BATES CHEMICAL

TECHNICAL DATA SHEET

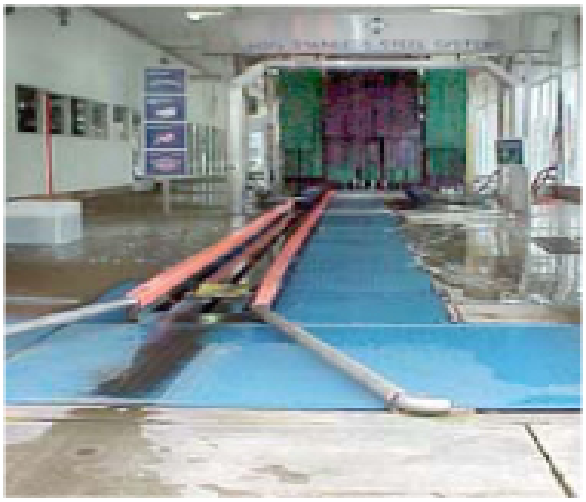
TRBC-200L for Cleaning/Recycling

TRBC-200L is a highly concentrated liquid blend of scientifically selected and adapted bacteria, enzymes, nutrients, and surfactant specifically designed to function in wash and recycled water systems. TRBC-200L contains bacteria that are capable of producing extremely high levels of enzymes necessary for the rapid degradation of various wastes such as fats, oils, grease, proteins, and petroleum hydrocarbons.

Introduction

Due to mounting environmental concerns, the use of wastewater treatment and reclaim systems in the car wash and other industries is becoming more prevalent. These recycled water systems are designed to conserve water and reduce the amount of polluted water being flushed into municipal sewer systems. Failure to reduce the waste to an acceptable level in these systems may result in costly surcharges. While this approach to wash water waste management seems practical, without tedious maintenance sludge and solids rapidly accumulate in the reclaim pits generating offensive odors and requiring frequent and costly physical removal.

TRBC-200L offers the need for a simple bio-friendly approach to reduce problems associated with the treatment, disposal, and reuse of wash water wastewater. Biological treatment is an environmentally responsible efficient and cost effective method of reducing odors, petroleum hydrocarbons, and other organic content resulting in lower disposal frequencies in such systems.



After years of research we are pleased to announce a highly concentrated shelf stable bacterial blend designed to accelerate the digestion of odor causing organic wastes while also reducing petroleum hydrocarbons and pumping frequency in car wash (photo above) and other wash water systems.

