Safety Data Sheet

Section 01 - Identification

Product Identifier	DryTec Briquettes® [Calcium Hypochlorite]
Other Means of Identification	Calcium hypochlorite tablets; cal hypo tabs; bleaching powder; calcium chlorohydrochlorite; calcium oxychloride; $Ca(OCl)_2$; chloride of lime; hypochlorous acid, calcium salt; lime chloride.
Product Use and Restrictions on Use	Disinfection in swimming pools and drinking water supplies; slime and odour control. Oxidizer.
Initial Supplier Identifier	ClearTech Industries Inc. 1500 Quebec Avenue Saskatoon, SK. Canada S7K 1V7
Prepared By	ClearTech Industries Inc. Technical Writer Phone: 1 (800) 387-7503
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Section 02 - Hazard Identification

GHS-Classification

Acute Toxicity-Oral	Category 4
Skin Corrosion/Irritation	Category 1B
Eye Corrosion/Irritation	Category 1
STOT-Single Exposure	Category 3

Physical Hazards

Oxidizing Solid	Category 2

Danger

Hazard Statements

H335 – May cause respiratory irritation.
H314 – Causes severe skin burns and eye damage.
H302 – Harmful if swallowed.
H272 – May intensify fire; oxidiser.
EUH 031 – Contact with acids liberates toxic gas.

Pictograms

Precautionary Statements

P210 – Keep away from heat, sparks, open flames, and hot surfaces. — No smoking.
P220 – Keep/Store away from clothing, incompatible and combustible materials.
P370 + P378 – In case of fire: Water spray or fog should be used to fight fires involving calcium hypochlorite.
P271 – Use only outdoors or in a well-ventilated area.
P280 – Wear protective gloves, protective clothing, eye protection, and face protection.
P270 – Do not eat, drink or smoke when using this product.
P301 +P330 + P331 – IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 – Immediately call a POISON CENTER or doctor/physician.
P260 – Do not breathe dust.
P303 + P361 + P353 – IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin
P363 – Wash contaminated clothing before reuse.
P304 + P340 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P403 + P233 – Store in a well-ventilated place. Keep container tightly closed.
P405 – Store locked up.
P501 – Dispose of contents/container in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 03 - Composition / Information on Ingredients

Chemical Name	CAS Number	Weight %	Unique Identifiers
Calcium Hypochlorite	7778-54-3	60-80%	
Sodium Chloride	7647-14-5	10-20%	
Calcium Chloride	10043-52-4	0-5%	
Calcium Hydroxide	1305-62-0	0-4%	
Calcium Carbonate	471-34-1	0-4%	
Calcium Chlorate	10137-74-3	0-5%	
1,2,4-Butanetricarboxylic Acid, 2-Phosphono-, Sodium Salt	40372-66-5	0.2-0.8%	
Water	7732-18-5	4.0-8.5%	

Section 04 - First Aid Measures

Inhalation

Can release corrosive chlorine gas. Take proper precautions to ensure your own safety before attempting rescue. Remove victim to fresh air. If breathing is difficult, oxygen may be administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. Avoid mouth-to-mouth contact by using mouth guards or shields. Immediately transport victim to an emergency care facility.

Skin Contact / Absorption

Avoid direct contact. As quickly as possible, flush contaminate area with lukewarm, gently flowing water for at least 30 minutes. Seek immediate medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.

Eye Contact

Avoid direct contact. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. Take care not to rinse contaminated water into the unaffected eye or onto the face. Seek immediate medical attention.

Ingestion

NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz.) of water to dilute material in stomach. If vomiting occurs naturally, rinse mouth and repeat administration of water. Avoid mouth-to-mouth contact by using mouth guards or shields. Seek immediate medical attention.

Additional Information

Provide general supportive measures. Consult a doctor and/or Poison Control Centre for all exposures except minor instances of inhalation or skin contact.

