



# MATERIAL SAFETY DATA SHEET

## SECTION I - CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name: <b>HIGH CALCIUM QUICKLIME</b>	<b>WHMIS – CLASSIFICATION:</b> <b>D2A / D2B: MATERIALS CAUSING OTHER TOXIC EFFECTS</b> <b>E: CORROSIVE MATERIAL</b>
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MANUFACTURER'S AND SUPPLIER'S NAME:

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<b>GRAYMONT (QC) INC.</b>	25 – 206, rue De Lauzon, Boucherville (Québec), J4B 1E7.
<b>GRAYMONT (PA) INC.</b>	965, East College Avenue, Pleasant Gap, PA 16823
<b>GRAYMONT (WESTERN CANADA) INC.</b>	190 – 3025, 12 <sup>th</sup> Street N.E., Calgary, Alberta, T2E 7J2
<b>GRAYMONT (WESTERN US) INC.</b>	3950 South, 700 East, Suite 301, Salt Lake City, Utah 84107
<b>GRAYMONT (WI) INC.</b>	Foot of Hill Avenue, Superior, Wisconsin 54880

**EMERGENCY TEL. No.: (613) 996 – 6666 CANUTEC (Canada) (800) 424 – 9300 CHEMTREC (US)**

Chemical Name <b>Calcium oxide</b>	Chemical Family <b>Alkaline earth oxide</b>	Chemical Formula <b>Complex mixture - mostly CaO</b>
Molecular Weight <b>CaO = 56.08</b>	Trade Name and Synonyms <b>High Calcium Quicklime, Lime, Quicklime, Calcium Oxide, Burnt Lime, Unslaked Lime, Fluxing Lime.</b>	Material Use <b>Neutralization, Flocculation, Flux (met.), Caustic agent, absorption</b>

## SECTION II - COMPOSITION AND INFORMATION ON INGREDIENTS

Hazardous Ingredients	Approximate Concentration	C.A.S. Number	Exposure limits (mg/m <sup>3</sup> )					
			OSHA PEL	ACGIH TLV	RSST VEMP	MSHA PEL	NIOSH REL	NIOSH IDLH
(Complex Mixture)	(% by weight)		(TWA) 8/40h	(TWA) 8/40h	(TWA) 8/40h	(TWA) 8/40h	(TWA) 10/40h	
<b>Calcium Oxide</b>	<b>90 to 100</b>	<b>1305-78-8</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>25</b>
<b>Crystalline Silica, Quartz</b>	<b>0.1 to 1</b>	<b>14808-60-7</b>	<b>10/(%SiO<sub>2</sub>)+2 respirable silica dust</b>	<b>0.025 respirable silica dust</b>	<b>0.1 respirable silica dust</b>	<b>10/(%SiO<sub>2</sub>)+2 respirable silica dust</b>	<b>0.05 respirable silica dust</b>	<b>50</b>
<b>Crystalline Silica, Quartz</b>	<b>0 to 0.1 (Note 1)</b>	<b>14808-60-7</b>	<b>10/(%SiO<sub>2</sub>)+2 respirable silica dust</b>	<b>0.025 respirable silica dust</b>	<b>0.1 respirable silica dust</b>	<b>10/(%SiO<sub>2</sub>)+2 respirable silica dust</b>	<b>0.05 respirable silica dust</b>	<b>50</b>

(Note 1) : Concentration of crystalline silica in a series of lime products will vary from source to source. It was not detected on some samples (< 0.1% w/w). Therefore two ranges are being disclosed. (Note 2) : ACGIH TLV Version 1973 has been adopted by the Mine Safety Health Administration (MSHA) as the regulatory Exposure Standard.

SECTION III - PHYSICAL AND CHEMICAL DATA				
Physical State Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Solid <input checked="" type="checkbox"/>	Odor and Appearance <b>Slight earthy odor - White crystalline substance</b>		Odor Threshold (p.p.m.) <b>Not applicable</b>	Specific Gravity <b>3.25 - 3.38</b>
Vapor Pressure (mm) <b>Not applicable</b>	Vapor Density (Air = 1) <b>Not applicable</b>	Evaporation Rate <b>Not applicable</b>	Boiling Point (°C) <b>2850</b>	Melting Point (°C) <b>2570 - 2625</b>
Solubility in Water (20°C) <b>0.125g/100g Solution</b>	Volatiles (% by volume) <b>Not applicable</b>	pH (25 °C) <b>Sat. soln CaO 12.45</b>	Bulk Density (kg/m <sup>3</sup> ) <b>720 - 1200</b>	Coefficient of water/oil distribution <b>Not applicable</b>