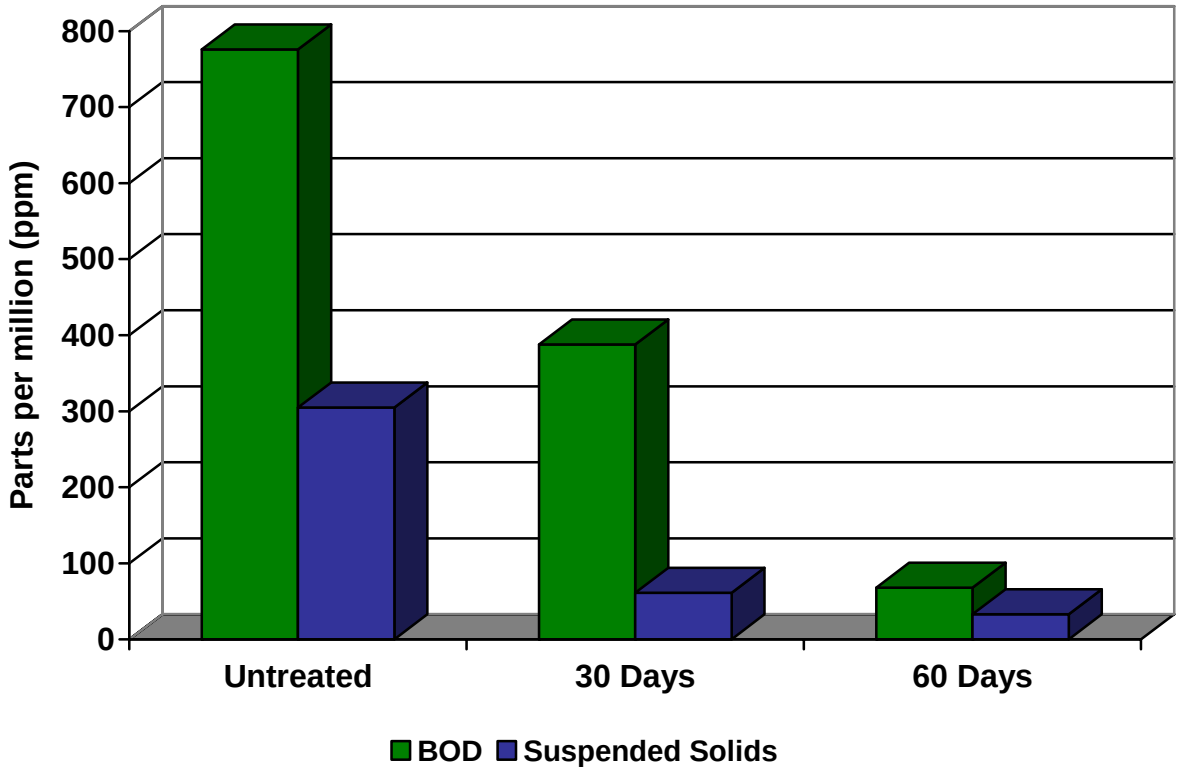
CAR WASH STUDY

Reduced Reclaim Pit Pump-out Frequency

The wastewater and solids in reclaim pits often contain cleaning agents, wax, dirt, and petroleum-based drying agents. **TRBC-200L** contains a unique blend of nine *Bacillus* strains formulated to accelerate digestion of sludge and solids that cause buildup in reclaim pits. Each strain is selected for optimum extracellular enzyme production to assure efficient and comprehensive breakdown of hydrocarbons such as gasoline, diesel fuel, and motor oil, as well as odor causing proteins, carbohydrates, cellulose, and fats.

TRBC-200L can substantially reduce the need for pumping in treatment systems because the bacterial strains digest the organic solids that accumulate in the reclaim pit. Digestion and utilization of the solids by TRBC-200L's bacterial blend was monitored in wastewater by measuring the Biochemical Oxygen Demand (BOD) and suspended solids over time. After 30 days wastewater treated with **TRBC-200L** showed a 50% reduction in BOD and 80% reduction in suspended solids (Figure 1).

Figure 1 – Organic Waste Reduction by Bacterial Strains in TRBC-200L



Odor Reduction Capabilities

TRBC-200L has been used for years to successfully control odors in wastewater systems, lift stations, animal waste lagoons, floor drains, and grease traps. The scientifically selected, nonpathogenic, spore-forming *Bacillus* strains found in **TRBC-200L** reduce odor by digesting malodorous compounds and will competitively exclude the odor-causing bacteria in the system.

Odors associated with wash water and recycle systems are often caused by bacteria that generate Volatile Fatty Acids (VFAs). To prove that **TRBC-200L** can be used in reclaim pits to successfully control odors, scientists have screened the specialized bacterial strains incorporated in **TRBC-200L** for their ability to utilize VFAs for cellular energy. As shown in Table 1, typical VFAs were utilized as a sole carbon source by the eight of the nine *Bacillus* strains in **TRBC-200L**.

Table 1 – VFA Degradation by the Eight Major Strains in TRBC-200L

Strain #	Acetic	Propionic	Lactic	Butyric	Isobutyric	Isovaleric
1	+	-	+	-	+	+
2	+	-	+	-	+	+
3	+	+	+	+	+	+
4	+	-	+	+	-	+
5	+	-	+	+	-	-
6	+	-	-	-	-	+
7	+	-	+	+	-	+
8	+	+	+	+	-	+

Scientifically Proven Petroleum Degradation

In car wash, cleaning, and other recycled wastewater systems, petroleum-based degreasing formulations, washing agents, dirt/dust particles, traffic grime, and other chemicals contribute to the origin of organic pollutants, especially aromatic compounds. Some aromatic compounds (e.g. benzene) are harmful to humans and the environment, requiring, remediation or removal of the pollutants before disposal of the waste.

