

***EPIZYM*[®]-200**

Microbial Ecosystem for the Biodegradation of Hydrocarbons in Wastewater

PRODUCT DESCRIPTION

EPIZYM-200 is a unique microbial ecosystem which enzymatically metabolizes various types of hydrocarbons and organic chemical contaminants in wastewater under aerobic and facultative anaerobic conditions.

The discharge of toxic organic wastes into municipal or industrial wastewater can markedly affect the microbial population that develops in wastewater treatment systems by inhibiting or poisoning vital microbial and enzyme systems. As a result of this loss of biological activity, waste conversions can be severely hampered until inactivated microorganisms adapt to the toxicants present or microbial cultures capable of coping with the toxicants are introduced into the system.

With its unique microbial ecosystem, EPIZYM-200 promotes the biological degradation of aliphatic and aromatic hydrocarbons, phenols, naphthalenes, amines, organic acids, aldehydes, ketones, glycols, alcohols, oils and other organic wastes released from petroleum refineries and organic chemical plants. EPIZYM-200 helps to reduce the effects of toxic shock loadings on municipal and industrial waste treatment systems.

CYANIDE WASTE

Inorganic and organic cyanide derivatives are extremely toxic to all life forms and can poison unadapted microorganisms even at very low concentrations. Although organic cyanides such as acrylonitrile have a lower index of toxicity than HCN, they are still toxic, at very low levels, to unadapted microorganisms. With its adapted microbial formulation, EPIZYM-200 promotes the oxidation of cyanides and nitriles under aerobic conditions in wastewater treatment systems through a unique oxidative biodegradation.

In coking operations at steel mills, large quantities of phenols, cyanides and ammonia are discharged in wastewater. These contaminants are highly resistant to normal biological treatment. The natural adaptation of wastewater treatment biomass is often unsuccessful due to the variance in shock loadings of these compounds in wastewater. Dissolved ammonia creates an antagonistic pH which inhibits biological growth and activity. Neutralization of the ammonia with sulfuric acid or phosphoric acid to

reduce the pH to 7.0 - 7.2 permits the biomass of the treatment system to use the ammonium ion as a source of metabolic nitrogen. With its adapted phenol and cyanide tolerant microbial content, EPIZYM-200 enzymatically oxidizes phenols and cyanides, reducing their concentrations to near zero. Thus, EPIZYM-200 aids in the efficient removal of these toxicants from wastewater treatment systems without additional excessive capital expenditures.

ORGANIC COLORS AND DYES

Colored wastes such as those being generated by paper mills, chemical plants and textile dyeing plants vary considerably in color and intensity. Tannins and lignins from paper mill pulping liquors produce red to brown effluents, which are extremely resistant to treatment. Textile dyeing processes use many different types of organic dyes. Chemical plants discharge highly colored chemical intermediates containing a variety of color producing chromophores. These colored wastes strongly interfere with natural photosynthetic processes of receiving waters and impose extremely high BOD loadings on wastewater treatment plants. With its unique microbial content, EPIZYM-200 biodegrades tannins, lignins, organic dyes and highly colored organic intermediates to compounds with little or no color intensity.

PHENOLS AND HALOGENATED ORGANIC COMPOUNDS

Phenols are very common contaminants in many refinery and industrial wastewater effluents. In addition, phenols contain the basic aromatic ring structure for many halogenated organic compounds in common use today. Phenol concentrations above 15 to 20 ppm are extremely toxic to unadapted microorganisms and destroy the integrity of the biomass in wastewater treatment plants. With its adapted natural microorganisms, EPIZYM-200 tolerates significantly higher concentrations of these toxic compounds and biodegrades them in less time. This increased biological activity is of major importance considering the vast amounts of recalcitrant halogenated organic wastes present in various industrial wastes.

APPLICATION SUGGESTIONS: INITIAL TREATMENT AND PREVENTIVE MAINTENANCE

ACTIVATED SLUDGE SYSTEMS AND TRICKLING FILTER

Initial Treatment

- 1) Add 3 kg EPIZYM-200 per day per 1,000 m³/day of wastewater (25 pounds/MGD*) for the first 5 days.
- 2) Reduce dosage to 0.6 kg per day per 1,000 m³/day of wastewater (5 lbs./MGD) for the next 10 days.

* MGD = million gallon (US) per day wastewater flow rate

Maintenance Treatment

3) Thereafter, add 0.5 kg per 4,000 m³/day of wastewater (1 lb./ MGD) bi-weekly or weekly.

OXIDATION LAGOONS

Initial Treatment:: For each 2,000 m³ of lagoon capacity, add 12 kg (50 lb. /MGD) EPIZYM-200 as a slurry in water daily for 5 days to the sewer feeding the lagoon.

Maintenance Treatment: Thereafter, add 0.5 kg per 2,000 m³ (2 lb./ MGD) of lagoon capacity weekly.

HYDRATION OF EPIZYM-200

- For long-term stability, EPIZYM-200 is supplied as a dehydrated powder.
- To activate the microorganisms, simply mix EPIZYM-200 with water before use.
- To rehydrate, add one part of EPIZYM-200 to eight to ten parts of warm (38° - 45°C), not hot water.
- Allow the mixture to stand for 30 minutes with occasional stirring.
- Upon completion of hydration, add the activated culture to the system to be treated.

PARAMETERS FOR USE

- pH: optimum 7, minimum 4.5, maximum 9.0.
- Dissolved oxygen: optimum > 3 ppm, minimum 2 ppm.
- Carbon/nitrogen ratio: optimum 10:1, maximum 20:1.
- Temperature: optimum 30°C (86°F), minimum 19°C (66°F), maximum 40°C (104°F).
- Free of toxic metals such as hexavalent chromium. Reasonable dilution of organic and inorganic cyanides and normally toxic compounds.

PACKAGING

EPIZYM-200 is supplied in 40 kilogram (88 pound), net weight polyethylene lined fiber drums.

PRODUCT STORAGE

Biological products are unlike inert chemical products. They require special treatment during storage and handling,

- * Do not store continuously at temperatures above 40°C (104°F).
- * Store out of direct sunlight in a well ventilated area.
- * Keep products dry until ready to hydrate.
- * Do not mix with any materials not recommended by Epicore, especially biocides and harsh chemicals.

SAFETY

EPIZYM-200 utilizes natural microorganisms which are harmless to humans, plants and animals. All Epicore biological products are non-toxic. They contain no toxic or hazardous chemicals, acids, caustics or solvents. They are not corrosive to metal, ceramic and plastic. Users are advised to consult the Material Safety Data Sheet for further information and guidance.

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2/08

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