

Calcium hypochlorite

sc-214653



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

Calcium hypochlorite

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Santa Cruz Biotechnology, Inc.
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800.457.3801 or 831.457.3800

EMERGENCY

ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

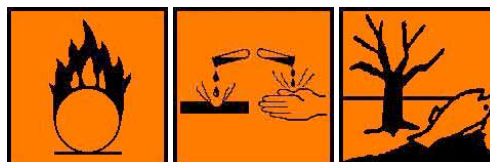
Cl₂-O₂.Ca, Ca-Cl₂-O₂, Ca-O₂-Cl₂, Ca(ClO)₂, "hypochlorous acid, calcium salt", "calcium chlorohydrochlorite", "calcium hypochloride", "calcium oxychloride", "bleaching powder", "B-K powder", Camporit, "Cal Hypo", "Pool Chlorine (Victorian DG Regs)", Hy-Chlor, Pittchlor, CCH, HTH

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	0	
Toxicity:	2	
Body Contact:	3	
Reactivity:	2	
Chronic:	2	

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Harmful if swallowed.
Contact with acids liberates toxic gas.
Causes burns.
Risk of serious damage to eyes.
Very toxic to aquatic organisms.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
- Ingestion of hypochlorites may cause burning in the mouth and throat, abdominal cramps, nausea, vomiting, diarrhoea, pain and inflammation of the mouth and stomach, fall of blood pressure, shock, confusion, and delirium.
Severe poisonings may lead to convulsion, coma and death.

EYE

- The material can produce chemical burns to the eye following direct contact.
Vapors or mists may be extremely irritating.
- If applied to the eyes, this material causes severe eye damage.
- Hypochlorite in pool water at concentrations of 1 ppm chlorine or less is non irritating to eyes if the pH is higher than 7.2 (slightly alkaline); At lower pH sensation of stinging, smarting of eyes with transient reddening may occur but generally no injury.
- Eye contact with a 5% hypochlorite solution may produce a temporary burning discomfort and slight irritation of the corneal epithelium with no injury.

SKIN

- The material can produce chemical burns following direct contact with the skin.
- Skin contact is not thought to produce harmful health effects (as classified using animal models).
Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Contact may cause severe itchiness, skin lesions and mild eczema.
A 5.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

- If inhaled, this material can irritate the throat and lungs of some persons.
- The material is not thought to produce adverse health effects following inhalation (as classified using animal models).
Nevertheless, adverse effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
- Chlorine vapour is extremely irritating to the upper respiratory tract and lungs Symptoms of exposure to chlorine include coughing, choking, breathing difficulty, chest pain, headache, vomiting, pulmonary oedema.
Inhalation may cause lung congestion, bronchitis and loss of consciousness.

CHRONIC HEALTH EFFECTS

- There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
There is limited evidence that, skin contact with this product is more likely to cause a sensitization reaction in some persons compared to the general population.
Reduced respiratory capacity may result from chronic low level exposure to chlorine gas. Chronic poisoning may result in coughing, severe chest pains, sore throat and haemoptysis (bloody sputum). Moderate to severe exposures over 3 years produced decreased lung capacity in a number of workers.
Delayed effects can include shortness of breath, violent headaches, pulmonary oedema and pneumonia.
Amongst chloralkali workers exposed to mean concentrations of 0.15 ppm for an average of 10.9 years a generalised pattern of fatigue (exposures of 0.5 ppm and above) and a modest increased incidence of anxiety and dizziness were recorded. Leukocytosis and a lower haematocrit showed some relation to exposure.
Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
calcium hypochlorite, dry	7778-54-3	94 app.
may contain		
calcium hydroxide hypochlorite	12394-14-8	(< 6

calcium chloride	10043-52-4	(
calcium hydroxide	1305-62-0	(
(Available chlorine >39%)		
Decomposes when wet and gives off toxic		
chlorine	7782-50-5	

Section 4 - FIRST AID MEASURES

SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

EYE

■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

■ If skin or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested. Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g.

NOTES TO PHYSICIAN

■ Excellent warning properties force rapid escape of personnel from chlorine vapour thus most inhalations are mild to moderate. If escape is not possible, exposure to high concentrations for a very short time can result in dyspnea, haemophysis and cyanosis with later complications being tracheobroncho-pneumonitis and pulmonary oedema. Oxygen, intermittent positive pressure breathing apparatus and aerosolised bronchodilators are of therapeutic value where chlorine inhalation has been light to moderate. Severe inhalation should result in hospitalisation and treatment for a respiratory emergency.

