

Safety Data Sheet



Section 1: Identification

Product identifier

- Product Name** • Reno Cast 80 LC-ALZ
Product Code • 158800

Relevant identified uses of the substance or mixture and uses advised against

- Recommended use** • Refractory applications

Details of the supplier of the safety data sheet

- Manufacturer** • Reno Refractories, Inc.
P O Box 201
Morris, AL 35116
United States
www.renorefractories.com
sales@renorefractories.com
Telephone (General) • 205-647-0240

Emergency telephone number

- Manufacturer** • 1-800-262-8200 - CHEMTREC

Section 2: Hazard Identification

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

- OSHA HCS 2012** • Carcinogenicity 1A
Specific Target Organ Toxicity Repeated Exposure 1

Label elements

OSHA HCS 2012

DANGER



- Hazard statements** • May cause cancer.
Causes damage to organs through prolonged or repeated exposure.

Precautionary statements

- Prevention** • Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.

Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves, clothing, and eye/face protection, .

Response • IF exposed or concerned: Get medical advice/attention.

Storage/Disposal • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to: WHMIS

Classification of the substance or mixture

WHMIS

- Other Toxic Effects - D2A
Other Toxic Effects - D2B

Label elements

WHMIS



WHMIS

- Other Toxic Effects - D2A
Other Toxic Effects - D2B

Other hazards

WHMIS

- In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

Substances

- Material does not meet the criteria of a substance.

Mixtures

Composition					
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive	Comments
Bauxite	CAS:1318-16-7	55.44% TO 58.96%	NDA	OSHA HCS 2012: STOT RE 2 (Lungs)	NDA
Aluminum oxide	CAS:1344-28-1	11.89% TO 24.5%	Inhalation-Rat LC50 • 0.2 mg/L 5 Hour(s) 28 Week(s)	OSHA HCS 2012: Not Classified	NDA
Zirconium(IV) silicate (1:1)	CAS:14940-68-2	5.88% TO 10%	NDA	OSHA HCS 2012: WHMIS:	NDA
Cement, alumina, chemicals	CAS:65997-16-2	3% TO 7%	NDA	OSHA HCS 2012: Not Classified	NDA
Silica, amorphous	CAS:7631-86-9	4.1% TO 4.47%	NDA	OSHA HCS 2012: Not Classified	NDA
NON WETTING AGENT	Proprietary	0.94% TO 3.9%	Ingestion/Oral-Rat LD50 • 4250 mg/kg	OSHA HCS 2012: Not Classified	NDA

Titanium dioxide	CAS:13463-67-7	2.04% TO 2.2%	NDA	OSHA HCS 2012: Carc. 2	NDA
Amorphous silica fume	CAS:69012-64-2	< 2%	NDA	OSHA HCS 2012: STOT RE 1 (Lungs)	NDA
Iron oxide	CAS:1309-37-1	1.26% TO 1.34%	NDA	OSHA HCS 2012: Not Classified	NDA
Quartz	CAS:14808-60-7	< 0.25%	NDA	OSHA HCS 2012: Carc. 1A; STOT RE 1 (Lungs)	NDA
Limestone	CAS:1317-65-3	0.01% TO 0.12%	NDA	OSHA HCS 2012: STOT RE 2 (Lung, Inhl)	NDA
Zirconium oxide	CAS:1314-23-4	< 0.0595%	NDA	OSHA HCS 2012: WHMIS:	NDA
Sodium hydroxide	CAS:1310-73-2	< 0.05%	NDA	OSHA HCS 2012: WHMIS: Corrosive - E	NDA
Rutile (TiO ₂)	CAS:1317-80-2	0.01% TO 0.03%	NDA	OSHA HCS 2012: WHMIS:	NDA
Boric acid	CAS:10043-35-3	< 0.03%	Ingestion/Oral-Rat LD50 • 2660 mg/kg	OSHA HCS 2012: WHMIS: Other Toxic Effects - D2A; Other Toxic Effects - D2B	NDA
Calcium oxide	CAS:1305-78-8	< 0.018%	NDA	OSHA HCS 2012: WHMIS: Corrosive - E	NDA
Potassium oxide	CAS:12136-45-7	< 0.01%	NDA	OSHA HCS 2012: WHMIS:	NDA
Formaldehyde	CAS:50-00-0	<= 0.0005%	Ingestion/Oral-Rat LD50 • 100 mg/kg Inhalation-Rat LC50 • 203 mg/m ³ Skin-Rabbit LD50 • 270 mg/kg	OSHA HCS 2012: Exposure limits	NDA

