CANADA COLORS & CHEMICALS LTD
80 SCARSDALE ROAD
DON MILLS, ONTARIO, CANADA M3B 2R7
(416)-449-7750

PRODUCT : HYDROFLUOSILICIC ACID 25% CODE: 496000

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER.....SULCO CHEMICALS LTD.
60 FIRST STREET EAST
ELMIRA, ONTARIO
N3B 2Z5
PREPARED BY.....ENVIRONMENTAL & REGULATORY AFFAIRS DEPARTMENT
PREPARATION DATE.....OCT 06/2003
PRODUCT NAME.....HYDROFLUOSILICIC ACID 25%
PRODUCT CODE.....496000
CHEMICAL FAMILY.....INORGANIC ACID
MATERIAL USE.....N.AV.
EMERGENCY PHONE NO.....(519)-669-5166

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS/COMPOSITION	EXPOSURE LEVELS	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
SILICATE (2-) HEXAFLUORO-, DIHYDROGEN % :23 CAS #:16961-83-4	SEE/VOIR SECTION 11	SEE SECTION 11	SEE SECTION 11

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:
SKIN CONTACT.....SEE BELOW
SKIN ABSORPTION.....N.AV.
EYE CONTACT.....SEE BELOW
INHALATION.....SEE BELOW
INGESTION.....SEE BELOW
EFFECTS OF ACUTE EXPOSURE.....MAY CAUSE IRRITATION OR BURNS IN ALL PARTS OF THE BODY, INCLUDING THE SKIN, EYES, THROAT, LUNGS, MOUTH, AND INTESTINAL TRACT. EXPOSURES HIGHER THAN THE RECOMMENDED LIMITS OVER LONG PERIODS OF TIME MAY CAUSE CHRONIC IRRITATION OF THE NOSE, THROAT AND BRONCHIAL PASSAGES. MAY CAUSE BONE CHANGESE (FLUOROSIS) OR CALCIUM METABOLISM DISORDERS.
EFFECTS OF CHRONIC EXPOSURE.....SEE ABOVE

SECTION 04: FIRST AID MEASURES

PRODUCT : HYDROFLUOSILICIC ACID 25% CODE: 496000

SECTION 16: OTHER INFORMATION

N.AP.=NOT APPLICABLE

PRODUCT : HYDROFLUOSILICIC ACID 25% CODE: 496000

SECTION 10: STABILITY AND REACTIVITY

NO, WHICH ONES?.....STRONG ALKALIES. METALS. GLASS. STONEWARE. STRONG CONCENTRATED ACIDS SUCH AS SULFURIC AND PERCHLORIC ACIDS.
REACTIVITY CONDITIONS?.....SEE ABOVE
HAZARDOUS PRODUCTS OF DECOMPOSITION.....AT TEMPERATURES ABOVE 108.3/ 227 F, MAY PRODUCE TOXIC, IRRITATING AND CORROSIVE GASES INCLUDING SIF6 AND HF.

SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL.....TWA = 2.5 MG/M3 (AS F). OSHA PEL: TWA = 2.5 MG/M3 (AS F)
ADDITIONAL INFORMATION.....MAXIMUM USE LEVEL FOR POTABLE WATER TREATMENT IS 6.0 MG/L
ACUTE TOXICITY:.....LDLO (SKIN-FROG) = 140 MG/KG
CARCINOGENICITY OF MATERIAL.....NOT LISTED BY IARC, NTP
REPRODUCTIVE EFFECTS.....N.AV.
IRRITANCY OF MATERIAL.....SEE SECTION 03
SENSITIZING CAPABILITY OF MATERIAL.....N.AV.
SYNERGISTIC MATERIALS.....N.AV.

SECTION 12: ECOLOGICAL CONSIDERATIONS

NO INFORMATION AVAILABLE.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL.....DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, PROVINCIAL, AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER.....1778
TDG CLASSIFICATION.....8
PACKING GROUP.....II
SPECIAL SHIPPING INSTRUCTIONS....N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION.....E
CPR COMPLIANCE.....THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

IARC.....INTERNATIONAL AGENCY FOR RESEARCH ON CANCER
NTP.....NATIONAL TOXICOLOGY PROGRAM
N.AV.=NOT AVAILABLE

PRODUCT : HYDROFLUOSILICIC ACID 25% CODE: 496000

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND EQUIPMENT.....MAINTAIN ADEQUATE VENTILATION. TRAIN WORKERS IN SAFE HANDLING. WASH THOROUGHLY AFTER WORKING WITH HYDROFLUOSILICIC ACID, ESPECIALLY AROUND THE FINGERNAILS. CHEMICAL SAFETY GOGGLES SHOULD BE WORN WHENEVER WORKING NEAR STORAGE TANKS OR VESSELS.

STORAGE NEEDS.....STORE IN PLASTIC CONTAINERS AWAY FROM HEAT. DO NOT USE METAL, GLASS, OR STONEWARE. SECONDARY CONTAINMENT SHOULD BE PROVIDED TO MINIMIZE ENVIRONMENTAL CONTAMINATION IN THE EVENT OF A LEAK, SPILL, OR OTHER RELEASE.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE.....RUBBER OR NEOPRENE

RESPIRATORY/TYPE.....FOR CONCENTRATIONS UP TO 20 PPM OF VAPOR (AS F), A CHEMICAL CARTRIDGE RESPIRATOR PROVIDING PROTECTION AGAINST FLUORIDE GASES MAY BE USED. ABOVE 20 PPM, A SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE SHOULD BE USED, OPERATED IN A POSITIVE PRESSURE DEMAND MODE.

