

# BioRem-2000

8612-055

## PRODUCT SALES SHEET

### BioRem-2000 Oil Digester - MTBE™

#### Description

- ◆ A powerful blend of 12 strains of microbes, enzymes and natural botanical nutrients designed to digest MTBE in groundwater applications.
- ◆ Biologically converts MTBE into carbon dioxide and water.
- ◆ Available in a ready-to-use liquid formula.
- ◆ All-natural ingredients that FDA-GRAS lists as safe for plants, animals, aquatic life and humans.

#### MTBE Characteristics

The characteristics of MTBE are unlike those of other gasoline constituents as MTBE is highly soluble and migrates quickly with groundwater and does not adhere well to soil particles. Because MTBE behaves differently in soil and water than other hydrocarbon constituents, the choice of an effective remediation technology may be different when MTBE is present with other fuel contaminants at a site.

While MTBE was initially thought to be resistant to biodegradation, this perception has changed dramatically in the last few years. New research initiatives has shown the efficacy of new specific strains of bacteria in BioRem-2000 Oil Digester™ and improved methods of biodegrading MTBE, including *ex-situ* bioremediation in bioreactors.

Number of Different Microbial Strains:	12
Microbial Count:	50 Billion/gram
Microbial Characteristic:	All GRAS Listed
Number of Enzyme Species:	7
Enzyme Activity:	6,000 u/mg.
pH Activity Range:	5-11 pH
Appearance:	Amber Liquid
Bioluminescence Test:	Positive for Living Cells
Salmonella:	Negative
Listeria:	Negative
Phosphorous:	Non-Detect

#### Technical Information

Usage	Dilution Ratio	Ready to use
Physical Properties	Appearance	Liquid
	Color	Amber
	Fragrance	None
	pH	7
	Phosphate Content	None
	Shelf Life	Minimum 3 Year

#### Advantages

BioRem-2000 Oil Digester - MTBE™ is a mixture of 12 strains of naturally-occurring microbes and seven enzymes coupled with adapted microbial nutrients used to remediate hydrocarbons. The microbes have the capability to produce extracellular enzymes which lead to the breakdown of hydrocarbon compounds, which transform them into carbon sources for the microbes.

The BioRem-2000 Oil Digester - MTBE™ use all-natural Nano-Technology to break down the adsorption of hydrocarbons in groundwater and aquifer matrix. The Nano Technology breaks down macroscopic clumps of petroleum into smaller units while increasing the surface area.

#### Usage Guide

The typical method is using an *ex-situ* bioreactor which is colonized by microbes in BioRem-2000 Oil Digester - MTBE™ as well as the addition of oxygen (air sparging) and nutrients to promote the aerobic degradation of the MTBE. To accomplish this, extraction wells are drilled and the groundwater is pumped into tanks. The contaminated water is inoculated with BioRem-2000 Oil Digester - MTBE™ along with nutrients and air sparging and treated before it is pumped back into the aquifer (rather than discharge it to a sewage treatment plant which was standard practice). The added nutrients and oxygen assist the microbes in bioremediating the MTBE-contaminated groundwater. The ideal system would continually re-circulate the water until cleanup levels had been achieved.

Groundwater can also be treated underground by pumping BioRem-2000 Oil Digester - MTBE™, nutrients and air into the wells. For *in-situ* application of BioRem-2000 Oil Digester - MTBE™, the product is introduced into an aerobic zone (*i.e.*, area of air sparging) by injection/extraction wells.