SECTION IV - FIRE OR EXPLOSION HAZARD DATA			
Flammability Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, under which conditions?			
Extinguishing Media <b>Quicklime does not burn. Use extinguisher appropriate for material burning.</b>			
Special Fire Fighting Procedures <b>Avoid using water unless necessary for other materials, in which case, flood to absorb heat generated. (Contact with water will evolve heat and could cause ignition of paper, cardboard, etc.). Wear self-contained breathing equipment approved by NIOSH.</b>			
Flash point (°C) and Method <b>Not applicable</b>	Upper flammable limit (% by volume) <b>Not applicable</b>	Lower flammable limit (% by volume) <b>Not applicable</b>	
Auto Ignition Temperature (°C) <b>Not applicable</b>	TDG Flammability Classification <b>Non-flammable</b>	Hazardous Combustion Products <b>None</b>	
Dangerous Combustion Products <b>None</b>			
EXPLOSION DATA			
Sensitivity to Chemical Impact <b>Not applicable</b>	Rate of Burning <b>Not applicable</b>	Explosive Power <b>Not applicable</b>	Sensitivity to Static Discharge <b>Not applicable</b>

<b>SECTION V - REACTIVITY DATA</b>		
Chemical Stability Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If no, under which conditions?	<b>Absorbs moisture and carbon dioxide in the air to form calcium hydroxide and calcium carbonate.</b>
Incompatibility to other substances Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If so, which ones?	<b>Boron tri-fluoride, chlorine tri-fluoride, ethanol, fluorine, hydrogen fluoride, phosphorus pentoxide; water and acids (violent reaction with generating heat and possible explosion in confined area).</b>
Reactivity Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If so, under which conditions?	<b>Reacts violently with strong acids. Reacts with water to form calcium hydroxide. The heat generated when mixed with water or moist air is sufficient enough to ignite surrounding materials such as paper, wood or cloth.</b>
Hazardous Decomposition Products	<b>None.</b>	
Hazardous Polymerization Products	<b>Will not occur.</b>	

<b>SECTION VI - TOXICOLOGICAL PROPERTIES</b>		
Route of Entry <input checked="" type="checkbox"/> Skin Contact <input type="checkbox"/> Skin Absorption <input checked="" type="checkbox"/> Eye Contact <input checked="" type="checkbox"/> Acute Inhalation <input type="checkbox"/> Chronic Inhalation <input checked="" type="checkbox"/> Ingestion		
Effects of Acute Exposure to Product		
Skin	<b>Severe irritation or burning of mucous and skin. Dehydration of tissues.</b>	
Eyes	<b>Severe eye irritation and burning, intense watering of the eyes, possible lesions, possible blindness when exposed for prolonged period. (Draize &gt;80).</b>	
Inhalation	<b>If inhaled in form of dust: nose, oral cavity and throat irritation, cough, sneezing, inflammation of breathing passages, ulceration and perforation of nasal septum, bronchitis, possible pneumonia.</b>	
Ingestion	<b>If ingested, burning and edema of digestive tracts, abundant salivation, difficulties in swallowing and breathing, vomiting blood, drop in blood pressure (indicates perforation of esophagus or stomach).</b>	
Effects of Chronic Exposure to Product:		
<b>Contact dermatitis. Following repeated or prolonged contact, this product can cause redness, desquamation and fissures. This product may contain trace amounts of crystalline silica. Excessive inhalation of respirable crystalline silica dust may result in respiratory disease, including silicosis, pneumoconiosis and pulmonary fibrosis.</b>		
LD <sub>50</sub> of Product (Specify Species and Route) <b>3059 mg/kg (Mouse/Intraperitoneal)</b>	Irritancy of Product <b>Severe to moist tissues</b>	Exposure limits of Product <b>Unavailable</b>
LC <sub>50</sub> of Product (Specify Species) <b>Unavailable</b>	Sensitization to Product <b>None</b>	Synergistic materials <b>None reported</b>

**SECTION VI - TOXICOLOGICAL PROPERTIES (Cont'd)**

Carcinogenicity     Reproductive effects     Tératogenicity     Mutagenicity

Quicklime is not listed as a carcinogen by ACGIH, MSHA, OSHA, NTP, DFG, RSST or IARC. It may, however, contain trace amounts of Crystalline Silica listed carcinogens by these organizations.

Crystalline Silica, which inhaled in the form of quartz or crystobalite from occupational sources, is classified by IARC as carcinogenic to humans. (Group 1)

Silica, crystalline (Airborne particles of respirable size) is regulated under California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Crystalline silica is listed as a chemical known to the State to cause cancer.

NIOSH considers crystalline silica to be potential occupational carcinogen as defined by the OSHA carcinogen policy [29 CFR 1990]. (Ca).

NTP lists respirable Crystalline Silica as known to be human carcinogens based on sufficient evidence of carcinogenicity in humans. (K).

ACGIH lists respirable Crystalline Silica (quartz) as suspected human carcinogen. (A2).

