Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

Fresh Gel

IDENTITY (As Used on Label and List) Bentonite as HYDROGEL, HYDROGEL 125, HYDROGEL HEB, HYDROGEL PRETREATED, EXTRA HIGH YIELD, NATURAL GEL, CEMENT GEL, BIG HORN, ENVIROGEL, ENVIROPLUG

Section I

Manufacturer's Name: WYO-BEN, INC	Emergency Telephone Number: (406) 652-6351
Address (Number, Street, City, State, and ZIP Code): P.O. Box 1979, Billings, MT 59102	Telephone Number for Information: (406) 652-6351
	Date Prepared: 11/1/88
	Signature of Preparer (optional): Richard K. Snow

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity;	Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Western Bentonite (As Inert or Nuisance Dust)	Total Dust	15mg/M^3			
	Respirable	5mg/M^3			
Quartz	Total Dust	$\frac{30mg/M^3}{\%SiO_2+2}$			
	Respirable	$\frac{10mg/M^3}{\%SiO_2+2}$	0.1mg/M^3		
Crystoballite	Total Dust	$\left(\frac{30mg/M^3}{\%SiO_2+2}\right)/2$			
	Respirable	$\left(\frac{10mg/M^3}{\%SiO_2+2}\right)/2$	0.05mg/M^3		
Tridymite	Total Dust	$\left(\frac{30mg/M^3}{\%SiO_2+2}\right)/2$			
	Respirable	$\left(\frac{10mg/M^3}{\%SiO_2+2}\right)/2$	0.05mg/M^3		

Western Bentonite is the ore form of the mineral sodium montmorillonite, an inert, naturally occuring clay mineral. Low concentrations of crystalline silica (SiO_2) in the form of quartz, crystoballite and tridymite may be present in airborne bentonite dust. The concentration level of total free silica in airborne bentonite dust is variable depending on origin of bentonite ore, fineness of product, moisture content of product, local activity and wind conditions, etc.

CAS No.: Bentonite 1302-78-9 Montmorillonite 1318-93-0

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H_2O = 1)	2.35
Vapor Pressure (mm Hg.)	N/A	Melting Point (Approx)	1450° C
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water: Insoluable, forms a colloidal suspension in water.

Appearance and Odor: Bluegray to green when moist solid; graybrown when in water suspension; creamywhite granules or powder as dry product. Dirt-dust-like odor.

Section IV — Fire and Explosion Hazard Data

Flash Point	Flammable Limits	LEL	UEL	Extinguishing Media	Special Fire Fighting Procedures
	N/A	N/A	N/A	N/A	N/A

Unusual Fire and Explosion Hazards

(Reproduce Locally)

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid: None
	Stable XX		

Incompatibility (*Materials to Avoid*): None

Hazardous Decomposition or Byproducts: None

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	XX	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Yes | Skin? No | Ingestion? No

Health Hazards (*Acute and Chronic*)

Acute (short term exposure): cough if exposed to dust levels higher than TLV's-Chronic (long term exposure): may lead to development of silicosis or other respiratory problems if consistently exposed to free silica containing airborne bentonite dust where levels are higher than TLV's.

Carcinogenicity: NTP? Not Listed | IARC Monographs? Bentonite:No-Silica:Yes | OSHA Regulated? No

Note: IARC, 1987, concludes there is limited evidence suggesting the carcinogenicity in humans of inhaled crystalline silica (IARC Class 2A)

Signs and Symptoms of Exposure

Long term exposure to free silica-containing bentonite dust, in excess of TLV's, may lead to silicosis or other respiratory problems. Labored breathing on heavy exertion, persistant dry cough are symptoms.

Medical Conditions Generally Aggravated by Exposure: Any respiratory illness

Emergency and First Aid Procedures

Remove affected personnel from dusty area to an area with clean air.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken In Case Material Is Released or Spilled

Avoid breathing dust, wear respirator approved for silica bearing dust. Vacuum up if possible to avoid generating airborne dust. Avoid adding water as product will become slippery when wetted.

Waste Disposal Method

Dispose of waste bentonite in a manner which will eliminate airborne dust or slippery conditions.

Precautions to Be Taken in Handling and Storing

Use NIOSH/MSHA approved respirators for silica bearing dust when free silica containing airborne bentonite dust levels exceed TLV's. Clean up spills promptly to avoid making dust.

Other Precautions

Caution if storage area floors become wetted as they may become slippery.

Section VIII — Control Measures

Respiratory Protection (*Specify Type*): Use respirators approved by NIOSH/MSHA for silica bearing dust.

Ventilation	Local Exhaust: Yes, if practical;	Special: Personal air supply may be useful
	Mechanical (*General*): Only if does not generate airborne dust.	under exceptionally dusty conditions.

Protective Gloves: Not necessary. Personal preference. | Eye Protection: Not necessary. Personal preference.

Other Protective Clothing or Equipment: None

Work/Hygienic Practices: Use handling procedures which avoid generating airborne dust.

* U.S.G.P.O.: 1986-491-529/45775

THRESHOLD LIMIT VALUE (TLV): TLV's or Threshold Limit Values of mineral dusts are the time weighted average concentration for a normal 8 hour work day or 40 hour work week, to which nearly all workers may be repeatedly exposed, without adverse effect. TLV's are published by American Conference of Governmental Industrial Hygienists (ACGIH). They are reviewed annually and changed on the basis of experience. Copies of TLV's may be obtained by writing to:

American Conference of Governmental
Industrial Hygienists
U. S. Public Health Service
P. O. Box 1937
Cincinnati, Ohio 45201

SILICOSIS: Silicosis may occur in persons who, over long periods of time, breath in very fine silica particles, (0-10 microns) in concentrations in excess of TLV's.