Section 4: First-Aid Measures

Description of first aid measures

Inhalation

- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Get medical attention immediately.

Skin

- In case of contact with substance, immediately flush skin with running water for at least 20 minutes. If skin irritation occurs: Get medical advice/attention.

Eye

- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. If eye irritation persists: Get medical advice/attention.

Ingestion

- Rinse mouth. Do not give anything by mouth to an unconscious person. Get medical attention immediately.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5: Fire-Fighting Measures

Extinguishing media

- **Suitable Extinguishing Media** • Material is non-combustible. In case of fire use media as appropriate for surrounding fire.

Unsuitable Extinguishing Media • None known.

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards • None known.

Hazardous Combustion Products • None known.

Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- Personal Precautions** • Isolate hazard area and deny entry to unauthorized and/or unprotected personnel. Do not walk through spilled material. Ensure adequate ventilation to remove vapors, fumes, dust etc. Wear appropriate personal protective equipment, avoid direct contact.
- Emergency Procedures** • Ventilate closed spaces before entering. Isolate hazard area and deny entry to unauthorized and/or unprotected personnel.

Environmental precautions

- No specific actions or treatments recommended related to exposure to this material.

Methods and material for containment and cleaning up

- Containment/Clean-up Measures** • Avoid generating dust.
 FOR SMALL SPILLS: Clean with a vacuum with a filtration system sufficient to remove and prevent recirculation of crystalline silica (a vacuum equipped with a high-efficiency particulate air (HEPA) filter is recommended).
 FOR LARGE SPILLS: Use a fine spray or mist to control dust creation and carefully scoop or shovel into clean dry container for later reuse or disposal.
 If, an appropriate vacuum is unavailable, only wet-clean-up methods should be used (i.e. misting). Moisture should be added as necessary to reduce exposure to airborne respirable silica dust.

Section 7 - Handling and Storage

Precautions for safe handling

- Handling** • Use good safety and industrial hygiene practices. Use only in well ventilated areas. Wear appropriate personal protective equipment, avoid direct contact. Wear long sleeves and/or protective coveralls. Do not breathe dust. Avoid contact with skin, eyes, and clothing. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Contaminated clothing must be vacuumed before removal. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

