



Chemicals Inc.

MATERIAL SAFETY DATA SHEET

ASHTA Chemicals Inc.

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CHLORINE LIQUID

CHEMTREC:(800) 424-9300

SECTION I

MATERIAL IDENTIFICATION

CHEMICAL NAME:	Chlorine	C.A.S. NO.:	
	7782-50-5		
TRADE NAME:	Chlorine, Compressed Chlorine	FIFRA:	#21139-1
SYNONYMS:	Liquid Chlorine	SARA 312/313:	Yes
CHEMICAL FORMULA:	Cl₂	CERCLA:	Yes
CHEMICAL FAMILY:	Halogen	TSCA INVENTORY:	Yes
N.F.P.A. REGISTRY:	3-0-0-OXY	HMIS:	3-0-0-G
LABELING:	Poison gas, corrosive	REPORTABLE QUANTITY:	10 Lbs.
WHMIS:	1%	OSHA PSM:	1500 lbs
D.O.T. IDENTIFICATION NO.:	UN 1017	D.O.T. LISTED:	Marine Pollutant
D.O.T. SHIPPING NAME:	Chlorine	D.O.T. HAZARD GUIDE:	#124
D.O.T. HAZARD CLASS:	2.3	PLACARD:	UN 1017

SECTION II

INGREDIENTS AND HAZARDS

PRINCIPAL COMPONENT:	Chlorine	PERCENT:	Essentially 100%
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS OR GASES:	Chlorine is one of the chemical elements. This substance can be absorbed into the body by inhalation and is corrosive to the eyes, skin and respiratory tract. Serious cases may be fatal.		
ADDITIONAL INFORMATION:	ACGIH TLV = 0.5 PPM (TWA), 1 PPM STEL OSHA PEL = 1 PPM		

SECTION III

PHYSICAL DATA

BOILING POINT:	-29.3°F or -34.0°C	pH:	Non-aqueous
SPECIFIC GRAVITY (H ₂ O=1):	Liquid At 0°C = 1.467		
VAPOR PRESSURE (PSIG):	At 70°F = 85.3	VAPOR DENSITY (Air = 1):	2.49
APPEARANCE/ODOR:	Gas is greenish yellow, liquid is amber. Odor is suffocating, pungent, irritating.		
PERCENT VOLATILE BY VOLUME:	100%		
EVAPORATION RATE:	Contingent on rate of heat absorption.		
SOLUBILITY IN WATER:	(About 0.7%)		
FREEZE/SOLIDIFICATION TEMP:	-149.8°F or -101°C		

SECTION IV

FIRE AND EXPLOSION DATA

FLASH POINT (METHOD):	None.
EXTINGUISHING MEDIA:	Suitable for surrounding fire.
AUTO IGNITION TEMP:	Non-combustible.
SPECIAL FIRE FIGHTING PROCEDURES:	Remove containers from fire zone if possible, except if chlorine is leaking. In presence of chlorine use self contained breathing apparatus and fire fighter turnout clothing.
UNUSUAL FIRE/EXPLOSION HAZARDS:	Many metals ignite in the presence of chlorine, for example, steel at about 485°F, titanium on contact with dry chlorine. It may react to cause fire and/or explosion on contact with organics like turpentine, penetrating oil, etc. Also with ether, ammonia, hydrocarbons, and fine particles of metals.

SECTION IV	FIRE AND EXPLOSION DATA, cont'd
ADDITIONAL INFORMATION:	Many reactions may cause fire (possibly with explosion). Avoid contact with combustibles, in particular hydrogen, acetylene, light organics and ammonia. Chlorine cylinders and ton containers are equipped with fusible plugs that melt at about 158°F.
SECTION V	HEALTH HAZARD DATA
OSHA PERMISSIBLE EXPOSURE LIMIT:	(C) 1 PPM
ACGIH THRESHOLD LIMIT VALUE:	0.5 PPM (8 Hour TWA)
IARC/NTP CARCINOGEN:	Not listed.
MUTAGENIC:	Not reported.
TERATOGENIC:	Not reported.
REPRODUCTIVE TOXICITY:	Studies show no effects on rats and rabbits exposed to chlorine.
MEDICAL CONDITION(S)	
AGGRAVATED BY EXPOSURE:	Emphysema, bronchitis, asthma and other respiratory diseases.
PRIMARY ROUTES OF EXPOSURE:	Inhalation, skin.
TARGET ORGANS:	Respiratory system.
EFFECTS OF EXPOSURE :	
INHALATION:	Symptoms vary from mild irritation with coughing and labored breathing to possible death from suffocation.
SKIN:	Liquid and gas are capable of causing a burn.
EYES:	Liquid and gas are capable of causing a burn.
INGESTION:	Not likely a problem because it is a gas at room temperature.
EMERGENCY FIRST AID:	
INHALATION:	Remove from contaminated area. If breathing has ceased, start artificial respiration at once. Obtain medical assistance.
SKIN:	Remove contaminated clothing under shower.
EYES:	Immediate flush with water at least 15 minutes. Use no oils or chemical neutralizers. Obtain medical assistance promptly.
INGESTION:	Not a likely occurrence. Vomiting should be induced.
ADDITIONAL INFORMATION:	One study which involved exposures to humans to 0.5 PPM for 8 hours and 1.0 PPM for 4 hours caused transient decreased pulmonary capacity as measured by pulmonary function tests.
SECTION VI	REACTIVITY DATA
STABILITY:.	Stable under normal conditions.
CONDITIONS TO AVOID:	Moisture in chlorine handling systems. Excessive heat or fire in storage areas, above 485°F.
INCOMPATIBILITY:	Chlorine reacts as an oxidizer with most organic materials (except those fully halogenated) at room temperature. It reacts with many metals at elevated temperatures. Dry chlorine will react with titanium and aluminum. Wet chlorine is corrosive to most metals except titanium.
HAZARDOUS DECOMPOSITION PRODUCTS:	Cannot decompose.
POLYMERIZATION:	Will not polymerize.
CONDITIONS TO AVOID:	Wet chlorine contact with most metals (except titanium).
ADDITIONAL INFORMATION:	Handle chlorine with full regard to its pressure characteristics.
SECTION VII	ENVIRONMENTAL PROTECTION PROCEDURES
SPILL RESPONSE:	Follow preplanned emergency procedures. Only properly equipped, trained, functional personnel should attempt to contain a leak. All other personnel should be evacuated from the danger area. Using full protective equipment, apply emergency kit device or other securement technology to stop the leak. Report spills as required to appropriate government authorities. For assistance call Chemtrec (800) 424-9300 or supplier.