EYE/TYPE.....CHEMICAL SAFETY GOGGLES AND FACE SHIELD.

FOOTWEAR/TYPE.....SEE BELOW

CLOTHING/TYPE.....ACID SUITS, INCLUDING BOOTS

OTHER/TYPE.....EYE-WASH; SAFETY SHOWER. PROTECTIVE EQUIPMENT SHOULD BE CLEANED THOROUGHLY AFTER EACH USE. DO NOT TOUCH EQUIPMENT AFTER USE UNTIL IT HAS BEEN NEUTRALIZED.

ENGINEERING CONTROLS.....LOCAL EXHAUST RECOMMENDED TO REDUCE EXPOSURE TO VAPORS TO LESS THAN 3 PPM AS FLUORIDE.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE.....COLOURLESS. LIQUID

ODOUR.....SOUR PENETRATING ODOR.

ODOUR THRESHOLD.....N.AV.

VAPOUR PRESSURE (MMHG).....24 @ 25 (C)

VAPOUR DENSITY (AIR=1).....N.AP.

EVAPORATION RATE.....(BUTYL ACETATE=1). 1.0

BOILING POINT.....108.3 C/227 F (DECOMPOSES)

PH.....N.AV.

SPECIFIC GRAVITY (WATER=1).....1.23 @ 15.6 C

SOLUBILITY IN WATER (% W/W).....COMPLETELY SOLUBLE.

COEFFICIENT OF WATER/OIL DIST....N.AV.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:

YES.....STABLE

NO, WHICH CONDITIONS?.....HEATING INCREASES VAPOR PRESSURE.

COMPATABILITY WITH OTHER SUBSTANCES:

YES

PRODUCT : HYDROFLUOSILICIC ACID 25% CODE: 496000

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:.....EYE CONTACT:.. FLUSH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, HOLDING LIDS APART TO ENSURE COMPLETE IRRIGATION OF THE EYE. GET IMMEDIATE MEDICAL ATTENTION. SKIN CONTACT:.. IMMEDIATELY WASH TWICE WITH SOAP AND WATER. REMOVE AND MACHINE WASH CONTAMINATED CLOTHING. GET MEDICAL ATTENTION IF PAIN PERSISTS AFTER AFFECTED AREA IS WASHED. INHALATION: REMOVE TO FRESH AIR. GET MEDICAL ATTENTION IF DISCOMFORT PERSISTS. INGESTION: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LARGE AMOUNTS OF WATER OR MILK WITH MILK OF MAGNESIA. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 05: FIRE FIGHTING MEASURES

FLAMMABILITY.....NOT FLAMMABLE
IF YES, UNDER WHICH CONDITIONS?
EXTINGUISHING MEDIA.....WATER, DRY CHEMICALS, AND CO2 CAN BE USED ON FIRES IN WHICH IT IS INVOLVED.
SPECIAL PROCEDURES.....WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. COOL CONTAINERS WITH WATER USING FOG NOZZLE.
UNUSUAL FIRE AND EXPLOSION HAZARDS.....REACTS WITH MANY METALS TO PRODUCE FLAMMABLE AND EXPLOSIVE HYDROGEN. DECOMPOSITION OCCURS ABOVE 108 C/227 F TO PRODUCE TOXIC, IRRITATING AND CORROSIVE GASES INCLUDING SIF6 AND HF.
FLASH POINT (C), METHOD.....N.AP.
AUTO IGNITION TEMPERATURE.....N.AV.
UPPER FLAMMABLE LIMIT (% BY VOL.).....N.AP.
LOWER FLAMMABLE LIMIT (% BY VOL.).....N.AP.
EXPLOSION DATA
EXPLOSIVE POWER.....N.AV.
RATE OF BURNING.....N.AV.
SENSITIVITY TO STATIC DISCHARGE.....N.AV.
SENSITIVITY TO IMPACT.....N.AV.
HAZARDOUS COMBUSTION PRODUCTS....AT TEMPERATURES ABOVE 108 C/227 F, MAY PRODUCE TOXIC, IRRITATING AND CORROSIVE GASES INCLUDING SIF6 AND HF.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL.....RESTRICT ACCESS TO AREA UNTIL COMPLETION OF CLEANUP. USE ACID SUITS AND ACID-RESISTANT FOOTWEAR. DIKE TO CONTAIN MATERIAL. COLLECT AS MUCH OF THE SPILLED MATERIAL AS POSSIBLE IN ACID RESISTANT CONTAINERS FOR POSSIBLE REUSE. ABSORB THE REMAINING MATERIAL WITH SAND, VERMICULITE OR OTHER ABSORBENT MATERIAL, OR NEUTRALIZE WITH SODA ASH, SODIUM BICARBONATE, LIMESTONE OR LIME, UNTIL ACIDITY IS NEUTRALIZED.

Brenntag Canada Inc.

