

MATERIAL SAFETY DATA SHEET

Section 1 – Chemical product and Company identification

MSDS Name:	Chlorine
Synonyms:	Chlorine, Dichlorine
Company Identification: (INDIA)	
For information in the INDIA, call:	ORIENT PAPER MILLS, CAUSTIC SODA UNIT, AMLAI, DIST: ANUPPUR (M.P.) INDIA. TEL. No. 07652-286266, FAX NO. 091-7652-286290,

Section 2 - Composition, Information on Ingredients

Product Code	Chemical name	Volume	TLVas per Factory Act 1948	PEL-OSHA
103	Chlorine	100	1.0 ppm TWA, 2.9 ppm STEL	1 ppm Ceiling

Section 3 - Hazards Identification

Emergency Overview: Corrosive and irritating to the eyes, skin and mucous membranes. Inhalation may result in chemical pneumonitis and pulmonary edema. Nonflammable. Oxidizer may explode or accelerate combustion if contacting reducing agents.

Potential Health Effects:

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	No	Yes	Yes	No

HEALTH EFFECTS:



Exposure Limits	Irritant	Sensitization	Teratogen	Reproductive Hazard	Mutagen
Yes	No	Yes	Yes	No	

Synergistic Effects Other agents that irritate the respiratory system
Carcinogenicity : - NTP: No IARC: No OSHA: No

EYE EFFECTS: Corrosive and irritating to the eyes. Contact with the liquid or vapor causes painful burns and ulcerations. Burns to the eyes result in lesions and possible loss of vision.

SKIN EFFECTS: Corrosive and irritating to the skin and all living tissue. It hydrolyzes very rapidly yielding hydrochloric acid. Skin burns and mucosal irritation are like that from exposure to volatile inorganic acids. Chlorine burns exhibit severe pain, redness, possible swelling and early necrosis.

INGESTION EFFECTS: Ingestion is unlikely.

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INHALATION EFFECTS: Corrosive and irritating to the upper and lower respiratory tract and all mucosal tissue. Symptoms include lacrimation, cough, labored breathing, and excessive salivary and sputum formation. Excessive irritation of the lungs causes acute pneumonitis and pulmonary edema, which could be fatal. Residual pulmonary malfunction may also occur. Chemical pneumonitis and pulmonary edema may result from exposure to the lower respiratory tract and deep lung. Some experimental evidence indicates chlorine causes mutagenic, teratogenic, and reproductive effects in animal studies.

Section 4 - First Aid Measures

EYES: Persons with potential exposure should not wear contact lenses. flush contaminated eye(s) with copious quantities of water. par eyelids to assure complete flushing. Continue for a minimum of 15 minutes. seek immediate medical attention.

SKIN: Remove contaminated clothing as rapidly as possible. Flush affected area with copious quantities of water. Seek immediate medical attention.

INGESTION: None required.

INHALATION: Prompt medical attention is mandatory in all cases of overexposure. Rescue personnel should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area and given artificial resuscitation and supplemental oxygen. assure that mucus or vomited material does not obstruct the airway by use of positional drainage. Delayed pulmonary edema may occur. keep the patient under medical observation for at least 24 hours.

Section 5 - Fire Fighting Measures



Conditions of Flammability:	Not flammable
Flash point:	None
Method:	Not Applicable
Auto ignition Temperature:	None
LEL (%):	None
UEL (%):	None
Hazardous combustion products:	None
Sensitivity to mechanical shock:	None
Sensitivity to static discharge:	None

FIRE AND EXPLOSION HAZARDS: Combustible materials burn in chlorine as they do in oxygen.

EXTINGUISHING MEDIA: None required. Use media suitable for surrounding materials.

Section 6 - Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or calls your closest BOC location.

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Section 7 - Handling and Storage

ELECTRICAL CLASSIFICATION: Nonhazardous.