Any chlorine inhalation in an individual with compromised pulmonary function (COPD) should be regarded as a severe inhalation and a respiratory emergency. [CCINFO, Dow 1988]

Effects from exposure to chlorine gas include pulmonary oedema which may be delayed. Observation in hospital for 48 hours is recommended

Diagnosed asthmatics and those people suffering from certain types of chronic bronchitis should receive medical approval before being employed in occupations involving chlorine exposure.

If burn is present, treat as any thermal burn, after decontamination.

For acute or repeated exposures to hypochlorite solutions:

· Release of small amounts of hypochlorous acid and acid gases from the stomach following ingestion, is usually too low to cause damage but may be irritating to mucous membranes. Buffering with antacid may be helpful if discomfort is evident.

· Evaluate as potential caustic exposure.

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung edema often do not manifest until a few hours have passed and they are aggravated by physical effort.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not applicable
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	2.35
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA

■ FOR SMALL FIRE:

· USE FLOODING QUANTITIES OF WATER.

· DO NOT use dry chemicals, CO2 or foam.

FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.

· May be violently or explosive reactive.

When any large container (including road and rail tankers) is involved in a fire,

consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Will not burn but increases intensity of fire.

· Heating may cause expansion or decomposition leading to violent rupture of containers.

Decomposition may produce toxic fumes of: hydrogen chloride.

FIRE INCOMPATIBILITY

■ Avoid storage with reducing agents.

· Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

PERSONAL PROTECTION

Glasses:

Full face- shield.
 Gloves:
 Respirator:
 Type B-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up all spills immediately.
- No smoking, naked lights, ignition sources.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- DO NOT touch the spill material.

Cover remainder with a weak reducing agent to destroy available chlorine and mix with water.

Transfer sludge to suitable container and neutralise with soda ash. Wash spill area with detergent, reducer and water.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid personal contact and inhalation of dust, mist or vapors.
- Provide adequate ventilation.

WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.

RECOMMENDED STORAGE METHODS

■ Liquid inorganic hypochlorites shall not to be transported in unlined metal drums. Inner packagings shall be fitted with vented closures and plastics drums and carboys shall have vented closures or be performance tested to a minimum of 250 kPa. All non-vented packagings shall be filled so that the ullage is at least 10% at 21-25 deg.C. Vented packagings may be filled to an ullage not less than 5% at 21-25 deg.C, provided that this ullage does not result in leakage from, nor distortion of, the packaging.

- DO NOT repack. Use containers supplied by manufacturer only.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

STORAGE REQUIREMENTS

■ In addition, Goods of Class 5.1, packing group II should be:

- stored in piles so that
- the height of the pile does not exceed 1 metre
- the maximum quantity in a pile or building does not exceed 1000 tonnes unless the area is provided with automatic fire extinguishers
- the maximum height of a pile does not exceed 3 metres where the room is provided with automatic fire extinguishers or 2 meters if not.
- the minimum distance between piles is not less than 2 metres where the room is provided with automatic fire extinguishers or 3 meters if not.
- the minimum distance to walls is not less than 1 metre.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	Notes
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	calcium hypochlorite, dry (CHLORINE)	0.07							
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	calcium hypochlorite, dry (CHLORINE)	0.002							
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	calcium hypochlorite, dry (CHLORINE)	0.00005							

US - Minnesota Permissible Exposure Limits (PELs)	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
US NIOSH Recommended Exposure Limits (RELs)	calcium hypochlorite, dry (Chlorine)					0.5	1.45 (Ceiling ([15-minute]))
Canada - Alberta Occupational Exposure Limits	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	2.9		
Canada - British Columbia Occupational Exposure Limits	calcium hypochlorite, dry (Chlorine)	0.5		1			
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	calcium hypochlorite, dry (Chlorine)	(C)1	(C)3				
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
US - Idaho - Limits for Air Contaminants	calcium hypochlorite, dry (Chlorine)					1	3
US - California Permissible Exposure Limits for Chemical Contaminants	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
US - Alaska Limits for Air Contaminants	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
US - Michigan Exposure Limits for Air Contaminants	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
US - Oregon Permissible Exposure Limits (Z-1)	calcium hypochlorite, dry (Chlorine)					1	3
US - Hawaii Air Contaminant Limits	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	3		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	calcium hypochlorite, dry (Chlorine)	1	3	3	9		
US - Washington Permissible exposure limits of air contaminants	calcium hypochlorite, dry (Chlorine)	0.5				1	

Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	calcium hypochlorite, dry (Chlorine)	0.5		1				
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	calcium hypochlorite, dry (Chlorine)	0.5	1.5	1	2.9			
US OSHA Permissible Exposure Levels (PELs) - Table Z1	calcium hypochlorite, dry (Chlorine)					1	3	
US ACGIH Threshold Limit Values (TLV)	calcium hypochlorite, dry (Chlorine)	0.5		1				TLV Basis: upper respiratory tract & eye irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	calcium hypochlorite, dry (Chlorine)					1	3	
Canada - Northwest Territories Occupational Exposure Limits (English)	calcium hypochlorite, dry (Chlorine)	1	3	3	8.7	3	8.7	
Canada - Nova Scotia Occupational Exposure Limits	calcium hypochlorite, dry (Chlorine)	0.5		1				TLV Basis: upper respiratory tract & eye irritation
Canada - Prince Edward Island Occupational Exposure Limits	calcium hypochlorite, dry (Chlorine)	0.5		1				TLV Basis: upper respiratory tract & eye irritation
Canada - Ontario Occupational Exposure Limits	calcium chloride (Calcium chloride)		5					
Canada - Alberta Occupational Exposure Limits	calcium hydroxide (Calcium hydroxide)		5					
Canada - British Columbia Occupational Exposure Limits	calcium hydroxide (Calcium hydroxide)		5					
US - Minnesota Permissible Exposure Limits (PELs)	calcium hydroxide (Calcium hydroxide)		5					
US NIOSH Recommended Exposure Limits (RELs)	calcium hydroxide (Calcium hydroxide)		5					
US OSHA Permissible Exposure Levels (PELs) - Table Z1	calcium hydroxide (Calcium hydroxide - Total dust)		15					

US OSHA Permissible Exposure Levels (PELs) - Table Z1	calcium hydroxide (Calcium hydroxide - Respirable fraction)		5		
US ACGIH Threshold Limit Values (TLV)	calcium hydroxide (Calcium hydroxide)		5		TLV Basis: eye, upper respiratory tract & skin irritation
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	calcium hydroxide (Calcium hydroxide Respirable fraction)		5		
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	calcium hydroxide (Calcium hydroxide)		5		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	calcium hydroxide (Calcium hydroxide Total dust)		15		
US - California Permissible Exposure Limits for Chemical Contaminants	calcium hydroxide (Calcium hydroxide)		5		
US - Idaho - Limits for Air Contaminants	calcium hydroxide (Calcium hydroxide - Total dust)		15		
US - Idaho - Limits for Air Contaminants	calcium hydroxide (Calcium hydroxide - Respirable fraction)		5		
US - Alaska Limits for Air Contaminants	calcium hydroxide (Calcium hydroxide)		5		
US - Michigan Exposure Limits for Air Contaminants	calcium hydroxide		5		
US - Oregon Permissible Exposure Limits (Z-1)	calcium hydroxide (Calcium hydroxide Total Dust)		10		*
US - Hawaii Air Contaminant Limits	calcium hydroxide (Calcium hydroxide)		5		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	calcium hydroxide (Calcium hydroxide)	-	5	-	10

US - Washington Permissible exposure limits of air contaminants	calcium hydroxide (Calcium hydroxide)	5	10	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	calcium hydroxide (Calcium hydroxide)	5	10	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	calcium hydroxide (Calcium hydroxide- Total dust)	15		
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	calcium hydroxide (Calcium hydroxide - Respirable fraction)	5		
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	calcium hydroxide (Calcium hydroxide)	5		
Canada - Prince Edward Island Occupational Exposure Limits	calcium hydroxide (Calcium hydroxide)	5		TLV Basis: eye, upper respiratory tract & skin irritation
US - Oregon Permissible Exposure Limits (Z-1)	calcium hydroxide (Calcium hydroxide Respirable Fraction)	5		*
Canada - Northwest Territories Occupational Exposure Limits (English)	calcium hydroxide (Calcium hydroxide)	5	10	
Canada - Nova Scotia Occupational Exposure Limits	calcium hydroxide (Calcium hydroxide)	5		TLV Basis: eye, upper respiratory tract & skin irritation

ENDOELTABLE

PERSONAL PROTECTION



RESPIRATOR

Type B-P Filter of sufficient capacity
Consult your EHS staff for recommendations

EYE

- Chemical goggles.
- Full face shield.