BRENNTAG

MATERIAL SAFETY DATA SHEET

CHLORINE, LIQUEFIED GAS

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.
43 Jutland Road.
Toronto, Ontario
M8Z 2G6
(416) 259-8231

WHMIS Number: 00010002
Index: GCD0016/04A
Effective Date: 2002 February 05
Date of Revision: 2004 March 08
Website: http://www.brenntag.ca

EMERGENCY TELEPHONE NUMBERS

Toronto, ON (416) 226-6117	Montreal, QC (514) 861-1211	Winnipeg, MB (204) 943-8827
Edmonton, AB (780) 424-1754	Calgary, AB (403) 263-8660	Vancouver, BC (604) 685-5036

PRODUCT IDENTIFICATION

Product Name: Chlorine, Liquefied Gas.
Chemical Name: Chlorine.
Synonyms: Not available.
Chemical Family: Halogen.
Molecular Formula: Cl2.
Product Use: Bacteriacide in water treatment. Chemical intermediate.
CAS #: 7782-50-5.
WHMIS Classification / Symbol: A: Compressed Gas, C: Oxidizer, D-1A: Very Toxic (acute effects), D-2A: Very Toxic (Chronic Effects), E: Corrosive.

READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT. Consult Product Technical Literature.

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Corrosive! May be fatal if inhaled. Causes severe skin and eye burns. Gas is extremely irritating to eyes and respiratory tract. Strong, offensive odor. Strong oxidizer. Contact with other combustible material can cause fire. Liquefied compressed gas. Contents under pressure. Ruptured containers may rocket.

POTENTIAL HEALTH EFFECTS

. Inhalation: Corrosive! Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. Toxic effects may be delayed. See "Other Health Effects" Section.

. Skin Contact: Corrosive! Chlorine vapours may cause burning and prickling sensations, reddening and blisters. Direct contact with liquid causes severe local irritation, blistering and burns. Avoid handling when the skin is moist, wet or abraided. Burns (chemical) can occur if not promptly removed. See "Other Health Effects" Section.

INTERNATIONAL: The following component or components of this product appear on the European Inventory of Existing Commercial Chemical Substances: Chlorine.

16. OTHER INFORMATION

ADDITIONAL INFORMATION AND SOURCES USED

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
3. Supplier's Material Safety Data Sheet(s).
4. "CHEMINFO", through "CCINFOdisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
5. Guide to Occupational Exposure Values, 2002, American Conference of Governmental Industrial Hygienists, Cincinnati, 2002.
6. The British Columbia Drug and Poison Information Centre, Poison Managements Manual, Canadian Pharmaceutical Association, Ottawa, 1981.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

British Columbia: 20333-102B Avenue, Langley, BC, V1M 3H1
Phone: (604) 513-9009 Facsimile: (604) 513-9010

Alberta: 6628 - 45 th. Street, Leduc, AB, T9E 7C9
Phone: (780) 986-4544 Facsimile: (780) 986-1070

Manitoba: 681 Plinguet Street, Winnipeg, MB, R2J 2X2
Phone: (204) 233-3416 Facsimile: (204) 233-7005

Ontario: 43 Jutland Road, Toronto, ON, M8Z 2G6
Phone: (416) 259-8231 Facsimile: (416) 259-6175

Quebec: 2900 Jean Baptiste Des., Lachine, PQ, H8T 1C8
Phone: (514) 636-9230 Facsimile: (514) 636-0877

Atlantic: A-105 Akerley Boulevard, Dartmouth, NS, B3B 1R7
Phone: (902) 468-9690 Facsimile: (902) 468-3085

Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.

irrigation water supplies, lakes, streams, ponds or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals: Chlorine gas will disperse to the atmosphere leaving no residue. Gaseous material can be absorbed in alkaline solutions of Caustic Soda, Soda Ash or Hydrated Lime. When absorbing Chlorine in alkaline solutions, the reaction is exothermic. Ensure the absorption is controlled as to heat and reaction. (3)

Since hypochlorites are formed, solutions must be treated with reducing agents such as sodium sulphite before disposal. Do not immerse container in caustic solution. Liquid and/or solid residues from neutralization must be disposed of in a permitted waste management facility. (3)

Hypochlorites: Carefully neutralize by adding hydrogen peroxide: one US pint of 35 % hydrogen peroxide solution per pound of hypochlorite to be neutralized. Dilute the neutralized residue with water. (3)

Waste Disposal Methods: This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

Safe Handling of Residues: See "Waste Disposal Methods".

Disposal of Packaging: Empty containers retain product residue (liquid and/or vapour) and can be dangerous. See above, "Deactivating Chemicals". Do not expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Return empty containers.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:
Chlorine, Class 2.3(8), UN1017.
Label(s)/Placard(s): Poison Gas, Corrosive.
ERAP Index: 500 Kg or L. Exemptions: Not available. Marine: P (Marine Pollutant).

US DOT CLASSIFICATION (49CFR 172.101, 172.102):
Chlorine, Class 2.3, UN1017.
Label(s)/Placard(s): Poison Gas, Corrosive.
Reportable Quantity (CERCLA-RQ): 10 lb / 4.54 Kg. Exemptions: Not applicable.
Special Documentation Addition: (i) Toxic Inhalation Hazard. (ii) Hazard Zone B.
Marine: P (Marine Pollutant).