Section 05 - Fire Fighting Measures

Suitable Extinguishing Media	Calcium hypochlorite does not burn. Extinguish fire using extinguishing agents suitable for the surrounding fire and not contraindicated for use with calcium hypochlorite. Calcium hypochlorite is an oxidizing agent. Therefore, flooding quantities of water spray or fog should be used to fight fires involving calcium hypochlorite.
Unsuitable Extinguishing Media	DO NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as some A:B:C agents), since an explosive compound can be formed. DO NOT use carbon dioxide, dry chemical powder or other extinguishing agents that smother flames, since they are not effective in extinguishing fires involving oxidizers.
Specific Hazards Arising From the Chemical	Calcium hypochlorite can undergo accelerated decomposition with the release of significant amounts of heat, chlorine and oxygen, forming an oxygen-rich atmosphere. Calcium hypochlorite is a serious fire and explosion hazard when contaminated with, or comes in contact, with oxidizable, combustible materials (e.g. cloth, greases, leather, and oils). It decomposes rapidly under intense fire conditions and closed containers may rupture violently due to rapid decomposition, if exposed to fire or excessive heat for a sufficient period of time. Combustion and thermal decomposition products include: chlorine, hydrogen chloride gas, oxygen gas and calcium oxides.
Special Protective Equipment and Precautions for Fire-Fighters	Product decomposes at approximately 170-180°C releasing oxygen gas. Container may rupture. Fire-fighters must wear NIOSH-approved, pressure demand, self-contained breathing apparatus with full face piece for possible exposure to hazardous gases. Emits toxic fumes under fire conditions. If possible, isolate materials not involved in the fire, if this can be done without risk, and protect personnel. If calcium hypochlorite is not involved the fire, move calcium hypochlorite containers form the fire area only if they have not been exposed to heat. DO NOT get water inside containers. Do not direct water directly on leak as this may cause leak to increase.
Further Information	The decomposition products of calcium hypochlorite, such as chlorine and hydrogen chloride are extremely hazardous to health. Do not enter without wearing specialized protective equipment suitable for the situation. Firefighter's normal protective equipment (Bunker Gear) will not provide adequate protection. Chemical protective clothing (e.g. chemical splash suit and positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

Section 06 - Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures	Use extreme caution in handling spilled material. Use spark-proof tools and explosion-proof equipment. Restrict access to area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Wear adequate personal protective equipment. Assume spilled material to be contaminated and therefore a fire hazard. Remove all sources of flammable and combustible materials. Ventilate area. Notify government environmental and occupational health and safety agencies. Do not mix with any other chemicals. Contamination with moisture, acids, organics or other easily combustible materials such as petroleum, paint products, wood or paper may cause fire or violent decomposition.
Environmental Precautions	Stop or reduce leak if safe to do so and prevent from entering sewers, waterways, or confined spaces. Notify government occupational health and safety and environmental authorities. Chlorine is highly toxic to all forms of aquatic life.
Methods and Materials for Containment and Cleaning Up	Keep materials which can burn away from spilled material. Assume the spilled material to be contaminated. SMALL SPILLS: Collect, using a clean, dry shovel. Transfer to a container, that contains water. Carefully destroy the hypochlorite by adding hydrogen peroxide. Hydrogen peroxide reacts with calcium hypchlorite to form calcium chloride and oxygen gas. Do not close container. Other chemicals that can be used are sodium sulfite and sodium bisulfite. Once calcium hypochlorite is reduced, the remaining solution should be neutralized cautiously with dilute hydrochloric or sulfuric acid. LARGE SPILLS: Contact fire and emergency services and the supplier for advice.

NOTE: Oxygen may be released during neutralization. Decontamination should be done in an open container, in a well-ventilated area away from sources of ignition.

Section 07 - Handling and Storage

Precautions for Safe Handling

This material is a MODERATE to STRONG OXIDIZER and is CORROSIVE. Calcium hypochlorite solid and solution also release corrosive chlorine gas. Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure. Use only a clean, dry scoop made of metal or plastic each time product is taken from the container. Do not add this product to any dispensing devise containing remnant of any other product. Such use may cause violent reactions leading to fire or explosion. Add this product to water; NEVER add water to product. Do not reuse container. Residual material remaining in empty container can react to cause fire.

Conditions for Safe Storage

Keep product tightly sealed in original containers. Store product in a cool, dry, well-ventilated area. Store away from combustible or flammable products. Keep product packaging clean and free of all contamination.
Do not store product where the average daily temperature exceeds 35°C/95°F. Storage above this temperature may result in rapid decomposition, evolution of chlorine gas and heat sufficient to ignite combustible products.

Incompatibilities

Flammable and combustible materials, ammonia, primary amines, urea, acids, ammonium chloride, ethanol or methanol, hydroxyl compounds, acetylene, acetic acid and potassium cyanide, reducing agents, metal oxides, charcoal, metals, organic sulfur compounds, sulfur, turpentine.

Section 08 - Exposure Controls and Personal Protection

Exposure Limit(s)

Component	Regulation	Type of Listing	Value
Calcium Hypochlorite	Not Established		
Chlorine	ACGIH	TLV-TWA	0.5ppm
	ACGIH	TLV-STEL	1ppm
Calcium Chloride	ACGIH	TLV-TWA	5 mg/m^3
Calcium hydroxide	ACGIH	TLV-TWA	5 mg/m^3
	OSHA	PEL-T-TWA	15 mg/m^3 (respirable fraction)
Calcium Carbonate	OSHA	PEL-T-TWA	15 mg/m^3 (respirable fraction)

Engineering Control(s)

Ventilation Requirements

Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions must be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.

