

Water & Environmental Technologies

BioRemove COD

BioRemove COD contains a combination of specially selected microorganisms that are blended to treat a broad spectrum of highly complex wastewaters. BioRemove COD is used in industrial and municipal wastewaters to improve COD/BOD reduction and plant stability.

Benefits

Industrial wastewater plants have the unique challenge of treating wastes that are generated through manufacturing or similar production processes. The characteristics of the wastewater are as varied as the waste contributors themselves. Even within the same industry, there are site-specific differences that make each plant unique. As regulations for water treatment have grown increasingly stricter and penalties for permit violations have increased, wastewater treatment has never been more important.

EnviroZyme has built a large microbial library over the years by finding microorganisms and classifying them according to their ability to perform certain functions. This allows EnviroZyme to develop formulations of microorganisms that are often much more effective than the naturally occurring microorganisms in wastewater plants. By adding these organisms, wastewater systems can better maintain the health of the microbial community during changing conditions and toxic shocks and enhance the ability of the microbial community to improve the effluent quality.

BioRemove COD contains a blend of microorganisms that can degrade a wide variety of organics which is ideal for industries with complex waste streams. Maintaining a healthy microbial community with BioRemove COD increases plant efficiency and simplifies operations by improving BOD and COD degradation, floc formation, and settleability.

Performance

BioRemove COD has been proven to be an effective biological solution for increasing effluent quality and plant stabilization while reducing performance variability in a wide range of industrial facilities. A chemical manufacturer experienced regular plant upsets at its 18,200 m³/day (4.8 mgd) activated sludge wastewater treatment plant due primarily to a highly variable influent wastewater COD. Historical problems included poor settleability, high polymer usage in the secondary clarifiers, and effluent COD excursions. The average loading to the plant was 1750 mg/L with the plant operating at a sludge retention time (SRT) of 20 days and an MLSS of 3,600 mg/L.

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The site was evaluated and a laboratory treatability study was performed using respirometry testing to quantify and predict the impact of BioRemove COD on the wastewater prior to conducting a field trial. The results of the testing (Fig. 1) show that a microbial community treated with BioRemove COD improved the maximum growth rate (μ_{max}) and increased the COD concentration at which the μ_{max} occurred. This information suggests that BioRemove COD can help the microbial community remove COD from the system more efficiently and at the same time tolerate higher COD loading, making the plant less prone to upsets.

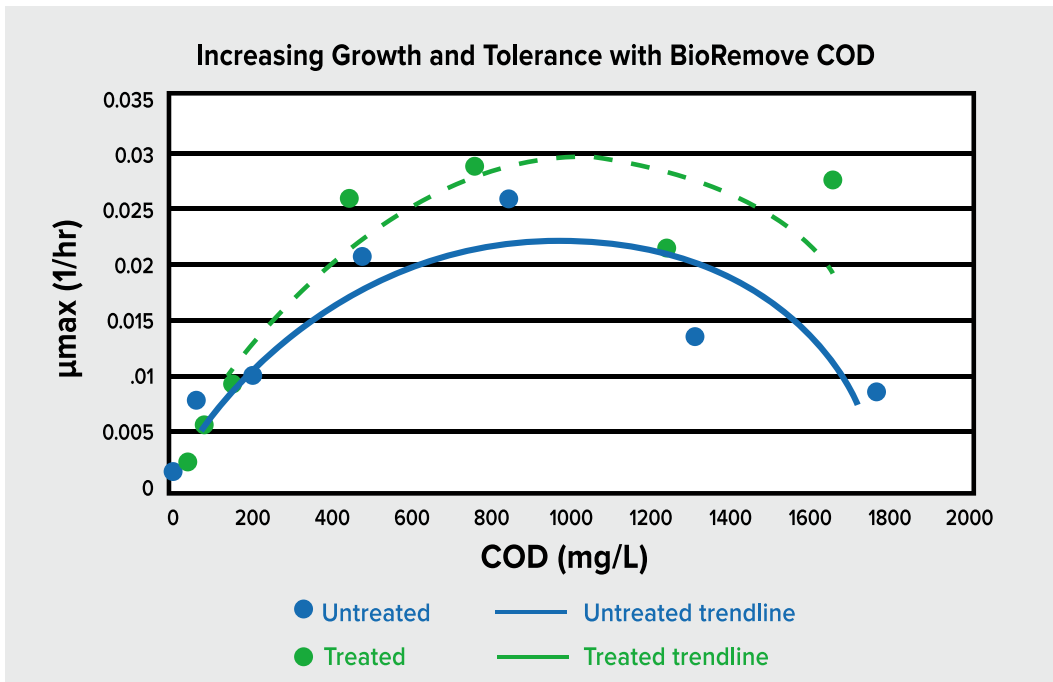


Fig. 1 Treatability study results showing increased growth and tolerance at higher COD concentration