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

- Neoprene gloves.
- DO NOT wear cotton or cotton-backed gloves.
- DO NOT wear leather gloves.
- Promptly hose all spills off leather shoes or boots or ensure that such footwear is protected with PVC over-shoes.

OTHER

- Overalls.
- PVC Apron.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

ENGINEERING CONTROLS

· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

· If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.

Mixes with water.

Contact with acids liberates toxic gas.

State	Divided solid	Molecular Weight	142.98
Melting Range (°F)	212 decomposes	Viscosity	Not Applicable
Boiling Range (°F)	Not applicable.	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not Applicable	pH (1% solution)	11.5 @ 5%
Decomposition Temp (°F)	212	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not applicable	Vapour Pressure (mmHG)	Not applicable
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	2.35
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	Not applicable.
Volatile Component (%vol)	Nil @ 38 C.	Evaporation Rate	Non Volatile

APPEARANCE

White powder with a pungent chlorine odour; soluble in water. Powerful oxidising agent; unstable to heat, friction or direct sunlight. Wetting of solid material can cause heating and decomposition, giving off oxygen and highly toxic chlorine gas.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
 - Product is considered stable under normal handling conditions.
 - Presence of elevated temperatures.
 - Presence of incompatible materials.
- Presence of rust (iron oxide) or other metal oxides catalyses decomposition.

STORAGE INCOMPATIBILITY

- Contact with acids produces toxic fumes.

Chlorine:

- is a strong oxidiser
- reacts explosively with acetylene, boron, diborane, or other boron hydrides at ordinary temperatures
- forms easily ignited, sensitive explosive mixtures with gases and vapours such as anhydrous ammonia, benzene, butane, ethane, ethylene, fluorine, hydrocarbons, formaldehyde, hydrogen, hydrogen bromide, hydrogen chloride, oxygen, propane, propene in the presence of heat,

hot surfaces, welding arc, sparks, strong sunlight, UV light, or a catalyst such as mercury oxide

- contact with 2-carboxymethylisothiuronium chloride or s-ethylisothiuronium hydrogen sulfate may form nitrogen trichloride. a dangerous explosive
- reacts violently with combustible materials, reducing agents, acetylene, molten aluminium (ignites on contact with the gas), alcohols, arsenic compounds, arsine, bismuth, boron, calcium compounds, carbon, diethylzinc, dimethylformamide, ether, ethyl phosphine, fluorine, germanium, hydrocarbons, hydrazine, hydrogen sulfide, hydroxylamine, iridium, lithium, lithium acetylide, magnesium, magnesium oxide, magnesium phosphide, mercury sulfide, methyl vinyl ether, metal carbides, molybdenum trioxide, potassium acetylide, sodium acetylide, sulfamic, sulfur dioxide, triethylborane and many other substances
- forms explosive mixtures with gasoline and petroleum products, such as mineral oil, , greases, phosphorus, silicones, turpentine, finely divided metals, organic compounds
- in its liquid form reacts explosively with carbon disulfide, linseed oil, propylene, rubber, wax, white phosphorus
- attacks some plastics and coatings
- may cause dangerous fires in contact with hot solid metals (especially steel - iron/ chlorine fire can cause the bursting of storage containers)
- when moist (150 ppm in water) is extremely corrosive to most metals especially in the presence of heat.
- reacts with water to give hydrogen chloride, with carbon monoxide to form phosgene, and with sulfur dioxide to give sulfuryl chloride

Chlorine storage areas shall be separated from anhydrous ammonia storage areas by a vapour path of at least 10 meters.