DFG lists respirable Crystalline Silica as a substance that causes cancer in man (1)

RSST lists respirable Crystalline Silica (quartz) as suspected human carcinogen.

**SECTION VII - PREVENTIVE MEASURES**

Personal Protective Equipment (PPE)	Wear clean, dry gloves, full length pants over boots, long sleeved shirt buttoned at the neck, head protection and approved eye protection selected for the working conditions.
Gloves (Specify)	Gauntlets Cuff style.
Respiratory (Specify)	<p>NIOSH approved respirator.</p> <p><u>Up to 10 mg/m<sup>3</sup></u>: (APF = 5) Any quarter-mask respirator.</p> <p><u>Up to 20 mg/m<sup>3</sup></u>: (APF = 10) Any particulate respirator equipped with an N95, R95 or P95 filter except quarter-mask respirator. Any supplied-air respirator.</p> <p><u>Up to 25 mg/m<sup>3</sup></u>: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode. Any powered, air purifying respirator with a high-efficiency particulate filter.</p> <p>For <u>respirable quartz levels</u> that exceed or are likely to exceed an 8-hr TWA of <u>0.1 mg/m<sup>3</sup></u>, a NIOSH approved (N/R/P95) dust respirator is recommended.</p> <p>For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of <u>0.5 mg/m<sup>3</sup></u>, a NIOSH approved HEPA (N/R/P100) filter respirator is recommended.</p> <p>For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of <u>5.0 mg/m<sup>3</sup></u>, a NIOSH approved positive pressure (SAR), full face respirator or equivalent is recommended.</p>
Eyes (Specify)	ANSI, CSA or ASTM approved safety glasses with side shields. Tight fitting dust goggles should be worn when excessive (visible) dust conditions are present. Do not wear contact lenses without tight fitting goggles when handling this chemical.
Footwear (Specify)	Resistant to caustics.
Clothing (Specify)	Fully covering skin. Remove when wet or contaminated. Change daily.
Other (Specify)	Evaluate degree of exposure and use PPE if necessary. After handling lime, employees must shower. If exposed daily, use oil, Vaseline, silicone base crème etc. to protect exposed skin, particularly neck, face and wrists.

**SECTION VII - PREVENTIVE MEASURES (Cont'd)**

Engineering Controls (e.g. ventilation, enclosed process, specify)

**Enclose dust sources; use exhaust ventilation (dust collector) at handling points, keep levels below Max. Concentration Permitted.**

Leak and Spill Procedure

**Limit access to trained personnel. Use industrial vacuums for large spills. Ventilate area.**

Waste Disposal

**Transport to disposal area or bury. Review Federal, Provincial and local Environmental regulations.**

Handling Procedures and Equipment

**Avoid skin and eye contact. Minimize dust generation. Wear protective goggles and in cases of insufficient ventilation, use NIOSH approved dust respirator. An eye wash station and safety shower should be readily available where this material or its water dispersions are used. Contact lenses should not be worn when working with this chemical.**

Storage Requirements

**Keep tightly closed containers in a cool, dry and well ventilated area, away from acids. Keep out of reach of children.**

Special Shipment Information

**Quicklime is neither regulated by the Transportation of Dangerous Goods (TDG) Regulations (Canada) nor by the Hazardous Materials Regulations (USA) unless this material is offered or intended for transportation by aircraft.**

**SECTION VIII - FIRST AID MEASURES**

Skin

**Carefully and gently brush the contaminated body surfaces in order to remove all traces of lime. Use a brush, cloth or gloves. Remove all lime-contaminated clothing. Rinse contaminated area with lukewarm water for 15 to 20 minutes. Consult a physician if exposed area is large or if irritation persists.**

Eyes

**Immediately rinse contaminated eye(s) with gently running lukewarm water (saline solution is preferred) for 15 to 20 minutes. In the case of an embedded particle in the eye, or chemical burn, as assessed by first aid trained personnel, contact a physician.**

Inhalation

**Move source of dust or move victim to fresh air. Obtain medical attention immediately. If victim does not breathe, give artificial respiration.**

Ingestion

**If victim is conscious, give 300 ml (10 oz) of water, followed by diluted vinegar (1 part vinegar, 2 parts water) or fruit juice to neutralize the alkali. Do not induce vomiting. Contact a physician immediately.**

General Advise

**Consult a physician for all exposures except minor instances of inhalation.**

**SECTION IX - REGULATORY INFORMATION**

Superfund Amendments and Reauthorization Act of 1986 (**SARA Title III**). / The Emergency Planning and "Community Right-to-Know" Act (**EPCRA**). / Comprehensive Environmental Response, Compensation and Liability Act (**CERCLA**). / Resource Conservation and Recovery Act (**RCRA**).

