

MATERIAL SAFETY DATA SHEET
Shand Fly Ash (CAS# 68131-74-8) - External Use Document

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Shand Fly Ash (CAS# 68131-74-8) - External Use Document
(Note that the only differences between this document and the internal document are the contact information, the addition of "product use" information, and the reference (in Section 2) to additional information with respect to thermal issues to be provided / available from SaskPower Fly Ash Sales.)

Product Description: Natural fly ash from Shand Power Station (SHPS), located near Estevan, Saskatchewan, Canada. NOTE that limestone (calcium carbonate) is usually injected into the boiler furnace during normal operation, resulting in an enhanced calcium content and available lime content (as CaO or Ca(OH)₂) in the fly ash relative to the fly ash that would result from combustion of the same source coal with no injected limestone.

Product Use: This product is used primarily in environmental remediation, oil well cementing, mine backfill, and road base stabilization applications. The (usually) high available lime content * means this type of fly ash has self-cementitious properties allowing it to harden and gain strength in the presence of water alone without additional cement. (* Note, however, that the available lime content may be highly variable and may be very low at times if limestone (calcium carbonate) injection to the boiler furnace is either reduced or out-of-service, consequently greatly affecting the fly ash's self-cementitious properties.)

Manufacturer / Supplier: SaskPower
2025 Victoria Avenue
Regina, Saskatchewan, Canada
S4P 0S1

Phone Number: 1-800-667-8022 toll free - SaskPower, Fly Ash Order Desk

Emergency Phone (24-hour): IN CASE OF A DANGEROUS GOODS EMERGENCY call CANUTEC at 613-996-6666 (collect calls accepted) (This includes workplace emergencies.)

Date of Preparation: April 20, 2011

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER

CORROSIVE MATERIAL - may cause burns, particularly in contact with moist tissues. **NOTE** that, due to injection of limestone into the boiler furnace during normal operation, this product typically contains an **ENHANCED** level of **AVAILABLE LIME** as CaO and / or Ca(OH)₂; **the free or available lime content may be highly variable: the available lime concentration, expressed as Ca(OH)₂, of a 2010 Nov. 01/05 composite was 8.9% while that for a 2010 Dec. 1 sample was 1.2%; both higher and lower available lime contents may be possible.**

TOXIC - harmful by inhalation (contains crystalline silica, quartz).

IRRITANT - may cause eye, skin and inhalation irritation.

Note that, to some extent, burns may be thermal as well as caustic due to the heat released by the reaction of ash components (e.g., available calcium oxide or calcium hydroxide) with moisture (e.g., eyes, mucus membranes, sweat).

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Although it is a transient rather than inherent characteristic of the fly ash, note that fly ash withdrawn directly from an electrostatic precipitator (ESP) hopper, fly ash storage (sales) silo, or encountered elsewhere in – or recently exited from – other power plant process equipment may be very hot due to retained heat originating from the coal combustion process. **Consequent to the loading of hot fly ash from a silo, fly ash transport trailers may contain, transport, and subsequently deliver hot ash. Temperatures may be high enough to cause serious burns and to damage materials or equipment that come into contact with the ash. Additionally, the chemical reactivity of the hot fly ash – for example, the reaction of alkaline ash constituents with water – may be greatly enhanced** relative to that of the ash at ambient temperatures, potentially generating additional heat, even higher temperatures, and – in the case of contact with water – flashing some of the water to steam.

Note that the hot fly ash (whether recently exited from the process or held in the storage (sales) silos) may have had almost no opportunity * for the surfaces of the lime (CaO) particles to have undergone any reaction with atmospheric humidity and / or carbon dioxide (CO₂). Thus, in addition to the increased rate of the CaO hydration reaction (due to the elevated ash temperature) – if the ash comes into contact with water – the lime particles may also have chemically unaltered surfaces, which may also make them more immediately reactive than their later cooled, “aged” state. (* In some cases, however, some of the fly ash may have had some contact with water via sprays in a downstream pollution-control process.)