	μ_{max} (maximum growth rate)	COD at μ_{max}
Treated with BioRemove COD	0.029	1,020 mg/L
Untreated control	0.023	906 mg/L

A BioRemove COD program was designed to help the plant handle higher COD loading and improve stability of the system. Figure 2 tracks the influent and effluent COD before and after beginning use of BioRemove COD. During treatment with BioRemove COD, the effluent stability greatly increased, and effluent COD was consistently low. Influent variability had minimal effect on the effluent.

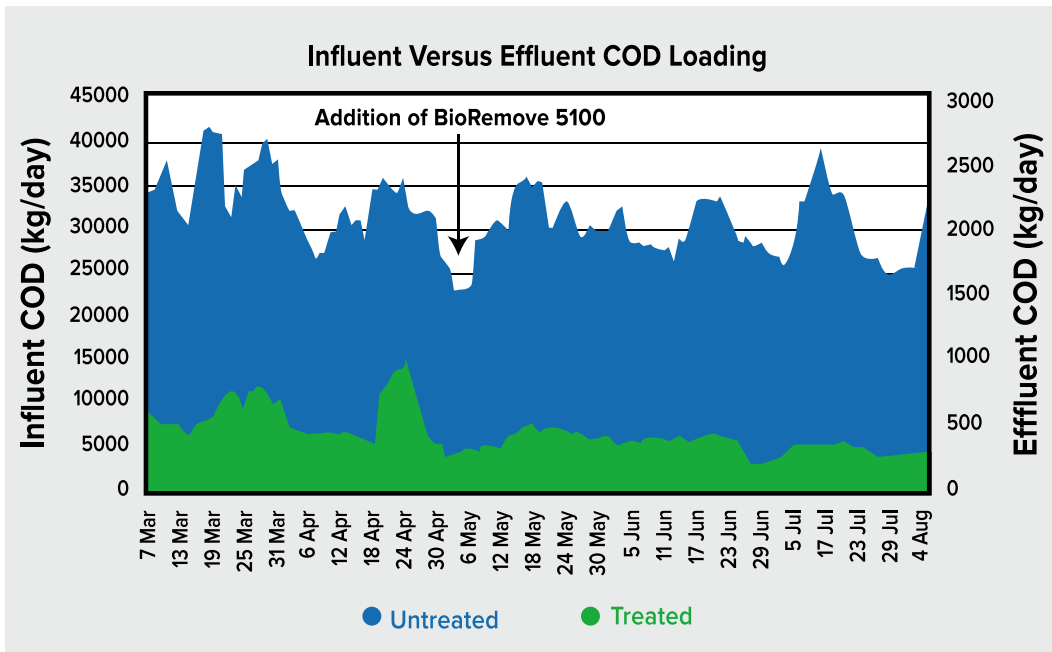


Fig. 2 Field results showing improved stability and COD reduction

In addition to the effluent COD stability, other improvements in plant operation included a reduction in the sludge volume index (SVI), showing improved settleability and enhanced flocculation and resulting in decreased polymer demand.

Recommended Use

BioRemove COD can be used in both industrial and municipal systems for applications including daily dosing to improve COD removal efficiency and maintain plant stability, increased dosage during high loading or upsets, and seeding during plant start-ups and recoveries. BioRemove COD is added daily directly to the aerobic treatment unit.

The dosage rate for BioRemove COD is dependent upon the volume of the biological reactor and the COD load. During the initial seeding period, an increased dosage is used to quickly establish the microorganisms in the system. When the microbial community is properly established, maintenance dosing is necessary to maintain an optimum level of biological activity.

Optimum pH and Temperature

The microorganisms in BioRemove COD perform within a pH range of 6.0–9.0, with an optimum near 7.0. Wastewater temperature affects activity, with an approximate doubling in maximum growth rate for each 10 °C (18 °F) increase in temperature to an approximate upper limit of 40 °C (104 °F). Very low activity can be expected below 5 °C (40 °F).

Product Characteristics

PRODUCT	APPLICATION	PHYSICAL FORM
BioRemove COD	COD removal	Dry tan powder

Safety, Handling, and Storage

Store in a cool, dry place. Avoid inhalation of dusts. Wash hands thoroughly with soap and water after handling. Avoid contact with eyes. More information can be found in the corresponding product safety data sheet (SDS).

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