MSDS CHLORINE GAS LIQUEFIED

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUBSTANCE: CHLORINE
TRADE NAMES/SYNONYMS:
MTG MSDS 22; CHLORINE MOLECULAR; DIATOMIC CHLORINE; DICHLORINE; MOLECULAR CHLORINE; UN 1017; Cl2; MAT04600; RTECS FO2100000
CHEMICAL FAMILY: halogens, gas
COMPANY INFORMATION Saudi Factory for Chlorine & Alkalies
Building #2101, Unit # 2, Riyadh 14545-8762, Kingdom of Saudi Arabia.
Contact # +966 11 810 1219 Email: Info@sachlo.com
EMERGENCY CONTACT DETAILS: +966554066597 +966550289633

SECTION 2: COMPOSITION, INFORMATION & SPECIFICATIONS

COMPONENT: CHLORINE
CAS NUMBER: 7782-50-5
Chemical Formula: CL2

Sr. #	Parameters	Unit	Limits
1	Chlorine	V/V %	99.5 Min

SECTION 3: HAZARDS IDENTIFICATION

GHS (GLOBAL HARMONIZED SYSTEM) LABELING FOR LIQUID CHLORINE:

Corrosive **Oxidizing Agent** **Health Hazard** **Acute Toxic**

Code	Word	Hazard Statement
H270	Danger	May cause or intensify fire; oxidizer.
H318	Danger	Causes serious eye damage.
H330	Danger	Fatal if inhaled.
H314	Danger	Causes severe skin burns and eye damage.
H280	Warning	Contains gas under pressure; may explode if heated.

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Code	Word	Hazard Statement
H335	**Warning**	**May cause respiratory irritation.**
H400	**Warning**	**Very toxic to aquatic life.**
H410	**Warning**	**Very toxic to aquatic life with long lasting effects.**

Precautionary Statements (P-Codes):
P260 – Do not breathe gas.
P271 – Use only outdoors or in a well-ventilated area.
P284 – Wear respiratory protection.
P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: yellow or green
PHYSICAL FORM: gas
ODOR: distinct odor, irritating odor
MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract burns, skin burns, eye burns
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat. May ignite combustibles.
POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: burns, chest pain, difficulty breathing, headache, dizziness, hyperactivity, emotional disturbances, bluish skin color, lung damage, death
LONG TERM EXPOSURE: burns, skin disorders, lack of sense of smell, lung damage
SKIN CONTACT:
SHORT TERM EXPOSURE: burns
LONG TERM EXPOSURE: burns
EYE CONTACT: burns
SHORT TERM EXPOSURE: burns
LONG TERM EXPOSURE: burns
INGESTION:
SHORT TERM EXPOSURE: Ingestion is unlikely under normal conditions of use; however, exposure to harmful amounts may occur in exceptional circumstances.
LONG TERM EXPOSURE: Ingestion is unlikely during normal handling and use; chronic exposure via ingestion is not anticipated.

SECTION 4: FIRST AID MEASURES

INHALATION

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SYMPTOMS: Immediate exposure may cause coughing, choking, difficulty breathing, burning sensation in the throat and chest, wheezing, shortness of breath, and irritation of the nose and throat. Severe exposure can lead to pulmonary edema (fluid accumulation in the lungs), which may be delayed for several hours after exposure.

FIRST AID:

Immediately move the victim to fresh air, keeping them warm and at rest.
If breathing is difficult, administer oxygen by trained personnel.
If the victim is not breathing, begin artificial respiration (preferably with a demand valve resuscitator or bag-valve-mask) and seek medical attention immediately.
Do not leave the victim unattended.
Symptoms such as coughing, breathing difficulty, or tightness in the chest may indicate serious lung injury medical evaluation is essential even if symptoms appear mild or improve initially.

MEDICAL TREATMENT:

Administration of humidified oxygen and, if indicated, corticosteroids (to reduce inflammation and prevent/reduce pulmonary edema).
Continuous monitoring for at least 48 hours in moderate to severe cases.
Avoid use of respiratory depressants.

SKIN CONTACT

SYMPTOMS: Frostbite from contact with the liquefied gas; redness, irritation, or blistering of exposed skin.

FIRST AID:

Immediately flush affected skin with large amounts of lukewarm (not hot) water for at least 15 minutes.
Remove contaminated clothing and shoes while flushing.
Do not rub affected areas to avoid further tissue damage.
For frostbite, loosely cover with a sterile, dry dressing.

MEDICAL TREATMENT:

Treat frostbite injuries as per medical protocols.
Apply topical antibiotics for open blisters; surgical evaluation may be required for severe tissue injury.

EYE CONTACT

SYMPTOMS: Redness, tearing, pain, blurred vision; severe exposure may cause corneal damage.

FIRST AID:

Immediately flush eyes with plenty of clean water for at least 15 minutes, keeping eyelids open.
Remove contact lenses if present and easy to do; continue rinsing.
Seek immediate ophthalmologic evaluation.

MEDICAL TREATMENT:

Continue irrigation until pH of conjunctival sac returns to normal.
Administer topical ophthalmic antibiotics if indicated.