IMO: Marine Pollutant: Chlorine.

15. REGULATORY INFORMATION

CANADA
CEPA - NSNR: This material is included on the DSL under the CEPA.
CEPA - NPRI: This material is on the NPRI list of substances.
Controlled Products Regulations Classification (WHMIS): A: Compressed Gas, C: Oxidizer, D-1A: Very Toxic (acute effects), D-2A: Very Toxic (Chronic Effects), E: Corrosive.

USA
Environmental Protection Act: This material is included on the TSCA Inventory.
OSHA Hazard Communication (29CFR 1910.1200) Classification: Compressed Gas, Oxidizer, Highly Toxic, Chronic Effects, Corrosive.

HMIS: 3 Health, 0 Fire, 0 Reactivity. (3)
NFPA: 4 Health, 0 Fire, 0 Reactivity. (3)

Toxicological Data:

Chlorine	LC50 (Inhal'n, Rat, 4h)	= 147 ppm (1)
	LC50 (Inhal'n, Mouse, 4h)	= 69 ppm (1)

Carcinogenicity Data: The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP. See "Other Studies Relevant to Material".
Reproductive Data: No adverse reproductive effects are anticipated.
Mutagenicity Data: No adverse mutagenic effects are anticipated.
Teratogenicity Data: No adverse teratogenic effects are anticipated.
Respiratory / Skin Sensitization Data: None known.

Synergistic Materials: Mortality in Chlorine-Nickel test groups for rainbow trout was found to be higher than that of either nickel or chlorine alone. The relevance to humans is not known. Incidences of respiratory sensitization in platinum refinery workers increased following a spill of chlorine. (3)

Other Studies Relevant to Material: Effects in rats during acute inhalation exposure to Chlorine were primarily attributed to its severe irritant effects. Repeated inhalation of Chlorine (1, 3 or 9 ppm for 6 weeks) by rats resulted in respiratory irritation, reduced body weight gain, organ weight changes, increased white blood cells, some animal deaths and changes in liver, kidney, spleen, thymus and gastric mucosa. Longer term (1 year) inhalation of Chlorine (0.1, 0.5 or 2.3 ppm) by monkeys resulted in eye and upper respiratory tract irritation. Effects observed in rabbits following repeated inhalation (up to 9 months) were weight loss, nasal irritation, sneezing and laboured respiration. Life-time inhalation of Chlorine (up to 2.5 ppm) produced nasal cell injury in rats and mice. No effects were observed in guinea pigs after repeated inhalation (87 days) or in mice after drinking chlorinated water (33 or 55 days).

Repeated exposure of rats to 30 ppm Chlorine in their drinking water resulted in reduced spleen weights and immunological effects. Long term (2 years) administration of Chlorine in drinking water (70, 140 or 275 ppm) resulted in an increase in leukemia in female rats at 140 ppm only. No adverse effects on fertility, life span, growth pattern, hematology or histology were seen in rats given chlorinated water (100 mg Chlorine / Litre daily) throughout the entire lifespan for 7 consecutive generations. No birth defects were observed in mice after drinking chlorinated drinking water during pregnancy. Chlorine produced no genetic changes in standard tests using animals. A positive response was observed in a test using human cells, while mixed responses have been reported in a variet of tests using bacterial cells or animal cells. (3)

12. ECOLOGICAL INFORMATION

Ecotoxicity: Highly toxic to aquatic life.

Fish toxicity:	critical concentration =	0.3 mg/L
Aesthetic:	critical concentration =	0.5 mg/L
Plant:	critical concentration =	100 mg/L

72-HR LC50 = 0.5 mg/L, Daphnia Magna
96-HR LC50 = 0.02 mg/L, Daphnia Magna
96-HR LC50 = 0.08 to 0.18 mg/L, Brook Trout
96-HR LC50 = 0.07 mg/L, Channel Catfish Fingerlings
96-HR LC50 = 0.44 to 2.32 mg/L, Bluegill Sunfish
96-HR LC50 = 1.6 mg/L, Redsid Shiner
96-HR LC50 = 0.70 mg/L, Blackside Dance

Exposure of Sand-dollar sperm to 0.002 mg/L for 5 minutes resulted in a 50 percent reduction in egg fertilization. Depressed shoot and total plant dry weight and shoot length were reported when the aquatic plant myriophyllum spicatum was continuously exposed to chlorine (as low as 0.05 mg total residual chlorine/L) for 96 hours. Chlorine is considered to be phytotoxic and has bactericidal, algicidal and fungicidal properties. Chlorine does not appear to retard seed germination. (3) This product does not bioaccumulate in aquatic or terrestrial food chains. (3)

Environmental Fate: In an uncontrolled spill scenario where the concentration of Chlorine is well above those used for drinking water, it can be dangerous if allowed to contaminate

Chlorine	1 ppm	0.5 ppm	1 ppm	----	0.5 ppm (Ceiling)

