

MATERIAL SAFETY DATA SHEET

MS-50079

EFFECTIVE: 7/7/02

REVISION: A

CO-00301-1

CHLORINE DIOXIDE GENERATING CARTRIDGE

FOR PRODUCT ASSISTANCE CONTACT CLORDISYS SOLUTIONS, INC. - (908) 236-4100
 EMERGENCY TELEPHONE NUMBERS (U.S.): **CLORDISYS SOLUTIONS, INC.:** 1-908-236-4100
 Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS and European Community Standards

ClorDiSys Solutions, Inc.
 P.O. Box 138
 Lebanon, NJ 08833-0138

PART I

What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):

CHLORINE DIOXIDE GENERATING CARTRIDGE

CHEMICAL NAME/CLASS:

Oxidizing Solid

PRODUCT USE:

Various Applications

SUPPLIER/MANUFACTURER'S NAME:

CLORDISYS SOLUTIONS, INC.

U.S. ADDRESS:

P.O. Box 138
 Lebanon, NJ 08833

U.S. EMERGENCY PHONE:

CLORDISYS SOLUTIONS, INC.: 1-908-236-4100

U.S. BUSINESS PHONE:

1-908-236-4100

DATE OF PREPARATION:

September 29, 2000

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS #	% w/w	EXPOSURE LIMITS IN AIR					
				ACGIH-TLV		OSHA-PEL		IDLH mg/m ³	OTHER mg/m ³
				TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³		
Sodium Chlorite	7758-19-2	231-836-6	88 - 94	NE	NE	NE	NE	NE	NE
Proprietary Inert Ingredient			6 - 12	NE	NE	NE	NE	NE	NE

NE = Not Established.

See Section 16 for Definitions of Terms Used.

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. 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.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a white, flaked, oxidizing solid, packaged in a cartridge. This product may have a slight chlorine odor. **Health Hazards:** The chief health hazard associated with responses would be the potential for irritation of the eyes, skin, nose, and other tissues which come in contact with this product. **Flammability Hazards:** This product can act to initiate and sustain the combustion of combustible materials. This material releases oxygen upon decomposition. **Reactivity Hazards:** Heat may be generated if this product comes in contact with water. **Environmental Hazards:** This product is harmful to terrestrial or aquatic plant and animal life. **Emergency Recommendations:** Emergency responders must wear proper personal protective equipment for the releases to which they are responding.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product, via route of entry, are as follows:

INHALATION: If dusts or particulates of this product are inhaled, difficulty breathing, irritation, coughing, and a sore throat may occur. Prolonged exposures or exposures to high dust concentrations of this product may damage the tissues of the respiratory system.

CHLORINE DIOXIDE GENERATING CARTRIDGE

3. HAZARD IDENTIFICATION (Continued)

CONTACT WITH SKIN or EYES: Eye contact can cause irritation, redness, watering, and burns. Depending on the duration of skin contact, skin overexposures may cause reddening, discomfort, irritation, and burns. Prolonged or repeated skin contact may cause dermatitis (inflamed, red skin).

SKIN ABSORPTION: Skin absorption is not a significant route of over-exposure for any component of this product.

INGESTION: Ingestion is not anticipated to be a likely route of occupational exposure to this product. If this product is swallowed, vomiting, nausea, diarrhea, and abdominal pain may result. Symptoms of such overexposure can include intestinal bleeding, blood in urine, kidney damage, kidney failure, and cessation of urination. Severe ingestion overexposure may cause liver damage, labored breathing, convulsions, and coma. If swallowed, this product may produce large quantities of oxygen gas that can cause severe damage by physical pressure. Ingestion of large volumes of this product may be fatal.

INJECTION: Injection is not anticipated to be a significant route of overexposure for this product. Injection of this product (via puncture with a contaminated object) can cause pain and irritation in addition to the wound.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**.

ACUTE: Inhalation may cause difficulty breathing, irritation, coughing, and a sore throat. Skin contact may cause reddening, discomfort, irritation, and burns if contact is prolonged. Eye contact can cause irritation, redness, watering, and burns. Severe ingestion overexposures may be fatal.

CHRONIC: Prolonged or repeated skin contact may cause dermatitis (inflamed, red skin). Refer to Section 11 (Toxicology Information) for additional information on this product's components.

TARGET ORGANS: **Acute:** Skin, eyes, gastrointestinal system, respiratory system.
Chronic: Skin, respiratory system.



HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH	(BLUE)	1
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FLAMMABILITY	(RED)	1
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REACTIVITY	(YELLOW)	1
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PROTECTIVE EQUIPMENT	B
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EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For routine applications.

See Section 16 for Definition of Ratings

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

Contaminated individuals must seek medical attention if any adverse effect occurs. Take a copy of label and MSDS to physician or health professional with the contaminated individual(s).

SKIN EXPOSURE: If spilled on skin, begin decontamination with copious amounts of running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes.

EYE EXPOSURE: If the product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have the contaminated individual "roll" eyes. The recommended minimum flushing time is 15 minutes.

INHALATION: If airborne dusts of this product are inhaled, remove victim to fresh air.

INGESTION: If this product is swallowed, DO NOT INDUCE VOMITING. CALL PHYSICIAN OR CALIFORNIA POISON CONTROL CENTER (1-800-764-7661; 1-800-876-4766) FOR MOST CURRENT INFORMATION.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting dermatitis, other skin disorders, kidney disorders, liver disorders, and blood disorders may be aggravated by exposure to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

CHLORINE DIOXIDE GENERATING CARTRIDGE**5. FIRE-FIGHTING MEASURES**

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Select fire extinguishing media appropriate for the surrounding area.

Water Spray: YES (for cooling)

Foam: YES

Halon: YES

Carbon Dioxide: YES

Dry Chemical: YES

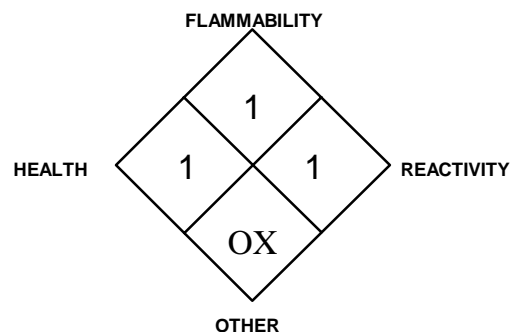
Other: Any "ABC" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is irritating and presents a moderate inhalation and contact hazard to firefighters. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., sodium oxides, hydrogen chloride). This product may become unstable at elevated temperatures. This product is an oxidizer; it can act to initiate and sustain the combustion of flammable materials.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Prevent the spread of any released product to combustible objects. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. Move containers from fire area if it can be done without risk to personnel. Cool fire-exposed containers with water to prevent rupture. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. Rinse contaminated equipment thoroughly before returning such equipment to service.

NFPA RATING

**See Section 16 for
Definition of Ratings**

6. ACCIDENTAL RELEASE MEASURES

RELEASE RESPONSE: Prevent the spread of any released product to combustible objects. Fans and portable vacuum units can be used to increase ventilation if deemed necessary. For small releases, clean up spilled solid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incident releases should be Level B: triple-gloves (fire-retardant gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus. A fire-retardant suit must be worn over the chemical resistant suit. Monitor the area for levels of this product's components and the level of oxygen. Monitoring must indicate that exposure levels are below those provided in Section 2 (Composition and Information on Ingredients) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus.

Sweep up or vacuum spilled solid. Test area with Starch-Iodide paper. If Starch-Iodide paper becomes discolored when in contact with an area moistened with water, neutralize area with 5% sodium thiosulfate solution. Place all spill residue in a suitable container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or the appropriate standards of Canada and EC Member States (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?***7. HANDLING and STORAGE**

WORK AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

CHLORINE DIOXIDE GENERATING CARTRIDGE**7. HANDLING and STORAGE (Continued)**

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers). Refer to NFPA 43A, *Liquid, Solid Oxidizers*, for additional information on storage. Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers that held this product.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures and appropriate Canadian standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients), if applicable. If existing ventilation is not adequate, product should be used with a local exhaust hood, or in ductless fume hood/portable ventilation system. All ventilation systems should pull air at or below the open container in order to pull dusts away from the person using the product. Ensure eyewash/safety shower stations are available near areas where this product is used.

INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS: In addition to the exposure limit values cited in Section 2 (Composition and Information on Ingredients), other exposure limits have been established by various countries for the components of this mixture; however, these values are not provided in this MSDS.

RESPIRATORY PROTECTION: None normally required for routine use. If respiratory protection is needed, such as during use of this product with other materials, or during emergency response to uncontrolled releases, use only protection authorized in 29 CFR 1910.134, applicable U.S. State regulations, Canadian CSA Standard Z94.4-93, or EC Member States (per European Standard EN 149). Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

EYE PROTECTION: Safety glasses as authorized in 29 CFR 1910.133, applicable U.S. State regulations, or the appropriate standards of Canada and its Provinces or EC Member States (per European Standard EN 166).

