

Safety Data Sheet



Section 1: Identification

Product identifier

Product Name • **FGD Fly Ash, Class C (from Coal) Unit #1 and #2**

Synonyms • Fly Ash

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

Recommended use • Supplementary cementitious material for concrete and concrete products. Also used in soil and road stabilization, sludge solidification and as fine filler in asphalt and other products

Details of the supplier of the safety data sheet

Manufacturer • Basin Electric Power Cooperative
Laramie River Station
347 Grayrocks Road Wheatland, WY 82201
United States
www.basinelectric.com

Telephone (General) • 307-322-9601

Emergency telephone number

Manufacturer • 307-322-9601

Section 2: Hazard Identification

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Skin Corrosion 1C - H314
Serious Eye Damage 1 - H318
Germ Cell Mutagenicity 2 - H341
Carcinogenicity 1A - H350
Specific Target Organ Toxicity Repeated Exposure 1 - H372

Label elements

OSHA HCS 2012

DANGER



- Hazard statements**
- Causes severe skin burns and eye damage. - H314
 - Causes serious eye damage - H318
 - Suspected of causing genetic defects. - H341
 - May cause cancer. - H350
 - Causes damage to organs through prolonged or repeated exposure. - H372

Precautionary statements

- Prevention**
- Obtain special instructions before use. - P201
 - Do not handle until all safety precautions have been read and understood. - P202
 - Do not breathe dust. - P260
 - Wash thoroughly after handling. - P264
 - Do not eat, drink or smoke when using this product. - P270
 - Wear protective gloves/protective clothing/eye protection/face protection. - P280
- Response**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. - P303+P361+P353
 - Wash contaminated clothing before reuse. - P363
 - Specific treatment, see supplemental first aid information. - P321
 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
 - Immediately call a POISON CENTER or doctor/physician. - P310
 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. - P301+P330+P331
 - IF exposed or concerned: Get medical advice/attention. - P308+P313
 - Get medical advice/attention if you feel unwell. - P314
- Storage/Disposal**
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

Other hazards

OSHA HCS 2012

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

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
Silica, amorphous	CAS:7631-86-9	35.39%	NDA	OSHA HCS 2012: Not Classified
Calcium oxide	CAS:1305-78-8	27.22%	NDA	OSHA HCS 2012: Skin Corr. 1C; Eye Dam. 1
Aluminum oxide	CAS:1344-28-1	17.83%	NDA	OSHA HCS 2012: STOT RE 2 (Lungs, Inhl)
Iron oxide	CAS:1309-37-1	5.31%	NDA	OSHA HCS 2012: Not Classified
Magnesium oxide	CAS:1309-48-4	4.86%	NDA	OSHA HCS 2012: Not Classified
Quartz	CAS:14808-60-7	4.5%	NDA	OSHA HCS 2012: Carc. 1A; STOT RE 1 (Lungs)
Sodium oxide	CAS:1313-59-3	2.12%	NDA	OSHA HCS 2012: Skin Corr. 1B; Eye Dam. 1

Titanium dioxide	CAS:13463-67-7	1.68%	NDA	OSHA HCS 2012: Carc. 2; STOT RE 2 (Lungs); Muta. 2;
Sulfur trioxide	CAS:7446-11-9	1.68%	NDA	OSHA HCS 2012: Skin Corr. 1A; Eye Dam. 1
Phosphorus oxide	CAS:1314-56-3	1.28%	Inhalation-Rat LC50 • 1217 mg/m ³ 1 Hour(s)	OSHA HCS 2012: Skin Corr. 1B; Eye Dam. 1
Silica, crystalline - tridymite	CAS:15468-32-3	< 1%	NDA	OSHA HCS 2012: Carc. 1A; STOT RE 1 (Lungs)
Potassium oxide	CAS:12136-45-7	0.77%	NDA	OSHA HCS 2012: Skin Corr. 1B; Eye Dam. 1
Barium oxide	CAS:1304-28-5	0.65%	NDA	OSHA HCS 2012: Not Classified
Cristobalite	CAS:14464-46-1	< 0.5%	NDA	OSHA HCS 2012: Carc. 1A; STOT RE 1 (Lungs)
Strontium oxide	CAS:1314-11-0	0.39%	NDA	OSHA HCS 2012: Not Classified
Manganese dioxide	CAS:1313-13-9	0.02%	Ingestion/Oral-Rat LD50 • 3478 mg/kg	OSHA HCS 2012: Exposure limits

Note: FGD Fly ash is a by-product of coal combustion. The material is composed primarily of complex aluminosilicate glass, mullite, hematite, magnetite spinel and quartz. Ingredient percentages will vary as a result of coal quality fluctuations.

