## MATERIAL SAFETY DATA SHEET

1. CHEMICAL IDENTITY					
Chemical Name	Chlorine				
Chemical Formula C	CI <sub>2</sub>				
Synonyms ]	Disinfectant				
Chemical Classification	Inorganic Gas or Liquid				
Trade Name					
CAS No.	782	?-50-5			
U N No.	1017				
Regulated I dentification					
Shipping Name	Chlorine				
Hazchem Code 2	2XE				
Codes / Label	17 is atomic number. Hazard class 2.3, Toxic gases				
Hazardous Waste ID No.					
Hazardous Ingredient Name	CAS No.				
Chlorine	7782-50-5				
2. PHYSICAL / CHEMICAL CHARACTERISTICS					
Physical state		Liquefied compressed gas			
Appearance		Greenish yellow			
Odour	· · · · · · · · · · · · · · · · · · ·		Irritating, Bleach like choking odor		
Solubility		Insoluble in water, soluble in alkalies			
Specific gravity		1.47 at 0 °C			
рН		Not pertinent			
Boiling range / Point		-34 °C			
Melting / Freezing point		-101 °C			
Vapor Density (Air=1)		2.49			
Vapor pressure at 35°C (mm Hg)		>4800 mm Hg at 20°C			
3. FIRE / EXPLOSION HAZARD DATA					
Flammability: No	LEL %			Flash Point (O	C) ° C
TDG Flammability:	UEL %			Flash Point (CC) °C	
Auto ignition temperature ° C		NA	Combustible L	_iquid	No

Explosion sensitivity to static electricity  Hazardous Combustion Products  Hazardous Polymerization  Will not occur  Organic peroxide  Others:  4. REACTIVITY DATA  Chemical Stability  Incompatibility with other material  Reactivity  Will not occur  Violent reaction with Aicholis, explosive reaction with metals, potentially dangerous reaction with Hydrocarbons, Lewis Acids, Sulfides, Trialkyl Boranes.  Toxic products are generated when combustible burn in Chlorine.  5. HEALTH HAZARD DATA  Routes of entry  Effects of Exposure / Symptoms  Emergency Treatment  Emergency Treatment  Emergency Treatment  Expess: Flush eyes with plenty of water for several minutes.  Inhalation: Remove the victim to fresh air area, support respiration, and give oxygen, if necessary.  Osto ppm in air and 0.31 ppm in water.  Osto ppm in air and 0.31 ppm in water.  Osto ppm in Faratings  Osto ppm  Ost	Explosion sensit	ivity to impact	Stable	Explosive ma	terial:	No
Hazardous Combustion Products Hazardous Polymerization Hazardous Polymerization Will not occur Pyrophoric Material No Organic peroxide No Corrosive material Yes Others:  4. REACTIVITY DATA Chemical Stability Incompatibility with other material Reactivity Stable Combustible substances, finely divided metals Wiolent reaction with Alcohols, explosive reaction with metals, potentially dangerous reaction with Hydrocarbons, Lewis Acids, Sulfides, Trialkyl Boranes. Toxic products are generated when combustible burn in Chlorine.  5. HEALTH HAZARD DATA Routes of entry Inhalation, ingestion, skin, eyes Effects of Exposure / Symptoms Eyes: Causes eye irritation Inhalation: Causes sneezing, copious salivation, general excitement, restlessness. High concentration causes respiratory distress and violent coughing, often with retching. Death may result from suffocation.  Emergency Treatment Eyes: Flush eyes with plenty of water for several minutes.  Inhalation: Remove the victim to fresh air area, support respiration, and give oxygen, if necessary.  Oral mouse LD50 Not listed STEL 1.0 ppm 3 mg/m³ O.002 ppm in air and 0.31 ppm in water. Permissible Exposure Limit (PEL) as per OSHA ACGIH Threshold Limit Value(TLV) NFPA RATINGS						
Organic peroxide No Corrosive material Yes Others:  4. REACTIVITY DATA Chemical Stability Incompatibility with other material Reactivity Reactivity Reaction with other material Reactivity Reaction Products Reactivity Reaction Products Reaction With Malcohols, explosive reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Malcohols, explosive reaction with Alcohols, perbasiles substances, finely divided metals  Inhalation: Reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Malcohols, explosive reaction with Malcohols, explosive reaction with Alcohols, perbasiles substances, finely divided metals  Inhalation: Reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Alcohols, perbasiles  Inhalation: Reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Alcohols, perbasil		bustion	1	Oxidizer:		Yes
Corrosive material Yes Others:  4. REACTIVITY DATA Chemical Stability Incompatibility with other material Reactivity Reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with Hydrocarbons, Lewis Acids, Sulfides, Trialkyl Boranes. Toxic products are generated when combustible burn in Chlorine. Steps: Causes eye irritation Inhalation: Causes sneezing, copious salivation, general excitement, restlessness. High concentration causes respiratory distress and violent coughing, often with retching. Death may result from sulfocation.  Engere Causes Flexible substances, finely divided metals Reactivity Reactivity Reaction with Alcohols, reaction with Hydrocarbons, Lewis Acids, Sulfielles, Trialky Boranes. Toxic products are generated when combustive reaction with Hydrocarbons, Lewis Acids, Sulfielles, Trialky Boranes. Toxic products are generated when combustive reaction with Hydrocarbons, Lewis Acids, Sulfi	Hazardous Polyi	merization	Will not occur	Pyrophoric Ma	aterial	No
A. REACTIVITY DATA Chemical Stability Incompatibility with other material Reactivity Reactivity Reactivity Reaction with Alcohols, explosive reaction with Alcohols, explosive reaction with metals, potentially dangerous reaction with Hydrocarbons, Lewis Acids, Sulfides, Trialkyl Boranes. Toxic products are generated when combustible burn in Chlorine.  5. HEALTH HAZARD DATA Routes of entry Inhalation, ingestion, skin, eyes Effects of Exposure / Symptoms Eyes: Causes eye irritation Inhalation: Causes sneezing, copious salivation, general excitement, restlessness. High concentration causes respiratory distress and violent coughing, often with retching. Death may result from suffocation.  Emergency Treatment Eyes: Flush eyes with plenty of water for several minutes.  Inhalation: Remove the victim to fresh air area, support respiration, and give oxygen, if necessary.  Oral mouse LD50 Not listed 1.0 ppm 3 mg/m³ Odour threshold Permissible Exposure Limit (PEL) as per OSHA ACGIH Threshold Limit Value(TLV) NFPA RATINGS				Organic perox	kide	No
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Chemical Stability  Incompatibility with other material  Reactivity  Reactivation, peracted whencomben.  Reactivity  Reactivity  Reactivity  Reactivity  Reactivit				Others:		
Incompatibility with other material  Reactivity  Reaction with Alcohols, explosive reaction with Hydrocarbons, Lewis Arights, patentially bearness.  Inhalation: Reaction with retching. Death may result from suffocation.  Remove the victim to fresh air area, support respiration, and give oxygen, if necessary.  Reactivity  Reactivity  Reactivity  Reactivity  Reaction with Alcohols, explosive reaction with Hydrocarbons, Lewis Arights, patentially danger and sendent support in Allouding and in Allouding Arights and Silver and S	4. REACTIVIT	Y DATA	1	1		
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Permissible Exposure Limit (PEL) as per OSHA  ACGIH Threshold Limit Value(TLV)  NFPA RATINGS	STEL			1.0 ppm 3 mg/m <sup>3</sup>		
OSHA ACGIH Threshold Limit Value(TLV)  NFPA RATINGS	Odour threshold			0.002 ppm in air and 0.31 ppm in water.		
NFPA RATINGS	Permissible Exposure Limit (PEL) as per OSHA			0.5 ppm		
	ACGIH Threshold Limit Value(TLV)			0.5 ppm		
Health 4 Flammability 0 Reactivity 0	NFPA RATING	S				
	Health	4	Flammability	0	Reactivity	0

