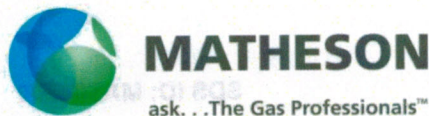


314-275-7322



Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

*** Section 1 - IDENTIFICATION ***

Manufacturer Information

MATHESON TRI-GAS, INC.

150 Allen Road, Suite 302

Basking Ridge, NJ 07920

General Information: 1-800-416-2505

Emergency #: 1-800-424-9300 (CHEMTREC)

Outside the US: 703-527-3887 (Call collect)

Material Name: CHLORINE

Trade Names/Synonyms

MTG MSDS 22; CHLORINE MOLECULAR; DIATOMIC CHLORINE; DICHLORINE; MOLECULAR CHLORINE;
UN 1017; Cl₂; RTECS: FO2100000

Chemical Family

halogens, gas

Product Use

industrial

Restrictions on Use

None known.

*** Section 2 - HAZARDS IDENTIFICATION ***

GHS Classification

Oxidizing gas, Category 1

Gas under pressure, Liquefied gas

Acute toxicity, Category 2

Skin corrosion/irritation, Category 1

Eye damage/irritation, Category 1

Specific target organ systemic toxicity following single exposure, Category 1

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Specific target organ systemic toxicity following repeated exposure, Category 1

Hazardous to the aquatic environment - acute hazard, Category 1

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statement(s)

May cause or intensify fire; oxidizer

Contains gas under pressure; may explode if heated

Fatal if inhaled

Causes severe skin burns and eye damage

Causes serious eye damage

Causes damage to organs

Causes damage to organs through prolonged or repeated exposure

Very toxic to aquatic life

Precautionary Statement(s)

Keep away from clothing and other combustible materials. Do not breathe gas, fumes, vapor, or spray. Do not eat, drink, or smoke when using this product. Keep reduction valves free from grease and oil. Wear respiratory protection. Wear protective gloves/clothing and eye/face protection. Use only outdoors or in a well-ventilated area. In case of fire, stop leak if safe to do so. Wash thoroughly after handling. Avoid release to the environment. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or doctor/physician. Specific treatment is urgent, see first aid section of Safety Data Sheet. Store locked up. Keep container tightly closed. Store in a well-ventilated place. Protect from sunlight. Collect spillage. Dispose in accordance with all applicable regulations.

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

*** Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS ***

CAS#	Component	Percent
7782-50-5	CHLORINE	100

*** Section 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

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.

Eyes

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 Physicians

For inhalation, consider oxygen.

Avoid gastric lavage or emesis.

Symptoms: Immediate

respiratory tract burns, skin burns, eye burns, respiratory system effects, central nervous system effects

Symptoms: Delayed

respiratory tract burns, skin burns, eye burns, kidney damage, tooth erosion, respiratory system effects

*** Section 5 - FIRE FIGHTING MEASURES ***

See Section 9 for Flammability Properties

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Specific Hazards Arising from the Chemical

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.

Unsuitable Extinguishing Media

Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents.

Protective Equipment and Precautions for Firefighters

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

Fire Fighting Measures

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).

Hazardous Combustion Products

Water or Moisture: hypochlorous acid, hydrochloric acid

*** Section 6 - ACCIDENTAL RELEASE MEASURES ***

Personal Precautions

Wear personal protective clothing and equipment, see Section 8.

Environmental Precautions

Avoid release to the environment. Keep out of water supplies and sewers. 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).

Methods for Containment

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Reduce vapors with water spray.

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Cleanup Methods

Stop leak if safe to do so - Prevent entry into waterways, drains, or confined areas. Do not touch spilled material. Eliminate all ignition sources if safe to do so. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Damaged cylinders should be handled only by specialists.

*** Section 7 - HANDLING AND STORAGE ***

Handling Procedures

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

Storage Procedures

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. 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 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).

*** Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION ***

Component Exposure Limits

CHLORINE (7782-50-5)

ACGIH: 0.5 ppm TWA

1 ppm STEL

Europe: 0.5 ppm STEL; 1.5 mg/m3 STEL

OSHA (Final): 1 ppm Ceiling; 3 mg/m3 Ceiling

OSHA (Vacated): 0.5 ppm TWA; 1.5 mg/m3 TWA

1 ppm STEL; 3 mg/m3 STEL

NIOSH: 0.5 ppm Ceiling (15 min); 1.45 mg/m3 Ceiling (15 min)

Component Biological Limit Values

There are no biological limit values for any of this product's components.

IDLH

10 ppm

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Engineering Controls

Ensure adequate ventilation. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face

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

Protective Clothing

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

Glove Recommendations

Wear appropriate chemical resistant gloves.

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 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.

Material Name: CHLORINE

Safety Data Sheet

SDS ID: MAT04600

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.

