

Water & Environmental Technologies

BioRemove COD SF

BioRemove COD SF is an advanced biological formulation for improving the degradation of nonionic and anionic surfactants. BioRemove COD SF reduces foaming and helps minimize the effects of surfactant-related upsets.

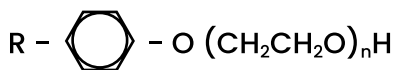
Benefits

Surfactants are a common component in industrial wastewater. Surfactants are used in many industrial processes and are also common in detergents used for cleaning operations. They typically enter the waste stream during rinsing steps.

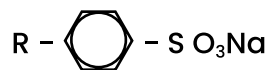
Surfactants can be a major contributor of COD and cause operational problems for the wastewater system. Excessive foaming can occur when the surfactant encounters turbulence and air bubbles in the aeration basin. Typical controls include expensive defoamers, physical removal, or temporarily reducing aeration, which can adversely affect treatment. In high concentrations, surfactants can cause toxicity and disperse floc particles, leading to poor settling and other operational problems.

BioRemove COD SF contains a blend of microorganisms that can degrade a variety of surfactants, including nonylphenol ethoxylates (NPEs) as well as linear and branched-chain ethoxylated alcohols. Enhancing a microbial community's capability for surfactant degradation with BioRemove COD SF reduces surfactant related foaming and improves plant stability.

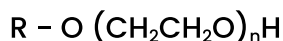
Nonionic and Anionic Surfactants



Alkylphenol Ethoxylate (APE)



Linear Alkyl Sulfonate (LAS)
and Alkylbenzene Sulfonate
(ABS)



Alcohol Ethoxylate (AE)



Soaps (alkali salts
of fatty acids)

R – Branched or linear alkyl, typically C₈ to C₁₀
n – Average ethylene oxide groups per mole

Performance

BioRemove COD SF has been proven to be an effective biological solution for surfactant degradation in both industrial plants and municipal plants that receive industrial flows.

A municipal treatment plant in the United States needed to restart a 4,500 m³ per day (1.2 mgd) system. The influent contained approximately 40% industrial waste with high surfactant concentrations. The main objective was to quickly establish a healthy microbial community capable of BOD, TSS, and ammonia removal, but controlling foaming was also a concern because of the high surfactant load in the influent wastewater.

Foaming can be typical for new biological system start-ups, but in this case, surfactants exacerbated the problem and preventative actions were needed. BioRemove COD SF was recommended to enhance the microbial community's ability to handle surfactants and minimize foaming. After beginning a biological program, the foam soon subsided, and the plant met its start-up goals ahead of schedule. Following the start-up, the plant continued adding BioRemove COD SF to prevent surfactant-related issues on an ongoing basis. Restoring nitrification often involves eliminating toxic sludge from the system before using a product such as BioRemove AM to revive the process.



Fig. 1 Excess foaming from surfactants in wastewater



Fig. 2 Normal operations using BioRemove COD SF

Recommended Use

The dosage rate for BioRemove COD SF is dependent on average daily flow, the volume of the biological reactor, and the COD or surfactant 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 developed, regular dosing is necessary to maintain an accelerated level of biological activity. Exact dosing recommendations are determined based on plant-specific conditions. Increased dosing of BioRemove COD SF is needed for seeding new systems or recovery from a surfactant-related upset.

Optimum pH and Temperature

BioRemove COD SF is added directly to the aeration tank. BioRemove COD SF performs within the pH range 6.0–9.0, with an optimum of 7.0, which allows it to perform well in most biological wastewater systems. Wastewater temperature affects the bacterial activity, with an approximate doubling of 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 (41 °F).

Product Characteristics

PRODUCT	APPLICATION	PHYSICAL FORM
BioRemove COD SF	Surfactant-based 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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