**Component Calcium Oxide has been reviewed against the following regulatory listings:**

- **SARA Section 302 – Emergency Planning Notification. Extremely Hazardous Substances (EHS) List and Threshold Planning Quantity (TPQ). (40 CFR, Part 355, Section 30): Not listed.**
- **SARA Section 304 – Emergency Release Notification. Extremely Hazardous Substances (EHS) and Reportable Quantity (RQ) List. (40 CFR, Part 355, Section 40): Not listed.**
- **SARA Section 311/312 – Hazard Categories (40 CFR, Part 370): This product is regulated under CFR 1910.1200 (OSHA Hazard Communication) as Immediate (Acute) Health Hazards – Irritant.**
- **SARA Section 313 – Toxics Release Inventory (TRI). Toxic Chemical List (40 CFR, Part 372). Not listed.**
- **CERCLA – Hazardous Substance (40 CFR, Part 302): Not listed in Table 302.4.**
- **RCRA – Hazardous Waste Number (40 CFR, Part 261, Subpart D): Not listed.**
- **RCRA – Hazardous Waste Classification (40 CFR, Part 261, Subpart C): Not classified.**

CWA 311. - Clean Water Act List of Hazardous Substances.

**Calcium Oxide has been withdrawn from the Clean Water Act (CWA) list of hazardous substances. (11/13/79) (44FR65400)**

California Proposition 65.

**Component Calcium Oxide does not appear on the above regulatory listing. This product may contain small amounts of crystalline silica. Silica, crystalline (Airborne particles of respirable size) is regulated under California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Crystalline silica is listed as a chemical known to the State to cause cancer.**

Transportation - Hazardous Materials Regulations (USA) & Transportation of Dangerous Goods (TDG) Regulations (Can).

**Calcium Oxide is listed in both table 172.101 of Title 49 CFR 172 and in schedule 18 D.G. List (Chapter 34 TDG ACT, SOR/DORS 93-525). Application of requirements is restricted to material offered or intended for transportation by aircraft. - Calcium oxide. By aircraft only. Class 8 - Corrosives. PIN UN1910. Packing group III. Maximum net quantity per package - passenger vehicles, 25kg.**

Toxic Substances Control Act (TSCA).

**All naturally occurring components of this product are automatically included in the USEPA TSCA Inventory List per 40 CFR 710.4 (b). All other components are listed on the USEPA TSCA Chemical Substances Inventory. Calcium Oxide is subject to inventory update reporting (IUR).**

Canadian Environmental Protection Act 1999 (CEPA) – Substances Lists (DSL/NDSL).

**Calcium Oxide is specified on the public Portion of the Domestic Substances List (DSL).**

ANSI/NSF 60 - Drinking Water Treatment Additives.

**Quicklime has been investigated with respect to elements identified by EPA as toxic and it has been classified for use in direct contact with drinking water. (In accordance with Standard ANSI/NSF 60). For a list of classified products, refer to Underwriters Laboratories Inc.'s Online Certifications Directory.**



FDA - U.S. Food and Drug Administration, Department of Health and Human Services.

**Calcium Oxide has been determined as "Generally Recognized As Safe" (GRAS) by FDA. See 21CFR184.1210. (CFR Title 21 Part 184 - - Direct food substances affirmed as generally recognized as safe).**

**SECTION X - OTHER INFORMATION**

<p>Hazardous Materials Identification System (U.S.)</p>		<p>National Fire Protection Association (U.S.) NFPA 704</p> <p>Health Hazard</p>	<p>Fire Hazard</p>  <p>Instability / Thermal Hazard</p> <p>Specific hazard</p>
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<p>WHMIS – Classification: “E” Corrosive Material.</p>	<p>WHMIS – Classification: “D2A and D2B”: Materials causing other toxic effects.</p>
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<p>Symbol:</p> 	<p>Symbol:</p> 
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Additional Information/Comments:  
**The technical data contained herein is given as information only and is believed to be reliable. GRAYMONT makes no guarantee of results and assumes no obligation or liability in connection therewith.**

Sources Used:  
 NFPA, NLA, TDG, CSST, RSST, (LSRO-FASEB), Hazardous Products Act, Environment Canada, Enviroguide, OSHA, ACGIH, IARC, NIOSH, CFR, NTP, HSDB, EPA SRS, RTECS, DFG, Chemistry and Technology of Lime and Limestone (John Wiley and Sons, Inc.), Lime and Limestone (WILEY-VCH).

**SECTION XI - PREPARATION INFORMATION**

<p>Prepared by:  <b>GRAYMONT (QC) INC.</b>                  Quality Assurance &amp; Technical Services</p>	<p>Telephone number:  <b>(450) 449-2262</b></p>	<p>Date :  <b>September 2009</b></p>
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An electronic version of this MSDS is available at: [www.graymont.com](http://www.graymont.com) under the PRODUCTS section.