HAND PROTECTION: None required when handling chemical in a sealed container. When direct contact with Chlorine Dioxide is possible, use butyl rubber, natural rubber, neoprene, and nitrile rubber gloves for routine use (do not use polyvinyl gloves). Gloves should be changed frequently during use of product. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS.

BODY PROTECTION: None required when handling chemical in a sealed container. When direct contact with Chlorine Dioxide is possible, use body protection appropriate for task (e.g., gown or apron).

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Not established.

EVAPORATION RATE (n-BuAc = 1): Similar to water.

SPECIFIC GRAVITY (water = 1): Not established.

MELTING/FREEZING POINT: 180-200°C (356-392°F)

SOLUBILITY IN WATER @ 25°C: 39%.

BOILING POINT: Not established.

VAPOR PRESSURE, mm Hg @ 20°C: Not established.

pH (25% Solution): > 12

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not established.

ODOR THRESHOLD: Not established.

FORM: Solid.

COLOR: White, flaky.

ODOR: Slight chlorine.

VISCOSITY: Not applicable.

FLASH POINT: Not applicable.

HOW TO DETECT THIS SUBSTANCE (warning properties): The odor and appearance may be a distinguishing characteristic for this product if spilled.

CHLORINE DIOXIDE GENERATING CARTRIDGE

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Products of thermal decomposition include sodium oxides and hydrogen chloride.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong reducers, finely powdered metals, phosphorus, sulfur, zinc, ammonia, organic materials, combustible materials.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure to or contact with extreme temperatures, incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The specific toxicology data available for the Sodium Chlorite component of this product are as follows. Data for other components are not given on this MSDS.

SODIUM CHLORITE:

Mutation in Microorganisms (*Salmonella typhimurium*) = 300 µg/plate

DNA Inhibition (oral, rat) = 84 mg/kg/12 weeks/continuous

Sperm Morphology (oral, rat) = 660 mg/kg/66 days/continuous

Micronucleus Test (intraperitoneal, mouse) = 15 mg/kg

Cytogenetic Analysis (fibroblast, hamster) = 20 mg/L

TDLo (oral, rat) = 365 mg/kg/1 year/continuous; Blood: pigmented or nucleated red blood cells, changes in other cell count (unspecified); Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (oral, rat) = 182 g/kg/26 weeks/intermittent; Liver function tests impaired; Changes in serum composition (e.g. TP, bilirubin, cholesterol), Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases

SODIUM CHLORITE (continued):

TDLo (oral, rat) = 800 mg/kg/female 8–15 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (oral, rat) = 16 g/kg/female 8–15 days after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TDLo (oral, rat) = 660 mg/kg/male 66 days pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TDLo (oral, rat) = 1130 mg/kg/male 8 weeks pre-mating/female 2 weeks pre-mating: 3 weeks post-birth; Reproductive: Effects on Newborn: biochemical and metabolic

TDLo (intraperitoneal, rat) = 160 mg/kg/female 8–15 days after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

SODIUM CHLORITE (continued):

TDLo (intraperitoneal, rat) = 80 mg/kg/female 8–15 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (oral, mouse) = 29,750 mg/kg/85 weeks/continuous; Tumorigenic: Carcinogenic by RTECS criteria; Liver: tumors

TDLo (oral, mouse) = 22 g/kg/female 1–21 days after conception/lactating female 28 days post-birth; Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

LD₅₀ (oral, rat) = 165 mg/kg; jaundice, other or unclassified; Kidney, Ureter, Bladder: interstitial nephritis; Biochemical: Metabolism (Intermediary): other

LC₅₀ (inhalation, rat) = 230 mg/m³/4 hours

LD₅₀ (oral, mouse) = 350 mg/kg

LD₅₀ (oral, guinea pig) = 300 mg/kg

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies..

IRRITANCY OF PRODUCT: This product may be mildly to moderately irritating to contaminated tissue, especially after prolonged or repeated exposure.

SENSITIZATION TO THE PRODUCT: This product is not known to be a skin or respiratory sensitizer.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on animal and human reproductive systems.

Mutagenicity: This product is not reported to produce mutagenic effects in humans. Animal mutation data are available for the Sodium Chlorite component of this product; these data were obtained during clinical studies on specific human animal tissues exposed to high doses of these compounds.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Sodium Chlorite component of this product provided teratogenic data.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Sodium Chlorite component of this product provided reproductive toxicity data.