*** Section 9 - PHYSICAL AND CHEMICAL PROPERTIES ***

Physical State:	Gas	Appearance:	Not available
Color:	yellow or green	Physical Form:	gas
Odor:	distinct odor, irritating odor	Odor Threshold:	0.01 ppm
pH:	Not available	Melting/Freezing Point:	-101 °C
Boiling Point:	-35 °C	Flash Point:	not flammable
Decomposition:	Not available	Evaporation Rate:	Not available
LEL:	Not available	UEL:	Not available
Vapor Pressure:	5168 mmHg @ 21 °C	Vapor Density (air = 1):	2.49
Density:	3.214 g/L @ 0 °C	Specific Gravity (water=1):	1.5649 @ -35 °C (liquid)
Water Solubility:	1.46 % @ 0 °C	Log KOW:	Not available
Auto Ignition:	Not available	Viscosity:	0.01327 cP @ 20 °C
Molecular Weight:	70.906	Molecular Formula:	Cl ₂

Solvent Solubility

Soluble: alkali, chlorides, alcohols

*** Section 10 - STABILITY AND REACTIVITY ***

Chemical Stability

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.

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Possibility of Hazardous Reactions

Will not polymerize.

Incompatible Materials

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

Decomposition Products

chlorine

Hazardous Decomposition

Water or Moisture: hypochlorous acid, hydrochloric acid

*** Section 11 - TOXICOLOGICAL INFORMATION ***

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

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

CHLORINE (7782-50-5)

Inhalation LC50 Rat 0.86 mg/L 1 h; Inhalation LC50 Rat 293 ppm 1 h

RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

CHLORINE (7782-50-5)

Inhalation: 368 mg/m³/30 minute(s) Inhalation Mouse LC50; 137 ppm/1 hour Inhalation Mouse LC50

293 ppm/1 hour Inhalation Rat LC50

Acute Toxicity Level

CHLORINE (7782-50-5)

Toxic: inhalation.

Immediate Effects

respiratory tract burns, skin burns, eye burns, respiratory system effects, central nervous system effects

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Delayed Effects

respiratory tract burns, skin burns, eye burns, tooth erosion, kidney damage, respiratory system effects

Irritation/Corrosivity Data

No animal testing data available for skin or eyes.

RTECS Irritation

The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

Local Effects

CHLORINE (7782-50-5)

Corrosive: inhalation, skin, eye.

Respiratory Sensitizer

No data available.

Dermal Sensitizer

No data available.

Carcinogenicity

Component Carcinogenicity

CHLORINE (7782-50-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

RTECS Mutagenic

The components of this material have been reviewed, and RTECS publishes data for one or more components.

RTECS Reproductive Effects

The components of this material have been reviewed, and RTECS publishes the following endpoints:

CHLORINE (7782-50-5)

565 mg/kg Oral Rat TDLo (male 8 week, prior to copulation 2 week, post 3 week, continuous)

RTECS Tumorigenic

The components of this material have been reviewed, and RTECS publishes data for one or more components.

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Specific Target Organ Toxicity - Single Exposure

respiratory system, central nervous system

Specific Target Organ Toxicity - Repeated Exposure

teeth, kidneys, respiratory system

Aspiration Hazard

Not applicable.

Medical Conditions Aggravated by Exposure

heart problems

*** Section 12 - ECOLOGICAL INFORMATION ***

Component Analysis - 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

Abiotic Degradation

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

Persistence and Degradability

No data available.

Bioaccumulative Potential

No data available.

Mobility in Environmental Media

No data available.

*** Section 13 - DISPOSAL CONSIDERATIONS ***

Disposal Methods

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

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

*** Section 14 - TRANSPORT INFORMATION ***

Component Marine Pollutants

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

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

US DOT Information

Shipping Name: Chlorine

UN/NA #: UN1017 Hazard Class: 2.3

Required Label(s): 2.3, 5.1, 8

Additional Info.: Toxic-Inhalation Hazard Zone B

IMDG Information

Shipping Name: Chlorine

UN #: UN1017 Hazard Class: 2.3

Required Label(s): 2.3, 5.1, 8

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

*** Section 15 - REGULATORY INFORMATION ***

Component Analysis

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified 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

SARA 304: 10 lb EPCRA 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 Hazardous Categories

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

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

Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
CHLORINE	7782-50-5	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes

*** Section 16 - OTHER INFORMATION ***

Safety Data Sheet

Material Name: CHLORINE

SDS ID: MAT04600

NFPA Ratings: Health: 4 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Other Information

Matheson Tri-Gas, Inc. makes no express or implied warranties, guarantees or representations regarding the product or the information herein, including but not limited to any implied warranty or merchantability or fitness for use. Matheson Tri-Gas, Inc. shall not be liable for any personal injury, property or other damages of any nature, whether compensatory, consequential, exemplary, or otherwise, resulting from any publication, use or reliance upon the information herein.

End of Sheet MAT04600