SaskPower Fly Ash Sales will provide additional information to existing customers – and to prospective customers as may be necessary or appropriate – by email or other means. If you require, but have not received, such communication – or to obtain more information – please contact the Fly Ash Order Desk at 1-800-667-8022, toll free.

Potential Health Effects: See Section 11 for more information.

Likely Routes of Exposure: Skin contact, eye contact, inhalation, and ingestion.

- Eye:** May cause serious chemical burns. Causes irritation (possibly severe). To some extent, burns may also be thermal.
- Skin:** May cause skin irritation. May cause burns in the presence of moisture.
- Ingestion:** May be harmful if swallowed. May cause stomach distress, nausea or vomiting. May cause burning of mouth, throat and esophagus.
- Inhalation:** Harmful by inhalation. May cause respiratory tract irritation. Prolonged or repeated exposure may lead to lung or other diseases.

Chronic Effects: Respirable crystalline silica in the form of quartz or cristobalite from occupational sources is listed by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a lung carcinogen.

Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling. While there may be a factor of individual susceptibility to a given exposure to respirable silica dust, the risk of contracting silicosis and the severity of the disease is clearly related to the amount of dust exposure and the length of time (usually years) of exposure.

Signs and Symptoms: Severe irritation, redness and pain. May cause burns in the presence of moisture. Redness. Pain. Blisters. Serious eye burns. Serious skin burns. Abdominal pain. Burning sensation. Shock or collapse.

Medical Conditions Aggravated By Exposure: Asthma. Allergies. Pre-existing lung disease.

Target Organs: Skin, eyes, gastrointestinal tract, respiratory system.

This product is a hazardous chemical as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Environmental Effects: May cause long-term adverse effects in the aquatic environment. See Section 12 for more information.

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Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS #	Wt. %
Silica, amorphous, fumed	7631-86-9	30 - 60
Aluminum oxide	1344-28-1	10 - 30
Calcium oxide	1305-78-8	10 - 30
Silica, crystalline, quartz	14808-60-7	5 - 10 or 7 - 13 *
Disodium oxide	1313-59-3	5 - 10
Ferric oxide	1309-37-1	3 - 7 or 5 - 10 †
Magnesium oxide	1309-48-4	1 - 5
Dipotassium oxide	12136-45-7	0.5 - 1.5
Titanium dioxide	13463-67-7	0.5 - 1.5
Barium oxide	1304-28-5	0.1 - 1 or 0.5 - 1.5 §
Phosphoric anhydride	1314-56-3	0.1 - 1

Refer to the text below with respect to interpretation of the ingredient table.

The coal ash originates as a result of the high-temperature conversion (in the presence of air) of the mineral matter originally present in the coal – plus those elements which may be incorporated into, or associated with, the organic structure of the coal – during the combustion process in the boiler furnace. Coal ash compositions (except for trace elements) are conventionally expressed as the oxides. However, for the most part – the major exception normally being a portion of the SiO₂ – the actual concentrations of the various ash elements as these discrete or uncombined oxides is normally believed to be low (or in some cases, perhaps even nil); most ** of the ash constituents are believed to exist as a complex mixture of silicates and aluminosilicates. (** However, for example, some free or available CaO – or Ca(OH)₂ – and iron oxides (possibly including Fe₃O₄) may also be present; **the free or available lime content may be highly variable: the available lime concentration, expressed as Ca(OH)₂, of a 2010 Nov. 01/05 composite was 8.9% while that for a 2010 Dec. 1 sample was 1.2%; both higher and lower available lime contents are possible.**) The composition of the fly ash is subject to variation, depending especially on the characteristics of the coal being delivered / burned at any given time and, to a lesser extent, boiler furnace operating conditions / performance. There may also be hopper-to-hopper variation in fly ash composition and physical characteristics – e.g., particle size – within an ESP that may not be evident in the aggregated (e.g., storage silo) fly ash.

