

MATERIAL SAFETY DATA SHEET

Metakaolin-Whitemud^{MK}

Section 1 – Chemical Product and Company Identification

MSDS Name: Metakaolin
Synonyms: China clay, Aluminum silicate
Product application: Supplementary cementing material (pozzolan)

Production Plant: Whitemud Resources Inc.
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SW18-T5-R2-W3
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306-266-2200

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MSDS prepared: 22 June 2009
MSDS prepared by: Rick Ketcheson 403-517-0058

Section 2 – Composition, Information on Ingredients

CAS#	Chemical Name	Percent
1332-58-7	Kaolin, calcined	Balance
14808-60-7	Total Quartz (SiO ₂)	18-20%
	Quartz (SiO ₂) < 4um	< 3%
	Quartz (SiO ₂) < 2.5 um	< 1.5%

Section 3 – Hazards Identification

Potential Health Effects:

- Eyes:** Dust may cause physical irritation.
Skin: Dust may cause physical irritation.
Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard during normal industrial handling.
Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling. When inhaled as a dust or a fume may cause benign pneumoconiosis.
Chronic: Chronic inhalation can cause pneumoconiosis.



WHMIS classification

Toxic Material Causing Other Toxic Effects
Canadian disclosure at 0.1% according to classification criteria

Additional information:

Whitemud^{MK} may contain up to 20% quartz which is part of the natural raw material as mined. Quartz has been classified by IARC (International Agency for Research on Cancer) as carcinogenic to humans by inhalation (Group I). Furthermore, quartz can cause silicosis and other lung diseases on prolonged inhalation exposure. These conditions are preventable if proper handling procedures, including the use of engineering controls and respirators are observed. The user is responsible for controlling the working environment according to local regulations, e.g. in the UK: COSHH Regulations.

Section 4 – First Aid Measures

- Eyes:** Flush eyes for a minimum of 15 minutes with water, lifting upper and lower eyelids. If irritation persists seek medical attention.
Skin: Wash thoroughly with soap and water while removing contaminated clothing. Seek medical attention if irritation persists.
Ingestion: Material will pass through body in normal manner. If large quantities are ingested, aid process by drinking plenty of fluids.
Inhalation: Move to fresh air. If breathing is difficult administer oxygen.

Section 5 – Fire Fighting Measures

Product is non-flammable, non-explosive and does not support combustion. Product in paper bags will not react with common fire-extinguishing agents.

- Auto-ignition Temperature:** Not applicable
Flash Point: Not applicable
Lower Explosion Limit: Not applicable
Upper Explosion Limit: Not applicable
NFPA Rating: Health 1: Flammability 0: Instability 0:



Section 6 – Accidental Release Measures

General Information: Avoid generating dust. Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up small spills with a vacuum with a high-efficiency particulate air (HEPA) filter. For larger spills, use a fine spray or mist to control dust generation. Alternatively wash to sewer system that is equipped for solids removal. Place in suitable container for disposal in landfill. Do not use dry sweeping or compressed air to clean up spills. Appropriate personal protection, including respiratory protection is required for all clean-up personnel.

Section 7 – Handling and Storage

Handling: Prevent dusty conditions that could cause employee exposure to high concentrations.
Storage: Keep product dry. Store in tightly closed containers or sealed bags. Product in paper bags should not be stored near sources of heat.

Section 8 – Exposure Controls and Personal Protection

Components with limit values that require monitoring at the workplace:	
1332-58-7 natural aluminosilicate (Kaolin)	
PEL	15 mg/m ³ total dust 5mg/m ³ respirable fraction OSHA TWA
REL	10 mg/m ³ total dust 5 mg/m ³ respirable fraction NIOSH TWA
TLV	2 mg/m ³ respirable fraction ACGIH TWA
14808-60-7 quartz (SiO₂)	
PEL	10 mg/m ³ ÷ (%quartz+2) OSHA TWA
REL	0.05 g/m ³ respirable dust NIOSH TWA
TLV	0.025 mg/m ³ ACGIH TWA

Engineering Controls: Use adequate ventilation to keep airborne concentrations as low as practicable.

Personal Protective Equipment:

Eyes: Wear approved safety glasses or chemical goggles. Facilities for eye flushing should be available.



Skin: Wear non-porous gloves when handling.



Clothing: Wear appropriate protective clothing, such as long-sleeved cotton coveralls, to prevent exposure of skin.



Respirators: NIOSH-approved respiratory protection equipment should be used if dust is present. Avoid breathing dust produced during the use of this and handling of this material. If the airborne crystalline silica concentration of the workplace is not known, Air Quality Monitoring should be conducted in order to determine the appropriate level of respiratory protection. If necessary, NIOSH air-purifying respirator or air supply should be used. Ensure the appropriate respirators are worn during, and following the task, including clean up or whenever airborne dust is present, to insure ambient dust levels are below occupational exposure limits. Provisions should be made for a respiratory protection-training program. Also see ANSI standard Z88.2 "American National Standard for Respiratory Protection", or the CSA Standard Z94.4-02 "Selection, Use, And Care of Respirators."



