HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **CycleCem I**

Revision Date: 23-Sep-2013 **Revision Number:** 5

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Trade Name:	CycleCem I
Synonyms:	None
Chemical Family:	Cement
Internal ID Code	HM007550

Product Use

Application:	Cement

Manufacturer's Name and Contact Details

Name and Address	Halliburton Energy Services 645 - 7th Ave SW Suite 2200 Calgary, AB T2P 4G8 Canada
Emergency Telephone Number	(281) 575-5000
Prepared By	Chemical Compliance Telephone: 1-580-251-4335 e-mail: fdunexchem@halliburton.com

2. HAZARD(S) IDENTIFICATION

WHIMIS Classification

WHMIS Hazard Class

E Corrosive Material
D2A Very Toxic Materials
Crystalline silica

WHMIS Symbol(s)

Summary of hazards of the product

Hazard Overview

May cause eye, skin, and respiratory irritation. Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT (w/w)	HMIRA Registry Number	Filing Date
Portland cement	65997-15-1	60 - 100%	Not applicable	Not applicable
Crystalline silica, quartz	14808-60-7	30 - 60%	Not applicable	Not applicable
Fly ash	68131-74-8	1 - 5%	Not applicable	Not applicable
Calcium chloride	10043-52-4	1 - 5%	Not applicable	Not applicable

4. FIRST AID MEASURES

Description of first aid measures

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Skin Wash with soap and water. Get medical attention if irritation persists.

Ingestion Under normal conditions, first aid procedures are not required.

Most important symptoms and effects, both acute and delayed

May cause eye and skin burns. Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically

5. FIRE FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media

None - does not burn.

Extinguishing media which must not be used for safety reasons

None known.

Special hazards arising from the substance or mixture

Special Exposure Hazards

Not applicable.

Advice for firefighters

Special Protective Equipment for Fire-Fighters

Not applicable.

Hazardous combustion products

Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions and emergency producedures

Protective Equipment

Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures

None known.

Procedure for Cleaning / Absorption

Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with eyes, skin, or clothing. This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.

Conditions for safe storage and Incompatible materials for storage

Store in a cool, dry location. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Product has a shelf life of 24 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Exposure Limits

Substances	CAS Number	ACGIH TLV-TWA	OSHA PEL-TWA
Portland cement	65997-15-1	TWA: 1 mg/m³	15 mg/m³
Crystalline silica, quartz	14808-60-7	TWA: 0.025 mg/m³	10 mg/m³ %SiO2 + 2
Fly ash	68131-74-8	TWA: 1 mg/m³	Not applicable
Calcium chloride	10043-52-4	Not applicable	Not applicable

Appropriate engineering controls

Engineering Controls Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.

Personal Protective Equipment (PPE)

Respiratory Protection Wear a NIOSH certified, European Standard EN 149 (FFP2/FFP3), or equivalent respirator when using this product.

Hand Protection Normal work gloves.

Skin Protection Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection Wear safety glasses or goggles to protect against exposure.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State: Solid **Color:** Gray

Odor: Odorless **Odor Threshold:** No information available

Property Remarks/ - Method	Values
pH:	12.4
pH Concentration of Solution:	No information available.
Freezing Point/Range	No information available.
Melting Point/Range	No information available
Boiling Point/Range (C):	No information available.
Flash Point/Range (C):	No information available.
Flash Point Method:	No information available.
Autoignition Temperature (C):	No information available.
Flammability Limits in Air - Lower (%):	No information available.
Flammability Limits in Air - Upper (%):	No information available.
Evaporation Rate (Butyl Acetate=1):	No information available.
Vapor Pressure @ 20 C (mmHg):	No information available.
Vapor Density (Air=1):	No information available.
Specific Gravity @ 20 C (Water=1):	No information available.
Solubility in Water (g/100ml):	Insoluble
Solubility in other solvents	No information available.
Partition Coefficient/n-Octanol/Water:	No information available.
Decomposition Temperature (C):	No information available.
Viscosity	No information available
Explosive Properties	No information available
Oxidizing Properties	No information available

Other Information

Molecular Weight (g/mole):	No information available.
VOC Content (%)	No information available

10. STABILITY AND REACTIVITY

Conditions of Reactivity

Conditions to Avoid	Keep away from any contact with water.
Hazardous Polymerization:	Will Not Occur

Chemical Stability
Stable

Sensitivity to Static Discharge
Not available

Sensitivity to Mechanical Impact
Not available

Incompatible materials
Hydrofluoric acid.