Trace amounts of various elements including arsenic, antimony, carbon, lead, nickel, manganese, chromium, boron, mercury, selenium, beryllium, cadmium, vanadium, and uranium may be detected in the fly ash as a result of their presence in the source coal. Sulphur, at a level of approximately 0.5 - 5% w/w expressed as sulphate (SO₄²⁻) is typically also present in the fly ash. Some of the sulphur may be incorporated into the complex silicate / aluminosilicate ash matrix while some may be present in discrete compounds. The sulphur that is present in discrete compounds is likely present primarily as a mixture of sulphate (SO₄²⁻ e.g., calcium sulphate) and sulphite (SO₃²⁻ e.g., calcium sulphite); the proportion of sulphate to sulphite is unknown – and is probably quite variable – and the sulphite is understood to be subject to oxidation to sulphate over time.

Similarly, phosphorus may be present – if present at all in a discrete compound form (unknown) – primarily as phosphate – PO₄³⁻ – rather than the highly reactive phosphoric anhydride (P₂O₅), which is the convention used for reporting the phosphorus (i.e., elemental "P") content of the fly ash.

* Current data indicates less than 10% w/w crystalline silica as quartz present in the fly ash; it is believed that some or much of the crystalline silica content of the source coal is fluxed by the high alkaline constituent content of the ash and thereby converted to amorphous silicates; however, due to variability in the mined coal and the combustion process and limitations in measurement, it is possible that crystalline silica content may vary considerably, with the possibility to exceed 10% w/w crystalline silica, quartz, at least on occasion. Crystalline silica as quartz (CAS# 14808-60-7) is listed in the ingredient table, above, as 5 – 10% or 7 – 13% w/w.

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Crystalline silica as quartz was reported as 1.9 – 2.1% (lab 1, one 2010/11/01, 11/05 composite sample and one 2010/12/01 sample) and 5.7 – 7.7% (lab 2, one 2010/11/01, 11/05 composite sample and one 2010/12/01 sample).

The possible presence in the fly ash of crystalline silica in the form of cristobalite (CAS# 14464-46-1) or tridymite (CAS# 15468-32-3) is not known; these forms of crystalline silica were not detected (one laboratory) (lab 2, one 2010/11/01, 11/05 composite sample and one 2010/12/01 sample).

† A 2010 Nov. 01/05 composite and a 2010 Dec. 1 sample yielded values of 3 - 4%; historically, however, ferric oxide values have been slightly higher, within the 5 - 10% range.

§ A 2010 Nov. 01/05 composite and a 2010 Dec. 1 sample yielded values of 0.7 – 0.9% as barium oxide; however, depending on the rate of limestone (calcium carbonate) injection to the boiler furnace, a slightly higher level of barium oxide may be possible in the Shand fly ash – i.e., in line with other SaskPower fly ash resulting from combustion of Estevan area coal (no limestone injection).

Appearance: Gray to tan-gray to tan solid in the form of a fine powder.

Section 4: FIRST AID MEASURES

Eye Contact: In case of contact, immediately flush eyes with **plenty of water** for at least 15 minutes, including under lids. If easy to do, remove contact lenses, if worn. **Get medical attention immediately.**

Skin Contact: If irritation occurs, flush skin with **plenty of water**. **HOWEVER**, due to the enhanced available lime content of this fly ash, except in cases where only minor amounts of fly ash are still present on the skin, it is **STRONGLY ADVISED** that **BEFORE** wetting the product / skin, that **the majority of the fly ash still on the skin be removed by gentle brushing – AVOID** the generation of dust; also, if possible / practical, it may be advisable to perform this brushing operation outdoors; once the bulk of the fly ash has been removed from the skin, flush skin with **plenty of water**. Get medical attention if irritation persists.

Inhalation: Remove person to fresh air. If symptoms persist, obtain medical attention.

Ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If conscious (and not in immediate risk of losing consciousness) and capable of swallowing, rinse mouth thoroughly with water and then drink plenty of water to dilute the material in the stomach. **Get medical attention immediately.**

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE FIGHTING MEASURES

Flammability: Not flammable by WHMIS/OSHA criteria.

Means of Extinction:

Suitable Extinguishing Media: Treat for surrounding material.

Unsuitable Extinguishing Media: Not available.

Products of Combustion: None.

