



CCM CHEMICALS SDN BHD
PASIR GUDANG WORKS

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : LIQUID CHLORINE

Recommended use : Used. For sewerage treatment, cleaning, bleaching and disinfection

Product Name : Liquid Chlorine

Trade Name : Liquid Chlorine

Chemical Name : Chlorine

Molar Mass : 71 g/mol

Address/Phone No. : CCM Chemicals Sdn Bhd
Pasir Gudang Works
PLO 411, Kawasan 4
Jalan Perak Satu
Kawasan Perindustrian Pasir Gudang
81700 Johor
Tel No. : **07-267133 / 07-2510562**
Fax No. : **07-2510560**

Emergency Phone No. : IN AN EMERGENCY DIAL 999
For specialist advice in an emergency, telephone 1-800-88-8565

Contact

Designation : Product Manager

Telephone No. : 03-51018388

2. HAZARD IDENTIFICATION

Physical Hazard Classes

Gases under pressure : Liquefied gas

Health Hazard Classes

Acute Toxicity (inhalation) : Category 3

Skin corrosion / Irritation : Category 2

Serious Eye Damage / Irritation : Category 2

Respiratory or skin sensitization : Respiratory Category 1

Specific target organ toxicity, single exposure Category 3

Environmental Hazards

Aquatic Acute : Category 1

Label Elements

Pictogram and Symbol.



Signal Word : **Danger**

Hazard Statement

H331 Toxic if inhaled

H319 Causes skin irritation

H335 May causes skin irritation

H315 Causes skin irritation

H400 Very toxic to aquatic life

Precautionary Statement(s):

Prevention:

P220 Keep / Store away from clothing / incompatible materials / combustible materials.

P244 Keep valves and fittings free from oil and grease.

P261 Avoid breathing dust / fume / gas / mist / vapours / spray.

P271 Use only outdoors or in a well-ventilated area.

P264 Wash hands thoroughly after handling.

P280 Wear protective gloves / protective clothing / eye protection / face protection.

P273 Avoid release to the environment.

Response:

P302+P352 IF ON SKIN:Wash with plenty of soap and water.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

P337+P313 If eye irritation persists: Get medical advice/attention.

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P370+P378 In case of fire: Use extinguishing media as outlined in Section 5 of this SafetyData Sheet to extinguish.

Storage:

P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

3. COMPOSITION/INFORMATION ON INGREDIENT**PRODUCT DESCRIPTION**

HAZARDOUS INGREDIENTS (S)	CAS No.	Proportion	Exposure	H Codes
Chlorine	007782-50-5	>99.5%	T	H331, H319, H335, H315, H400

4. FIRST AID MEASURES**OBTAIN IMMEDIATE MEDICAL ATTENTION**

- Inhalation : Remove patient from exposure, Keep warm and rest. Administer oxygen if necessary. Apply artificial respiration if breathing has ceased or show signs of failing. During resuscitation, care must be taken to avoid contamination by substance from the patient. Obtain medical attention.
- Skin Contact : If contact with liquid chlorine, remove contaminated clothing. After contact with skin, wash immediately with plenty of water for at least 15 minutes. Care must be taken to prevent the spread of material from contaminated clothing. Do not attempt chemical neutralization or apply any salves or ointments to damaged skin .Obtain medical attention.
- Eye Contact : SPEED IS ESSENTIAL. Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 minutes. Obtain medical attention.
- Ingestion : Do not induce vomiting. Obtain medical attention.

4.1 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED.

Contact with this material will cause burns to the skin, eyes and mucous membranes.
Unconsciousness. Cough, shortness of breath, headache, nausea, vomiting. May cause lung damage

4.2 INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

Continue oxygen if necessary. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pulmonary oedema may develop. Positive end expiratory pressure pulmonary ventilation plus steroid therapy should be considered in severe cases. Symptomatic treatment and supportive therapy as indicated.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

Use suitable extinguishing media for the surrounding fire. Keep fire exposed containers cool by spraying with water. Use water with caution, chlorine in water can be very corrosive. DO NOT spray on to leaking containers.

Specific hazards arising from the substance or mixture:

Non-combustible. Oxidising agent ; may assist combustion. Mixtures of chlorine and hydrogen are explosive over a wide range of concentrations.

Special Protective equipment and precautions for fire fighters

A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions

Special protective equipment and precautions for firefighters

Special Protective Equipment for Firefighters: Firefighters MUST use self contained breathing equipment, eye protection and full protective clothing when fighting fires in which chlorine is involved. Use water spray to keep fire-exposed containers cool, but avoid area where chlorine is leaking.