- Storage** • Keep container closed. Store in a covered location. Store in a cool, dry place. Keep from freezing. Storage and work area should be periodically cleaned to minimize dust accumulation.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines						
	Result	ACGIH	Canada Ontario	Canada Quebec	Mexico	NIOSH
Formaldehyde (50-00-0)	Ceilings	0.3 ppm Ceiling	1.5 ppm Ceiling	2 ppm Ceiling; 3 mg/m ³ Ceiling	2 ppm Ceiling; 3 mg/m ³ Ceiling	0.1 ppm Ceiling (15 min)
	STELs	Not established	1 ppm STEL	Not established	Not established	Not established
	TWAs	Not established	Not established	Not established	Not established	0.016 ppm TWA
Limestone (1317-65-3)	STELs	Not established	Not established	Not established	20 mg/m ³ STEL [LMPE-CT]	Not established
	TWAs	Not established	Not established	10 mg/m ³ TWAEV (Limestone, containing no Asbestos and <1% Crystalline silica, total dust)	10 mg/m ³ TWA LMPE-PPT	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)
Calcium oxide (1305-78-8)	TWAs	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWAEV	2 mg/m ³ TWA LMPE-PPT	2 mg/m ³ TWA
Boric acid (10043-35-3)	STELs	6 mg/m ³ STEL (inhalable fraction, listed under Borate compounds, inorganic)	6 mg/m ³ STEL (inhalable, listed under Borate compounds, inorganic)	Not established	Not established	Not established
	TWAs	2 mg/m ³ TWA (inhalable fraction, listed under Borate compounds, inorganic)	2 mg/m ³ TWA (inhalable, listed under Borate compounds, inorganic)	Not established	Not established	Not established
Sodium hydroxide (1310-73-2)	Ceilings	2 mg/m ³ Ceiling	2 mg/m ³ Ceiling	2 mg/m ³ Ceiling	2 mg/m ³ Ceiling	2 mg/m ³ Ceiling
Quartz (14808-60-7)	TWAs	0.025 mg/m ³ TWA (respirable fraction)	0.10 mg/m ³ TWA (designated substances regulation, respirable, listed under Silica, crystalline)	0.1 mg/m ³ TWAEV (respirable dust)	0.1 mg/m ³ TWA LMPE-PPT (respirable fraction)	0.05 mg/m ³ TWA (respirable dust)
Iron oxide (1309-37-1)	STELs	Not established	Not established	Not established	10 mg/m ³ STEL [LMPE-CT] (as Fe)	Not established
	TWAs	5 mg/m ³ TWA (respirable fraction)	5 mg/m ³ TWA (respirable)	5 mg/m ³ TWAEV (dust and fume, as Fe); 10 mg/m ³ TWAEV (containing no Asbestos and <1% Crystalline silica, regulated under Rouge, total dust)	5 mg/m ³ TWA LMPE-PPT	5 mg/m ³ TWA (dust and fume, as Fe)
Amorphous silica fume (69012-64-2)	TWAs	Not established	2 mg/m ³ TWA (respirable, listed under Silica fume)	2 mg/m ³ TWAEV (containing no Asbestos and <1% Crystalline silica, respirable dust)	2 mg/m ³ TWA LMPE-PPT; 10 mg/m ³ TWA LMPE-PPT (inhalable particulate); 3 mg/m ³ TWA LMPE-PPT (respirable particulate)	Not established
	STELs	Not established	Not established	Not established	20 mg/m ³ STEL [LMPE-CT] (as Ti)	Not established

Titanium dioxide (13463-67-7)	TWAs	10 mg/m3 TWA	10 mg/m3 TWA	10 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, total dust)	10 mg/m3 TWA LMPE -PPT (as Ti)	Not established
Silica, amorphous (7631-86-9)	TWAs	Not established	Not established	Not established	Not established	6 mg/m3 TWA
Aluminum oxide (1344-28-1)	TWAs	Not established	Not established	10 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, total dust, as Al)	10 mg/m3 TWA LMPE -PPT	Not established

Exposure Limits/Guidelines (Con't.)

	Result	OSHA
Formaldehyde (50-00-0)	STELs	2 ppm STEL (see 29 CFR 1910.1048)
	TWAs	0.75 ppm TWA
Limestone (1317-65-3)	TWAs	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Calcium oxide (1305-78-8)	TWAs	5 mg/m3 TWA
Sodium hydroxide (1310-73-2)	TWAs	2 mg/m3 TWA
Iron oxide (1309-37-1)	TWAs	10 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust, listed under Rouge); 5 mg/m3 TWA (respirable fraction, listed under Rouge)
Titanium dioxide (13463-67-7)	TWAs	15 mg/m3 TWA (total dust)
Aluminum oxide (1344-28-1)	TWAs	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Exposure Control Notations

Mexico

- Iron oxide (1309-37-1): **Carcinogens:** (A4 - Not classifiable as a human carcinogen)
- Titanium dioxide (13463-67-7): **Carcinogens:** (A4 - Not classifiable as a human carcinogen)
- Formaldehyde (50-00-0): **Carcinogens:** (A2 - Suspected human carcinogen)
- Aluminum oxide (1344-28-1): **Carcinogens:** (A4 - Not classifiable as a human carcinogen)