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Explosion Data:

Sensitivity to Mechanical Impact: Not available.

Sensitivity to Static Discharge: Not available.

Protection of Firefighters: Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

Section 6: ACCIDENTAL RELEASE MEASURES

Precautions: Restrict access to the area. Ensure clean-up is conducted by trained personnel only. Wear adequate protective clothing and equipment. Clean-up personnel need protection against contact with skin and eyes, as well as **AGAINST INHALATION OF DUST** (see Section 8). Prevent accidental contact between the spilled product and water, and **AVOID generating dust**.

Methods for Clean-Up: Contain the spill or leak. Do not touch the spilled material. This material is a water pollutant: prevent the material from entering drains, sewers, ditches, or waterways.

Small spills: Carefully shovel into clean, dry, labelled containers and cover. **AVOID or minimize the production of dust**. Sweeping, the use of compressed air, or the use of a non-HEPA vacuum are therefore to be AVOIDED. The use of a HEPA vacuum may be acceptable. Under certain conditions, and under the advisement and supervision of a knowledgeable authority, it may be appropriate to carefully wet down the spilled material to avoid the production of dust; in this circumstance, prevent the wetting water and fly ash from entering drains, sewers, ditches, or waterways; note that contact of the fly ash with water may generate heat; note that contact with the fly ash will strongly elevate the pH of the wetting water (see Section 9); don't let the wetting water come into contact with skin or eyes; don't let the wetting water (either prior or subsequent to contact with the spilled fly ash) come into contact with stored fly ash (i.e., fly ash that is not part of the accidental release).

Large spills: Contact the appropriate emergency services and product supplier (see Section 1) for advice.

Notify environmental authorities in the event of any reportable release of this product to the environment.

Other Information: Not available.

Section 7: HANDLING AND STORAGE

Handling:

Avoid contact with skin and eyes. Do not swallow. **Do not breathe dust**. Wear appropriate PPE (see Section 8). When using do not eat or drink. Wash hands before eating, drinking, or smoking.

Use dust-tight containers and keep containers closed when not in use. Prevent accumulation of dust.

Avoid generating dust. Protect containers from physical damage. Prevent water from contacting stored product. Empty containers may contain residues which are hazardous.

Good housekeeping is important to prevent accumulation of dust. **Avoid generating dust**. The use of compressed air for cleaning clothing, equipment, etc, is not recommended.

Storage:

Store in dust-tight, dry, labelled containers. Keep containers closed when not in use. Avoid any dust buildup by frequent cleaning and suitable construction of the storage area. Do not store in an area equipped with emergency water sprinklers. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area.

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Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

See Section 3 regarding fly ash composition.

Exposure to this material can be controlled in many ways. The measures appropriate for a particular work site depend on how this material is used and on the extent of exposure.

Exposure Guidelines

Ingredient	Exposure Limits	
	OSHA-PEL	ACGIH-TLV
Silica, amorphous, fumed	80 mg/m ³ / %SiO ₂	10 mg/m ³
Aluminum oxide	15 mg/m ³ (total) 5 mg/m ³ (resp)	10 mg/m ³
Calcium oxide	5 mg/m ³	2 mg/m ³
Silica, crystalline, quartz	((10 mg/m ³)/(%SiO ₂ +2) (resp)); ((30 mg/m ³)/(%SiO ₂ +2) (total)); ((250)/(%SiO ₂ +5) mppcf (resp))	0.025 mg/m ³
Disodium oxide	Not available.	Not available.
Ferric oxide	10 mg/m ³	5 mg/m ³ (iron oxide fume; dust as Fe)
Magnesium oxide	15 mg/m ³	10 mg/m ³
Dipotassium oxide	Not available.	Not available.
Titanium dioxide	15 mg/m ³ (total)	10 mg/m ³
Barium oxide	0.5 mg/m ³ (Ba) *	0.5 mg/m ³ (Ba) **
Phosphoric anhydride	1 mg/m ³	1 mg/m ³

* - soluble barium compounds; the actual form(s) of barium present in the ash, and therefore the solubility in water, is not known.