Label Hazard warning	
6. PREVENTI VE MEASURES	
Handling & Storage Precautions	Store in a cool, dry, relatively isolated well ventilated place. Store in cylinders, pressure vessels, or pipelines.
Personal Protective Equipment	Avoid contact with liquid or vapors. Provide PVC gloves, gumboots, rubber overcoat, head mask, self-contained breathing apparatus
7. EMERGENCY / FIRST AID MEASURES	
Fire extinguishing media	
Special procedure	Keep the containers cool by spraying water if exposed to heat or flame.
Unusual Hazards	Poisonous gases are produced in fire.
Exposure	
First aid measures	Eyes: Flush eyes with plenty of water for several minutes.  Inhalation: If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.
Antidotes / Dosages	There are no specific antidotes for chlorine. Wash the affected area with plenty of water and if chlorine is ingested give milk or butter milk.
Spills	
Steps to be taken	Shut off leaks if without risk. Contain liquid with sand or earth. Prevent the liquid from entering the sewer. Vapors create toxic atmosphere. Knock down vapors with water spray.
Waste disposal method	Neutralize small liquid spillages with soda ash & drain with abundant water. Cover pool with protein foam, so that the release of vapour to atmosphere is low and under control.

In case of large gas escapes, the presence of cloud can be marked with ammonia with which it will turn into a mist. Run away from the gas clouds in a direction perpendicular to the wind direction. Avoid liquid chlorine from leaking and body contact. Persons with pulmonary diseases should avoid the exposure. Can react to cause fires /

explosion on contact with Turpentine, Illuminating gas, Polypropylene, Rubber, Sulfamic Acid, Acetaldehyde, Alcohols. Bring the leaking portion of the cylinder to the uppermost position, so that only the gas escapes and not the liquid.				
9. MANUFACTURERS / SUPPLIERS DATA	<ul> <li>We are only chlorine users</li> </ul>			
Name of the firm				
Contact person in Emergency				
Address				
Telephone / Telefax Nos.				
Local Bodies involved				
Standard Packing				
Trem Card Details / Ref				
Other:				

## 10. DISCLAIMER

Information contained in this material data sheet is believed to be reliable but not representation, guarantee or warranties of any kind are made as to its accuracy, suitability for a particular application or results to be obtained from them. It is up to the manufacturer/seller to ensure that the information contained in the material safety data sheet is relevant to the product manufactured/handled or sold by him as the case may be.