Section 4: First-Aid Measures

Description of first aid measures

Inhalation

- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If signs/symptoms continue, get medical attention.

Skin

- In case of contact, immediately flush with plenty of water for at least 15 minutes. Wash skin with soap and water. If skin irritation occurs: Get medical advice/attention.

Eye

- Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Get medical attention immediately.

Ingestion

- Do NOT induce vomiting. Dilute by drinking milk or water. Never give anything by mouth to an unconscious person. Get medical attention immediately if symptoms occur.

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 • In case of fire use media as appropriate for surrounding materials.

Unsuitable Extinguishing Media • No data available

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards • Material is non-combustible and is not expected to pose a fire or explosion hazard.

Hazardous Combustion Products

- No data available

Advice for firefighters

- Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wear appropriate personal protective equipment, avoid direct contact.

Emergency Procedures

- Keep unauthorized personnel away. Ventilate closed spaces before entering.

Environmental precautions

- Avoid run off to waterways and sewers.

Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Stop leak if you can do it without risk. Avoid generating dust. Spills may be cleaned up by sweeping or by using an industrial vacuum cleaner, vacuum truck, or front-end loader. Spilled material may be dampened with a water mist to control airborne dust before removal.

Section 7 - Handling and Storage

Precautions for safe handling

Handling

- Avoid eye contact and prolonged contact with skin. Avoid prolonged or repeated inhalation of ash particulates in air. Avoid accidental release. Avoid creating dust. When handling fly ash, use local mechanical ventilation or extraction in areas where dust could escape into the work environment. For bulk deliveries, closed pumping systems are recommended. When handled pneumatically use standard dust filters on vehicles and silos. Work areas should be cleaned regularly. If generating dust cannot be avoided, follow personal protective equipment recommendations.

Conditions for safe storage, including any incompatibilities

Storage

- Store dry and away from water. Keep container/package tightly closed and in a well-ventilated place.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines				
	Result	ACGIH	NIOSH	OSHA
Manganese dioxide as Manganese compounds	Ceilings	Not established	Not established	5 mg/m ³ Ceiling (as Mn) <i>as Manganese compounds</i>
	STELs	Not established	3 mg/m ³ STEL (as Mn) <i>as Manganese compounds</i>	Not established
	TWAs	Not established	1 mg/m ³ TWA (as Mn) <i>as Manganese compounds</i>	Not established

Cristobalite (14464-46-1)	TWAs	0.025 mg/m3 TWA (respirable fraction)	0.05 mg/m3 TWA (respirable dust)	Not established
Silica, crystalline - tridymite (15468-32-3)	TWAs	Not established	0.05 mg/m3 TWA (respirable dust)	Not established
Titanium dioxide (13463-67-7)	TWAs	10 mg/m3 TWA	Not established	15 mg/m3 TWA (total dust)
Quartz (14808-60-7)	TWAs	0.025 mg/m3 TWA (respirable fraction)	0.05 mg/m3 TWA (respirable dust)	Not established
Magnesium oxide (1309-48-4)	TWAs	10 mg/m3 TWA (inhalable fraction)	Not established	15 mg/m3 TWA (fume, total particulate)
Iron oxide (1309-37-1)	TWAs	5 mg/m3 TWA (respirable fraction)	5 mg/m3 TWA (dust and fume, as Fe)	10 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust, listed under Rouge); 5 mg/m3 TWA (respirable fraction, listed under Rouge)
Aluminum oxide (1344-28-1)	TWAs	1 mg/m3 TWA (respirable fraction) <i>as Aluminum insoluble compounds</i>	Not established	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Calcium oxide (1305-78-8)	TWAs	2 mg/m3 TWA	2 mg/m3 TWA	5 mg/m3 TWA
Silica, amorphous (7631-86-9)	TWAs	Not established	6 mg/m3 TWA	Not established

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.

