



TATA CHEMICALS LIMITED

SAFETY DATA SHEET (SDS)

Name of chemical : Chlorine

1. PRODUCT IDENTIFICATION / COMPANY ADDRESS

Trade Name	Chlorine	Common Name	Chlorine	Synonyms	Bertholite, Chlore;
Company Name / Address / Phone / Fax	<p>Tata Chemicals Limited, Mithapur District : Devbhoomi Dwarka (Gujarat) 361 345 INDIA <u>Contact in case of Emergency Only:</u> +91(02892 675802 /03) Contact Person :+91 9227676113 Mr. Devendra Thakur</p>				
Chemical Name	Chlorine (Gas or Liquid)				

2. HAZARD IDENTIFICATION

Hazard Classification	Ox. Gas 1 H270 Liquefied gas H280 Acute Tox. 2 (Inhalation: gas) H330 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400
LABEL ELEMENTS	<p><u>HAZARD PICTOGRAMS.</u></p> <p>GHS03 GHS04 GHS05 GHS06 GHS07 GHS09</p>
Signal word	Danger
Hazard statement	H270 - may cause or intensify fire; oxidizer H280 - contains gas under pressure; may explode if heated H314 - causes severe skin burns and eye damage H330 - fatal if inhaled h400 - very toxic to aquatic life

Precautionary statement	<p>P202 - Do not handle until all safety precautions have been read and understood.</p> <p>P244 - Keep reduction valves/valves and fittings free from oil and grease.</p> <p>P260 - Do not breathe gas.</p> <p>P264 - Wash hands thoroughly after handling.</p> <p>P271+P403 - Use and store only outdoors or in a well-ventilated place.</p> <p>P273 - Avoid release to the environment.</p> <p>P280+P284 - Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection.</p> <p>P370+P376 - In case of fire: Stop leak if safe to do so.</p> <p>P405 - Store locked up .</p> <p>P501 - Dispose of contents/container Dispose in a safe manner in accordance with local/national regulations</p>
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3. COMPOSITION / INFORMATION AND INGREDIENTS

Structural Formula	CI-CI	Chemical Family	Halogen
		Molecular weight	70.90
CAS No	7782-50-5	Molecular Formula	Cl ₂
Name	Product identifier	%	Classification
Chlorine	7782-50-5	100%	Ox. Gas 1; Press. Gas Compr. Gas; Acute Tox. 3; Skin Irrit. 2; Eye Irrit. 2; STOT SE 3; Aquatic Acute 1; H270, H280, H331, H315, H319, H335, H400

4. FIRST AID MEASURE

Ingestion	<ul style="list-style-type: none"> • Do not give anything by mouth to an unconscious person. • Do not induce vomiting unless told to do so by doctor.
Inhalation	<ul style="list-style-type: none"> • PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. • Quick removal from the contaminated area is most important. • Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. • Keep the person warm and quiet. Assure that mucus or vomited material does not obstruct the airway by positional drainage. • Keep the patient under medical observation for at least 24 hours.

Eyes	<ul style="list-style-type: none"> • PERSONS WITH POTENTIAL EXPOSURE SHOULD NOT WEAR CONTACT LENSES. • Flush contaminated eye(s) with copious quantities of water. • Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes. • Seek immediate medical attention.
Skin	<ul style="list-style-type: none"> • Remove contaminated clothing as rapidly as possible. • Flush affected area with copious quantities of water. • Seek immediate medical attention.
Antidote	
Most important symptoms/ effects, acute and or delayed	<p>Eye Contact-Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.</p> <p>Inhalation- Fatal if inhaled. May cause respiratory irritation.</p> <p>Skin contact- Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.</p> <p>Frostbite- Try to warm up the frozen tissues and seek medical attention.</p>
Indication of immediate medical attention and special treatment needed	<p>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</p> <p>No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.</p>

5. FIRE FIGHTING MEASURES

Fire extinguishing media	Use an extinguishing agent suitable for the surrounding fire.
Hazardous decomposition products	Decomposition products may include the following materials: halogenated compounds.
Special fire fighting procedure	Use water spray or fog to knock down fire fumes if possible. [no direct water applied to chlorine tonner or container]
Precaution to Fire Fighters	Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

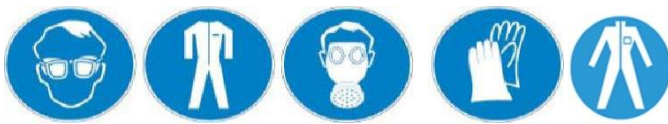
Personal precaution	DANGER: Oxidizing gas. Corrosive. Evacuate personnel to a safe area. Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE). (gas tight, chemical-protective) Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Contact with flammable materials may cause fire or explosion. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Precautions for the environment	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect the spillage.
Clean up method	Do not allow material to contaminate ground water system. <ul style="list-style-type: none"> • Try to prevent the material from entering drains or water courses. • Prevent further leakage or spillage if safe to do so. • Inform the responsible authorities in case of gas leakage, or of entry into waterways, soil or drains. • The liquid form is heavier than water. (Will form hazardous reaction products) Pay attention to the spreading of gases especially at ground level (heavier than air) and to the direction of the wind <p>Small Spill - Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.</p> <p>Large Spill - Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment</p>

