



GreenZyme®

MATERIAL SAFETY DATA SHEET

1. PRODUCT NAME:

- GreenZyme®

2. SUBSTANCE IDENTIFICATION:

- Biological liquid enzyme.
- Enzymes(DNA proteins), H₂O and Stabilizers.

3. APPLICATION:

- Well stimulation and Enhanced Oil Recovery

4. PHYSICAL DATA:

- Semi-clear yellow with a slight fermentation odor.
- Evaporation rate: Not applicable
- pH: 3.5 to 5(in concentrated form); injection form, pH: 5 to 7
- Flash point: None
- Explosion limits: None
- Boiling point: 212°F or 100°C
- Specific gravity: 1
- Solubility in water: Complete, 100% dispersible.
- Vapor pressure: 17.5 mmHg-20°C
- In process applications, GreenZyme® can be heated up to 100°C, higher if necessary under pressure, e.g. greater than 400°C in steam-huff-puff process.

5. HEALTH EFFECTS AND FIRST AID:

- Inhalation: Non-hazardous. Remove to fresh air. Treat symptomatically. Contact a physician.
- Skin contact: Thoroughly rinse solution off the skin with soap and water for at least 15 minutes. If an itching sensation or redness occurs, contact a physician.
- Eye contact: May cause minor irritation, flush eyes with soap and water for at least 15 minutes. If a burning or itching sensation develops, contact a physician.
- Ingestion: Relatively harmless. If swallowed, drink two liters of water. If intestinal symptoms occur, contact physician.

6. REACTIVITY DATA:

- Reactivity: Stable under all conditions
- Incompatibilities: None
- Hazardous polymerization: Will not occur

7. FIRE AND EXPLOSION DATA:

- Primarily water based solution
- Non fire hazardous
- Not explosive

8. SAFEGUARDS MEASURES:

- Ventilation: Provide adequate ventilation, as with any soap or surfactant solution.

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- Eye protection: Avoid contact with eyes. Contact lenses are not recommended while working with any solutions.
- Protecting clothing: Avoid skin contact with solution concentrate for long periods of time.

9. SPILL AND LEAK INFORMATION:

- Wash and flush down the area of the spill with liberal amount water.

10. STORAGE AND DISPOSAL:

- Enzyme solution may be stored in most any area, but should be kept away from direct heat or in area where temperatures can reach over 160°F for prolong period of time.
- Shell life: Over three year.
- Use: Within three years.
- Disposal: If necessary, dispose of any unused dilute and/or concentrated solution in non-hazardous waste facility. All disposal methods must be in compliance will Federal, State, Province and local laws and regulations. Regulations may vary in different locations.
- Container disposal: Drums may be cleaned with mild soap solution and can be reused.

11. TRANSPORTATION INFORMATION:

This product is not regulated by Department of Transportation

- Marine Transport:
 - Proper Shipping Name: Non Flammable Liquid
 - UN/ID No: None
 - Hazard Class: 1
 - Flash Point: None

12. CONTROLS/PERSONAL PROTECTION

- Occupational exposure: Avoid inhalation and direct contact with skin and eyes.
- Control Measures: Provide adequate mechanical ventilation. Methods include process or personnel enclosure, mechanical ventilation. If engineering control and work practices are not effective in preventing and controlling exposure then suitable protective equipment which is known to perform satisfactorily should be used. Use of the basic principles of hygiene will enable this material to be used safely.
- Eye protection: Wear chemicals resistant goggles. Avoid contact with eyes. Contact lenses are not recommended while working with any solutions
- Protective clothing: Avoid skin contact. Use rubber gloves for handling this material when prolonged or frequently repeated contact could occur. Prevent skin exposure to solution concentrate for any extended period of time. If hands are cut or scratched, use rubber gloves, even for brief exposures. Normal work wear should be overalls and/or apron.
- Respiratory Protection: Maintain adequate ventilation. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Use respirators with cartridges for alcohols.

HARMONY CODE NUMBER

- 3507.90.0000

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