

Wastewater Solutions

Novozymes BioEase™ 4210 & 4245

## Application Sheet

Novozymes' fats, oils, and grease (FOG) treatment solutions are an advanced blend of microorganisms selected for controlling FOG buildup, reducing blockages, and simplifying collection system maintenance.

### Benefits

FOG typically enters the sewer system from restaurants and residential sources. As it enters the system, it begins coating the sewer and floats on top of the water in locations where the water is relatively still, for example pump stations or low-flow sections of pipe. As FOG coats the sewer line, it can accumulate over time and eventually cause blockages which can lead to sewer line overflows. Also, as FOG accumulates in low-oxygen environments, it can partially degrade, leading to foul-odor volatile fatty acids which cause the pH of the water to drop. The low pH encourages the stripping of hydrogen sulfide, which not only causes additional odors but is corrosive and a human health hazard.

A standard method of remedying FOG buildup is by physical means. This often includes having a crew of operators jet the line, which pushes the FOG downstream. This can increase FOG loading and cause operational problems at the receiving plant.

BioEase FOG degradation products are a cost-effective alternative to labor-intensive FOG control methods. Regular use prevents the buildup of FOG and helps reduce operating costs by decreasing the need for physical cleaning of pump stations and sewer lines. Furthermore, pump stations operate without sensor fouling and clogging, and the sewers maintain their flow capacity, improving the overall operation of the system.

## Product range

### BioEase 4210: Easy-to-use FOG control

With its blend of patented spore-forming FOG degraders, fast-acting vegetative FOG-degrading microorganisms, and Biosock® delivery system, BioEase 4210 is Novozymes' high-performance solution for FOG control. Biosocks are attached to a cord, tied to a manhole ladder, and suspended in the water. For best results, they need to be removed and replaced every 1–2 weeks.



### BioEase 4245: FOG buildup removal

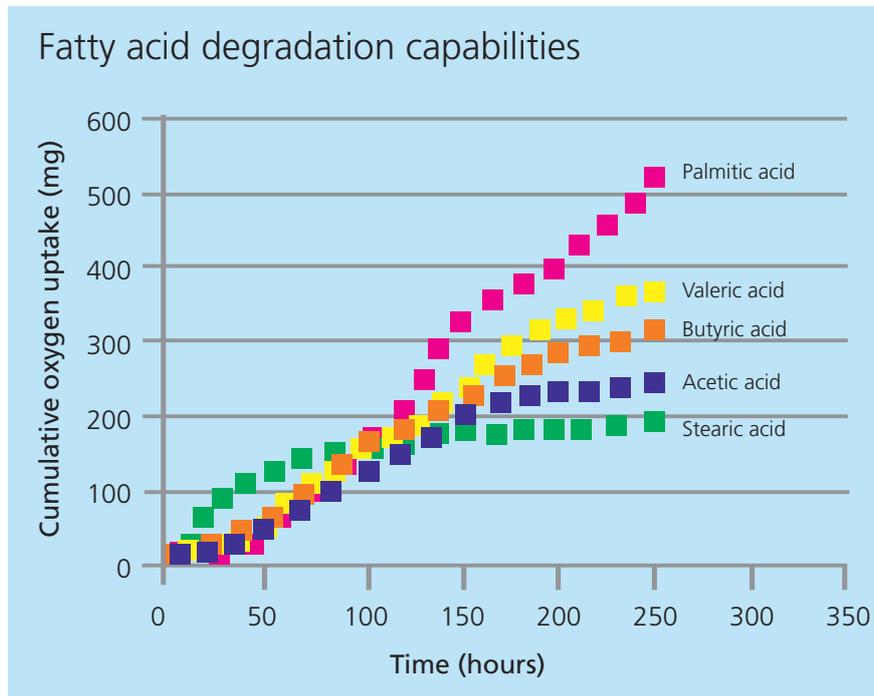
When FOG has already built up, BioEase 4245 works to remove the deposits. As a liquid, it can be applied directly onto the grease or pumped into the collection system flow. Novozymes' patented FOG-degrading microorganisms actually attach to FOG accumulations and work to degrade the FOG in place. Alternatively, BioEase 4245 can be easily dosed into the system on a semicontinuous basis, either manually or with an automatic dosing system for grease control.



## Performance

FOG control and buildup removal are best achieved through long-term continuous use. Depending on flow rates and FOG loading in the collection system, BioEase technology can more than double the time between cleanings and eliminate hot spots where FOG has a tendency to accumulate.

BioEase FOG control technology promotes fatty acid degradation using a synergistic blend of microorganisms selected for high rates of organic digestion along with additives to enhance the biodegradation. FOG is composed of triglycerides. BioEase breaks the triglycerides into glycerol and short-chain fatty acids, both of which are biologically degraded. In addition, the BioEase components are lipophilic, so they will attach to grease deposits, increasing the rate of degradation. Figure 1 demonstrates the biodegradation of fatty acids using Novozymes' patented FOG degradation technology.