Typically, the lung tissue reacts to the presence of silica particles by forming fibrous matter around the particle. Evidence suggests that particles below two microns (0.002 millimeter) in size may be the most dangerous since they can be breathed deeper into the lungs in high concentrations. In rapidly developing silicosis, symptoms appear 8 to 18 months after the first exposure. Chronic silicosis, the type usually encountered in industry, generally, is produced 5-20 years after the chronic silica inhalation.

Silicosis is generally classified in three separate stages by medical authorities.

The first stage of the disease produces no disability. The affected person can carry on their work as well as ever. Frequently, the individual is not aware that anything is wrong, and the disease is revealed only by opaque nodular shadows on a chest X-ray coupled with a known exposure to crystalline free silica.

In the second stage, respiration may be affected in some persons but not

ADVISORY BULLETIN
REGARDING FREE SILICA IN BENTONITE CLAY

GENERAL: Bentonite clay is not considered to be a toxic, hazardous or carcinogenic material by any state, federal or international agency. Bentonite clay may, however, contain a small percentage of free silica in the crystalline forms of alpha quartz and/or cristobalite and/or tridymite. These substances may also be found in varying amounts in most other earthen materials including sand, soil and other clays.

Chronic (long term or repeated short term) exposure to dusts containing respirable free crystalline silica may lead to the development of non-cancerous respiratory disease such as silicosis.

Additionally, IARC (The International Agency for Research on Cancer) has recently concluded in Volume 42, IARC Monographs (1987), that there is limited evidence for the carcinogenicity of crystalline silica to humans through exposure by inhalation (IARC Classification 2A). In this same report IARC also notes that, in animal studies, clay minerals appear to have a protective effect by reducing the pathogenic effect of crystalline silica. We do not wish to deny any potential carcinogenic hazard from free crystalline silica, nevertheless, we feel it is necessary to point out that bentonite has been used for many years without apparent carcinogenic hazard to human health.

Minimization of potential respiratory disease and carcinogenic hazards may be obtained by employing the examination and protective measures suggested for prevention of possible silicosis. To determine if a hazardous exposure to silica exists, respirable dust samples must be taken in the work area for qualitative and quantitative determination of silica content and total quantitative dust per given unit of air.

RESPIRABLE DUST SILICA ANALYSIS: Qualitative determination of crystalline silica concentrations in respirable dust samples is the only acceptable means of silica exposure evaluation. Evaluation should not be based on qualitative analysis of the raw bentonite mineral or settled dust in the work area inasmuch as this is not representative of the actual silica dust content in the breathing zone of the employee. A standard procedure using personal sampling pumps should be employed in silica dust sampling. Consult current NIOSH (National Institute for Occupational Safety and health) publications on sampling and analysis of respirable silica dust.

The third stage can develop after the second stage even though the individual has been removed from exposure to silica dust. However, the progress of the disease will be slower without continued dust exposure. Breathing may become severely labored. The worker is far below normal physically and is susceptible to other respiratory diseases. Chest X-ray may show an enlarged heart as a result of the body's attempts to overcome the resistance of restricted blood vessels in the lungs. Heart failure, and death ultimately can result. Pulmonary tuberculosis and emphysema are frequent complications.

PREVENTION OF POSSIBLE SILICOSIS: The following is recommended for the protection of employees in industries where free silica may be present in respirable dust over extended periods of time.

1. Health and Employment History Examination - An employee health history must be examined prior to placing him in any dusty work condition - particularly when free silica may be present. It also should include a review of respiratory problems such as tuberculosis, histoplasmosis, emphysema, etc.

2. Physical Examination - The pre-employment examination should include pulmonary function testing, and both lateral and posteranterior X-rays of the chest. The pulmonary function testing should include "Forced Vital Capacity" (FVC), and the "Forced Expiratory Flow in One Second" (FEV i.o.) tests. A competent pulmonary occupational physician should be chosen to interpret the pulmonary function tests. A competent radiologist should be chosen to interpret X-rays, both at the time of employee placement in a dusty atmosphere and following future routine X-rays for consistency in comparison and interpretation.

3. Follow-up Examination - Pulmonary function, and PA and Lateral X-rays of the chest should be conducted annually or as the pulmonary physician and radiologist require during the employee's tenure in a dusty trade containing respirable particles of silica.

4. Monitor Respirable Dust for Silica - Frequent monitoring should be conducted to assure maintenance of respirable dust levels below the TLV.

5. Dust Controls and Preventative Maintenance - Plant dust control equipment

must be installed and maintenance constantly performed to maintain respirable dust to zero or well below the TLV. See ACGIH publication "Industrial Ventilation, a Manual of Recommended Practices".

6. Respiratory Protective Equipment - The employee must be required to wear NIOSH/MSHA approved respiratory protective equipment effective against dusts containing free silica. NIOSH/MSHA respirators bear approval numbers beginning with "TC-21C".

7. Removing Employees from Dusty Atmosphere - Should an employee be diagnosed as having an indication of Silicosis, such employee should be immediately transferred to a non-dusty work place.