Most metals corrode rapidly with wet chlorine. Systems must be kept dry. Lead, gold, tantalum and hastelloy are most resistant to wet chlorine. Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<250 psig) piping or systems. Do not heat cylinder by any means to increase rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into cylinder. Protect cylinders from physical damage. Store in cool, dry, well-ventilated areas of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125oF (52oC). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full & empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's. Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

Section 8 - Exposure Controls, Personal Protection

Ingredient %	Volume	PEL-OSHA	TLV-ACGIH3	LD50 Or LC50Route/ Species
Chlorine Formula: Cl ₂	100	0.1 ppm ceiling	0.5 ppm TWA 1.0 ppm STE	LC50 293 ppm/ 1H(rat)

- Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.
- As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

ENGINEERING CONTROLS : Hood with forced ventilation. Use local ventilation to prevent Accumulation above the exposure limit.

EYE/FACE PROTECTION : Gas-tight safety goggles or full-face respirator.



SKIN PROTECTION : PVC, Kel-F ® or Teflon ®.

RESPIRATORY PROTECTION : Positive pressure air line with full-face mask and escape bottle or Self-contained breathing apparatus should be available for emergency use.

OTHER/GENERAL PROTECTION: Safety shoes, safety shower, eyewash "fountain", face shield.

Section 9 - Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	Gas	
Vapor pressure at 70 °F	100.2	psia
Vapor density at STP (Air = 1)	2.47	

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Evaporation point	Not Available	
Boiling point	-29.3	°F
	-34.1	°C
Freezing point	-149.8	°F
	-101	°C
pH	Not Available	
Specific gravity	Not Available	
Oil/water partition coefficient	Not Available	
Solubility (H ₂ O)	1% at 9.4oC	
Odor threshold	Not Available	
Odor and appearance	Greenish-yellow gas with sharp suffocating odor. Liquid is amber colored.	

Section 10 - Stability and Reactivity

STABILITY: Stable

INCOMPATIBLE MATERIALS: Hydrocarbons, ammonia, ether, hydrogen, acetylene, turpentine, powdered metals and other reducing agents.

HAZARDOUS POLYMERIZATION: Will not occur

Section 11 - Toxicological Information

TUMORIGENIC: Evidence of carcinogenic activity in experimental rats exposed orally.

REPRODUCTIVE: Embryo and fetotoxicity observed after exposure of female rats exposed at 565 mg/kg prior to mating. Effects also observed from exposure of pregnant rats at same level.

MUTAGENIC: Mutagenic effects seen in bacterial, mammalian and insect assay systems.

OTHER: Toxic effects reported in renal system, blood and spleen from inhalation exposure of rats.

Section 12- Ecological Information

No data given



Section 13 - Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

Section 14 - Transport Information

Road Trucks- OPM-CSU moves chlorine through trucks in 900 / 1000 kg tonners

Pipeline – OPM bring chlorine safely onto their site via chemical pipelines.

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Section 15 - Regulatory Information

Chlorine is listed under the accident prevention provisions of section 112(r) of the Clean Air Act (CAA) with a threshold quantity (TQ) of 2,500 pounds.

SARA TITLE III NOTIFICATIONS AND INFORMATION

Chlorine is listed as an extremely hazardous substance (EHS) subject to state and local reporting under Section 304 of SARA Title III (EPCRA). The presence of chlorine in quantities in excess of the threshold planning quantity (TPQ) of 100 pounds requires certain emergency planning activities to be conducted. Releases of chlorine in quantities equal to or greater than the reportable quantity (RQ) of 10 pounds are subject to reporting to the National Response Center under CERCLA, Section 304 SARA Title III.

SARA TITLE III - HAZARD CLASSES:

Acute Health Hazard

Chronic Health Hazard

Fire Hazard

Sudden Release of Pressure Hazard

Reactivity Hazard

SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:



This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME PERCENT BY VOLUME

CHLORINE	100.0
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Section 16 - Other Information

The information provided in this 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 any other materials or in any process, unless specified in the text

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