MATERIAL SAFETY DATA SHEET

Product Trade Name: **BENSEAL®**

Revision Date: 25-Mar-2010

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

   **Product Trade Name:** BENSEAL®
   **Synonyms:** None
   **Chemical Family:** Mineral
   **Application:** Viscosifier

   **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
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2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>CAS Number</th>
<th>PERCENT</th>
<th>ACGIH TLV-TWA</th>
<th>OSHA PEL-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentonite</td>
<td>1302-78-9</td>
<td>60 - 100%</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Crystalline silica, tridymite</td>
<td>15468-32-3</td>
<td>0 - 1%</td>
<td>0.05 mg/m³</td>
<td>1/2 x 10 mg/m³ %SiO₂ + 2</td>
</tr>
<tr>
<td>Crystalline silica, cristobalite</td>
<td>14464-46-1</td>
<td>0 - 1%</td>
<td>0.025 mg/m³</td>
<td>1/2 x 10 mg/m³ %SiO₂ + 2</td>
</tr>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>1 - 5%</td>
<td>0.025 mg/m³</td>
<td>10 mg/m³ %SiO₂ + 2</td>
</tr>
</tbody>
</table>

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

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD
May cause eye and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD
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.

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
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

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

Notes to Physician
Treat symptomatically.

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 - Upper (%): 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 0*, Flammability 0, Reactivity 0

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.

Storage Information

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 60 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.

Personal Protective Equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

Wear a NIOSH certified, European Standard EN 149, 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

Physical State: Solid
Color: Various
Odor: Mild earthy
pH: 8-10
Specific Gravity @ 20 C (Water=1): 2.6
Density @ 20 C (lbs./gallon): 62
Bulk Density @ 20 C (lbs/ft3): 63-73
Boiling Point/Range (F): Not Determined
Boiling Point/Range (C): Not Determined
Freezing Point/Range (F): Not Determined
Freezing Point/Range (C): Not Determined
Vapor Pressure @ 20 C (mmHg): Not Determined
Vapor Density (Air=1): Not Determined
Percent Volatiles: Not Determined
Evaporation Rate (Butyl Acetate=1): Not Determined
Solubility in Water (g/100ml): Insoluble
Solubility in Solvents (g/100ml): Not Determined
9. PHYSICAL AND CHEMICAL PROPERTIES

- **VOCs (lbs./gallon):** Not Determined
- **Viscosity, Dynamic @ 20 C (centipoise):** Not Determined
- **Viscosity, Kinematic @ 20 C (centistrokes):** Not Determined
- **Partition Coefficient/n-Octanol/Water:** Not Determined
- **Molecular Weight (g/mole):** Not Determined

10. STABILITY AND REACTIVITY

- **Stability Data:** Stable
- **Hazardous Polymerization:** Will Not Occur
- **Conditions to Avoid:** None anticipated
- **Incompatibility (Materials to Avoid):** Hydrofluoric acid.
- **Hazardous Decomposition Products:** Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
- **Additional Guidelines:** Not Applicable

11. TOXICOLOGICAL INFORMATION

- **Principle Route of Exposure:** Eye or skin contact, inhalation.
  
  **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).

- **Skin Contact:** May cause mechanical skin irritation.

- **Eye Contact:** May cause eye irritation.

- **Ingestion:** None known

- **Aggravated Medical Conditions:** Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.
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.

Other Information  
For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests  
Oral Toxicity: Not determined  
Dermal Toxicity: Not determined  
Inhalation Toxicity: Not determined  
Primary Irritation Effect: Not determined  
Carcinogenicity: Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).  
Genotoxicity: Not determined  
Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION  
Mobility (Water/Soil/Air)  Not determined  
Persistence/Degradability  Not determined  
Bio-accumulation  Not Determined  

Ecotoxicological Information  
Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)  
Acute Crustaceans Toxicity: Not determined
13. DISPOSAL CONSIDERATIONS

Disposal Method
If practical, recover and reclaim, recycle, or reuse by the guidelines of an approved local reuse program. Should contaminated product become a waste, dispose of in a licensed industrial landfill according to federal, state, and local regulations.

Contaminated Packaging
Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Shipping Information

Labels: 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.

WHMIS Hazard Class
D2A Very Toxic Materials
Crystalline silica

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

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

For questions about the Material 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***