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State: Liquefied Gas.
Appearance and Odour: Greenish yellow liquified gas with a sharp, pungent, irritating odour.
Odour Threshold (ppm): 0.06 ppm (Detection); 0.2 ppm (Perception).
Boiling Range (Deg Celsius): -35 to -34.
Melting/Freezing Point (Deg Celsius): -101.
Vapour Pressure (mm Hg at 20 Deg. Celsius): 4,788 to 5,120 (Approximately 82.5 to 85 psig).
Vapour Density (Air = 1.0): 2.5.
Relative Density (g/cc): 1.467.
Bulk Density: 88.76 lb/ft3 at 15.6 Degrees Celsius.
Viscosity: 0.3538 at 15.6 Degrees Celsius.
Evaporation Rate (Butyl Acetate = 1.0): Not available.
Water Solubility: 0.71 % at 1 ATM, 21 Degrees Celsius. Slightly soluble in water. Chlorine reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4)
Solubility: Soluble in alkaline solutions, carbon tetrachloride, hydrochloric acid and sodium chloride solutions.
% Volatile by Volume: 100.
pH: 1.5 to 2.0 (0.8 % Aqueous Solution). Strongly Acidic.
Coefficient of Water/Oil Distribution: Not applicable.
Volatile Organic Compounds (VOC): 0 %.

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions: Stable.
Under Fire Conditions: Although non-combustible in air, chlorine supports the combustion of other materials.
Hazardous Polymerization: Will not occur.

Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition. Avoid contact with water. Chlorine reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4)

Materials to Avoid: This product is a strong oxidizer. Strong oxidizers can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants. Reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4)

Chlorine reacts with combustible, organic or nitrogen compounds (hydrocarbons, cleaning solvents, paints or thinners, oil, grease gasoline, petroleum products, turpentine, alcohols, carbon disulphide, hydrogen acetylene, hydrogen, ether and ammonia). (3,4)
Strong oxidizers. Lewis or mineral acids.

At ordinary temperatures: Dry Chlorine (gas or liquid) is not corrosive to most common metals, including steel, stainless steel, silver, iron, cast iron, nickel and its alloys, copper, brass, bronze, lead platinum and tantalum. Dry Chlorine (gas or liquid) reacts with aluminum, zinc, arsenic, gold, mercury, class 300 stainless steel, titanium, selenium, tellurium and tin. (3,4)

At high temperatures: Dry Chlorine is corrosive to most metals. The reaction rate of dry Chlorine increases rapidly above a temperature which is characteristic for the metal. (3,4)

Decomposition or Combustion Products: Thermal decomposition products are toxic and may include oxides of Chlorine and irritating gases. Chlorine reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4)

11. TOXICOLOGICAL INFORMATION

and tonne containers are equipped with fusible plugs. The fusible plugs are designed to melt at temperatures above 70 Deg. Celsius to reduce the internal pressure of the cylinder by releasing Chlorine gas.

Special Materials to be Used for Packaging or Containers: Chlorine is stable in steel containers at room temperatures when stored dry. Intense local heat above 215 C on steel walls can cause steel to ignite chlorine. (3) Equipment for storage, handling or transportation should NOT be made of: stainless steel. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls: Local exhaust ventilation required. Ventilation should be corrosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

For personnel entry into confined spaces (i.e. bulk storage tanks) a proper procedure must be followed. It must include consideration of, among other things, ventilation, testing of tank atmosphere, provision and maintenance of SCBA, and emergency rescue. Use the "buddy" system. The second person should be in view and trained and equipped to execute a rescue. (4)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye Protection: Use full face-shield and gas-tight goggles when there is potential for contact. Contact lenses should not be worn when working with this material.

Skin Protection: Gloves and protective clothing made from neoprene should be impervious under conditions of use. Prior to use, user should confirm impermeability. Skin protection should be insulated against cold temperatures. Do not use gloves or protective clothing made from leather and rubber or plastic. Discard contaminated gloves.

Respiratory Protection: DO NOT USE chemical cartridge respirators with oxidizable sorbents (charcoal). Chlorine: Up to 5 ppm, wear a chemical cartridge respirator with Chlorine or acid gas cartridges; up to 10 ppm self-contained breathing apparatus (SCBA). (3,4) Use an air-supplied respirator if concentrations are high or unknown.

If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (4)

Immediately Dangerous to Life and Health (IDLH) value: 10 ppm. (4) The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory equipment. In the event of failure of respiratory protective equipment, every effort should be made to exit immediately. (4)

Other Personal Protective Equipment: Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact. Use of a Chlorine gas monitor with local and remote alarms and monitoring is strongly recommended.

EXPOSURE GUIDELINES

ACGIH TLV		OSHA PEL		NIOSH REL	
(STEL)		(TWA)	(STEL)	(TWA)	(STEL)

fire zone whenever possible. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

Fire Fighting Protective Equipment: Use self-contained breathing apparatus and special protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures: In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. See Section 13, "Deactivating Chemicals".