Personal Protective Equipment

Respiratory

- None required if engineering and handling controls are adequate to keep exposure below the PEL. If PEL is exceeded, use approved respiratory protection that is fitted correctly. May need to consider air supplied respirators if concentration is heavy.

Eye/Face

- At a minimum, safety glasses should be worn when concentrated airborne fly ash dust is present. May need to consider wearing goggles if dust concentration is heavy. Eye wash stations should be readily accessible. Contact lenses should not be worn when in proximity of this product.

Skin/Body

- Wear impervious gloves to prevent contact and for protection from abrasion. Tyvek or similar disposable coveralls as needed. Showering and clean clothes are indicated after exposure.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

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

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	Fine gray or tan powder with no odor.
Color	Gray or tan.	Odor	Odorless
Odor Threshold	No data available		
General Properties			
Boiling Point	> 1000 C(> 1832 F)	Melting Point	> 1000 C(> 1832 F)
Decomposition Temperature	No data available	pH	10 to 12
Specific Gravity/Relative Density	2.67 Water=1	Water Solubility	No data available
Viscosity	No data available		
Volatility			
Vapor Pressure	No data available	Vapor Density	No data available
Evaporation Rate	No data available		
Flammability			
Flash Point	Not relevant	UEL	Not relevant
LEL	Not relevant	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

- Keep dry until used to preserve product utility.

Incompatible materials

- Must be kept dry. Dissolves in hydrofluoric acid producing corrosive silicon tetrafluoride gas.

Hazardous decomposition products

- No data available

Section 11 - Toxicological Information

Information on toxicological effects

Components		
Silica, amorphous (35.39%)	7631-86-9	Acute Toxicity: Inhalation-Rat LCLo • >200 g/m ³ 1 Hour(s); <i>Lungs, Thorax, or Respiration:</i> Fibrosis, focal (pneumoconiosis) ; Irritation: Eye-Rabbit • 25 mg 24 Hour(s) • Mild irritation
		Acute Toxicity: Inhalation-Human TCLo • 16 mppcf 8 Hour(s) 17.9 Year(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Fibrosis, focal (pneumoconiosis) ; <i>Lungs, Thorax, or Respiration:</i> Cough ; <i>Lungs, Thorax, or Respiration:</i> Dyspnea ; Multi-dose Toxicity: Inhalation-Rat TCLo • 15 mg/m ³ 79 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Fibrosing