Fire-fighting equipment/instructions

In case of fire and/or explosion do not breathe fumes. Remove pressurized gas cylinders from the immediate vicinity. Cylinders can burst violently when heated, due to excess pressure build-up. Cool containers / tanks with water spray. Evacuate area and fight fire remotely due to the risk of explosion.

6. ACCIDENTAL RELEASE MEASURE

Personal precautions, protective equipment and emergency procedures

Keep people away from and upwind of leak. Keep out of low areas. Closed spaces must be ventilate before entering. Wear appropriate protective equipment and clothing during clean-up.

Methods and materials for containment and cleaning up

Ensure full personal protection (including respiratory protection) during removal of spillages. Provided it is safe to do so, isolate the source of the leak. If possible turn leaking containers so that gas escapes rather than liquid. Neutralised the leak material with limestones and soda ash.

Environmental precautions

Contain spillages with sand or earth, cover with polythene sheeting. Do not allow to enter drains, sewer or watercourses. Spillages or uncontrolled discharge into watercourses must be alerted to the appropriate regulatory body.

7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Precautions for safe handling

Do not breath gas. Do not use grease and oils. Avoid contact with skin or eyes. Wherever possible should be handled in high containment systems. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Wear appropriate PPE Equipment. Avoid release to the environment.

Hygiene measures :

Do not eat, drink or smoke when using this product. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing thoroughly

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Keep container in a well ventilated place. Keep container tightly closed and dry. Keep away from heat and direct sunlight. Cylinders should be securely kept upright at all times. Drums should be stored horizontally. Check regularly for leaks.

8. EXPOSURE CONTROL AND PERSONAL PROTECTION

Atmospheric levels should be controlled in compliance with the occupational exposure limit. For operations where there is a risk of exposure to chlorine, full protective clothing and suitable respiratory equipment must be worn.

Occupational Exposure Limits

HAZARDOUS INGREDIENTS (S)	LTEL 8hr TWA		TLV-STEL	
	ppm	mg/m ³	ppm	mg/m ³
Chlorine	0.5	1.5	1	2.9

US. ACGIH Threshold Limit Values

Material	Type	Value
CHLORINE (CAS 7782-50-5)	STEL	1 ppm
	TWA	0.5 ppm

Engineering controls

Ensure adequate ventilation. Should be handled in closed systems, if possible. Provide eye wash and emergency shower facilities.

Biological limit values

No biological exposure limits noted for the ingredient(s).

PERSONAL PROTECTIVE EQUIPMENT

Eye/face protection

Wear goggles/face shield.

Skin/Protective Clothing

Wear suitable protective clothing and gloves. Neoprene and butyl rubber are better than PVC.

Respiratory protection

For high (unknown) concentrations suitable respiratory equipment with positive air supply must be worn. Canister type respirators may be suitable for low concentrations up to 50ppm and short exposure times. Wear cartridge/canister respirator is used check with protective equipment manufacture's data.

Thermal Hazards

Wear appropriate thermal protective clothing, when necessary

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	gas (usually supplied as a liquid under pressure)
Odor	Pungent
Odor Threshold	1ppm (approx.)
Color	greenish - yellow
Physical State	Gas compressed, liquefied
pH	Not available
Boiling Point (Deg C)	- 34
Melting Point (Deg C)	- 101
Flash point	Not applicable.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	Not applicable.
Vapor pressure (mm Hg)	6.7 barg absolute at 20 Deg C
Vapour Density (Air=1)	2.49 at 20 Deg C (relative to air)
Solubility (Water)	slightly soluble
Solubility (other)	soluble in : most organic solvents
Relative density.	Not available
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity (mPa.s)	0.35
Critical Temp. (Deg)	144
Specific Gravity	1.468 (liquid density) at 0 Deg C

10. STABILITY AND REACTIVITY

Stability	:	Stable
Conditions to avoid	:	The presence of moisture in gaseous and liquid chlorine increases corrosive attack on most common metals.
Hazardous Reactions	:	Oxidising agent ; may assist combustion. Can react violently if in contact with many organic materials such as mineral oils and greases (including silicones) and finely divided metals. Dry chlorine reacts violently with titanium. Form explosive compounds with alcohols, glycols, ammonia and its compound. Form explosive mixtures with hydrogen over wide range of concentrations. Can cause an iron/chlorine fire with steel at a temperatures over 100 deg C.
Hazardous Decomposition Product (s)	:	Hydrogen chloride in the presence of water.