Hazardous Decomposition Products
Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).

11. TOXICOLOGICAL INFORMATION

Routes of entry
Eye or skin contact, inhalation.

Information on Toxicological Effects
Acute effects from exposure

Inhalation	Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below). Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).
Eye Contact	May cause severe eye irritation.
Skin Contact	Can dry skin. May cause an allergic skin reaction. May cause alkali burns with confined contact.
Ingestion	None known

Chronic effects from exposure

Chronic Effects/Carcinogenicity

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Irritancy of product

Irritation

Corrosive to eyes
Corrosive to skin

Sensitization of product

Sensitization

May cause an allergic skin reaction.

Mutagenicity

Mutagenic Effects

Contains no ingredient listed as a mutagen

Carcinogenicity

Carcinogenic Effects

Contains crystalline silica which may cause silicosis, a delayed and progressive lung disease. The IARC and NTP have determined there is sufficient evidence in humans of the carcinogenicity of crystalline silica with repeated respiratory exposure.

Reproductive Toxicity

Reproductive Toxicity

This product does not contain any known or suspected reproductive hazards

Teratogenicity/embryotoxicity

Teratogenic

Not a confirmed teratogen or embryotoxin.

Toxicologically synergistic material Not available

Acute Toxicity

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Portland cement	65997-15-1	No data available	>2000 mg/kg	No data available
Crystalline silica, quartz	14808-60-7	500 mg/kg (Rat)	No data available	No data available
Fly ash	68131-74-8	2000 mg/kg (Rat)	No data available	No data available
Calcium chloride	10043-52-4	1000 mg/kg (Rat)	2630 mg/kg (Rat)	No data available

12. ECOLOGICAL INFORMATION

Toxicity
Ecotoxicity Effects

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Portland cement	65997-15-1	No information available	No information available	No information available	No information available
Crystalline silica, quartz	14808-60-7	No information available	No information available	No information available	No information available
Fly ash	68131-74-8	EC50: 1400 - 2000 mg/L (Scenedesmus subspicatus)	LC50: 700 - 2000 mg/L (Leuciscus idus)	No information available	TLM96: > 1000 ppm (Crangon crangon) EC50: 140 - 2000 mg/L (Daphnia magna)
Calcium chloride	10043-52-4	No information available	No information available	No information available	No information available

Persistence and Degradability
No information available

Bioaccumlation potential
No information available

Mobility in soil
No information available

Results of PBT and vPvB assessment
No information available.

Other adverse effects
Endocrine Disruptor Information
This product does not contain any known or suspected endocrine disruptors

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Canadian TDG
UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable

IATA/ICAO
UN Number: Not restricted.

UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable

IMDG/IMO
UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable

Special Precautions for User None

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

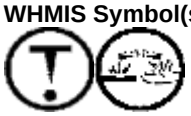
15. REGULATORY INFORMATION

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.

Canadian Regulations
Canadian DSL Inventory All components listed on inventory or are exempt.

WHMIS Hazard Class
E Corrosive Material
D2A Very Toxic Materials
Crystalline silica

WHMIS Symbol(s)



US Regulations
US TSCA Inventory All components listed on inventory or are exempt.

16. OTHER INFORMATION

Preparation Information
Prepared By
Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

Revision Date: 23-Sep-2013

Not applicable

Additional Information For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Key or legend to abbreviations and acronyms
WHMIS: Workplace Hazardous Materials Information System

Key literature references and sources for data
www.ChemADVISOR.com/

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****