Wear respirator, protective clothing and gloves. Ruptured containers may rocket. Ventilate enclosed spaces. Where possible, elevate the leak to the highest position of the cylinder, such that gas and not liquid escapes. Apply emergency device. Eliminate all sources of ignition. Move unprotected personnel upwind of leaking container. Call emergency response naming the chemical and the type of container that is leaking. Consider the use of fog-nozzles to control vapours. Do not immerse in water. Notify applicable government authority if release is reportable or could adversely affect the environment. Vapour knock down water is corrosive and toxic, thus it should be diked for containment. Ensure compatible materials are used. For a leaking container: dispose of contents to a safe out-of-doors area or a hood with forced ventilation. Attach appropriate control valve provided with a trap or check valve and a long piece of flexible hose connected to the valve outlet. Discharge the gas at a moderate rate into an adequate amount of approximately 15% aqueous Sodium Hydroxide or other alkali or reducing solution in suitable container. When all the gas is discharged, close the cylinder valve and tag the cylinder as defective. (3)

7. HANDLING AND STORAGE

HANDLING

Handling Practices: Use normal "good" industrial hygiene and housekeeping practices. Vapours are heavier than air. Use self-contained breathing apparatus. Secure containers at all times. Fix leaks promptly. Immerse contaminated clothing in water immediately and KEEP WET until discarded or laundered. Avoid moisture contamination. Chlorine reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4)

Do not store or transport with food or feed. Keep away from combustibles and incompatible materials.

Ventilation Requirements: See Section 8, "Engineering Controls".

Other Precautions: Use only with adequate ventilation and avoid breathing vapours. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use.

STORAGE

Storage Temperature (Deg Celsius): Ideal storage temperature is 10-27 Deg. Celsius. Do not expose sealed containers to temperatures above 51 Degrees Celsius. (3)

Ventilation Requirements: Do not use in poorly ventilated or confined areas without proper respiratory protection. Ventilation should be corrosion proof.

Storage Requirements: Store in a cool, well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Do not expose sealed containers to temperatures above 51 Degrees Celsius. Use of a Chlorine gas monitor with local and remote alarms and monitoring is strongly recommended. Secure containers at all times. Fix leaks promptly. Regularly inspect process equipment, piping and detection equipment. Chlorine cylinders

alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians: Treatment for corrosive chemical contact with skin:

1. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible.
2. Remove anything that is constrictive, such as rings, bracelets or footwear, before swelling begins.
3. Cover the exposed part with a clean, preferably sterile, lint-free dressing.
4. For severe exposure, immediately seek medical attention and monitor breathing and treat for shock.

When treating frost bite, flush affected areas with water no warmer than 44 Deg. Celsius. Do not use heated water or dry heat and frozen parts should not be rubbed before or after thawing.

Medical conditions that may be aggravated by exposure to this product include neurological, cardiovascular and skin disorders, diseases of the skin, eyes or respiratory tract.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flammability Class (WHMIS): Not regulated.
Flash Point (TCC, Deg. Celsius): Not Flammable.
Autoignition Temperature (Deg. Celsius): Not applicable.
Flammability Limits in Air (%): LEL: Not applicable. UEL: Not applicable.

Hazardous Combustion Products: Thermal decomposition products are toxic and may include oxides of Chlorine and irritating gases. Chlorine reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4)

Unusual Fire or Explosion Hazards: Although non-combustible in air, chlorine supports the combustion of other materials. Flammable gases and vapours will form explosive mixtures with chlorine. Chlorine cylinders and tonne containers are equipped with fusible plugs. The fusible plugs are designed to melt at temperatures above 70 Deg. Celsius to reduce the internal pressure of the cylinder by releasing Chlorine gas. Expansion of liquid and change of state from liquid to vapour will allow mixture to encompass a large area. If tank is involved in a fire situation, a BLEVE (Boiling Liquid Expanding Vapour Explosion) may result. Ruptured containers may rocket. Where possible, elevate the leak to the highest position such that gas and not liquid escapes.

This product is a strong oxidizer. Strong oxidizers can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants.

Sensitivity to Mechanical Impact: Not expected to be sensitive to mechanical impact.
Rate of Burning: Not available.
Explosive Power: Not available.
Sensitivity to Static Discharge: Not expected to be sensitive to static discharge.

EXTINGUISHING MEDIA

Fire Extinguishing Media: Use media appropriate for surrounding fire and/or materials.

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters: Fire-exposed containers should be kept cool by spraying with water to reduce pressure. Isolate materials that are not involved in the fire and protect personnel. Cool containers with flooding quantities of water until well after the fire is out. Chlorine reacts with water or humidity to produce Hydrochloric Acid and Hypochlorous Acid. These two acids cause metal corrosion. (3,4) Remove containers from

. Skin Absorption: May be absorbed through intact skin. Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin.

. Eye Contact: Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur. See "Other Health Effects" Section.

. Ingestion: Corrosive! Product is a gas. Ingestion is not a likely route of exposure. See "Other Health Effects" Section.

Other Health Effects: Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential.

May cause frostbite, olfactory fatigue, tooth erosion, shock, central nervous system (CNS) depression and asphyxia and cyanosis. Olfactory fatigue is a term used to describe a condition characterized by the temporary loss of odour perception. CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure. Cyanosis is characterized by navy blue, almost black lips, tongue, and mucous membranes, with skin colour being slate gray. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia. Asphyxia is characterized by increased breathing volume, accelerated pulse rate, muscular incoordination, faulty judgement, emotional instability, fatigue, nausea, vomiting, bewilderment, gasping respiration and unconsciousness.