Quartz (4.5%)	14808-60-7	alveolitis; Lungs, Thorax, or Respiration:Other changes; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation; Inhalation-Rat TClO • 25 mg/m³ 5 Day(s)-Intermittent; Lungs, Thorax, or Respiration:Fibrosis, focal (pneumoconiosis); Lungs, Thorax, or Respiration:Sputum; Immunological Including Allergic:Increase in cellular immune response; Tumorigen / Carcinogen: Inhalation-Rat TClO • 50 mg/m³ 6 Hour(s) 71 Week(s)-Intermittent; Tumorigenic:Carcinogenic by RTECS criteria; Liver:Tumors
Silica, crystalline - tridymite (< 1%)	15468-32-3	Tumorigen / Carcinogen: Intratracheal-Mouse TDLo • 400 mg/kg; Tumorigenic:Equivocal tumorigenic agent by RTECS criteria; Lungs, Thorax, or Respiration:Tumors
Sulfur trioxide (1.68%)	7446-11-9	Acute Toxicity: Inhalation-Guinea Pig LCLo • 30 mg/m³ 6 Hour(s); Liver:Hepatitis (hepatocellular necrosis), diffuse; Lungs, Thorax, or Respiration:Structural or functional change in trachea or bronchi; Endocrine:Other changes
Aluminum oxide (17.83%)	1344-28-1	Multi-dose Toxicity: Inhalation-Rabbit TClO • 200 mg/m³ 5 Hour(s) 28 Week(s)-Intermittent; Lungs, Thorax, or Respiration:Structural or functional change in trachea or bronchi; Lungs, Thorax, or Respiration:Chronic pulmonary edema; Related to Chronic Data:Death in the Other Multiple Dose data type field; Inhalation-Rat TClO • 200 mg/m³ 5 Hour(s) 28 Week(s)-Intermittent; Lungs, Thorax, or Respiration:Structural or functional change in trachea or bronchi; Lungs, Thorax, or Respiration:Chronic pulmonary edema; Related to Chronic Data:Death in the Other Multiple Dose data type field
Iron oxide (5.31%)	1309-37-1	Multi-dose Toxicity: Inhalation-Rat TClO • 500 µg/m³ 24 Hour(s) 61 Day(s)-Continuous; Brain and Coverings:Other degenerative changes; Blood:Changes in serum composition (e.g., TP, bilirubin cholesterol); Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels:True cholinesterase; Mutagen: DNA damage • Unreported Route-Human • Lung (Somatic cell) • 40 µg/disk 4 Hour(s); Tumorigen / Carcinogen: Subcutaneous-Rat TDLo • 135 mg/kg; Tumorigenic:Equivocal tumorigenic agent by RTECS criteria; Tumorigenic:Tumors at site of application
Magnesium oxide (4.86%)	1309-48-4	Multi-dose Toxicity: Inhalation-Rat TClO • 1000 mg/m³ 4 Hour(s) 50 Day(s)-Intermittent; Lungs, Thorax, or Respiration:Other changes; Blood:Other hemolysis with or without anemia; Tumorigen / Carcinogen: Intratracheal-Hamster TDLo • 480 mg/kg 30 Week(s)-Intermittent; Tumorigenic:Equivocal tumorigenic agent by RTECS criteria; Sense Organs and Special Senses:Olfaction:Tumors; Lungs, Thorax, or Respiration:Tumors
Titanium dioxide (1.68%)	13463-67-7	Irritation: Skin-Human • 300 µg 3 Day(s)-Intermittent • Mild irritation; Multi-dose Toxicity: Inhalation-Rat TClO • 250 mg/m³ 6 Hour(s) 4 Week(s)-Intermittent; Lungs, Thorax, or Respiration:Chronic pulmonary edema; Lungs, Thorax, or Respiration:Other changes; Inhalation-Rat TClO • 10 mg/m³ 6 Hour(s) 13 Week(s)-Intermittent; Lungs, Thorax, or Respiration:Fibrosis (interstitial); Lungs, Thorax, or Respiration:Other changes; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation; Mutagen: Micronucleus test • Ingestion/Oral-Mouse • 280 mg/kg 7 Day(s)-Intermittent; DNA damage • Ingestion/Oral-Mouse • 280 mg/kg 7 Day(s)-Intermittent; Cytogenetic analysis • Ingestion/Oral-Mouse • 280 mg/kg 7 Day(s)-Intermittent; Tumorigen / Carcinogen: Inhalation-Rat TClO • 250 mg/m³ 6 Hour(s) 2 Year(s)-Intermittent; Tumorigenic:Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration:Tumors
Phosphorus oxide (1.28%)	1314-56-3	Acute Toxicity: Ingestion/Oral-Rat LD50 • 3478 mg/kg; Inhalation-Rat LC50 • 1217 mg/m³ 1 Hour(s); Lungs, Thorax, or Respiration:Chronic pulmonary edema; Lungs, Thorax, or Respiration:Other changes; Blood:Hemorrhage; Reproductive: Inhalation-Mouse TClO • 49 mg/m³ 7 Hour(s)

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012 • No data available
Aspiration Hazard	OSHA HCS 2012 • No data available
Carcinogenicity	OSHA HCS 2012 • Carcinogenicity 1A
Germ Cell Mutagenicity	OSHA HCS 2012 • Germ Cell Mutagenicity 2
Skin corrosion/Irritation	OSHA HCS 2012 • Skin Corrosion 1C
Skin sensitization	OSHA HCS 2012 • No data available
STOT-RE	OSHA HCS 2012 • Specific Target Organ Toxicity Repeated Exposure 1

STOT-SE	OSHA HCS 2012 • No data available
Toxicity for Reproduction	OSHA HCS 2012 • No data available
Respiratory sensitization	OSHA HCS 2012 • No data available
Serious eye damage/Irritation	OSHA HCS 2012 • Serious Eye Damage 1

Target Organs

- Lungs

Route(s) of entry/exposure

- Inhalation, Skin, Ingestion

Medical Conditions Aggravated by Exposure

- Excessive dust exposure may aggravate existing respiratory disorders or diseases. Possible complications of allergies resulting in irritation to skin, eyes and respiratory passage may occur from excessive exposure to dusts. Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure.