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INGESTION

NOTE: Ingestion of liquefied chlorine is highly unlikely under normal handling.

FIRST AID:

Do **not** induce vomiting.
Rinse mouth thoroughly with water.
Give small sips of water if the person is conscious and alert.
Seek immediate medical attention.

MEDICAL TREATMENT:

Symptomatic and supportive care.
Monitor for possible esophageal or gastric burns.

SECTION 5: FIRE FIGHTING MEASURES

FLAMMABILITY:

Chlorine is non-flammable but acts as a strong oxidizer.
It can support combustion of many materials that are normally non-flammable in air.

FIRE & EXPLOSION HAZARDS:

Chlorine reacts violently with many substances, producing toxic or corrosive gases, heat, and possible explosions.
Contact with ammonia forms nitrogen trichloride, an unstable and highly explosive compound.
Reacts with hydrocarbons (e.g., oil, grease, fuels) to form chlorinated compounds, some of which are flammable or explosive.
Contact with finely divided metals, hydrogen, sulfur, and many organic materials can result in fire or explosion.

SUITABLE EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding combustible materials.
Water spray may be used to keep containers cool and disperse chlorine vapors; avoid direct water stream on leaking liquid chlorine as it may spread the release.

UNSUITABLE EXTINGUISHING MEDIA:

Do not use dry chemical extinguishers directly on chlorine leaks, which are ineffective for controlling gas release.

SPECIAL FIREFIGHTING PROCEDURES:

Evacuate the area and fight the fire from a safe location.
Wear full protective clothing, including self-contained breathing apparatus (SCBA).
Approach from upwind to avoid toxic vapors.
Stop the chlorine release if it is safe to do so.
Use water spray to reduce airborne chlorine concentrations and protect personnel and equipment.

HAZARDOUS DECOMPOSITION PRODUCTS:

Chlorine gas at high temperatures can react to produce hydrogen chloride and other toxic gases.
Move containers from the fire area only if it can be done safely. Cool exposed containers with water spray until well after the fire is extinguished to prevent re-pressurization or rupture. Stay clear of container ends due to possible projectile hazards. If Moving Containers is Impossible, keep unnecessary personnel away, Isolate the hazard area and

deny entry, Establish an evacuation radius of at least 800 meters (½ mile) in all directions. Small Fires in Cargo or Storage Area If safe to do so, contain the fire and allow it to burn under controlled conditions and Use extinguishing agents appropriate for surrounding combustible materials. Continue cooling exposed containers with water spray until well after the fire is out. Apply water spray from a protected location or a safe distance. Avoid direct, high-pressure water streams on a chlorine leak, which may increase vapor release. Protective Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for chlorine service. Avoid inhalation of chlorine vapors or combustion by-products. Always work upwind of the release and keep out of low-lying areas where chlorine gas can accumulate.

SECTION 6: ACCIDENTAL RELEASE MEASURES

AIR RELEASE:
Liquefied chlorine rapidly vaporizes to a dense gas that stays close to the ground and can travel long distances.
Prevent entry into occupied areas, basements, or confined spaces.
Use water spray to knock down and disperse vapors but avoid high-pressure streams directly on the leak.
WATER RELEASE:
Avoid direct release into waterways, chlorine reacts with water to form hypochlorous and hydrochloric acids, which are toxic to aquatic life. Contain contaminated water for proper neutralization (e.g., with sodium thiosulfate).
SOIL RELEASE:
Prevent liquid chlorine from contacting soil, if contact occurs, it can cause localized chemical burns and persistent soil contamination. Use diking or trenching to contain liquid and prevent migration to water sources.

OCCUPATIONAL RELEASE:
IMMEDIATE ACTIONS
Activate the site emergency alarm and stop all work in the affected area.
Evacuate all non-essential personnel immediately; move upwind and avoid low-lying areas.
Isolate the leak area; restrict entry to trained emergency responders only.
Shut down local ventilation systems to prevent gas migration into other work zones.
PROTECTIVE EQUIPMENT FOR RESPONDERS
Wear self-contained breathing apparatus (SCBA) and full chemical-protective clothing resistant to chlorine.
Use chemical-resistant gloves, boots, and face protection.
Only personnel trained in chlorine leak control procedures should attempt containment.
CONTAINMENT:
If safe, close container valves or use approved chlorine ton-container leak repair kits.
Use water fog to reduce vapor concentration and protect surrounding personnel and equipment, avoid high-pressure streams directly on the leak.
EVACUATION AND ISOLATION:
Establish a **minimum isolation distance of 500 meters** in all directions for large releases.
For occupational indoor release, evacuate the entire building and adjacent affected zones.

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MONITORING:
Use fixed and portable chlorine detectors to assess gas concentrations before allowing re-entry.
Do not permit re-entry until chlorine levels are below **0.5 ppm (TWA)**.

SECTION 7: HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Keep separated from incompatible substances. Store outside or in a detached building.
SHELF LIFE: If properly stored, it has an infinite shelf-life & will remain intact until it is reacted with other materials.