** - barium and soluble barium compounds; the actual form(s) of barium present in the ash, and therefore the solubility in water, is not known.

Engineering Controls: When using product, provide local and general exhaust ventilation to keep airborne dust concentrations below exposure limits. Use wet methods, if appropriate, to reduce the generation of dust.

Personal Protective Equipment:

Eye/Face Protection: Wear approved eye protection (properly fitted dust- or splash-proof chemical safety goggles) and face protection (face shield).

Hand Protection: Wear suitable gloves.

Skin and Body Protection: Wear suitable protective clothing, including appropriate boots, boot covers, overshoes, etc., as may be appropriate.

Respiratory Protection: In case of insufficient ventilation to maintain airborne fly ash levels below the exposure limits, wear suitable NIOSH-approved, properly fitted respiratory equipment. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance, and inspection.

General Hygiene Considerations: Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Opaque fine powder.
Color:	Gray to tan-gray to tan.
Odour:	No odour.
Odour Threshold:	Not applicable.
Physical State:	Solid (fine powder).

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pH (water slurry):	≥ 12.5 (for a 20 g + 80 mL water slurry)
Viscosity:	Not applicable.
Freezing Point:	Not available.
Boiling Point:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not applicable.
Lower Flammability Limit:	Not available.
Upper Flammability Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not applicable.
Specific Gravity:	A 2010 Nov. 01/05 composite sample and a 2010 Dec. 1 sample had values of 2.6 – 2.7 @ 20 °C. Possible range not available; historically stated as 2.8 - 3.4 @ 20 °C.
Solubility in Water:	Mostly insoluble; however, reacts to form highly alkaline solution with pH ≥ 12.5 for a 20 g + 80 mL water slurry.
Coefficient of Water/Oil Distribution:	Not available.
Auto-ignition Temperature:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	Not available.

Section 10: STABILITY AND REACTIVITY

Stability: Stable under normal storage conditions. Keep dry in storage.

Incompatible Materials: Moisture (reaction may generate heat). Strong acids. Boric oxide. Boron trifluoride. Phosphorus pentoxide*. Chlorates. Chlorine trifluoride. Chlorine. Ammonium salts. Fluorine. Hydrogen sulfide. Carbon dioxide. Hydroxylamine. Nitrogen tetroxide. Triuranium octoxide. Ammonia. Hydrogen fluoride. Oxygen difluoride. Chloroform. Potassium. Propargyl alcohol. Sodium carbonate. Sodium hydroxide.

Hazardous Decomposition Products: None.

Hazardous Polymerization: Does not occur.

Corrosivity to Metals: The fly ash, itself – particularly if moist or wet – or solutions that are or have been in contact with the fly ash may be corrosive to metals, especially including aluminum metal.

Reactivity: See Section 2 with respect to the possibility of enhanced chemical reactivity of the fly ash when it is hot.

Note that the incompatible materials listed are largely based on the presence of the fly ash components as listed in the composition table in Section 3. Recall, however, that the listed composition follows a particular convention for the expression of fly ash elemental composition and that some of the compounds listed may only be present (in that form) to a limited extent (or even not at all). Therefore, the incompatible materials listing may be somewhat conservative in that **some** of the incompatible materials listed **may not necessarily** have any particularly troublesome level of interaction with the fly ash. Conversely, however, some of the incompatible materials listed may indeed have a troublesome level of interaction with the fly ash, up to and including very violent reaction.

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* Note that the phosphorus pentoxide (phosphoric anhydride) listed in the composition table in Section 3, above, is per the convention used for reporting the phosphorus (i.e., elemental "P") content of the fly ash; the phosphorus in the fly ash – if present at all in a discrete compound form (unknown) – may be present primarily as phosphate – PO_4^{3-} – rather than the highly reactive phosphoric anhydride (P_2O_5).