11. TOXICOLOGICAL INFORMATION

Inhalation	:	Toxic by inhalation. Irritating to respiratory system. Atmospheric concentrations in excess of the occupational exposure limit may lead to immediate severe irritation of the upper respiratory airways, intense coughing, choking and bronchospasm (15-20ppm); shortness of breath, chest pain, possible nausea and vomiting (30ppm). There is some evidence that such exposures may cause bronchial hyper reactivity in susceptible individuals. Chemical tracheo - bronchitis, pulmonary oedema may appear up to 48 hours after exposure (above 40ppm)
Skin Contact	:	Irritating to skin. Gas can cause irritation and may cause blistering in high concentrations particularly if moist. Liquid causes freeze burns.
Eye Contact	:	Irritating to eyes. Gas causes irritation (severity depending on concentration and duration of exposure above 5ppm).The liquid causes severe burns.
Ingestion	:	Will cause corrosion of and damage to the gastrointestinal tract.
Long Term Exposure	:	Repeated exposure by inhalation to concentrations of chlorine in excess of the occupational exposure standard may result in adverse effect on the respiratory tract.
Acute toxicity	:	Inhalation LC50 (rat): 293 ppm/1hr. Irritation Threshold: approximately 0.5 ppm Unconsciousness and death may occur following exposure to concentrations above 50ppm, (dependent upon duration of exposure).

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

High tonnage material produced in wholly contained system. The product is sparingly soluble in water. The product has low potential for bioaccumulation.

Persistence and Degradation

There is evidence of partial hydrolysis in water. The substance is highly reactive and will not persist in the environment.

Toxicity

Very toxic to aquatic organisms. Highly toxic to sewage micro-organisms. Can cause damage to vegetation. Can cause severe damage to aquatic plants

Effect of Effluent Treatment

The product is substantially removed in biological treatment processes. There is evidence of inhibition to the aerobic treatment process at a concentration 0.50(mg/l).

13. DISPOSAL CONSIDERATIONS

Waste disposal method

Chlorine gas will disperse to atmosphere leaving no residue. When possible, move leaking container to an isolated area. Positioned to release gas, not liquid. Absorb in alkaline solution of caustic soda, soda ash or hydrated lime. Liquid or solid residue must be disposed of in a permitted waste management facility.

14. TRANSPORT INFORMATION

ROAD/RAIL

UN No.	:	1017
Proper shipping name	:	Chlorine
ADR/RID Class	:	2
ADR/RID Item No.	:	2 TC
ADR SIN	:	1017

SEA (IMDG)

UN No.	:	1017
Proper shipping name	:	Chlorine
IMDG Class	:	
- primary	:	2.3
Label codes	:	2.3, 5.1, 8
Packing Group	:	8
Marine Pollutant	:	Yes
Special Precaution in transporting substance	:	None

US DOT

Shipping name	:	Chlorine
UN No.	:	1017
Hazard Class	:	2.3
Label Codes	:	2.3, 5.1, 8
Special Provision	:	Toxicity Inhalation Hazard Zone B

AIR

UN No. : 1017
Proper shipping name : Chlorine

TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in passenger aircraft and cargo aircraft.

SPECIAL PRECAUTIONS FOR USER

Before transportation, make sure that the containers are tightly sealed and that there are no liquid or gas leaks. When transporting containers, be sure that they are tightly fastened. An appropriate buffer material should be placed between them to prevent them from bumping each other and being damaged during transport.

15. REGULATORY INFORMATION**Malaysia Regulations:-**

1. Occupational Safety & Health (CIMAH) Regulations 1996
2. Occupational Safety & Health (CLASS) Regulations 2013
3. Occupational Safety & Health (USECHH) Regulations 2000

16. OTHER INFORMATION

Information furnishes in this data sheet is accurate to the best of our knowledge, information at the time of printing. Information serve as guidance for the safe handling, usage, processing, storage, transportation, disposal and discharge and should not be assumed as guarantee or quality specification. Information are relevant to the mentioned substance and is not accurate if this substance is mix with other substances or into process unless stated above.

MSDS Recent Revision Date: 1st January 2020

MSDS Recent Revision : 7

This data sheet was prepared in accordance with OSH CLASS Regulations 2013

Chemical Emergency Telephone Number : 1-800-88-8565

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