



MATERIAL SAFETY DATA SHEET

Product Name: Ram Hardness Control

4949 Greenhouse Road Houston, TX 77084-2205

281/856-7600 - 800/456-3459 - Fax 281/856-7015

Material Name: Calcium Chloride

ID: C1-107

***** Section 1 - Chemical Product and Company Identification *****

Part Number: Technical, Prilled

Chemical Name: Calcium Chloride

Product Use: For Manufacturing Use

Synonyms: Calcium chloride (CaCl₂); Calcium dichloride; Calcium (2+) chloride.

Emergency #: (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

***** Section 2 - Composition / Information on Ingredients *****

CAS #	Component	Percent
10043-52-4	Calcium Chloride	94-100

Component Information/Information on Non-Hazardous Components

Calcium Chloride is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

***** Section 3 - Hazards Identification *****

Emergency Overview

Calcium Chloride is a white, odorless crystalline solid. May irritate eyes, skin, and mucous membranes. Generates heat upon contact with water.

Hazard Statements

CAUTION! MAY IRRITATE EYE, SKIN, AND RESPIRATORY TRACT. MAY BE HARMFUL IF SWALLOWED. Do not breathe dust. Do not allow contact with eyes, skin, or clothing. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation.

Potential Health Effects: Eyes

Calcium Chloride dusts or liquids from concentrated solutions may cause severe irritation and moderate corneal injury. Symptoms may include tearing and a burning sensation. Solid particles of Calcium Chloride may cause transient eye irritation and superficial injury.

Potential Health Effects: Skin

Contact of solid with dry skin is mildly irritating; strong solutions cause marked irritation or burns. Symptoms may include redness, burns, and peeling skin. Irritation may increase if Calcium Chloride is trapped beneath clothing or if skin is damp or broken.

Potential Health Effects: Ingestion

Calcium Chloride is a moderately severe irritant; acute ingestion has resulted in gastrointestinal hemorrhage. Ingestion may cause gastrointestinal irritation, including anorexia, constipation, nausea, or vomiting.

Potential Health Effects: Inhalation

May irritate mucous membranes. Symptoms may include burning sensation or pain in the nose, nose bleed, or tickling sensation in the throat.

HMIS Ratings: Health Hazard: 1 Fire Hazard: 0 Physical Hazard: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

***** Section 4 - First Aid Measures *****

First Aid: Eyes

Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

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*** Section 4 - First Aid Measures (Continued) ***

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Ingestion

DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Does not burn

Method Used: Not applicable

Upper Flammable Limit (UFL): Not applicable

Lower Flammable Limit (LFL): Not applicable

Auto Ignition: Not applicable

Flammability Classification: Not applicable

Rate of Burning: Does not burn

General Fire Hazards

Calcium Chloride generates heat upon contact with water. Contact with reactive metals may evolve flammable and explosive hydrogen gas.

Hazardous Combustion Products

When heated to decomposition, Calcium Chloride emits toxic fumes of hydrogen chloride.

Extinguishing Media

Use water, dry chemical, carbon dioxide, or foam to extinguish. Use water spray to cool fire-exposed containers.

Fire Fighting Equipment/Instructions

Evacuate area and fight fire from a safe distance. As in any fire, wear self-contained breathing apparatus, pressure-demand, and full protective gear.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 1 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary, use a dust suppressant agent that does not react with Calcium Chloride.

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Neutralize spill area with soda ash or lime. Avoid contamination of soil and prevent spill residue from running to groundwater or storm drains.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials that burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

*** Section 7 - Handling and Storage ***

Handling Procedures

All employees who handle this material should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use Calcium Chloride only with adequate ventilation. Wash thoroughly after handling.

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*** Section 7 - Handling and Storage (Continued) ***

Storage Procedures

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. Material should be stored in secondary containers or in a diked area, as appropriate. 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. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. 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 (i.e., sprinkler system, portable fire extinguishers).

Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Do not cut, grind, weld, or drill near this container. Never store food, feed, or drinking water in containers that held Calcium Chloride. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

No exposure guidelines have been established.

B: Component Exposure Limits

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

The exposure limits given are for Particulates Not Otherwise Classified (PNOC).

OSHA: 15 mg/m³ TWA (Total dust)
5 mg/m³ TWA (Respirable fraction)

DFG MAKs 4 mg/m³ TWA (Inhalable fraction)
1.5 mg/m³ TWA (Respirable fraction)

Engineering Controls

Use engineering methods to control hazardous conditions. This includes exhaust ventilation directly to the outside and using a corrosion-resistant ventilation system separate from other exhaust ventilation systems.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear chemical safety goggles. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Use impervious gloves. Gloves should be tested to determine their suitability for prolonged contact with this material. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator or dust mask. If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. 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).

