, self-contained breathing apparatus.
Hand protection	:	Wear appropriate chemical resistant gloves.
Eye protection	:	Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body protection	:	Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold-insulating clothing.

9. Physical and Chemical Properties

Form	:	Gas.
Color	:	Yellow or green.
Odor	:	Distinct odor, irritating odor.

Molecular weight	: 70.906
Vapor pressure	: 5168 mmHg @ 21°C
Vapor density	: 2.49 (air = 1)
Boiling point	: -35°C
Melting point	: -101°C
Water solubility	: 1.46% @ 0°C
Specific gravity	: 1.5649 @ -35°C (liquid) (water = 1)
Solvent solubility	: Soluble: alkali, chlorides, alcohols.

10. Stability and Reactivity

Stability	: Stable under normal conditions.
Conditions to avoid	: Avoid contact with combustible materials. Minimize contact with material. Avoid inhalation of material or combustible by-products. Keep out of water supplies and sewers. May ignite or explode on contact with combustible materials.
Materials to avoid	: Combustible materials, bases, metals, halogens, material salts, reducing agents, amines, metal carbide, metal oxides, oxidizing materials, halo carbons, acids, arsenic, calcium, iodine, mercuric oxide, ethers, fluorine.
Hazardous decomposition products	: Thermal decomposition products: chlorine. Water or moisture: hypochlorous acid, hydrochloric acid.

11. Toxicological Information

The components of this material have been reviewed in various sources and the following endpoints are published:

CHLORINE (7782-50-5) : Inhalation LC50 Rat: 0.86 mg/L/1H; Inhalation LC50 Rat: 293 ppm/1H

Acute Toxicity Level

CHLORINE (7782-50-5) : Toxic: Inhalation

Component Carcinogenicity

ACGIH : A4 – Not Classified as a Human Carcinogen

Local Effects

CHLORINE (7782-50-5) : Corrosive: inhalation, skin, eye.

Medical Conditions Aggravated by Exposure

Heart problems.

12. Ecological Information

Aquatic Toxicity

CHLORINE (7782-50-5) : Fish: 96 Hr LC50 *Lepomis macrochirus*: 0.44 mg/L [flow-through]; 96 Hr LC50 *Oncorhynchus mykiss*: 0.014 mg/L [flow-through]; 96 Hr LC50 *Oncorhynchus mykiss*: 0.014 mg/L; 96 Hr LC50 *Oncorhynchus mykiss*: 0.104 – 0.168 mg/L [static]; 96 Hr LC50 *Pimephales promelas*: 0.08 mg/L [flow-through]; 96 Hr LC50 *Pimephales promelas*: 0.1 mg/L
Invertebrate: 48 Hr LC50 *Daphnia magna*: 0.017 mg/L

13. Disposal Considerations

Waste from residues : Dispose in accordance with all applicable regulations. Subject to disposal / unused products regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

Contaminated packaging : Return cylinder to supplier.

14. Transport Information

DOT (US only)

Proper shipping name : Chlorine
Class : 2.3
UN/ID No. : UN1017
Labeling : Poison gas, Corrosive
Additional Info : Toxic-Inhalation Hazard Zone B

Component Marine Pollutants

This material contains one or more of the following chemicals required by U.S. DOT to be identified as marine pollutants.

Component	CAS	
CHLORINE	7782-50-5	DOT regulated marine pollutant

15. Regulatory Information

U.S. Federal Regulations

This material contains one or more of the following chemicals required under SARA Section 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

CHLORINE (7782-50-5) : SARA 302: 100 lb TPQ
10 lb final RQ; 4.54 kg final RQ
SARA 313: 1.0% de minimis concentration
CERCLA: 10 lb final RQ; 4.54 kg final RQ
OSHA (safety): 1500 lb TQ

SARA 311/312

Acute: Yes
Chronic: Yes
Fire: Yes
Reactive: No
Pressure: Yes

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
CHLORINE	7782-50-5	Yes	Yes	Yes	Yes	Yes	Yes

Not regulated under California Proposition 65.