

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

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

PRODUCT USE: industrial

CREATION DATE: Jan 24 1989

REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CHLORINE

CAS NUMBER: 7782-50-5

PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

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, vomiting, chest pain, difficulty breathing, headache, dizziness, hyperactivity, emotional disturbances, bluish skin color, lung congestion, lung damage, death

LONG TERM EXPOSURE: burns, lack of sense of smell, tooth decay, difficulty breathing, lung damage

SKIN CONTACT:

SHORT TERM EXPOSURE: burns, frostbite

LONG TERM EXPOSURE: burns

EYE CONTACT:

SHORT TERM EXPOSURE: burns, frostbite

LONG TERM EXPOSURE: burns

INGESTION:

SHORT TERM EXPOSURE: ingestion of a gas is unlikely

LONG TERM EXPOSURE: ingestion of a gas is unlikely

4. FIRST AID MEASURES

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.

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.

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

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

NOTE TO PHYSICIAN: For inhalation, consider oxygen. Avoid gastric lavage or emesis.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Oxidizer. May ignite or explode on contact with combustible materials. Containers may rupture or explode if exposed to heat.

EXTINGUISHING MEDIA: water

Large fires: Flood with fine water spray.

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: 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).

FIRE FIGHTING PROTECTIVE EQUIPMENT: Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

FLASH POINT: not flammable

LOWER FLAMMABLE LIMIT: Not available

UPPER FLAMMABLE LIMIT: Not available

AUTOIGNITION: Not available

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 RELEASE:

Do not touch spilled material. Stop leak if possible without personal risk. Avoid contact with combustible materials. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces 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

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. Store in a cool, dry place. Store in a well-ventilated area. NFPA 430 Code for the Storage of Liquid and Solid Oxidizing Materials. 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 the 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). Keep separated from incompatible substances.

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

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

CHLORINE:

- 1 ppm (3 mg/m³) OSHA ceiling
- 0.5 ppm (1.5 mg/m³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
- 1 ppm (3 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
- 0.5 ppm ACGIH TWA
- 1 ppm ACGIH STEL
- 0.5 ppm (1.45 mg/m³) NIOSH recommended ceiling 15 minute(s)

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

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold insulating clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: 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 this substance.

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Any air-purifying full-facepiece 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-facepiece 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas

COLOR: yellow or green

ODOR: distinct odor, irritating odor

MOLECULAR WEIGHT: 70.906

MOLECULAR FORMULA: Cl₂

BOILING POINT: -31 F (-35 C)

FREEZING POINT: -150 F (-101 C)

DECOMPOSITION POINT: Not available

VAPOR PRESSURE: 5168 mmHg @ 21 C

VAPOR DENSITY (air=1): 2.49

SPECIFIC GRAVITY (water=1): 1.5649 @ -35 C (liquid)

DENSITY: 3.214 g/L @ 0 C

WATER SOLUBILITY: 1.46% @ 0 C

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: 0.01 ppm

EVAPORATION RATE: Not applicable

VISCOSITY: 0.01327 cP @ 20 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

SOLVENT SOLUBILITY:

Soluble: alkali, chlorides, alcohols

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. May ignite or explode on contact with combustible materials.

INCOMPATIBILITIES: combustible materials, bases, metals, halogens, metal salts, reducing agents, amines, metal carbide, metal oxides, oxidizing materials, halo carbons, acids, arsenic, calcium, iodine, mercuric oxide, ethers, fluorine

HAZARDOUS DECOMPOSITION:

Thermal decomposition products or contact with water or moisture: hypochlorous acid, hydrochloric acid

Thermal decomposition products: chlorine

POLYMERIZATION: Will not polymerize.

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

TARGET ORGANS: teeth, respiratory system, kidneys, central nervous system, eyes, skin

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart problems

TUMORIGENIC DATA: Available.

MUTAGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 390 ug/L 96 hour(s) LC50 (Mortality) Orangethroat 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 spicatum*)

FATE AND TRANSPORT:

BIODEGRADATION: No data available.

ABIOTIC DEGRADATION: Rapidly undergoes disproportionation in water to form hypochlorous acid and chloride ion.

BIOCONCENTRATION: This material is believed not to bioaccumulate.

ATMOSPHERIC PROCESSES: Undergoes rapid photodissociation in air.

13. DISPOSAL CONSIDERATIONS

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

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
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden
ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone B
MARINE POLLUTANT: CHLORINE



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Chlorine
UN NUMBER: UN1017
CLASS: 2.3; 8

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 Subpart B):
CHLORINE: 100 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):
CHLORINE: 10 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: Yes
FIRE: Yes
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
CHLORINE

OSHA PROCESS SAFETY (29 CFR 1910.119):

CHLORINE: 1500 LBS TQ

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: A, D1A, E.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDL): Listed on DSL.

16. OTHER INFORMATION

MSDS SUMMARY OF CHANGES

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