To develop a product such as **TRBC-200L** to address these concerns, bacteria were collected in samples from petroleum contaminated environments such as car wash pits, tank washing facilities, and soil surrounding leaky petroleum storage tanks. Bacteria were isolated and the hydrocarbon-degrading ability of each isolate was confirmed using gas chromatograph analysis. After ten days the bacterial strains in TRBC-200L are capable of significantly reducing the concentration of gasoline, diesel, and motor oil by 45%, 64% and 24%, respectively (Figure 2). Further breakdown of the BTEX components in gasoline is illustrated in Figure 3.

Figure 2 –Reduction of Hydrocarbons by TRBC-200L

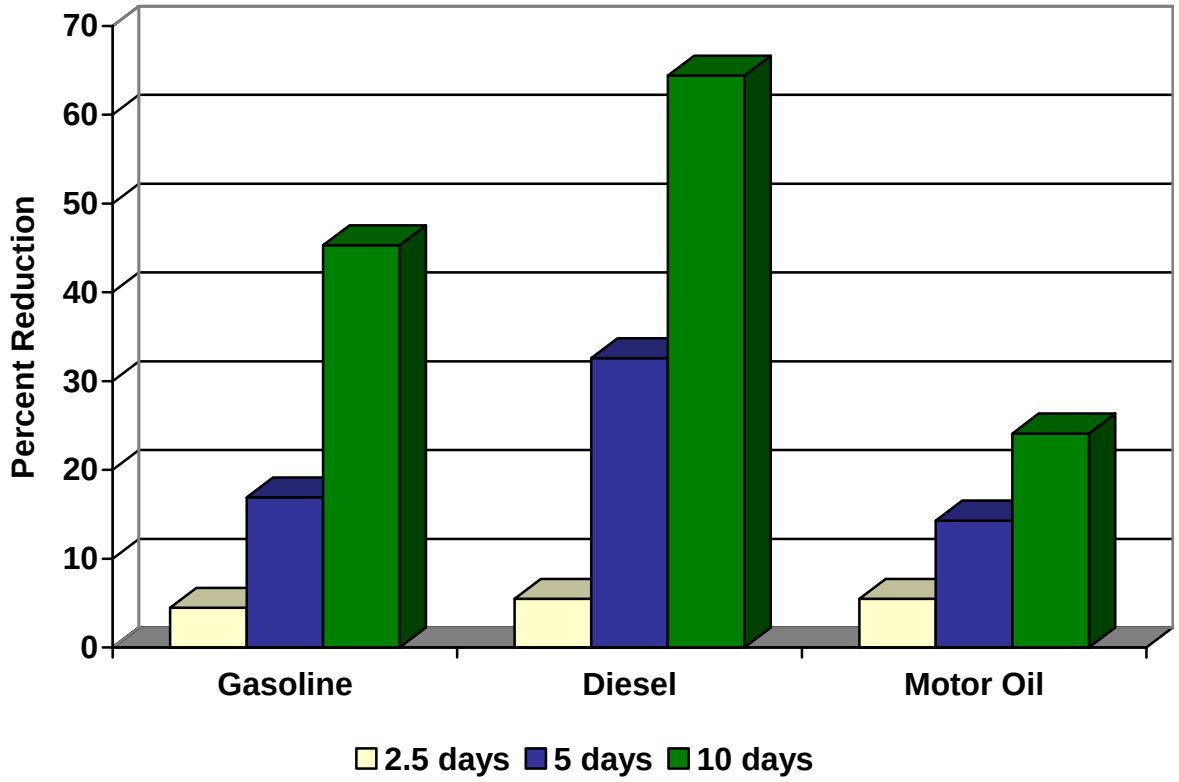
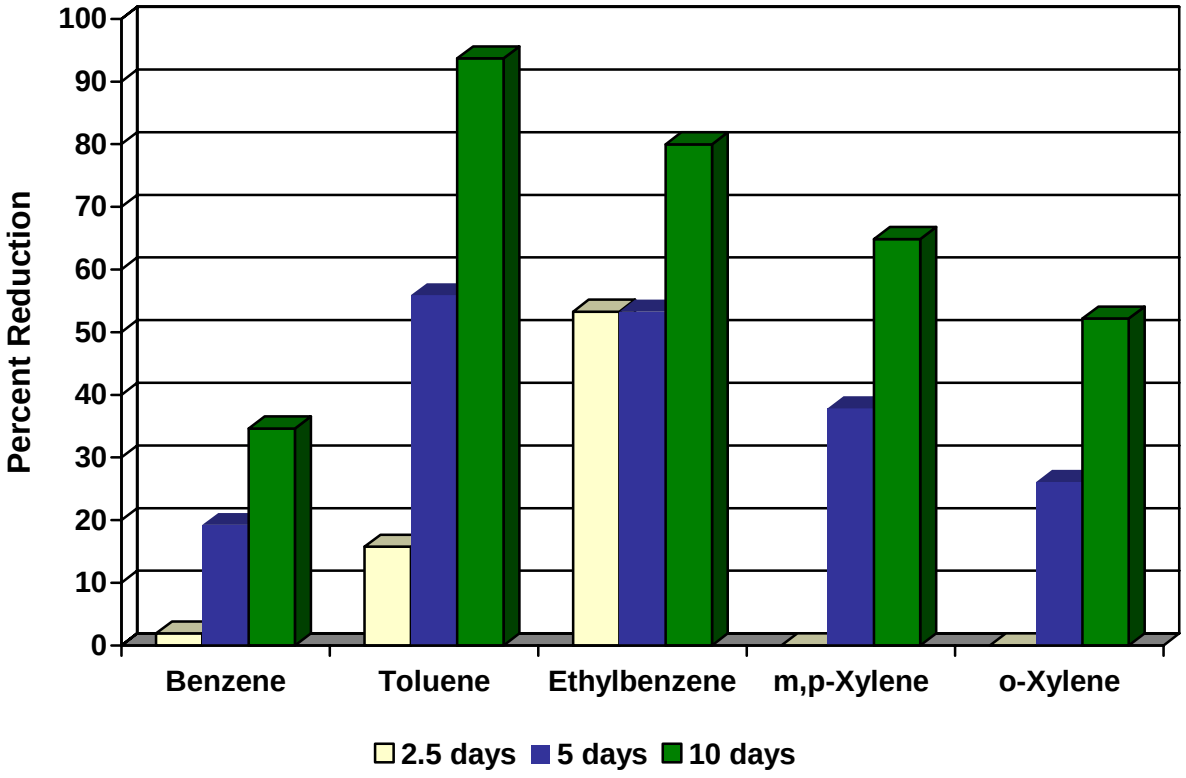