Chlorine: Inhalation exposure can result in primary irritation of the respiratory tract, gradual loss of pulmonary function and asthma-like attacks in suseptible individuals. Acute exposure is characterized by the irritation of the respiratory tract causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function. Overexposure may lead to bronchitis, bronchial spasm and pulmonary oedema. Chronic exposure may lead to asthmatic attack in certain individuals, with the following symptoms: chest tightness, wheezing, cough and shortness of breath. (3)

3. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

Hazardous Ingredients	CAS No.	ACGIH TLV	%
Chlorine	007782-50-5	0.5 ppm *A4	95 - 100

A4 = Not classifiable as a human carcinogen. (ACGIH-A4)

4. FIRST AID MEASURES

FIRST AID PROCEDURES

. Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.

. Skin Contact: Flush skin with running water for a minimum of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Flush skin with running water for a minimum of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. See "Note to Physicians" below.

Treat frostbite by immediately immersing affected areas in warm water until the skin has warmed up and turned pink. Obtain medical attention IMMEDIATELY.

. Eye Contact: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

. Ingestion: Do not attempt to give anything by mouth to an unconscious person. If victim is

CANADA COLORS & CHEMICALS LTD
80 SCARSDALE ROAD
DON MILLS, ONTARIO, CANADA M3B 2R7
(416)-449-7750

PRODUCT : SODIUM HYPOCHLORITE 12% CODE: 832827

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER.....DUTCH CHEMICAL
44 CLAYSON ROAD
WESTON, ONT
M9M 2G7
PREPARED BY.....ENVIRONMENTAL & REGULATORY AFFAIRS DEPARTMENT
PREPARATION DATE.....SEP 24/2003
PRODUCT NAME:.....SODIUM HYPOCHLORITE 12%
PRODUCT CODE:.....832827
CHEMICAL FORMULA.....NaOCl
MOLECULAR WEIGHT.....N.AV.
CHEMICAL FAMILY.....CHLORITE
MATERIAL USE.....WATER PURIFICATION, BLEACHING AGENT AND DESINFECTANT.
EMERGENCY PHONE NO.....(416)-444-2112

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS/COMPOSITION	EXPOSURE LEVELS	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
SODIUM HYPOCHLORITE % :12-20 CAS #:7681-52-9	SEE/VOIR SECTION 11	SEE SECTION 11	SEE SECTION 11

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:
SKIN CONTACT.....CORROSIVE. CAN CAUSE SEVERE LOCAL IRRITATION, BURNS AND BLISTERS. PROLONGED OR REPEATED CONTACT WITH DILUTED SOLUTIONS MAY BLEACH SKIN OR CAUSE DERMATITIS.
SKIN ABSORPTION.....N.AV.
EYE CONTACT.....VERY CORROSIVE!. CAN CAUSE IRRITATION AND SEVERE DAMAGES RESULTING IN BLINDNESS.
INHALATION.....CORROSIVE. MAY CAUSE IRRITATION OF THE NOSE AND UPPER RESPIRATORY TRACT, HEADACHE AND COUGHING.
INGESTION.....CORROSIVE. BURNING IN MOUTH AND THROAT. SEVERE PAIN, VOMITING, DIARRHEA.
EFFECTS OF ACUTE EXPOSURE.....SEE ABOVE
EFFECTS OF CHRONIC EXPOSURE.....N.AV.

SECTION 04: FIRST AID MEASURES

PRODUCT : SODIUM HYPOCHLORITE 12% CODE: 832827

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:.....INHALATION: MOVE VICTIM TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION ONLY IF BREATHING HAS STOPPED. OBTAIN MEDICAL ATTENTION IMMEDIATELY. SKIN CONTACT: REMOVE CONTAMINATED CLOTHING. FLUSH AFFECTED AREA WITH WATER FOR AT LEAST 20 MINUTES. OBTAIN MEDICAL ATTENTION. EYE CONTACT:.. FLUSH EYES IMMEDIATELY WITH RUNNING WATER FOR AT LEAST 30 MINUTES HOLDING EYELIDS OPEN. OBTAIN MEDICAL ATTENTION IMMEDIATELY. INGESTION:.. IF VICTIM IS ALERT AND NOT CONVULSING, RINSE MOUTH OUT AND GIVE 1/2 TO 1 GLASS OF WATER TO DILUTE MATERIAL. DO NOT INDUCE VOMITING. OBTAIN IMMEDIATE MEDICAL ATTENTION.

SECTION 05: FIRE FIGHTING MEASURES

FLAMMABILITY.....NOT FLAMMABLE
IF YES, UNDER WHICH CONDITIONS?
EXTINGUISHING MEDIA.....USE APPROPRIATE MEDIA TO EXTINGUISH SURROUNDING FIRE.
SPECIAL PROCEDURES.....FULL PROTECTIVE EQUIPMENT, INCLUDING A SELF-CONTAINED BREATHING APPARATUS, SHOULD BE WORN. REMOVE STORAGE VESSELS FROM FIRE ZONE IF POSSIBLE. USE ATER SPRAY TO COOL CONTAINERS TO AVOID PRESSURE BUILD-UP.
FLASH POINT (C), METHOD.....NON-FLAMMABLE
AUTO IGNITION TEMPERATURE.....N.AP.
UPPER FLAMMABLE LIMIT (% BY VOL.).....N.AP.
LOWER FLAMMABLE LIMIT (% BY VOL.).....N.AP.
EXPLOSION DATA
- EXPLOSIVE POWER.....NO DATA
- RATE OF BURNING.....NO DATA

SENSITIVITY TO STATIC DISCHARGE.....NO DATA
- SENSITIVITY TO IMPACT.....NO DATA

UNUSUAL FIRE AND EXPLOSION HAZARDS.....N.AV.
HAZARDOUS COMBUSTION PRODUCTS....N.AV.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL.....STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR LEAK:. VENTILATE THE AREA. STOP AND CONTAIN LEAK OR SPILL. ABSORB USING AN INERT MATERIAL (SAND, ASHES, ETC.), COLLECT AND DISPOSE. FOR RECOVERY, PUMP INTO POLYETHYLENE CONTAINERS.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND EQUIPMENT.....SEE SECTION 8 FOR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT. PROTECT CONTAINERS AGAINST PHYSICAL DAMAGE.