CHLORINE DIOXIDE GENERATING CARTRIDGE**11. TOXICOLOGICAL INFORMATION (Continued)**

REPRODUCTIVE TOXICITY INFORMATION (continued): A *mutagen* is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An *embryotoxin* is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A *teratogen* is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A *reproductive toxin* is any substance that interferes in any way with the reproductive process.

ACGIH BIOLOGICAL EXPOSURE INDICES: Currently, there are no ACGIH Biological Exposure Indices (BEIs) determined for the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will slowly decompose into other organic compounds.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to plant and animal-life (especially if large quantities are released).

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to aquatic plant and animal life. Additional aquatic toxicity data are available for components of this product:

SODIUM CHLORITE:

LC₅₀ (*Carassius auratus* goldfish) 240 hours = 11,764.3 mg/L (@ 23.5°C, tap water, static bioassay)

LC₅₀ (*Tinca tinca* tench) 12 hours = 112 mg/L @ 25°C, freshwater, static bioassay)

LC₅₀ (*Tinca tinca* tench) 12 hours = 1142 mg/L @ 20°C, freshwater, static bioassay)

SODIUM CHLORITE:

LC₅₀ (*Tinca tinca* tench) 24 hours = 119 mg/L @ 25°C, freshwater, static bioassay)

LC₅₀ (*Tinca tinca* tench) 24 hours = 104 mg/L @ 20°C, freshwater, static bioassay)

EC₅₀ (*Daphnia magna* water flea) 48 hours = 340.7-469.2 mg/L s.c. (11.5-14.5°C, well water, static bioassay)

GERMAN ENVIRONMENTAL LISTINGS:

Aquatic Hazard Class (WGK): None of the components of this product have specific WGK classifications assigned. As such, the classification for this product, per the VwVS regulations is WGK 3.

<u>Chemical</u>	<u>Rating</u>
Sodium Chlorite	2

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada or EC Member States. Unused product, if unaltered, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. See product insert for further information.

U.S. EPA WASTE NUMBER: D001 (Characteristic/Ignitability), applicable to wastes consisting only of this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Sodium Chlorite

HAZARD CLASS NUMBER and DESCRIPTION: 5.1 (Oxidizer)

UN IDENTIFICATION NUMBER: UN 1496

PACKING GROUP: PG II

DOT LABEL(S) REQUIRED: Oxidizer

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2000: 143

MARINE POLLUTANT: No component of this product is designated as a Marine Pollutant, per Appendix B to 49 CFR 172.101.

CHLORINE DIOXIDE GENERATING CARTRIDGE

14. TRANSPORTATION INFORMATION (Continued)

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is considered as dangerous goods. Use the above information for the preparation of Canadian Shipments. Additional Canadian information provided below.

SPECIAL PROVISION: 3
LTC INDEX: 6
LIMIT PASSENGER CARRYING VEHICLE: 5 kg
LIMIT PASSENGER CARRYING SHIP: Prohibited
MARINE POLLUTANT: Possible Marine Pollutant

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS UNDER IATA RULES. This material is considered as dangerous goods by the International Air Transport Association.

PROPER SHIPPING NAME: Sodium Chlorite
HAZARD CLASS NUMBER and DESCRIPTION: 5.1 (Oxidizer)
UN IDENTIFICATION NUMBER: 1496
PACKING GROUP: PG II
HAZARD LABEL(S) REQUIRED: OXIDIZER
ERG CODE: 5L

The following Packaging Information is applicable to this product:

PROPER SHIPPING NAME	PASSENGER AND CARGO AIRCRAFT				CARGO AIRCRAFT ONLY	
	Limited Quantity		Packing Instruction	Max. Qty per Pkg	Packing Instruction	Max. Qty per Pkg
	Packing Instruction	Max. Qty per Pkg				
Sodium Chlorite	Y509	2.5 kg	509	5 kg	512	25 kg

INTERNATIONAL MARITIME ORGANIZATION (IMO): This material is considered as dangerous goods by the International Maritime Organization.

PROPER SHIPPING NAME: Sodium Chlorite
HAZARD CLASS NUMBER and DESCRIPTION: 5.1 (Oxidizer)
UN IDENTIFICATION NUMBER: 1496
PACKING GROUP: PG II
LABEL(S) REQUIRED: OXIDIZER
MARINE POLLUTANT: This product is not designated by the IMO to be a Marine Pollutant.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This material is considered by the United Nations Economic Commission for Europe to be dangerous goods.