Other

Emergency shower and eyewash must be available and tested in accordance with regulations and be in close proximity.

Protective Equipment

Eyes/Face

Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.

Hand Protection

Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.

Skin and Body Protection	Body suite, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse. Impervious boots of chemically resistant material should be worn at all times. No special footwear is required other than what is mandated at place of work.
Respiratory Protection	No specific guidelines are available. Contact the material manufacturer or supplier for specific advice. Solutions of calcium hypochlorite release corrosive chlorine gas at normal temperatures. The solid material also decomposes to release chlorine gas. For chlorine: Wear NIOSH-approved self-contained breathing apparatus and protective clothing. NOTE: Substance reported to cause eye irritation or damage; may require eye protection. NIOSH RECOMMENDATIONS FOR CHLORINE CONCENTRATIONS IN AIR: Up to 5 ppm: (APF = 10) Chemical cartridge respirator; SAR. Up to 10 ppm: (APF = 25) SAR operated in a continuous-flow mode; Powered, air-purifying respirator with cartridge(s). (APF = 50) Chemical cartridge respirator with a full facepiece and cartridge(s); Air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister; SCBA with a full facepiece; Full facepiece SAR. Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode; SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister; Any appropriate escape-type SCBA. NOTE: The IDLH concentration for chlorine is 10 ppm. 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 protection equipment. The respirator use limitations specified by the approving agency and the manufacturer must be observed. Recommendations apply only to NIOSH approved respirators. Air-purifying respirators do not protect against oxygen-deficient atmospheres.
Thermal Hazards	Not Available

Section 09 - Physical and Chemical Properties

Appearance

Physical State	Solid
Colour	White tablet
Odour	Chlorine like odour
Odour Threshold	~ 1.4 mg/m^3 (based on threshold of chlorine)

Property

pH	>10.9
Melting Point/Freezing Point	100°C
Initial Boiling Point and Boiling Range	Product decomposes @ 100°C

Flash Point	Not combustible
Evaporation Rate	Not Available
Flammability	Not flammable. Calcium hypochlorite is a strong oxidizing agent and can increase the risk of fire or the intensity of a fire.
Upper Flammable Limit	Not Applicable
Lower Flammable Limit	Not Applicable
Vapour Pressure (mm Hg, 20°C)	Does not form vapour.
Vapour Density (Air=1)	Not Applicable
Relative Density	67-71 (kg/m^3)
Solubility(ies)	217g/L at 27°C in water
Partition Coefficient: n-octanol/water	Log P_{ow} = -2.46
Auto-ignition Temperature	Not Applicable
Decomposition Temperature	170-180°C
Viscosity	Not Applicable
Explosive Properties	Not sensitive to mechanical impact or static discharge.
Specific Gravity (Water=1)	2.35
% Volatiles by Volume	Not Available
Formula	$Ca(OCl)_2$
Molecular Weight	142.98 g/mol

Section 10 - Stability and Reactivity

Reactivity	The National Fire Protection Association (NFPA) lists calcium hypochlorite (over 50% by weight) as a class 3 oxidizer. Class 3 Oxidizers cause a sever increase in the burning rate of combustible materials with which they came into contact.
Stability	Inherently unstable. The rate of decomposition of the pure, dry material is extremely low at room temperature. Decomposition is accelerated in the presence of small amounts of water, moist air, carbon dioxide and/or the presence of contaminants. When it decomposes, the vigorous reaction generates a great deal of heat, oxygen and very corrosive chlorine gas.
Possibility of Hazardous Reactions	Small quantities will not usually undergo self-heating or spontaneous ignition under normal conditions of storage and handling. However, small quantities may spontaneuously ignite, either through self-heating due to decomposition or due to the presence of contaminants. Self-heating materials can eventually ignite through progeressive accelerating decomposition if they are store or processed above the Self Accelerating Decomposition Temperature (SADT). The decomposition temperature is much lower for bulk quantities than for small quantities.
Conditions to Avoid	Heat, sunlight (a heat source), contamination with combustible materials, moisture/high humidity, acidic conditions, the presence of metals and other impurities.

Incompatible Materials	Flammable and combustible materials, ammonia, primary amines, urea, acids, ammonium chloride, ethanol or methanol, hydroxyl compounds, acetylene, acetic acid and potassium cyanide, reducing agents, metal oxides, charcoal, metals, organic sulfur compounds, sulfur, turpentine.
Hazardous Decomposition Products	Chlorine, oxygen, dichlorine monoxide, calcium chlorate, calcium hydroxide, calcium carbonate.