Potential Health Effects

Inhalation

Acute (Immediate)

- Particle inhalation may cause nasal dryness, irritation and obstruction, coughing, sneezing, sinusitis, frequent headaches and upper respiratory symptoms such as shortness of breath and reduced pulmonary function.

Chronic (Delayed)

- Chronic overexposure to dust containing respirable sized crystalline silica can cause delayed lung injury (silicosis).

Skin

Acute (Immediate)

- Causes severe skin burns and eye damage.

Chronic (Delayed)

- No data available

Eye

Acute (Immediate)

- Irritant. Ash particles can cause eye irritation, watering, redness and caustic burns.

Chronic (Delayed)

- No data available

Ingestion

Acute (Immediate)

- Swallowed fly ash may cause abdominal discomfort.

Chronic (Delayed)

- No data available

Other

Acute (Immediate)

- Product becomes alkaline when exposed to moisture. Exposure can dry the skin; cause alkali burns and affects the mucous membranes. Dust can irritate the eyes and upper respiratory system. Toxic effects noted in animals include, alveolar damage with pulmonary edema. Swallowed fly ash may cause abdominal discomfort.

Chronic (Delayed)

- Repeated overexposure to very high levels of respirable crystalline silica for periods as short as six months have caused acute silicosis. Repeated inhalation of fly ash dust containing crystalline silica can cause bronchitis, silicosis (scarring of the lung) and lung cancer. It may also increase the risk of scleroderma (a disease affecting the connective tissue of the skin, joints, blood vessels and internal organs). Studies have shown that smoking increases the risk of bronchitis, silicosis and lung cancer in persons exposed to crystalline silica. It is recommended that all storage and work areas should be smoke free zones. Inhalation of high levels of fly ash dust may result in severe inflammation of the small airways of the lung and asthma-like symptoms. Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis. There is evidence that exposure to respirable silica or the disease silicosis is associated with an increased incidence of scleroderma, tuberculosis and kidney disorders.

Mutagenic Effects

- Repeated and prolonged exposure may cause mutagenic effects.

Carcinogenic Effects

- Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects			
	CAS	IARC	NTP
Cristobalite	14464-46-1	Group 1-Carcinogenic	Not Listed

Silica, crystalline - tridymite	15468-32-3	Group 1-Carcinogenic	Not Listed
Sulfur trioxide	7446-11-9	Group 1-Carcinogenic	Not Listed
Titanium dioxide	13463-67-7	Group 2B-Possible Carcinogen	Not Listed
Quartz	14808-60-7	Group 1-Carcinogenic	Known Human Carcinogen

Other information

- Note: Described Effect Depends On Duration And Degree Of Exposure.

Key to abbreviations

TC = Toxic Concentration

TD = Toxic Dose

Section 12 - Ecological Information

Toxicity

- Non-mandatory section - information about this substance not compiled for this reason.

Persistence and degradability

- Non-mandatory section - information about this substance not compiled for this reason.

Bioaccumulative potential

- Non-mandatory section - information about this substance not compiled for this reason.

Mobility in Soil

- Non-mandatory section - information about this substance not compiled for this reason.

Other adverse effects

- Non-mandatory section - information about this substance not compiled for this reason.