Canada Ontario

- Quartz (14808-60-7): **Designated Substances:** (0.10 mg/m3 TWA (respirable fraction, listed under Silica, crystalline))

Canada Quebec

- Quartz (14808-60-7): **Carcinogens:** (C2 carcinogen - effect suspected in humans)
- Formaldehyde (50-00-0): **Carcinogens:** (C2 carcinogen - effect suspected in humans)

ACGIH

- Iron oxide (1309-37-1): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)
- Titanium dioxide (13463-67-7): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)
- Quartz (14808-60-7): **Carcinogens:** (A2 - Suspected Human Carcinogen)
- Formaldehyde (50-00-0): **Carcinogens:** (A2 - Suspected Human Carcinogen) | **Sensitizers:** (dermal sensitizer; respiratory sensitizer)
- Boric acid (10043-35-3): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen (listed under Borate compounds, inorganic))

Exposure Limits Supplemental

OSHA

- Silica, amorphous (7631-86-9): **Mineral Dusts:** (20 mppcf TWA; (80)/(%)SiO2) mg/m3 TWA)
- Quartz (14808-60-7): **Mineral Dusts:** ((30)/(%)SiO2 + 2) mg/m3 TWA, total dust; (250)/(%)SiO2 + 5) mppcf TWA, respirable fraction; (10)/(%)SiO2 + 2) mg/m3 TWA, respirable fraction)

ACGIH

- Iron oxide (1309-37-1): **TLV Basis - Critical Effects:** (pneumoconiosis)

- Titanium dioxide (13463-67-7): **TLV Basis - Critical Effects:** (lower respiratory tract irritation)
- Quartz (14808-60-7): **TLV Basis - Critical Effects:** (lung cancer; pulmonary fibrosis)
- Formaldehyde (50-00-0): **TLV Basis - Critical Effects:** (eye and upper respiratory tract irritation)
- Sodium hydroxide (1310-73-2): **TLV Basis - Critical Effects:** (eye, skin and upper respiratory tract irritation)
- Boric acid (10043-35-3): **TLV Basis - Critical Effects:** (upper respiratory tract irritation (listed under Borate compounds, inorganic))
- Calcium oxide (1305-78-8): **TLV Basis - Critical Effects:** (upper respiratory tract irritation)

Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is not leakage from the equipment). Collection systems must be designed and maintained to prevent the accumulation and recirculation of respirable silica into the workplace.

Personal Protective Equipment

Respiratory

- For limited exposure use an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear protective eyewear (goggles, face shield, or safety glasses).

Hands

- Wear appropriate gloves.

Skin/Body

- Wear long sleeves and/or protective coveralls.

General Industrial Hygiene Considerations

- Do not breathe dust. Avoid contact with skin, eyes or clothing. Do not remove dusts from clothing by blowing or shaking. Do not eat, drink or smoke during work. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Dispose of in an approved landfill.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

STEL = Short Term Exposure Limits are based on 15-minute exposures

NIOSH = National Institute of Occupational Safety and Health

TWAEV = Time-Weighted Average Exposure Value

OSHA = Occupational Safety and Health Administration

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Gray granular dry powder with an earthy odor.
Color	Gray	Odor	Earthy
Particulate Size	600 µ	Odor Threshold	No data available
General Properties			
Boiling Point	No data available	Melting Point/Freezing Point	No data available
Decomposition Temperature	No data available	pH	No data available
Specific Gravity/Relative Density	= 2.53 Water=1	Water Solubility	Negligible < 0.1 %

Viscosity	No data available		
Volatility			
Vapor Pressure	No data available	Vapor Density	No data available
Evaporation Rate	No data available	VOC (Wt.)	0 %
VOC (Vol.)	0 %		
Flammability			
Flash Point	No data available	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- No dangerous reaction known under conditions of normal use.

Chemical stability

- Stable under normal temperatures and pressures.

