Sample Material Safety Data Sheet (MSDS)

Section 1: Product Identification *Chlorine*

Manufacturer's Name		**Suppliers's Name**	
Chemco Manufacturing		Chempro Distributing	
Street Address		**Street Address**	
1234 Any Street		5678 Another Avenue	
City	**Province**	**City**	**Province**
Edmonton	AB	Edmonton	AB
Postal Code	**Emergency Tel:**	**Postal Code**	**Emergency Tel:**
T5T5T5	(888) 123-4567	T6T6T6	(888) 876-5432
Chemical Name		**Chemical Family**	**Chemical Formula**
Chlorine		Halogen	Cl_2
Product Use			
Pulp bleaching, water treatment, manufacture of plastics, organic and inorganic chlorides, refrigerants, pharmaceuticals.			

Section 2: Hazardous Ingredients *Chlorine*

Hazardous Ingredient	w/w%	**CAS Number**	**PINumber**
Chlorine	99.5	7782-50-5	1017
			

Section 3: Physical Data *Chlorine*

Physical State	**Odour and Appearance**		**Odour Threshold**
Gas at room temperature	amber liquid or greenish-yellow gas, penetrating odour		0.2 - 0.4 ppm
Vapour Pressure	**Vapour Density (air=1)**		**Evaporation Rate**
4800 mm Hg at 20°C	2.49		not applicable; gas
Boiling Point	**Freezing Point**		**Critical Temperature**
-34°C	-101°C		144°C
pH	**Specific Gravity**	**Solubility in Water**	**Coeff of Water/Oil Distr.**
5.5 @ 0.7% Solution	1.41 (liq. at 20°C)	0.7% at 20°C	not available

Section 4: Fire and Explosion Data *Chlorine*

Flammability - If yes, under which conditions?	
Yes [ ] No [X] Chlorine will support the burning of most combustible materials.	
Means of Extinction	
Use extinguishing media appropriate for surrounding fire.	
Special Procedures	
Use water spray to keep fire-exposed containers cool and continue until well after fire is out. Do not spray water directly on a chlorine leak, however, if it is necessary to stop the flow of gas, use water spray to direct escaping gas away from individuals effecting the shut-off. Firefighters MUST use self-contained breathing equipment, eye protection and full protective clothing when fighting fires in which chlorine is involved.	
Flashpoint and Method	**Auto Ignition Temperature**
Non-flammable	Not Applicable
Upper Explosion Limit (% by volume)	**Lower Explosion Limit (% by volume)**
Not Applicable	Not Applicable
Hazardous Combustion Products	
Toxic substances are formed when combustibles burn in chlorine. Chlorine reacts explosively, or forms explosive compounds, with many chemicals, such as acetylene, turpentine, ether, ammonia gas, and hydrogen.	
Sensitivity to Impact	**Sensitivity to Static Discharge**
Not Sensitive	Not Sensitive

Section 5: Reactivity Data *Chlorine*

Chemical Stability - (if no, under which conditions?)
Yes [X] No [ ] Dry chlorine is stable in steel containers at ambient conditions.
Incompatibility with other substances - (If yes, which ones)
Strong oxidizer. Avoid contact with reducing agents, combustible materials. Chlorine may react violently or explosively with ammonia, acetylene, ether, turpentine and other hydrocarbons, hydrogen, titanium, aluminum and other metals.
Reactivity, and under what conditions?
Wet chlorine (>150ppm H_2O) corrosively attacks most common metals. Chlorine reacts with CO to form toxic phosgene; SO_2 to form sulfuryl chloride; water to form hydrochloric and hypochlorous acid. Chlorine reaction to some organic compounds can be explosive.
Hazardous Decomposition Products
None

Section 6: Toxicological Properties (Health Hazard Information)

Chlorine

Route of entry		
Ingestion [X]	Skin Absorption [ ]	Eye Contact [X]
Inhalation Acute [X]	Inhalation Chronic [X]	Skin Contact [X]
Effects of Acute Exposure to Material		
LIQUID: burns skin, eyes, mucous membranes. GAS: eye and respiratory irritation, dyspnea, retching, vomiting, pulmonary edema. A few deep breaths at 1000 ppm Cl_2 may cause death, 30 ppm causes intense coughing.		
Effects of Chronic Exposure to Material		
Prolonged or repeated exposures above 5 ppm may cause damage to respiratory tract.		
Lethal Dose/Concentration (Specify Species and Route)		
LD_{50}: not available	**LC_{50}**: 293 ppm (Rat - 1 hr. inhalation)	
Irritancy		**Synergistic Material**
Severe skin, eye, respiratory		Not Available
Exposure Limits (ACGIH/TLV's)		
TWA = 0.5 ppm	STEL = 1 ppm	IDLH = 30 ppm
Sensitizing capability	**Carcinogenicity**	**Reproductive Effects**
Not a sensitizer	No evidence	Insufficient data

Section 7: Preventive Measures *Chlorine*

Personal Protective Equipment
Eye wash stations and chemical safety showers must be immediately available. If routine respiratory protection is required, institute a complete respiratory protection program. Emergency or planned entry into unknown or IDLH concentration requires positive pressure self-contained or air-supplied with full facepiece.
Engineering Controls (Specify: e.g. Ventilation, Enclosed Processes)
Provide general and local exhaust ventilation to meet TLV.
Leak and Spill Procedures
Chlorine gas may be absorbed in alkaline solution (caustic soda, soda ash, hydrated lime); control pH>10. Dispose of residue in accordance with Environmental Regulations.
Handling Procedures and Equipment
Regularly inspect and test piping and containment for chlorine service. Consult Chlorine Institute guidelines.
Storage Requirements
Store in ventilated areas of low fire potential, away from incompatible materials. Protect containers from weather and physical damage.
Special Shipping Information
Must meet Transport Canada Dangerous Goods Regulations (SOR/85-77) Class 2.3 - Poison gas

Section 8: First Aid Measures *Chlorine*

Get medical assistance for all exposures except minor inhalation or minor skin contact.
INHALATION: Remove victim to fresh air. Restore or support breathing as required. Trained person may administer oxygen until breathing is eased. Keep victim warm and at rest. SKIN: Remove contaminated clothing under safety shower. Flush skin thoroughly with water (30 minutes). Do not attempt to neutralize with chemicals. Use cold packs to reduce pain. EYE: Flush with copious amounts of water (30 minutes). Do not attempt to neutralize with chemicals. Use cold packs to reduce pain.

Section 9: Preparation Data *Chlorine*

Prepared by	
Chemco	
Date	**Phone Number**
March 1, 2010	(888) 123-4567