Personal Protective Equipment: General

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

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*** Section 9 - Physical & Chemical Properties ***

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance: White	Odor: Odorless
Physical State: Solid granules	pH: 8-9 (35% soln)
Vapor Pressure: Practically zero	Vapor Density: Not applicable
Boiling Point: 3038 deg F (1670 deg C)	Melting Point: 1422 deg F (772 deg C)
Solubility (H₂O): 74.5 g/ml (20 deg C)(with liberation of much heat)	Specific Gravity: 2.15 (water = 1)
Freezing Point: Not determined	Particle Size: 8 Mesh
Softening Point: Not available	Evaporation Rate: Not applicable
Viscosity: 5.81 centipoise at 20 deg C	Bulk Density: 42-55 lbs/ft ³
Percent Volatile: Not determined	Molecular Weight: 110.99
Vol Org Carbons: Not available	Octanol/H₂O Coeff.: Not available
Heat Value: Not available	Sat. Vapor Conc.: Not available
	Chemical Formula: CaCl ₂

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable

Chemical Stability: Conditions to Avoid

Use caution when mixing with water and all incompatibles listed below.

Incompatibility

Water-exothermic reaction with water. Methyl Vinyl Ether-generates heat and can polymerize violently when mixed with Calcium chloride. Bromine Trifluoride-reacts violently and attacks calcium chloride. Furan-2-Peroxyacetic Acid-explodes at room temperature upon addition of calcium chloride. Reactive metals (e.g., zinc)-may evolve flammable, explosive hydrogen gas. (Boric oxide + Calcium oxide) violent reaction.

Hazardous Decomposition

When heated to decomposition, calcium chloride emits toxic fumes of hydrogen chloride.

Hazardous Polymerization

Violent polymerization occurs when mixed with Methyl Vinyl Ether.

*** Section 11 - Toxicological Information ***

Acute Toxicity

A: General Product Information

May irritate mucous membranes. Symptoms may include burning sensation or pain in the nose, nose bleed, or tickling sensation in the throat. Cases of perforation of the nasal septum have been reported with chronic overexposure. Calcium Chloride dusts or liquids from concentrated solutions may cause severe eye irritation and moderate corneal injury. Symptoms may include tearing and a burning sensation in the eye. Solid particles of calcium chloride have caused transient eye irritation and superficial injury. Contact of solid with dry skin is mildly irritating; strong solutions cause marked irritation or burns. Symptoms may include redness, burns, and peeling skin. Skin irritation may increase if Calcium Chloride is trapped beneath clothing or if skin is damp or broken. Ingestion may cause gastrointestinal irritation, including anorexia, constipation, nausea, or vomiting. Calcium chloride is a moderately severe gastrointestinal irritant; acute ingestion has caused gastrointestinal hemorrhage. Calcium chloride may cause acidosis when ingested.

Calcium chloride (280 mg/kg, IV) produced arrhythmia, heart fibrillation, and death in mice.

B: Component Analysis - LD₅₀/LC₅₀

Calcium Chloride (10043-52-4)

LD₅₀ (oral, rat) = 1 g/kg; LD₅₀ (subcutaneous, rat) = 2630 mg/kg; LD₅₀ (intraperitoneal, rat) = 264 mg/kg; LD₅₀ (intramuscular, rat) = 25 mg/kg; LD₅₀ (oral, mouse) = 1940 mg/kg; LD₅₀ (intraperitoneal, mouse) = 210 mg/kg; Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold, changes in motor activity (specific assay); LD₅₀ (subcutaneous, mouse) = 823 mg/kg; LD₅₀ (intravenous, mouse) = 42 mg/kg

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*** Section 11 - Toxicological Information (Continued) ***

Acute Toxicity (continued):