Section 11 - Toxicological Information

Acute Toxicity Estimate

Component	Oral LD_{50}	Dermal LD_{50}	Inhalation LC_{50}
DryTec Briquettes	1,243 mg/kg	2,693 mg/kg	813 mg/m^3

This product has been classified in accordance with the Hazardous Products Regulations using ATE formula documented in the GHS standard.

Chronic Toxicity – Carcinogenicity

Component	IARC
DryTec Briquettes	None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

Skin Corrosion/Irritation	Calcium hypochlorite is corrosive to the skin.
Ingestion	Ingestion can cause burning of the mouth and throat. Product can be fatal if swallowed.
Inhalation	Inhalation of dust and deposition of particales in the respiratory tract can lead to irritation of the tissue and cause a variety of effects. These effects are dependent on concentration and include: upper respiratory tract irritation, nasal congestion, coughing, sore throat, laryngitis and shortness or breath. In operations where there are high concentrations of respirable particles, pulmonary edema may be produced.
Serious Eye Damage/Irritation	Corrosive to the eyes.
Respiratory or Skin Sensitization	This material is not known or reported to be a skin or respiratory sensitizer.
Germ Cell Mutagenicity	There is no human information available and there are no studies using live animals available. Calcium hypochlorite was mutagenic in bacteria and cultured mammalian cells.
Reproductive Toxicity	There is no human or animal information available for calcium hypochlorite.
STOT-Single Exposure	Severely irritating to respiratory system.
STOT-Repeated Exposure	Calcium Hypochlorite can irritate the lungs. Repeated exposure may cause bronchitis to develop with cough, phlegm, and/or shortness of breath.
Aspiration Hazard	Not Available
Synergistic Materials	Not Available

Section 12 – Ecological Information

Ecotoxicity

Component	Toxicity to Algae	Toxicity to Fish	Toxicity to Daphnia and Other Aquatic Invertebrates
Calcium Hypochlorite	EC_{50}(Pseudokirchneriella subcapitata, 72 hr): 0.983mg/L	LC_{50}(Lepomis macrochirus,96 hr): 0.057mg/L	EC_{50}(Daphnia magna, 48hr):0.073mg/L
Sodium Chloride	Not Available	LC_{50}(Lepomis macrochirus,96 hr): 5.84g/L	EC_{50}(Daphnia magna, 48hr):402.6mg/L
Calcium Chloride	Not Available	LC_{50}(Lepomis macrochirus,96	EC_{50}(Daphnia magna,

Calcium Hydroxide	EC_{50}(Aphanizomenon flos-aquae,22hr): 84mg/L	hr): 10650mg/L LC50(Gambusia affinis,96hr): 160mg/L	24hr):573.06mg/L LC50(Crangon septemspinosa,96hr): 158mg/L
Calcium Carbonate	Not Available	LC50(Gambusia affinis, 24-96hr): >56000mg/L	Not Available

Biodegradability Product not biodegradable. Chlorine can however, be converted to chloride by reducers in natural environment. Presence of light will accelerate dissipation of chlorine in water.

Bioaccumulation Chlorine is highly toxic to all forms of aquatic life, there is no potential for bioaccumulation or bioconcentration.

Mobility Not Available

Other Adverse Effects Not Available

Section 13 – Disposal Considerations

Waste From Residues/Unused Products Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Contaminated Packaging Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 – Transport Information

UN Number UN1748

UN Proper Shipping Name CALCIUM HYPOCHLORITE MIXTURE, DRY

Transport Hazard Class(es) 5.1

Packaging Group II

Environmental Hazards Not listed as a marine pollutant under Canadian TDG Regulations, schedule III.

Special Precautions Not Available

Transport in Bulk Not Available

Additional Information

Packing Group	Limited Quantity Index
II	1 Kg
III	5 Kg

TDG

Other Secure containers (full and/or empty) with suitable hold down devises during shipment and ensure all caps, valves, or closures are secured in the closed position.

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 14 of this MSDS / SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and/or published test data regarding the classification of this product are listed in the references at section 16 of this MSDS / SDS.

Section 15 – Regulatory Information

NOTE: THE PRODUCT LISTED ON THIS SDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS SDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

Section 16 – Other Information

Preparation Date August 18, 2015

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of

our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

1) CHEMINFO
2) eChemPortal
3) TOXNET
4) Transportation of Dangerous Goods Canada
5) HSDB
6) ECHA
7) PAN

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