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- No data available

Incompatible materials

- No data available

Hazardous decomposition products

- No data available

Section 11 - Toxicological Information

Information on toxicological effects

Components		
Silica, amorphous (4.1% TO 4.47%)	7631-86-9	Irritation: Eye-Rabbit • 25 mg 24 Hour(s) • Mild irritation
Titanium dioxide (2.04% TO 2.2%)	13463-67-7	Irritation: Skin-Human • 300 µg 3 Day(s)-Intermittent • Mild irritation; Tumorigen / Carcinogen: Inhalation-Rat TCLo • 250 mg/m ³ 6 Hour(s) 2 Year(s)-Intermittent; <i>Tumorigenic: Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: Tumors</i>
NON WETTING AGENT (0.94% TO 3.9%)	Proprietary	Acute Toxicity: Ingestion/Oral-Rat LD50 • 4250 mg/kg; Behavioral: Somnolence (general depressed activity); Behavioral: Ataxia; Lungs, Thorax, or Respiration: Respiratory depression; Reproductive: Intraperitoneal-Mouse TDLo • 3200 mg/kg (9D preg); Reproductive Effects: Effects on Fertility: Post-implantation mortality
Limestone (0.01% TO 0.12%)	1317-65-3	Multi-dose Toxicity: Inhalation-Rat TCLo • 84 mg/m ³ 4 Hour(s) 40 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration: Fibrosis (interstitial); Liver: Other changes; Kidney, Ureter, and Bladder: Other changes</i>
Sodium hydroxide (< 0.05%)	1310-73-2	Acute Toxicity: Skin-Rabbit TCLo • 25 pph; Behavioral: Food intake (animal); Nutritional and Gross Metabolic: Changes in Chemistry or Temperature: Body temperature increase; Skin and Appendages: After topical exposure: Primary irritation; Irritation: Eye-Rabbit • 1 mg 30 Second(s)-Rinse • Severe irritation; Skin-Rabbit • 500 mg 24 Hour(s) • Severe irritation

Rutile (TiO2) (0.01% TO 0.03%)	1317-80-2	Multi-dose Toxicity: Inhalation-Mouse TLo • 300000 µg/kg 30 Day(s)-Intermittent; <i>Brain and Coverings:Other degenerative changes</i> ; <i>Biochemical:Metabolism (intermediary):Lipids, including transport</i> ; <i>Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation</i>
Boric acid (< 0.03%)	10043-35-3	Acute Toxicity: Ingestion/Oral-Rat LD50 • 2500 mg/kg; <i>Behavioral:Convulsions or effect on seizure threshold</i> ; <i>Behavioral:Ataxia</i> ; Ingestion/Oral-Rat TDLo • 2000 mg/kg; <i>Reproductive Effects:Paternal Effects:Spermatogenesis</i> ; <i>Reproductive Effects:Paternal Effects:Testes, epididymis, sperm duct</i> ; Inhalation-Rat LCLo • 28 mg/m³ 4 Hour(s)
Calcium oxide (< 0.018%)	1305-78-8	Acute Toxicity: Intraperitoneal-Mouse LD50 • 3059 mg/kg

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012 • Data lacking
Skin corrosion/Irritation	OSHA HCS 2012 • Data lacking
Serious eye damage/Irritation	OSHA HCS 2012 • Data lacking
Skin sensitization	OSHA HCS 2012 • Data lacking
Respiratory sensitization	OSHA HCS 2012 • Data lacking
Aspiration Hazard	OSHA HCS 2012 • Data lacking
Carcinogenicity	OSHA HCS 2012 • Carcinogenicity 1A
Germ Cell Mutagenicity	OSHA HCS 2012 • Data lacking
Toxicity for Reproduction	OSHA HCS 2012 • Data lacking
STOT-SE	OSHA HCS 2012 • Data lacking
STOT-RE	OSHA HCS 2012 • Specific Target Organ Toxicity Repeated Exposure 1

Route(s) of entry/exposure

- Inhalation, Skin, Eye, Ingestion

Medical Conditions Aggravated by Exposure

- Any pre-existing conditions of the lungs. Disorders of the lungs.

Potential Health Effects

Inhalation

Acute (Immediate)

- Nuisance dust may affect the lungs but reactions are typically reversible.