B: Component Analysis - TDLo/LDLo

LDLo (oral, rabbit) = 1384 mg/kg; LDLo (intravenous, rat) = 161 mg/kg; LDLo (intravenous, rabbit) = 274 mg/kg; LDLo (intravenous, dog) = 274 mg/kg; LDLo (intravenous, cat) = 249 mg/kg; LDLo (intravenous, guinea pig) = 150 mg/kg; LDLo (subcutaneous, rabbit) = 472 mg/kg; LDLo (subcutaneous, dog) = 274 mg/kg; LDLo (subcutaneous, cat) = 249 mg/kg; LDLo (subcutaneous, frog) = 666 mg/kg; LDLo (intraarterial, guinea pig) = 300 mg/kg; TDLo (intravenous, woman) = 20 mg/kg/1 hour/continuous; Skin and Appendages: dermatitis (after systemic exposure); Nutritional and Gross Metabolic: changes in calcium; TDLo (oral, rat) = 2016 mg/kg/30 days/intermittent; Brain and Coverings: recordings from specific areas of CNS; Cardiac: pulse rate Blood: changes in leukocyte (WBC) count; TDLo (oral, rat) = 112 g/kg/20 weeks/continuous; Tumorigenic: equivocal tumorigenic agent by RTECS criteria Endocrine: thyroid tumors

Carcinogenicity

A: General Product Information

Calcium chloride is a questionable carcinogen with experimental tumorigenic (thyroid) data in rats.

B: Component Carcinogenicity

Calcium Chloride is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology

No information available.

Neurotoxicity

No information available.

Mutagenicity

Calcium chloride has caused mutagenic effects in two *in-vivo* rat cell tests and in one yeast cell test.

Teratogenicity

No information available.

Other Toxicological Information

Sex Chromosome Loss and Nondisjunction (*Saccharomyces cerevisiae*) = 200 mmol/L; Unscheduled DNA Synthesis (intraperitoneal, rat) = 2500 μ mol/kg; Cytogenetic Analysis (Ascites tumor, rat) = 3500 mg/kg

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

Dangerous to aquatic life in high concentrations.

B: Ecotoxicity

TLm (bluegill) 24 hours = 8,400 mg/L; TLm (marine fish) 48 hours = 2,400 mg/L; Lethal (rock bass) 168 hours = 555 ppm (tap water); LD₅₀ (sunfish) 96 hours = 10,650

Environmental Fate

Persistency: will remain in dissolved state indefinitely. Calcium chloride does not biodegrade or bioaccumulate.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, not regulated as a hazardous waste.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for Calcium Chloride.

Disposal Instructions

Dispose of in accordance with all applicable Federal, State, or provincial, and local regulations.

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*** Section 14 - Transportation Information ***

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

Shipping Name: Not Regulated
Hazard Class: Not Classified
UN/NA #: Not Classified
Packing Group: None
Required Label(s): None

International Air Transport Association (IATA)

For Shipments by Air transport: We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). "For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties."

UN: UN 3077

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (calcium chloride)

Hazard Class: 9

Packing Group: III

Passenger & Cargo Aircraft Packing Instruction: 911

Passenger & Cargo Aircraft Maximum Net Quantity: No Limit

Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911

Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg

Special Provisions: A97

ERG Code: 9L

International Maritime Organization (I.M.O.) Classification

Calcium Chloride is not regulated under I.M.O.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

None.

B: Component Analysis

Calcium Chloride is not listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Calcium Chloride. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Calcium Chloride	10043-52-4	No	No	No	Yes	No

State Regulations

A: General Product Information

This product does not contain any components known to the supplier that require labeling under California Proposition 65.

B: Component Analysis - State

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Component	CAS #	CA	FL	MA	MN	NJ	PA
Calcium Chloride	10043-52-4	No	No	No	No	No	No

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*** Section 15 - Regulatory Information (Continued) ***

US Federal Regulations (continued)

Other Regulations

A: General Product Information

None.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Calcium Chloride	10043-52-4	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

Component	CAS #	Minimum Concentration
Calcium Chloride	10043-52-4	No disclosure limit

ANSI Labeling (Z129.1):

CAUTION! MAY BE HARMFUL IF INHALED OR INGESTED. MAY CAUSE EYE, SKIN AND RESPIRATORY IRRITATION. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep from contact with clothing. Keep container closed. 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, avoiding the generation of airborne dusts. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

*** Section 16 - Other Information ***

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koleman, PhD

Contact Phone: (713) 896-9966

Revision Log

- 07/18/00 4:03 PM SEP revised company name, Sect 1 and 16, from Corporation to Ltd.
- 05/14/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
- 07/24/01 2:56 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
- 2/18/02: 10:35 AM HDF Up-date of SARA Hazard Ratings.
- 07/22/03: 4:15 PM HDF General review and up-date of entire MSDS. Up-graded Section 10 Reactivity Information. Up-date of HMIS categories. Up-date of Section 8. Up-date of Section 14.
- 06/22/05 12:45PM SEP Updated IATA Section 14.

This is the end of MSDS # C1-107