PRODUCT : SODIUM HYPOCHLORITE 12% CODE: 832827

SECTION 07: HANDLING AND STORAGE

STORAGE NEEDS.....STORAGE TEMPERATURE:. BELOW 29 C AND ABOVE FREEZING POINT. STORE IN A COOL (BELOW 29 C) DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLES AND DIRECT SUNLIGHT. LONG-TERM STORAGE IS IMPOSSIBLE WITHOUT DECOMPOSITION. USE POLYETHYLENE CONTAINERS.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE.....USE RUBBER GLOVES
RESPIRATORY/TYPE.....NIOSH/MSHA APPROVED AIR-PURIFYING RESPIRATOR EQUIPPED WITH CHLORINE CARTRIDGES WHEN NECESSARY.
EYE/TYPE.....USE CHEMICAL SAFETY GOGGLES WHEN THERE IS A POTENTIAL FOR EYE CONTACT.
FOOTWEAR/TYPE.....RUBBER BOOTS IF NECESSARY ALSO.
CLOTHING/TYPE.....RUBBER APRON
OTHER/TYPE.....SAFETY SHOWERS AND EYEWASH FOUNTAINS SHOULD BE INSTALLED IN STORAGE AND HANDLING AREAS.
ENGINEERING CONTROLS.....LOCAL EXHAUST VENTILATION.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE.....CLEAR, GREENISH-YELLOW AQUEOUS SOLUTION
ODOUR.....STRONG CHLORINE ODOUR
ODOUR THRESHOLD.....NO DATA
VAPOUR PRESSURE (MMHG).....17.5 MMHG AT 20 C
VAPOUR DENSITY (AIR=1).....NO DATA
EVAPORATION RATE.....NO DATA
BOILING POINT.....SLOWLY DECOMPOSES AT 40 C TO NACL AND NACLO3
PH.....11.5 - 13.0
SPECIFIC GRAVITY (WATER=1).....APPROXIMATELY. 1.165 G/ML FOR A 12%; 1.26 G/ML FOR A 20%
SOLUBILITY IN WATER (% W/W).....MISCIBLE IN ALL PROPORTION IN WATER.
COEFFICIENT OF WATER/OIL DIST....NO DATA

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:
YES
NO, WHICH CONDITIONS?.....UNDER FIRE CONDITIONS. UNSTABLE ABOVE 40 C, WHEN EXPOSED TO SUNLIGHT OR IN CONTACT WITH METALS.

COMPATABILITY WITH OTHER SUBSTANCES:
YES
NO, WHICH ONES?.....ACIDS. AMMONIA. OXIDIZABLE MATERIALS. UREA. NICKEL. COPPER. TIN. MANGANESE. IRON. MOST METALS

REACTIVITY CONDITIONS?.....TEMPERATURES ABOVE 40 C
HAZARDOUS PRODUCTS OF DECOMPOSITION.....CHLORINE GAS WHEN IN CONTACT WITH ACID; OXYGEN WHEN IN CONTACT WITH METALS. CHLORINE
HAZARDOUS POLYMERIZATION.....WILL NOT OCCUR

PRODUCT : SODIUM HYPOCHLORITE 12% CODE: 832827

SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL.....ACGIH - TLV:. 0.5 PPM,. (AS CHLORINE)
LC 50 OF MATERIAL, SPECIES &.....LC50 (INHALATION, RAT): >10,500 MG/M3/H
ROUTE
LD 50 OF MATERIAL, SPECIES &.....LD50 (ORAL, RAT): 8910 MG/KG
ROUTE
CARCINOGENICITY OF MATERIAL.....THE INGREDIENTS OF THIS PRODUCT ARE NOT LISTED AS CARCINOGENS.
REPRODUCTIVE EFFECTS.....NO INFORMATION IS AVAILABLE.
TERATOGENICITY.....NO INFORMATION IS AVAILABLE.
IRRITANCY OF MATERIAL.....SEE SECTION 03
SENSITIZING CAPABILITY OF.....N.AV.
MATERIAL
SYNERGISTIC MATERIALS.....NONE KNOWN

SECTION 12: ECOLOGICAL CONSIDERATIONS

NO INFORMATION AVAILABLE.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL.....DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, PROVINCIAL, AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER.....1791
TDG CLASSIFICATION.....8
PACKING GROUP.....III
SPECIAL SHIPPING INSTRUCTIONS....N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION.....D2B. E
CPR COMPLIANCE.....THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

ACGIH.....AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
N.AV.=NOT AVAILABLE
N.AP.=NOT APPLICABLE