Chronic (Delayed)

- Chronic overexposure to dust containing respirable sized crystalline silica can cause delayed lung injury (silicosis). Inhalation of dust containing crystalline silica pulmonary diseases such as asthma and lung disorder associated with smoking.

Skin

Acute (Immediate)

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)

- No data available.

Eye

Acute (Immediate)

- Excessive concentrations of nuisance dust in the workplace may reduce visibility and may cause unpleasant deposits in eyes.

Chronic (Delayed)

- No data available.

Ingestion

Acute (Immediate)

- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed)

- No data available.

Carcinogenic Effects

- May cause cancer. IARC studies have shown sufficient evidence from animal studies to categorize crystalline silica as a group 1 carcinogen.

Carcinogenic Effects				
	CAS	OSHA	IARC	NTP
Formaldehyde	50-00-0	Specifically Regulated Carcinogen	Group 1-Carcinogenic	Known Human Carcinogen
Quartz	14808-60-7	Not Listed	Group 1-Carcinogenic	Known Human Carcinogen
Titanium dioxide	13463-67-7	Not Listed	Group 2B-Possible Carcinogen	Not Listed

Key to abbreviations

LD = Lethal Dose

TC = Toxic Concentration

TD = Toxic Dose

Section 12 - Ecological Information

Toxicity

- Material data lacking.

Persistence and degradability

- Material data lacking.

Bioaccumulative potential

- Material data lacking.

Mobility in Soil

- Material data lacking.

Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

Waste treatment methods**Product waste**

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class (es)	Packing group	Environmental hazards
DOT	NDA	Not Regulated	NDA	NDA	NDA
TDG	NDA	Not Regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not Regulated	NDA	NDA	NDA

Special precautions for user

- None specified.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- No data available

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications • Chronic

State Right To Know				
Component	CAS	MA	NJ	PA
Aluminum oxide	1344-28-1	Yes	Yes	Yes
Bauxite	1318-16-7	No	No	No
Boric acid	10043-35-3	No	No	No
NON WETTING AGENT	<i>Proprietary</i>	No	No	No
Cement, alumina, chemicals	65997-16-2	No	No	No
Formaldehyde	50-00-0	Yes	Yes	Yes
Iron oxide	1309-37-1	Yes	Yes	Yes
Limestone	1317-65-3	Yes	Yes	Yes
Potassium oxide	12136-45-7	No	Yes	No
Quartz	14808-60-7	Yes	Yes	Yes
Rutile (TiO ₂)	1317-80-2	No	No	Yes
Amorphous silica fume	69012-64-2	No	No	No
Silica, amorphous	7631-86-9	Yes	Yes	Yes
Sodium hydroxide	1310-73-2	Yes	Yes	Yes
Titanium dioxide	13463-67-7	Yes	Yes	Yes
Zirconium oxide	1314-23-4	Yes	No	No
Zirconium(IV) silicate (1:1)	14940-68-2	No	No	No

Inventory				
Component	CAS	Canada DSL	Canada NDSL	TSCA
Aluminum oxide	1344-28-1	Yes	No	Yes
Bauxite	1318-16-7	No	No	No
Boric acid	10043-35-3	Yes	No	Yes
NON WETTING AGENT	<i>Proprietary</i>	Yes	No	Yes
Cement, alumina, chemicals	65997-16-2	Yes	No	Yes
Formaldehyde	50-00-0	Yes	No	Yes
Iron oxide	1309-37-1	Yes	No	Yes
Limestone	1317-65-3	No	Yes	Yes
Potassium oxide	12136-45-7	Yes	No	Yes
Quartz	14808-60-7	Yes	No	Yes
Rutile (TiO ₂)	1317-80-2	Yes	No	Yes
Amorphous silica fume	69012-64-2	Yes	No	Yes

Silica, amorphous	7631-86-9	Yes	No	Yes
Sodium hydroxide	1310-73-2	Yes	No	Yes
Titanium dioxide	13463-67-7	Yes	No	Yes
Zirconium oxide	1314-23-4	Yes	No	Yes
Zirconium(IV) silicate (1:1)	14940-68-2	Yes	No	Yes