SECTION 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
CHLORINE:

Regulatory Agency / Standard	Exposure Limit	Notes
OSHA PEL (29 CFR 1910.1000)	1 ppm (ceiling)	Do not exceed at any time
ACGIH TLV	0.5 ppm (TWA, 8-hour)	Time-Weighted Average
ACGIH TLV	1 ppm (STEL)	Short-Term Exposure Limit (15 min)

APPROPRIATE ENGINEERING CONTROLS
Use local exhaust ventilation to maintain airborne concentrations below the applicable exposure limits.
Install continuous chlorine gas monitoring in storage and handling areas with audible/visual alarms.
Provide emergency eye wash stations and safety showers near chlorine handling points.
Ensure handling and filling stations are in well-ventilated areas, preferably outdoors or in open sided shelters.

INDIVIDUAL PROTECTION MEASURES / PERSONAL PROTECTIVE EQUIPMENT (PPE)
RESPIRATORY PROTECTION:
For routine operations: Use a NIOSH/MSHA-approved full-face respirator with chlorine gas cartridges when airborne concentrations may exceed 0.5 ppm.
For emergencies or unknown concentrations: Use positive-pressure SCBA (Self-Contained Breathing Apparatus).
Respirators must be selected and fitted according to OSHA 29 CFR 1910.134 or equivalent KSA standards.
EYE / FACE PROTECTION:
Use chemical safety goggles and a face shield when handling liquefied chlorine or connecting/disconnecting containers.
SKIN / HAND PROTECTION:
Wear **chemical-resistant gloves** made from butyl rubber, Viton®, or other chlorine-resistant materials.
Wear long-sleeved, chemical-resistant protective clothing; for large-scale or emergency operations, wear fully encapsulating chemical-protective suits (Level A or B, depending on conditions).

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FOOT PROTECTION:
Use chemical-resistant boots (e.g., PVC or neoprene) with steel toe and shank for added mechanical protection.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: yellow or green
ODOR: distinct odor, irritating odor
MOLECULAR WEIGHT: 70.906
MOLECULAR FORMULA: Cl_2
BOILING POINT: - (-34 °C)
FREEZING POINT: -150 F (-101 C)
VAPOR PRESSURE: 85.3 PSIG)
VAPOR DENSITY (air=1): 2.49
SPECIFIC GRAVITY: Not applicable
DENSITYENSITY IN GASEOUS STATE: 3.214g/cm^3 at 0 °C
WATER SOLUBILITY: Easily Soluble in water
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: 0.01 ppm
EVAPORATION RATE: Not applicable
VISCOSITY: No data available
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: alkali

SECTION 10: STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.
CONDITIONS TO AVOID: Avoid contact with combustible materials. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.
INCOMPATIBILITIES: combustible materials, bases, metals, halogens, metal salts, reducing agents, amines, metal carbide, metal oxides, oxidizing materials, halo carbons, acids
HAZARDOUS DECOMPOSITION:

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Thermal decomposition products: chlorine
POLYMERIZATION: Will not polymerize.

SECTION 11: TOXICOLOGICAL INFORMATION

CHLORINE:
TOXICITY DATA:
293 ppm/1 hour(s) inhalation-rat LC50
CARCINOGEN STATUS: ACGIH: A4 -Not Classifiable as a Human Carcinogen
LOCAL EFFECTS:
Corrosive: inhalation, skin, eye
ACUTE TOXICITY LEVEL:
Toxic: inhalation
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart problems.
TUMORIGENIC DATA: Available.
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 390 ug/L 96-hour(s) LC50 (Mortality) Orange throat darter (Etheostoma spectabile)
INVERTEBRATE TOXICITY: 637.5 ug/L 1-hour(s) LC50 (Mortality) Pacific oyster (Crassostrea gigas)
ALGAL TOXICITY: 50-1000 ug/L 23 hour(s) (Population) Algae,phytoplankton,algal mat (Algae)
PHYTOTOXICITY: 20 ug/L 96-day(s) (Growth) Water-milfoil (Myriophyllum spectrum)

SECTION 13: DISPOSAL CONSIDERATIONS

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

SECTION 14: TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Chlorine
ID NUMBER: UN1017
HAZARD CLASS OR DIVISION: 2.3
LABELING REQUIREMENTS: 2.3; 8
ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone B
CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Chlorine

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ID NUMBER: UN1017
CLASSIFICATION: 2.3, 8

SECTION 15: REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
CHLORINE: 10 LBS RQ
SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
CHLORINE: 100 LBS TPQ
SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
CHLORINE: 10 LBS RQ
SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes
SARA TITLE III SECTION 313 (40 CFR 372.65):
CHLORINE
OSHA PROCESS SAFETY (29CFR1910.119):
CHLORINE: 1500 LBS TQ
STATE REGULATIONS:
California Proposition 65: Not regulated.
CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: ACD1E
NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.
TSCA 12(b) EXPORT NOTIFICATION: Not listed.
CANADA INVENTORY (DSL/NDSL): Not determined.

SECTION 16: OTHER INFORMATION

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