7. HANDLING AND STORAGE

General precaution	Do not breathe gas/vapor. Avoid all contact with skin, eyes, or clothing. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents
Personal protection	Wear leather safety gloves and safety shoes when handling cylinders. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Storage	Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Separate from acids, alkalis, reducing agents and combustibles. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F)..
Incompatibilities	Acids, alkalis, reducing agents and combustibles.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Personal protection			
			
Skin	Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder change out or wherever contact with product is possible.	Eyes	Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breakings transfer connections. Provide readily accessible eye wash stations and safety showers.
Respiration	When workplace conditions warrant respirator use, Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).	Other	
Exposure limits			
TLV-TWA	TWA: 1.5 mg/m ³ 8 hours. TWA: 0.5 ppm 8 hours.	TLV-STEL	STEL: 2.9 mg/m ³ 15 minutes. STEL: 1 ppm 15 minutes.
Appropriate Engineering Control	Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.		

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless. Green. Yellow gas. compressed liquefied gas	Molecular Weight	70.90	Specific gravity	No data available
Odour/Odor threshold	Suffocating pungent odor. 0.23 mg/m ³	Flash Point °C	143.85°C (290.9°F)	pH/ Acidity	No data available
Auto Ignition Temp. °C		Boiling Point °C @ 760 mm Hg	-34°C (-29.2°F)	Melting Point °C	-101°C (-149.8°F)
Vapor Press. Mm Hg @ 20 °C	6.9 bar (100 psi)	Vapour Density	2.5 (Air = 1)	Water Solubility @ 20 °C	7.41 g/l
LEL %	Non flammable	UEL %	Non flammable	% Volatile	
Evaporation rate	Heat of vaporization: 123.9 BTU per pound	Viscosity @ 25 °C		PH	
Octanol / Water Partition Coefficient	No data Available			No data available	

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal conditions.	Possibility of Hazardous reaction	Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following: contact with combustible materials
Hazardous Reactions/ Decomposition products	Toxic fumes. Chlorides.	Incompatible Materials	Flammable materials, other reducing agents, and nearly all metals. Moist chlorine is highly corrosive except to glass, stoneware, porcelain, and certain alloys and only at low pressure.

Condition to avoid	<p>Air contact. High temperature. Moisture. Incompatible materials.</p> <ul style="list-style-type: none"> •Titanium will react vigorously, resulting in spontaneous ignition, when contacted by Dry Chlorine. • Combustion will be supported in carbon steel systems and equipment containing a Chlorine environment at temperatures greater than 480 °F. • Properly purge systems and equipment PRIOR to conducting Hot Work. • Hydrocarbons, ammonia, ether, hydrogen, acetylene, turpentine, powdered metals and other reducing agents
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11. TOXICOLOGICAL INFORMATION

Routes of exposure	Inhalation, dermal, Mouth.				
LD50 (oral / rats) mg/kg		LD50 (dermal/ rats) mg/kg		LC50 (inhalation / rats) - 4 hrs. mg/l	146.5 ppm/4h
Target Organ Effects	Respiratory tract irritation Eyes, skin and respiratory tract.				
Symptoms related to physical, chemical & toxicological characteristics	Causes serious eye damage. Fatal if inhaled.				

12. ECOLOGICAL INFORMATION

Mobility in Soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Persistence and degradability	Not applicable for inorganic gases.
Bio accumulative Potential	No data available
Effects on fish	LC50 - 0.44 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus) 0.014 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss). EC50-0.017 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Effects on birds	No data available
Effects on bees	No data available

13. DISPOSAL CONSIDERATIONS

Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to manufacturer.

14. TRANSPORT INFORMATION

UN No.	1017	IMDG No.	1017
Shipping Name	Chlorine	Hazard class	2.3
Packing group		Hazard Sub class	8
Marine Pollutant	Yes	Labels required	2.3 - Poison gas
Warning Statement	Keep away from foodstuffs, children, heat /flames & destroy empty container after use.		
Packaging / Precaution			
Shipping Marking			

15. REGULATORY INFORMATION**LABELING:****PHRASES R:**

R23/24/25-Toxic if inhalation, contact with skin or swallowed.

R41-Serious damage to eyes.

R37/38 Irritating to respiratory system and skin.

PHRASES S:

(S1/2): Keep locked up and out of the reach of children

S13: Keep away from food, drink and animal foodstuffs

S20/21: When using do not eat, drink or smoke

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

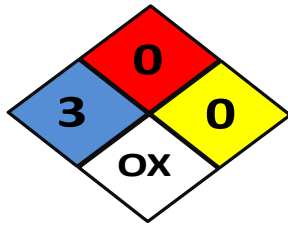
S28: After contact with skin, wash immediately with plenty of water.

S36/37/39: Wear suitable protective clothing, gloves and eye/face protection

S45: In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

NFPA Rating :



The information provided in this Material Safety data sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with other materials

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