HALLIBURTON

# MATERIAL SAFETY DATA SHEET

**Product Trade Name:** **OPTIFLO-III DELAYED RELEASE BREAKER**

**Revision Date:** 26-Mar-2014 **Revision Number:** 15

## 1. Product and Company Identification

**Product Identifier**

**Product Trade Name:** OPTIFLO-III DELAYED RELEASE BREAKER
**Synonyms:** None
**Chemical Family:** Sulfate
**Internal ID Code** HM001139

**Product Use**

**Application:** Breaker

**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**

C Oxidizing Materials
D2B Toxic Materials
D2A Very Toxic Materials
Crystalline silica

**WHMIS Symbol(s)**

**Summary of hazards of the product**

**Hazard Overview**

May cause eye, skin, and respiratory irritation. May cause allergic skin and respiratory reaction. May be harmful if swallowed. Oxidizer. 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 |
|---|---|---|---|---|
| Ammonium persulfate | 7727-54-0 | 60 - 100% | Not applicable | Not applicable |
| Crystalline silica, quartz | 14808-60-7 | 10 - 30% | Not applicable | Not applicable |

## 4. First aid measures

**Description of first aid measures**

**Inhalation** If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

**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** In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

**Ingestion** Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed**

May cause eye and skin irritation. May cause allergic skin and respiratory reaction. 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**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

None known.

**Special hazards arising from the substance or mixture**

**Special Exposure Hazards**

Oxidizer. May ignite combustibles. Decomposition in fire may produce toxic gases.

**Advice for firefighters**

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**Hazardous combustion products**

Toxic fumes. Ammonia. Sulfuric acid. 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**

Prevent from entering sewers, waterways, or low areas.

**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. Flush area with water.

## 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. Wash hands after use. Launder contaminated clothing before reuse.

**Conditions for safe storage and Incompatible materials for storage**

Store away from reducing agents. Store in a cool, dry location. Store between 20 F (-6 C) and 100 F (38 C). Product has a shelf life of 12 months.

## 8. Exposure Controls/Personal Protection

**Occupational Exposure Limits**

**Exposure Limits**

| Substances | CAS Number | ACGIH TLV-TWA | OSHA PEL-TWA |
|---|---|---|---|
| Ammonium persulfate | 7727-54-0 | 0.1 mg/m$^3$ | Not applicable |
| Crystalline silica, quartz | 14808-60-7 | TWA: 0.025 mg/m$^3$ | 10 mg/m$^3$<br>%SiO2 + 2 |

**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), AS/NZS 1715:2009, or equivalent respirator when using this product.

**Hand Protection** Impervious rubber gloves. Neoprene gloves. Nitrile gloves.

**Skin Protection** Rubber apron. 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** Chemical goggles; also wear a face shield if splashing hazard exists.

**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:** | Off white to tan |
| **Odor:** | Mild acrid | **Odor Threshold:** | No information available |

| Property<br>Remarks/ - Method | Values |
|---|---|
| **pH:** | 5 |
| **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:** | Not Determined |
| **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):** | 1.76 |
| **Solubility in Water (g/100ml):** | No information available. |
| **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):** | 228.22 |
| **VOC Content (%)** | No information available |

## 10. Stability and Reactivity

**Conditions of Reactivity**

| | |
|---|---|
| **Conditions to Avoid** | Avoid contact with readily oxidizable materials. |
| **Hazardous Polymerization:** | Will Not Occur |

**Chemical Stability**
Stable

**Sensitivity to Static Discharge**
Not available

**Sensitivity to Mechanical Impact**
Not available

**Incompatible materials**
Avoid halogens. Contact with acids. Organic matter. All flammables, especially petroleum products, asphalt & other volatile flammables. Amphoteric metals such as aluminum, magnesium, lead, tin, or zinc.

**Hazardous Decomposition Products**
Toxic fumes. Ammonia. Sulfuric acid. 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**

May cause allergic respiratory reaction. May cause respiratory irritation. 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).

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).

**Eye Contact** May cause eye irritation

**Skin Contact** May cause skin irritation. May cause an allergic skin reaction.

**Ingestion** Causes burns of the mouth, throat and stomach.

**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** Irritating to eyes Irritating to skin

**Sensitization of product**

**Sensitization** May cause an allergic skin reaction. May cause allergic respiratory reaction.

**Mutagenicity**

Mutagenic Effects Not regarded as mutagenic

**Carcinogenicity**

Carcinogenic Effects No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, NTP, or OSHA.

**Reproductive Toxicity**

Reproductive Toxicity This product does not contain any known or suspected reproductive hazards

**Teratogenicity/embryotoxicity**

Teratogenic Not a teratogen or embroytoxin.

**Toxicologically synergistic material** Not available

**Acute Toxicity**

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|---|
| Ammonium persulfate | 7727-54-0 | 495 mg/kg ( Rat ) | No data available | 520 mg/L ( Rat ) 1 h |
| Crystalline silica, quartz | 14808-60-7 | 500 mg/kg ( Rat ) | No data available | No data available |

## 12. Ecological Information

**Toxicity**
**Ecotoxicity Effects**

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|---|---|---|---|---|---|
| Ammonium persulfate | 7727-54-0 | No information available | LC50; 103 mg/l (Lepomis macrochirus) | No information available | EC50: 120 mg/L (Daphnia magna) |
| Crystalline silica, quartz | 14808-60-7 | EC50(72h): 89 mg/L (biomass) (Scenedesmus subspicatus) (similar substance) | LC50(96h): 508 mg/L (Danio rerio) (similar substance) | No information available | LC50(48h): 731 mg/L (Daphnia magna) (similar substance) LC50(48h) 33.5 mg/L (Ceriodaphnia dubia) (similar substance) |

**Persistence and Degradability**
The methods for determining biodegradability are not applicable to inorganic substances.

**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** Disposal should be made in accordance with federal, state, and local regulations.

**Contaminated Packaging** This bag may contain residue of a hazardous material. Some authorities may regulate such containers as hazardous waste. Dispose of container according to national or local regulations.

## 14. Transport Information

**Canadian TDG**

**UN Number:** UN1444,
**UN Proper Shipping Name:** Ammonium Persulfate
**Transport Hazard Class(es):** , 5.1
**Packing Group:** , III
**EMS:** EmS F-A, S-Q

**IATA/ICAO**

| | |
|---|---|
| **UN Number:** | UN1444, |
| **UN Proper Shipping Name:** | Ammonium Persulfate |
| **Transport Hazard Class(es):** | , 5.1 |
| **Packing Group:** | , III |

**IMDG/IMO**

| | |
|---|---|
| **UN Number:** | UN1444, |
| **UN Proper Shipping Name:** | Ammonium Persulfate |
| **Transport Hazard Class(es):** | , 5.1 |
| **Packing Group:** | , III |
| **EMS:** | EmS F-A, S-Q |

**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

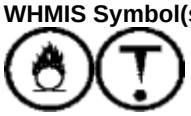
**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.**

### Canadian Regulations

**Canadian DSL Inventory** Product contains one or more components not listed on the inventory.

**WHMIS Hazard Class**
C Oxidizing Materials
D2B Toxic Materials
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:** 26-Mar-2014

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/

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