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

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 • Acute, Chronic

Inventory						
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	TSCA
Aluminum oxide	1344-28-1	Yes	No	Yes	No	Yes
Barium oxide	1304-28-5	Yes	No	Yes	No	Yes
Calcium oxide	1305-78-8	Yes	No	Yes	No	Yes
Cristobalite	14464-46-1	Yes	No	Yes	No	Yes
Iron oxide	1309-37-1	Yes	No	Yes	No	Yes
Magnesium oxide	1309-48-4	Yes	No	Yes	No	Yes
Manganese dioxide	1313-13-9	Yes	No	Yes	No	Yes
Phosphorus oxide	1314-56-3	Yes	No	Yes	No	Yes
Potassium oxide	12136-45-7	Yes	No	Yes	No	Yes
Quartz	14808-60-7	Yes	No	Yes	No	Yes
Silica, amorphous	7631-86-9	Yes	No	Yes	No	Yes
Silica, crystalline - tridymite	15468-32-3	No	No	Yes	No	No
Sodium oxide	1313-59-3	Yes	No	Yes	No	Yes
Strontium oxide	1314-11-0	Yes	No	Yes	No	Yes
Sulfur trioxide	7446-11-9	Yes	No	Yes	No	Yes
Titanium dioxide	13463-67-7	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Sodium oxide	1313-59-3	E
• Potassium oxide	12136-45-7	E
• Barium oxide	1304-28-5	D1B, D2B
• Phosphorus oxide	1314-56-3	D1A, E
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	D2A
• Strontium oxide	1314-11-0	E
• Calcium oxide	1305-78-8	E
• Iron oxide	1309-37-1	Uncontrolled product according to WHMIS classification criteria
• Magnesium oxide	1309-48-4	Uncontrolled product according to WHMIS classification criteria 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
• Titanium dioxide	13463-67-7	

• Aluminum oxide	1344-28-1	website.) Uncontrolled product according to WHMIS classification criteria
• Manganese dioxide	1313-13-9	C, D2B D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Silica, crystalline, encapsulated on Health Canada's WHMIS Division website.)
• Cristobalite	14464-46-1	Uncontrolled product according to WHMIS classification criteria
• Silica, amorphous	7631-86-9	D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Silica, crystalline, encapsulated on Health Canada's WHMIS Division website.)
• Quartz	14808-60-7	Uncontrolled product according to WHMIS classification criteria

Canada - WHMIS - Ingredient Disclosure List

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	1 %
• Sulfur trioxide	7446-11-9	1 %
• Silica, crystalline - tridymite	15468-32-3	1 %
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	1 %
• Iron oxide	1309-37-1	1 %
• Magnesium oxide	1309-48-4	1 %
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	1 %
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	1 %
• Silica, amorphous	7631-86-9	1 %
• Quartz	14808-60-7	1 %

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed

• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

United States

Labor

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	1000 lb TQ
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

Environment

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed

• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	100 lb EPCRA RQ
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed

• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	100 lb TPQ (This material is a reactive solid. The TPQ does not default to 10000 pounds for non-powder, non-molten, non-solution form)
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	1.0 % de minimis concentration (fibrous forms)
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed

• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

United States - California

Environment

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	carcinogen, initial date 9/2/11 (airborne, unbound particles of respirable size)
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	carcinogen, initial date 10/1/88 (airborne particles of respirable size)

U.S. - California - Proposition 65 - Developmental Toxicity

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed

• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

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

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed

• Silica, amorphous	7631-86-9	Not Listed
• Quartz	14808-60-7	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
• Sodium oxide	1313-59-3	Not Listed
• Potassium oxide	12136-45-7	Not Listed
• Barium oxide	1304-28-5	Not Listed
• Phosphorus oxide	1314-56-3	Not Listed
• Sulfur trioxide	7446-11-9	Not Listed
• Silica, crystalline - tridymite	15468-32-3	Not Listed
• Strontium oxide	1314-11-0	Not Listed
• Calcium oxide	1305-78-8	Not Listed
• Iron oxide	1309-37-1	Not Listed
• Magnesium oxide	1309-48-4	Not Listed
• Titanium dioxide	13463-67-7	Not Listed
• Aluminum oxide	1344-28-1	Not Listed
• Manganese dioxide	1313-13-9	Not Listed
• Cristobalite	14464-46-1	Not Listed
• Silica, amorphous	7631-86-9	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

Last Revision Date	<ul style="list-style-type: none"> • 11/November/2014
Preparation Date	<ul style="list-style-type: none"> • 11/November/2014
Disclaimer/Statement of Liability	<ul style="list-style-type: none"> • The information contained in this Safety Data Sheet (SDS) is believed to be correct since it was obtained from sources we believe are reliable. However, no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variation in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility of provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.

Key to abbreviations

NDA = No Data Available