Figure 3 – Reduction of BTEX in Gasoline by Bacterial Strains in TRBC-200L



Importance of Proper Dosage

For proper results, **TRBC-200L** must be added or administered at the proper dosages in all systems to insure that the proper number of organisms is present to successfully degrade the organic compounds over a reasonable period of time. The degradation rates shown in the graphs were based on a minimum concentration of 50,000 to 500,000 bacteria/ml of TRBC-200L in the carwash reclaim pit. Similar results have been shown in other wastewater treatment systems. Researchers have shown that dosing a system with less than optimal bacterial concentrations can reduce the likelihood of success.

DOSAGE GUIDELINES

Wash Water and Recycle Systems

As a minimum dosage, add 1 gallon of **TRBC-200L** to every 4000 gallons of water used or stored in pits. Degradation rates will also depend on natural nutrients present and the concentration and type of waste being treated. Maintaining the proper temperature and pH in all systems will also be extremely helpful.

Hard Surface Cleaning Applications

Dilute TRBC-200L from 10:1 to 100:1 depending on application. For dilutions of 1:30 or greater, a compatible, biodegradable anionic or non-ionic surfactant may be used in addition to boost cleaning capacity.

General Wastewater and Misc. Treatment

Please consult your **TECHNICAL REPRESENTATIVE**.

PRODUCT PROPERTIES

Form: Teal/green liquid
Fragrance: Wintergreen
Shelf life: 1 year guaranteed
Effective pH range: 5°C - 55°C (40°F - 130°F)
Enzyme production: Amylase, Protease, Lipase, Esterase, Urease, Cellulase, Xylanase, and a series of Hydrocarbon degrading enzymes.

Storage and Handling

Store in a cool place. DO NOT FREEZE. Avoid eye and skin contact. Wash hands upon contact, or after use. Rinse eyes thoroughly if product comes into contact with eyes. Keep out of reach of children. See MSDS for more information.

Packaging

TRBC-200L is available in 4-gallon cases, 5-gallon pails, and 55-gallon drums. Totes, bulk, or other specialty packaging is available upon request.

TO ORDER CONTACT :

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