Canada

Labor		
Canada - WHMIS - Classifications of Substances		
• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Uncontrolled product according to WHMIS classification criteria
• Potassium oxide	12136-45-7	E
• Rutile (TiO2)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	A, B1, D1A, D2A, D2B; B3, D1A, D2A, D2B, E (regulated under Formol)
• Iron oxide	1309-37-1	Uncontrolled product according to WHMIS classification criteria E (including 0.04% in aqueous solution, 0.04N, 0.08%, 0.4% in aqueous solution, 2%, 2.5%, 4% in aqueous solution, 5%, 10%, 16%, 20%, 40%, 50% in aqueous solution, 8.7N)
• Sodium hydroxide	1310-73-2	D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Titanium dioxide, mixture containing on Health Canada's WHMIS Division website.)
• Titanium dioxide	13463-67-7	Uncontrolled product according to WHMIS classification criteria
• Aluminum oxide	1344-28-1	D2A
• Limestone	1317-65-3	Uncontrolled product according to WHMIS classification criteria
• Silica, amorphous	7631-86-9	D2A
• Boric acid	10043-35-3	Uncontrolled product according to WHMIS classification criteria
• Zirconium oxide	1314-23-4	D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Silica, crystalline, encapsulated on Health
• Quartz	14808-60-7	

Canada's WHMIS Division
website.)**Canada - WHMIS - Ingredient Disclosure List**

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	1 %
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	1 %
• Formaldehyde	50-00-0	0.1 %
• Iron oxide	1309-37-1	1 %
• Sodium hydroxide	1310-73-2	1 %
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	1 %
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	1 %
• Boric acid	10043-35-3	1 %
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	1 %

Environment**Canada - CEPA - Priority Substances List**

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	Priority Substance List 2 (substance considered toxic)
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

Canada - CEPA - Schedule I - List of Toxic Substances

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed

• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	1000 lb TQ
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	2 ppm STEL (See 29 CFR 1910.1048, 15 min); 0.5 ppm Action Level (See 29 CFR 1910.1048); 0.75 ppm TWA (See 29 CFR 1910.1048)
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	100 lb final RQ; 45.4 kg final RQ
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	1000 lb final RQ; 454 kg final RQ
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	100 lb EPCRA RQ
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed

• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	500 lb TPQ
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	0.1 % de minimis concentration
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	1.0 % de minimis concentration (fibrous forms)
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	Included in waste streams: K009, K010, K038, K040, K156, K157

• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	waste number U122
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - U Series Wastes - Acutely Toxic Wastes & Other Hazardous Characteristics

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	waste number U122
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed

• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO2)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	carcinogen, 1/1/1988 (gas)
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	carcinogen, 9/2/2011 (airborne, unbound particles of respirable size)
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	carcinogen, 10/1/1988 (airborne particles of respirable size)

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO2)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	40 µg/day NSRL (gas)
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO2)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	

• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Cement, alumina, chemicals	65997-16-2	Not Listed
• Zirconium(IV) silicate (1:1)	14940-68-2	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Rutile (TiO ₂)	1317-80-2	Not Listed
• NON WETTING AGENT	<i>Proprietary</i>	Not Listed
• Amorphous silica fume	69012-64-2	Not Listed
• Bauxite	1318-16-7	Not Listed
• Formaldehyde	50-00-0	
• Iron oxide	1309-37-1	Not Listed
• Sodium hydroxide	1310-73-2	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Limestone	1317-65-3	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Boric acid	10043-35-3	Not Listed
• Zirconium oxide	1314-23-4	Not Listed
• Quartz	14808-60-7	Not Listed

Other Information

- **WARNING:** This product contains a chemical known to the State of California to cause cancer.

Section 16 - Other Information**Revision Date**

- 27/April/2018

Last Revision Date

- 08/January/2016

Preparation Date

- 08/January/2016

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Key to abbreviations

NDA = No data available