Section 11: TOXICOLOGY INFORMATION

EFFECTS OF ACUTE EXPOSURE

Component Analysis

Ingredient	LD ₅₀ (oral)	LC ₅₀
Silica, amorphous, fumed	5000 mg/kg, rat	> 2.2 mg/L 1hr, rat
Aluminum oxide	> 5000 mg/kg, rat	Not available.
Calcium oxide	500 mg/kg, rat	Not available.
Silica, crystalline, quartz	500 mg/kg, rat	Not available.
Disodium oxide	Not available.	Not available.
Ferric oxide	> 10000 mg/kg, rat	Not available.
Magnesium oxide	Not available.	Not available.
Dipotassium oxide	Not available.	Not available.
Titanium dioxide	> 10000 mg/kg, rat	Not available.
Barium oxide	Not available.	Not available.
Phosphoric anhydride	Not available.	Not available.

Note that, to some extent, burns may be thermal as well as caustic due to the heat released by the reaction of ash components (e.g., available calcium oxide or calcium hydroxide) with moisture (e.g., eyes, mucus membranes, sweat) or due to contact with hot ash (see Section 2).

- Eye:** May cause serious chemical burns. Causes irritation (possibly severe). To some extent, burns may be thermal. Severe irritation, redness and pain. May cause burns in the presence of moisture. Serious eye burns.
- Skin:** May cause skin irritation. May cause burns in the presence of moisture. Redness. Pain. Blisters. Serious skin burns.
- Ingestion:** May be harmful if swallowed. May cause stomach distress, nausea or vomiting. May cause burning of mouth, throat and esophagus. Abdominal pain. Burning sensation. Shock or collapse.
- Inhalation:** Harmful by inhalation. May cause respiratory tract irritation. Prolonged or repeated exposure may lead to lung or other diseases.

EFFECTS OF CHRONIC EXPOSURE

Target Organs: Eyes, skin, respiratory system, gastrointestinal tract.

Chronic Effects: Repeated exposure to calcium oxide has been shown to cause ulceration of the nasal septum, bronchitis and pneumonia. Chronic inhalation of silica quartz may cause autoimmune disease. Chronic exposure to an ingredient in this mixture has been reported to cause renal injury and adverse effects on visual acuity.

This product contains crystalline silica, quartz possibly up to 10% (or 13%) by weight. Due to variability in the mined coal and the combustion process and limitations in measurement, it is possible that crystalline silica content may vary considerably, with the possibility to exceed 10% (or 13%) w/w crystalline silica, quartz, at least on occasion.

Respirable crystalline silica in the form of quartz or cristobalite from occupational sources is listed by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a lung carcinogen.

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Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling. While there may be a factor of individual susceptibility to a given exposure to respirable silica dust, the risk of contracting silicosis and the severity of the disease is clearly related to the amount of dust exposure and the length of time (usually years) of exposure.

Carcinogenicity: Hazardous by WHMIS/OSHA criteria.

Ingredient	Chemical Listed as Carcinogen or Potential Carcinogen *
Silica, amorphous, fumed	I-3
Aluminum oxide	Not listed.
Calcium oxide	Not listed.
Silica, crystalline, quartz	G-A2, I-1, N-1, CP65
Disodium oxide	Not listed.
Ferric oxide	G-A4, I-3
Magnesium oxide	G-A4
Dipotassium oxide	Not listed.
Titanium dioxide	G-A4, I-2B
Barium oxide	Not listed.
Phosphoric anhydride	Not listed.

* See Section 15 for more information.

Mutagenicity: Not hazardous by WHMIS/OSHA criteria.

Reproductive Effects: Not hazardous by WHMIS/OSHA criteria.

Developmental Effects:

Teratogenicity: Not hazardous by WHMIS/OSHA criteria.

Embryotoxicity: Not hazardous by WHMIS/OSHA criteria.

Respiratory Sensitization: Not hazardous by WHMIS/OSHA criteria.

Skin Sensitization: Not hazardous by WHMIS/OSHA criteria.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: May cause long-term adverse effects in the aquatic environment.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions:

This product, if discarded as supplied, is not considered a hazardous waste under Federal Waste Regulations 40 CFR 261. If processing, use, or contamination alters the material, the waste must be tested using methods described in 40 CFR 261 to determine if it meets applicable definition of hazardous waste. Dispose according to all relevant Federal, provincial, state, and local regulations. Notify environmental authorities in the event of any reportable release of this product to the environment.