- Inorganic oxidising agents can react with reducing agents to generate heat and products that may be gaseous (causing pressurization of closed containers). The products may themselves be capable of further reactions (such as combustion in the air).
- Organic compounds in general have some reducing power and can in principle react with compounds in this class. Actual reactivity varies greatly with the identity of the organic compound.
- Inorganic oxidising agents can react violently with active metals, cyanides, esters, and thiocyanates.
- Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.
- Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.
- Presence of rust (iron oxide) or other metal oxides catalyses decomposition of inorganic hypochlorites.
- Contact with water can cause heating and decomposition giving off chlorine and oxygen gases. Solid hypochlorites in contact with water or moisture may generate sufficient heat to ignite combustible materials. Thermal decomposition can be sustained in the absence of oxygen.
- Contact with acids produces toxic fumes of chlorine.
- Bottles of strong sodium hypochlorite solution (10-14% available chlorine) burst in storage due to failure of the cap designed to vent oxygen slowly during storage. A hot summer may have exacerbated the situation. Vent caps should be checked regularly (using full personal protection) and hypochlorites should not be stored in direct sunlight or at temperatures exceeding 18 deg. C
- Anhydrous solid hypochlorite may decompose violently on heating or if subject to friction.
- Inorganic hypochlorites reacts violently with many incompatible materials including fuels, oils, wood, paper, etc. which become readily ignitable. Avoid contact with peroxides glycerine, lubricating oil, combustibles, amines, solvents, charcoal, metal oxides and salts, copper , mercaptan, sulfur, organic sulfides, turpentine.
- Contact of hypochlorites with nitromethane, alcohols, glycerol, phenol or diethylene glycol monomethyl ether results in ignition.
- Ammonia or primary aliphatic or aromatic amines may react with hypochlorites to form N-mono- or di-chloramines which are explosively unstable (but less so than nitrogen trichloride). Contact in drains between effluents containing ammonium salts and hypochlorites and acid lead to the formation of nitrogen trichloride which decomposed explosively. Whilst cleaning a brewery tank, reaction between an acidified ammonium sulfate cleaning preparation and sodium hypochlorite, lead nitrogen chloride formation and violent explosion
- Interaction of ethyleneimine (aziridine) with hypochlorites gives an explosive N-chloro compound
- Interaction of metal hypochlorites with nitrogenous materials may lead to the formation of nitrogen trichloride with explosive decomposition.
- Metal oxides catalyse the oxygen decomposition of the hypochlorite.
- Heating with carbon under confinement can result in explosion. Explosive interaction has occurred with carbonised food residues. After an attempt to clean these using bleach, and after heating, sodium chlorate appears to have been formed with consequent violent explosion
- Removal of formic acid from industrial waste streams with sodium hypochlorite solutions produced explosion at 55 deg. C.
- Explosions following reaction with methanol are attributed to formation of methyl hypochlorite.
- When finely divided materials such as sugar, wood dust and paper are contaminated with hypochlorite solution they burn more readily when dry.
- Calcium hypochlorite with over 60% "active" chlorine ignites on contact with lubricating oils, damp sulfur, organic thiols or sulfides
- Incompatible with sanitising bowl cleaners containing bisulfites.
- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

Avoid storage with reducing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

calcium hypochlorite, dry

TOXICITY AND IRRITATION

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

CALCIUM HYDROXIDE HYPOCHLORITE:

CALCIUM HYDROXIDE:

CHLORINE:

CALCIUM HYPOCHLORITE, DRY:

- Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance.

Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

CALCIUM HYDROXIDE:

CALCIUM CHLORIDE:

■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

CALCIUM HYDROXIDE HYPOCHLORITE:

CALCIUM HYPOCHLORITE, DRY:

■ Hypochlorite salts are extremely corrosive and can cause severe damage to the eyes and skin.

A number of fibrosarcomas and squamous cell carcinomas were observed in mice treated dermally with repeated subcarcinogenic doses of 4-nitroquinoline-1-oxide, followed by dermal treatment with sodium hypochlorite.