Substance Identification No.: 1496
Name of Substance: Sodium Chlorite
Hazard Identification No. (Description): 50
Label: 5.1 (OXIDIZER)
Class and Item Number: 5.1 14° (b)

CHLORINE DIOXIDE GENERATING CARTRIDGE

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: There are no components of this product that are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): None

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are not covered under any specific State regulations.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

ANSI LABELING (Z129.1): **DANGER!** OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY CAUSE RESPIRATORY TRACT, SKIN, AND EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED. Keep from contact with clothing and other combustible materials. Do not taste or swallow. Avoid contact with skin and eyes. Avoid breathing dusts or particulates. Store in tightly closed container. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH-approved respiratory protection as appropriate.

FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention.

IN CASE OF FIRE: Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Sweep up spill, avoiding the generation of airborne dusts. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

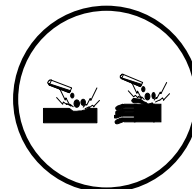
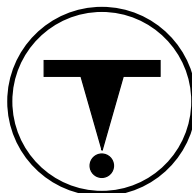
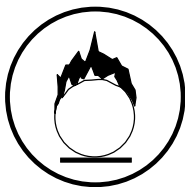
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: The components of this product are not on the CEPA Priority Substances Lists.

CANADIAN WHMIS SYMBOLS:

Class C: Oxidizer

Class D2B: Other Toxic Effects (Harmful if swallowed)

Class E: Corrosive Material



CHLORINE DIOXIDE GENERATING CARTRIDGE

15. REGULATORY INFORMATION (Continued)

EUROPEAN COMMUNITY INFORMATION:

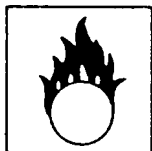
EC LABELING AND CLASSIFICATION: This product meets the definition of Oxidizing [O] and Toxic [T] as defined by the European Community Council Directive 67/548/EEC.

EC CLASSIFICATION: Oxidizing; Toxic [O; T]

EC RISK PHRASES: Contact with combustible material may cause fire. Toxic by inhalation, in contact with skin, and if swallowed. Irritating to eyes, respiratory system, and skin. [R: (2)-8-23/24/25-36/37/38]

EC SAFETY PHRASES: Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) Keep away from combustible material. In case of contact with eyes, rinse immediately with water and seek medical advice. Take off immediately all contaminated clothing. Wear suitable protective clothing, gloves, and eye/face protection. If swallowed, seek medical advice immediately and show this container or label. [S: (2)-17-26-27-36/37/39-46]

EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOL:



EUROPEAN COMMUNITY INFORMATION FOR CONSTITUENTS: The following information is available for components of this product.

Sodium Chlorite:

EC EINECS/ELINCS NUMBER: 231-836-6.

EC CLASSIFICATION: Oxidizing; Toxic [O; T]

EC RISK PHRASES: Contact with combustible material may cause fire. Toxic by inhalation, in contact with skin, and if swallowed. Irritating to eyes, respiratory system, and skin. [R: 8-23/24/25-36/37/38]

EC SAFETY PHRASES: Keep out of reach of children. (*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*) Keep away from combustible material. In case of contact with eyes, rinse immediately with water and seek medical advice. Take off immediately all contaminated clothing. Wear suitable protective clothing, gloves, and eye/face protection. [S: (2)-17-26-27-36/37/39]

16. OTHER INFORMATION

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The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. ClorDiSys Solutions, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, ClorDiSys Solutions, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

CHLORINE DIOXIDE GENERATING CARTRIDGE

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards. **Health Hazard:** **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). **Flammability Hazard:** **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). **Reactivity Hazard:** **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures). PPE Rating B: Hand and eye protection is required for routine chemical use.

NATIONAL FIRE PROTECTION ASSOCIATION: **Health Hazard:** **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). **Flammability Hazard and Reactivity Hazard:** Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). **Flash Point** - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. **Autoignition Temperature:** The minimum temperature required to initiate combustion in air with no other source of ignition. **LEL** - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL** - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

U.S. and CANADA: This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.

EUROPEAN: EC is the European Community (formerly known as the **EEC**, European Economic Community). **EINECS:** This is the European Inventory of Now-Existing Chemical Substances. The **ARD** is the European Agreement Concerning the International Carriage of Dangerous Goods by Road and the **RID** are the International Regulations Concerning the Carriage of Dangerous Goods by Rail.