Section 14: TRANSPORTATION INFORMATION

Ground shipment of this material is not regulated as a hazardous material / dangerous good under US D.O.T. or Canadian TDG regulations. This material IS REGULATED as a hazardous material / dangerous good, however, for the purpose of transport by aircraft.

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IATA Classification:

Corrosive Solid, Basic, Inorganic, n.o.s. (Calcium oxide); UN3262; Class 8; PGIII

Section 15: REGULATORY INFORMATION

Federal Regulations

Canadian: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

US: MSDS prepared pursuant to the Hazard Communication Standard (CFR29 1910.1200).

SARA Title III

Ingredient	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313
Silica, amorphous, fumed	Not listed.	Not listed.	Not listed.	Not listed.
Aluminum oxide	Not listed.	Not listed.	Not listed.	313
Calcium oxide	Not listed.	Not listed.	Not listed.	Not listed.
Silica, crystalline, quartz	Not listed.	Not listed.	Not listed.	Not listed.
Disodium oxide	Not listed.	Not listed.	Not listed.	Not listed.
Ferric oxide	Not listed.	Not listed.	Not listed.	Not listed.
Magnesium oxide	Not listed.	Not listed.	Not listed.	Not listed.
Dipotassium oxide	Not listed.	Not listed.	Not listed.	Not listed.
Titanium dioxide	Not listed.	Not listed.	Not listed.	Not listed.
Barium oxide	Not listed.	Not listed.	Not listed.	Not listed.
Phosphoric anhydride	Not listed.	Not listed.	Not listed.	Not listed.

Section 311-312: Delayed (chronic) health hazard.

State Regulations

California Proposition 65:

This product contains a chemical known to the State of California to cause cancer (Silica, crystalline, quartz).

Global Inventories

Ingredient	Canada DSL/NDL	USA TSCA
Silica, amorphous, fumed	DSL	Yes.
Aluminum oxide	DSL	Yes.
Calcium oxide	DSL	Yes.
Silica, crystalline, quartz	DSL	Yes.
Disodium oxide	DSL	Yes.
Ferric oxide	DSL	Yes.
Magnesium oxide	DSL	Yes.
Dipotassium oxide	DSL	Yes.
Titanium dioxide	DSL	Yes.
Barium oxide	DSL	Yes.
Phosphoric anhydride	DSL	Yes.

HMIS - Hazardous Materials Identification System

Health - 2* Flammability - 0 Physical Hazard - 1 PPE - B

NFPA - National Fire Protection Association:

Health - 2 Fire - 0 Reactivity - 1

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

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WHMIS Classification(s):

- Class D2A - Carcinogenicity
- Class D2A - Chronic Toxic Effects
- Class D2B - Skin/Eye Irritant
- Class E - Corrosive Material

WHMIS Hazard Symbols:



SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

- OSHA (O)** Occupational Safety and Health Administration.
- ACGIH (G)** American Conference of Governmental Industrial Hygienists.
A1 - Confirmed human carcinogen.
A2 - Suspected human carcinogen.
A3 - Animal carcinogen.
A4 - Not classifiable as a human carcinogen.
A5 - Not suspected as a human carcinogen.
- IARC (I)** International Agency for Research on Cancer.
1 - The agent (mixture) is carcinogenic to humans.
2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.
- NTP (N)** National Toxicology Program.
1 - Known to be carcinogens.
2 - Reasonably anticipated to be carcinogens.

Section 16: OTHER INFORMATION

Disclaimer:

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use. To the best of Saskatchewan Power Corporation's knowledge, it is believed that the information contained herein is accurate; however, Saskatchewan Power Corporation makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein. In addition, this information may be used in a manner beyond Saskatchewan Power Corporation's knowledge and control. The information is therefore provided without any representation or warranty expressed or implied.

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Prepared by: Nexreg Compliance Inc.
Phone: (519) 488-5126
www.nexreg.com