■ Hypochlorite salts are classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

CALCIUM HYPOCHLORITE, DRY:

TOXICITY IRRITATION

Oral (rat) LD50: 850 mg/kg Nil Reported

TOXICITY IRRITATION

CALCIUM HYDROXIDE HYPOCHLORITE:

Oral (rat) LD50: 850 mg/kg Nil Reported

[CCINFO]*

as calcium hypochlorite CAS 7778-54-3

CALCIUM CHLORIDE:

Oral (rat) LD50: 1000 mg/kg Skin (unknown): moderate*
 Eye (unknown): severe* [ICI]

■ The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

CALCIUM HYDROXIDE:

Oral (rat) LD50: 7340 mg/kg Eye (rabbit): 10 mg - SEVERE

CHLORINE:

Inhalation (human) LCLo: 500 ppm/5 minutes
 Inhalation (rat) LC50: 293 ppm/1 hour

Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms.
 This material and its container must be disposed of as hazardous waste.
 Avoid release to the environment.
 Refer to special instructions/ safety data sheets.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
calcium hypochlorite, dry	LOW		LOW	HIGH
calcium chloride			LOW	
calcium hydroxide			LOW	
chlorine			LOW	

GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / EHS TRN A1a A1b A1 A2 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No
Calcium 207
163 Ino 0 0 Ino (4) NI 1 0 2 3A 3 D 3 hypochlor 3 rg rg ite solutions containin g less than 15% but
more than 1.5% Ca(OCl)₂ / CAS:7778- 54- 3 / NH3485000

Legend: EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships) NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acuteaquatic toxicity LC/ECIC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acute mammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation& corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities, For column A2: R=Readily biodegradable, NR=Not readily biodegradable. For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lunginjury, N=Neurotoxic, I=Immunotoxic. For column E1: NT=Not tainting (tested), T=Tainting test positive. For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances. The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard. (GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

Reactivity characteristic: use EPA hazardous waste number D003 (waste code R).

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

! Puncture containers to prevent re-use and bury at an authorized landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory.

Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

For small quantities of oxidizing agent:

- Cautiously acidify a 3% solution to pH 2 with sulfuric acid.
- Gradually add a 50% excess of sodium bisulfite solution with stirring.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.

Dissolve, neutralise and decant as liquid.

Aqueous solutions of calcium hypochlorite may be neutralised with sodium sulfite, sodium bisulfate or dilute hydrogen pe

Discharge neutral liquid to sewer, diluted with water.

Bury residue in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION



DOT:

Symbols: None Hazard class or Division: 5.1

Identification Numbers: UN1748 PG: II

Label Codes: 5.1 Special provisions: 165, 166,

A7, A9,

IB8, IP2,

IP4, IP13,

N34, W9
Packaging: Exceptions: 152 Packaging: Non- bulk: 212
Packaging: Exceptions: 152 Quantity limitations: 5 kg
Passenger aircraft/rail:
Quantity Limitations: Cargo 25 kg Vessel stowage: Location: D
aircraft only:
Vessel stowage: Other: 4, 25, 48,
52, 56,
58, 69,
142
Hazardous materials descriptions and proper shipping names:
Calcium hypochlorite, dry or Calcium hypochlorite mixtures dry with more than
39 percent available chlorine (8.8 percent available oxygen)

Air Transport IATA:

ICAO/IATA Class: 5.1 ICAO/IATA Subrisk: None
UN/ID Number: 1748 Packing Group: II
Special provisions: A135
Cargo Only
Packing Instructions: 512 Maximum Qty/Pack: 25 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 509 Maximum Qty/Pack: 5 kg
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: Y509 Maximum Qty/Pack: 2.5 kg
Shipping Name: CALCIUM HYPOCHLORITE, DRY

Maritime Transport IMDG:

IMDG Class: 5.1 IMDG Subrisk: None
UN Number: 1748 Packing Group: II
EMS Number: F-H , S-Q Special provisions: 313 314
Limited Quantities: 1 kg Marine Pollutant: Yes
Shipping Name: CALCIUM HYPOCHLORITE, DRY or CALCIUM HYPOCHLORITE MIXTURE, DRY
with more than 39% available chlorine (8.8% available oxygen)

Section 15 - REGULATORY INFORMATION

calcium hypochlorite, dry (CAS: 7778-54-3) is found on the following regulatory lists;

"Canada - Saskatchewan Industrial Hazardous Substances","Canada Domestic Substances List (DSL)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - Massachusetts Oil & Hazardous Material List","US - New Jersey Right to Know Hazardous Substances","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US CWA (Clean Water Act) - List of Hazardous Substances","US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances","US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Chemicals Additional List","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act","US NFPA 1 Annex B Typical Oxidizers","US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide","US Toxic Substances Control Act (TSCA) - Inventory"