Section 9– Physical and Chemical Properties

Physical State:	Solid (Powder)
Appearance:	Fine, Off-white
Odor:	Odourless
pH:	7.2 (50% solids suspension)
Vapor Pressure:	Negligible
Vapor Density:	Not applicable
Evaporation Rate:	Not applicable
Viscosity:	Not applicable
Boiling Point:	Not applicable
Freezing/Melting Point:	Not available
Decomposition Temperature:	Not available
Solubility:	Insoluble in water
Specific Gravity:	2.6
Bulk Density:	50 lbs/ft ³ (800 kg/m ³)
Molecular Formula:	Al ₂ O ₃ 2SiO ₂
Molecular Weight:	222.1

Section 10 – Stability and Reactivity

Chemical Stability: Stable under ambient temperatures and pressures.

Reactivity: Product is intended for use as a pozzolan as partial replacement of portland cement in concrete or other cement based products. Pozzolans react with Ca(OH) from the hydration of hydraulic cement to produce Calcium Silicate Hydrates (CSH). CSH are highly stable minerals under normal ambient conditions. Product may react with lime or quicklime

(Ca(OH)) in the presence of water. Otherwise, product is stable and chemically inert with no hazardous decomposition products.

Section 11 – Toxicological Information

RTECS#:	1332-58-7: GF 1670500 -Kaolin 1408-60-7: VV 7330000 - Quartz
LD50/LC50:	Not available
Carcinogenicity:	Quartz (crystalline silica) is an IARC Group 1 carcinogen
Epidemiology:	No documented effects
Teratogenicity:	No documented effects
Reproductive effects:	No documented effects
Neurotoxicity:	No documented effects
Mutagenicity:	No documented effects
Irritancy of product	No documented effects
Skin/respiratory sensitization	No documented effects
Synergistic Products/effects	Intended use is for partial replacement of portland cement in concrete or portland cement based products. Effects are not synergistic. Follow recommendations for use of portland cement.
Other Studies:	No documented effects

An epidemiological study performed on workers in the kaolin processing industry showed that the incidence of lung disease was not significantly higher than the general population. However, the study also showed that prolonged inhalation of high concentrations of dust could cause detectable deposits in the lungs.

This product contains up to 20% quartz, which may cause cancer, silicosis or other fibrotic lung diseases with prolonged exposure. The most recent IARC classification of crystalline silica (quartz) is that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1). These conditions are preventable through the use of engineering controls and the use of appropriate respirators.

Whitemud Resources Inc. knows of no medical conditions abnormally aggravated by exposure to this product. The primary route of entry is inhalation. Kaolin has GRAS status (generally recognized as safe for a specified use) related to the manufacture of food packaging materials.

Section 12 – Ecological Information

No adverse ecological effects are expected. May affect turbidity of water if discharged in large quantities to lakes or streams.

Section 13 – Disposal Considerations

Metakaolin is a non-hazardous waste. Disposal must follow local landfill laws and regulations as well as provincial and federal (Canada) and state and federal (US) requirements.

Section 14 – Transport Information

	Canada - TDG	US -DOT
Shipping Name	Metakaolin	Metakaolin
Hazard Class	Not Regulated	Not Regulated
UN Number	Not Regulated	Not Regulated
Packing Group	Not Regulated	Not Regulated

Section 15 – Regulatory Information

**US Federal
TSCA**

CAS# 1332-58-7 is listed on the TSCA Inventory.

Health and Safety Reporting List:

None of the components are on the Health and Safety Reporting List.

Chemical Test Rules:

None of the components in this product are under a Chemical test Rule.

Section 12b:

None of the components are listed under TSCA Section 12b.

Significant New Use Rule:

None of the components in this product have a SNUR under TSCA.

CERCLA Hazardous Substances

And corresponding RQs:

None of the components in this product have an RQ.

SARA Section 302 Extremely

Hazardous Substances:

None of the components in this product have a TPQ.

Section 313:

No components are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants, any Class 1 or 2 Ozone depletors.

Clean Water Act:

None of the components in this product are listed as Hazardous Substances, Priority Pollutants or Toxic Pollutants under the CWA.

OSHA:

State:

Kaolin can be found on the following state right to know lists: California (listed as Silica, amorphous), New Jersey (listed as Silica, amorphous), Pennsylvania, Minnesota, Massachusetts.

California Prop 65 – No

Significant Risk Level:

None of the components of this product are listed.

CANADA

CAS# 1332-58-7 is listed on Canada's DSL List

WHMIS Classifications:

D2A, due to crystalline silica content.

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

Ingredient Disclosure List:

CAS# 1332-58-7 is not listed.

Section 16 – Additional Information

This Material Safety Data Sheet, or the information contained herein, should be provided to any individuals who will handle, store, transport or otherwise be exposed to the product. Information presented in the Material Safety Data Sheet presumes that the user will employ proper handling techniques and use the product as intended, without alteration. Whitemud Resources Inc. believes the information in the MSDS is reliable and current as of the date of publication, but makes no such warranty. Whitemud's Technical Committee reviews this MSDS on a regular basis, not to exceed every two calendar years. If the publication date of the MSDS is more than two years old, contact Whitemud or visit the Whitemud website at www.whitemudresources.com to obtain the most current information.