SECTION VII	ENVIRONMENTAL PROTECTION PROCEDURES, cont'd
WASTE DISPOSAL METHODS:	Chlorine gas will disperse to the atmosphere leaving no residue. Neutralizing chemicals are caustic soda solutions, soda ash solutions and lime solutions.
PROTECTIVE EQUIPMENT:	Requires NIOSH approved self-contained breathing apparatus and may require a fully encapsulated suit.
SECTION VIII	SPECIAL PROTECTION INFORMATION
EYE PROTECTION:	Splash goggles or full face gas mask.
RESPIRATORY PROTECTION:	NIOSH- approved acid gas chemical cartridge respirator or full face with canister - within allowable limits. For unknown concentrations use approved self-contained breathing apparatus.
OTHER PROTECTION:	For exposure to high concentrations of liquid chlorine full body protection (chemical suit) is required. In the open and/or fire situations, fireman's turn-out clothing is recommended. In light concentrations, one piece tyvek suit sealed at the neck, wrists, and ankles is functional.
VENTILATION RECOMMENDED:	Sufficient to control below TLV or PEL. Chlorine will collect at the floor or ground level. Exhaust systems must be designed accordingly. Absorption or scrubber systems are recommended.
GLOVE TYPE RECOMMENDED:	Non-porous, i.e. neoprene, butyl or viton.
ADDITIONAL INFORMATION:	Do not attempt to handle chlorine without previous training in respiratory equipment for toxic gases.
SECTION IX	SPECIAL PRECAUTIONS
HYGIENIC PRACTICES IN HANDLING AND STORING:	Avoid inhalation of vapors and body contact as body moisture will form a weak acid.
PRECAUTIONS TO BE TAKEN FOR HANDLING AND STORING:	Do not attempt to handle, store, or use chlorine without complete review of the Chlorine Institute's chlorine manual or formal training. Chlorine systems and support systems must be kept free of organics, clean, dry (free of moisture) and protected from fire. Proper selection of materials of construction of a chlorine system is critical to safety.
PRECAUTIONS FOR REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT:	Purge free of chlorine.
OTHER PRECAUTIONS:	Obtain medical assistance promptly after exposure. Preplanning for emergencies and training of personnel is essential to safe handling.
SECTION X	TRANSPORTATION
USUAL SHIPPING CONTAINERS:	Steel tank cars, tank trucks, ton containers, 100 and 150 pound cylinders.
USUAL SHELF LIFE:	Unlimited.
STORAGE/TRANSPORT TEMPS:	Ambient.
SUITABLE STORAGE MATERIALS/COATINGS:	Steel.
UNSUITABLE:	Titanium, chrome, aluminum and reactive metals.
OTHER INFORMATION:	To activate a Chlorine Emergency Response Team, call Chemtrec 800-424-9300.

Chlorine is shipped as a dry compressed gas in steel containers. Local heating of this equipment (above 485 EF) can result in a chlorine-iron fire from the inside of the container, resulting in sudden release of contents. To assist exposure victims, avoid further exposure by removal of saturated clothing and protection of the respiratory system by continuous supply of air or oxygen by mask. Keep patient half upright and warm. Get prompt medical attention. There is no known antidote for chlorine, however, inhalation of moisture with fresh air as from a household vaporizer expedites recovery for inhalation victims.

CHRONIC TOXICITY:

Rhesus monkeys exposed to concentrations to 2 PPM for 6 hours a day, 5 days a week for one year did not exhibit any signs of chronic toxicity.

REVIEWED: **04/09**

(No changes made)

SUPERSEDES: **03/06**

(No changes made)

11/03

(Added WHMIS percentage, OSHA PSM Threshold Quantity)

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