Regulations for ingredients

calcium hydroxide hypochlorite (CAS: 12394-14-8) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives","Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada National Pollutant Release Inventory (NPRI)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","US - Alaska Limits for Air Contaminants","US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified","US - California Occupational Safety and Health Regulations

(CAL/OSHA) - Hazardous Substances List", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Toxic Air Contaminant List Category II", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Massachusetts Oil & Hazardous Material List", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Hazardous Substance List", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know Hazardous Substances", "US - Oregon Hazardous Materials", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)", "US CERCLA Priority List of Hazardous Substances", "US Clean Air Act - Hazardous Air Pollutants", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest", "US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides", "US Department of Transportation (DOT) Marine Pollutants - Appendix B", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA Acute Exposure Guideline Levels (AEGs) - Final", "US EPA High Production Volume Chemicals Additional List", "US EPA Master Testing List - Index I Chemicals Listed", "US EPCRA Section 313 Chemical List", "US Food Additive Database", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US NIOSH Recommended Exposure Limits (RELS)", "US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory", "WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

calcium chloride (CAS: 10043-52-4) is found on the following regulatory lists;

"Canada - Ontario Occupational Exposure Limits", "Canada Domestic Substances List (DSL)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP", "IMO Provisional Categorization of Liquid Substances - List 3: (Trade-named) mixtures containing at least 99% by weight of components already assessed by IMO, presenting safety hazards", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Chemicals Additional List", "US Toxic Substances Control Act (TSCA) - Inventory"

calcium hydroxide (CAS: 1305-62-0,1332-69-0) is found on the following regulatory lists;

"Canada - Alberta Occupational Exposure Limits", "Canada - British Columbia Occupational Exposure Limits", "Canada - Northwest Territories Occupational Exposure Limits (English)", "Canada - Nova Scotia Occupational Exposure Limits", "Canada - Prince Edward Island Occupational Exposure Limits", "Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)", "Canada - Saskatchewan Industrial Hazardous Substances", "Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "Canada Domestic Substances List (DSL)", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Alaska Limits for Air Contaminants", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Hazardous Substance List", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know Hazardous Substances", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air

contaminants","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit Values (TLV)","US DOE Temporary Emergency Exposure Limits (TEELs)","US Food Additive Database","US NIOSH Recommended Exposure Limits (RELs)","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US Toxic Substances Control Act (TSCA) - Inventory"

chlorine (CAS: 7782-50-5) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives","Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada National Pollutant Release Inventory (NPRI)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","US - Alaska Limits for Air Contaminants","US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)","US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)","US - California Permissible Exposure Limits for Chemical Contaminants","US - California Toxic Air Contaminant List Category II","US - Connecticut Hazardous Air Pollutants","US - Hawaii Air Contaminant Limits","US - Idaho - Limits for Air Contaminants","US - Massachusetts Oil & Hazardous Material List","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Hazardous Substance List","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know Hazardous Substances","US - Oregon Hazardous Materials","US - Oregon Permissible Exposure Limits (Z-1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants","US - Washington Permissible exposure limits of air contaminants","US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit Values (TLV)","US ACGIH Threshold Limit Values (TLV) - Carcinogens","US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)","US CERCLA Priority List of Hazardous Substances","US Clean Air Act - Hazardous Air Pollutants","US CWA (Clean Water Act) - List of Hazardous Substances","US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances","US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest","US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides","US Department of Transportation (DOT) Marine Pollutants - Appendix B","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA Acute Exposure Guideline Levels (AEGs) - Final","US EPA High Production Volume Chemicals Additional List","US EPA Master Testing List - Index I Chemicals Listed","US EPCRA Section 313 Chemical List","US Food Additive Database","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act","US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases","US NIOSH Recommended Exposure Limits (RELs)","US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US SARA Section 302 Extremely Hazardous Substances","US Toxic Substances Control Act (TSCA) - Inventory","USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27","WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

Section 16 - OTHER INFORMATION

Ingredients with multiple CAS Nos

Ingredient Name CAS calcium hydroxide 1305-62-0, 1332-69-0

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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