MATERIAL SAFETY DATA SHEET

Product Trade Name: BaraShield™-663
Revision Date: 12-Aug-2014

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BaraShield™-663
Synonyms: None
Chemical Family: Blend
Application: Loss Circulation Material

Manufacturer/Supplier
Baroid Fluid Services
Product Service Line of Halliburton
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (281) 575-5000

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

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>ACGIH TLV-TWA</th>
<th>OSHA PEL-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>30 - 60%</td>
<td>10 mg/m³</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>0.1 - 1%</td>
<td>TWA: 0.025 mg/m³</td>
<td>10 mg/m³ %SiO₂ + 2</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>1 - 5%</td>
<td>10 mg/m³</td>
<td>15 mg/m³</td>
</tr>
</tbody>
</table>

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview
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, AS/NZS 1715, or equivalent respirator when using this product. Review the Safety Data Sheet (SDS) for this product, which has been provided to your employer.

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

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

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

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

Notes to Physician: Not Applicable

5. FIRE FIGHTING MEASURES

Flash Point/Range (F): Not Determined
Flash Point/Range (C): Not Determined
Flash Point Method: Not Determined
Autoignition Temperature (F): Not Determined
Autoignition Temperature (C): Not Determined
Flammability Limits in Air - Lower (%): Not Determined
Flammability Limits in Air - Lower (oz./ft³): Not Determined
Flammability Limits in Air - Upper (%): Not Determined
Flammability Limits in Air - Upper (oz./ft³): Not Determined

Fire Extinguishing Media: All standard firefighting media.

Special Exposure Hazards: Not applicable.

Special Protective Equipment for Fire-Fighters: Not applicable.

NFPA Ratings: Health 0, Flammability 0, Reactivity 0
HMIS Ratings: Health 1*, Flammability 0, Physical Hazard 0, PPE: E

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: 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

Handling Precautions: 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. Avoid contact with eyes, skin, or clothing.
Storage Information

Store away from acids. 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. Do not reuse empty container. Product has a shelf life of 36 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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

Respiratory Protection
Wear a NIOSH certified, European Standard EN 149 (FFP2/FFP3), AS/NZS 1715, 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
None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State:</td>
<td>Granules</td>
</tr>
<tr>
<td>Color:</td>
<td>Gray</td>
</tr>
<tr>
<td>Odor:</td>
<td>Slight</td>
</tr>
<tr>
<td>pH:</td>
<td>7</td>
</tr>
<tr>
<td>Specific Gravity @ 20 C (Water=1):</td>
<td>1.6-2.0</td>
</tr>
<tr>
<td>Density @ 20 C (lbs./gallon):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Bulk Density @ 20 C (lbs/ft3):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Boiling Point/Range (F):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Boiling Point/Range (C):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Freezing Point/Range (F):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Freezing Point/Range (C):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Vapor Pressure @ 20 C (mmHg):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Vapor Density (Air=1):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Percent Volatiles:</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Evaporation Rate (Butyl Acetate=1):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Solubility in Water (g/100ml):</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Solubility in Solvents (g/100ml):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>VOCs (lbs./gallon):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Viscosity, Dynamic @ 20 C (centipoise):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Viscosity, Kinematic @ 20 C (centistokes):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Partition Coefficient/n-Octanol/Water:</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Molecular Weight (g/mole):</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability Data: Stable

Hazardous Polymerization: Will Not Occur

Conditions to Avoid None anticipated

Incompatibility (Materials to Avoid) Strong acids.
Hazardous Decomposition Products
Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C). Carbon monoxide and carbon dioxide.

Additional Guidelines
Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure
Eye or skin contact, inhalation.

Symptoms related to exposure

Acute Toxicity

Inhalation
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.

Ingestion
None known

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.

Toxicology data for the components

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>6450 mg/kg (Rat)</td>
<td>&gt; 2000 mg/kg (Rat)</td>
<td>&gt; 3 mg/L (Rat) 4h</td>
</tr>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>&gt; 5000 mg/kg (Rat)</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>10000 mg/kg (Rat)</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION
Ecotoxicological Information

Ecotoxicity Product

- **Acute Fish Toxicity:** Not determined
- **Acute Crustaceans Toxicity:** Not determined
- **Acute Algae Toxicity:** Not determined

Ecotoxicity Substance

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>EC50(72h): &gt; 14 mg/L (growth rate)</td>
<td>LC50(96h): &gt; 100 mg/L (saturated solution)</td>
<td>EC50(3h): &gt; 1000 mg/L (Activated sludge)</td>
<td>EC50(48h): &gt; 100 mg/L (saturated solution) (Oncorhynchus mykiss)</td>
</tr>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No information available</td>
<td>LL0(96h): 10000 mg/L (Danio rerio) (similar substance)</td>
<td>No information available</td>
<td>LL5(24h): &gt; 10000 mg/L (Daphnia magna) (similar substance)</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

<table>
<thead>
<tr>
<th>Substances</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>The methods for determining biodegradability are not applicable to inorganic substances.</td>
</tr>
<tr>
<td>Crystalline silica, quartz</td>
<td>The methods for determining biodegradability are not applicable to inorganic substances.</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

No information available

12.4. Mobility in soil

No information available

12.5. Results of PBT and vPvB assessment

No information available.

<table>
<thead>
<tr>
<th>Substances</th>
<th>PBT and vPvB assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>Not PBT/vPvB</td>
</tr>
</tbody>
</table>

12.6. Other adverse effects

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

US DOT

- **UN Number:** Not restricted.
- **UN Proper Shipping Name:** Not restricted
- **Transport Hazard Class(es):** Not applicable
- **Packing Group:** Not applicable

US DOT Bulk

- **DOT (Bulk):** Not Applicable

Canadian TDG ul0

- **UN Number:** Not restricted.
- **UN Proper Shipping Name:** Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable

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

IATA/ICAO
UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable
Special Precautions for User: None

15. REGULATORY INFORMATION

US Regulations
US TSCA Inventory All components listed on inventory or are exempt.
EPA SARA Title III Extremely Hazardous Substances Not applicable
EPA SARA (311,312) Hazard Class Acute Health Hazard
Chronic Health Hazard
EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity Not applicable.
EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65 The California Proposition 65 regulations apply to this product.
MA Right-to-Know Law One or more components listed.
NJ Right-to-Know Law One or more components listed.
PA Right-to-Know Law One or more components listed.

Canadian Regulations
Canadian DSL Inventory All components listed on inventory or are exempt.
WHMIS Hazard Class Crystalline silica
D2A Very Toxic Materials

16. OTHER INFORMATION
The following sections have been revised since the last issue of this SDS
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.

Disclaimer Statement
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***END OF MSDS***