**Fig. 1.** Biodegradation of fatty acids using Novozymes' patented FOG degradation technology.

The partial breakdown of grease causes the pH to drop due to the release of fatty acids, creating an environment that is inhibitory to most bacteria. However, BioEase FOG control products are active at low pH levels. Furthermore, the addition of BioEase alleviates problems with low pH by breaking down both short- and long-chain fatty acids, thus maintaining an environment more amenable to active microbial degradation.

When applied within sewer systems, BioEase FOG control products can be used to alleviate sewer overflows due to FOG buildup and blockages. Regular use of BioEase FOG control products can prevent the buildup of FOG in the sewer line and in lift stations, helping to prevent pump and sensor fouling and collection system odors caused by FOG buildup.

A municipality was experiencing high cleanout costs for a sewer line connected to a shopping center. Because of the high amount of FOG buildup, the line was cleaned every 8 weeks.

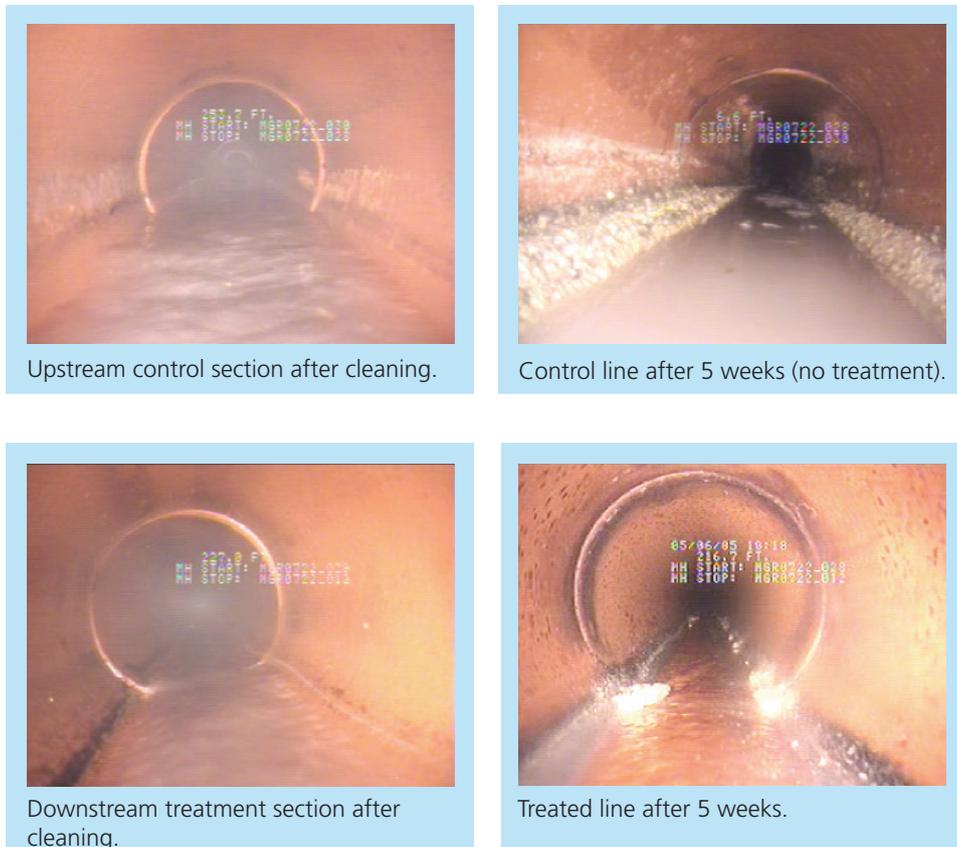


Fig. 2. Sewer pipe after cleaning; with and without treatment.

The photo top left is a FOG hot spot immediately after sewer jetting. The photo top right shows a typical grease buildup in the same section of pipe just 5 weeks later. The photo bottom left shows downstream from the same FOG hot spot immediately after sewer jetting. This section of line was treated with Novozymes patented FOG-degrading strains. The photo bottom right shows much less buildup at 5 weeks compared to the upstream untreated section. With monitoring, the municipality let the treated line go for 7 months before cleaning it again. Novozymes patented FOG degrading strains extended the cleanout cycle by 5 months.

### Recommended use

#### BioEase 4210

The product can be applied in pump stations or wet wells or within a gravity sewer in a 907-g (2-lb) Biosock for gradual release. The sock is lowered into the water from a manhole or manway and tied off to maintain it in place. It can be partially submerged within a wet well or allowed to sit in the flow within a sewer. The product can also be applied directly as a powder or liquid.

**BioEase 4245**

As a liquid, BioEase 4245 provides direct treatment for hot spots and areas of high buildup. It can be metered into the flow for semicontinuous dosing or sprayed directly onto the FOG buildup in pump stations and manholes.

The dosing of each of the products is dependent on the wastewater flow, the grease load, and the cleanout frequency.

**Product characteristics**

BioEase 4210 is a free-flowing tan powder packaged in 907-g (2-lb) Biosocks.

BioEase 4245 is a green liquid.

**Safety, handling, and storage**

Store in a cool, dry place at 10–35 °C (50–95 °F). Avoid inhalation of dusts. Wash hands thoroughly with warm, soapy water after handling. Avoid contact with eyes.

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