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Rethink Tomorrow

MCW 2003

MUNICIPAL COLD WEATHER

Application Sheet

MCW 2003 is a blend of beneficial microorganisms for application to municipal wastewater systems with low-temperature conditions. The addition of MCW 2003 can help maintain COD removal efficiency at low temperatures. The regular addition of MCW 2003 can also help reduce the impact of high influent COD and hydraulic washouts.

Benefits

Temperature drops impact the biochemical reactions associated with bacterial metabolism and reproduction. Reaction rates typically decrease by a half for each 10 °C (50 °F) drop. This decrease in reaction rate is often first seen as a decrease in oxygen uptake rate (OUR) activity or as a decline in COD removal. It can take months for the microbial community to adapt to low-temperature conditions, causing plant operating problems.

MCW 2003 contains beneficial microorganisms proven to tolerate cold-temperature wastewater applications. By building microbial communities with MCW 2003 just prior to seasonal changes, wastewater operators ensure a safe and fast transition for winter operation. Many wastewater facilities find it difficult to lower their F/M ratio in cold temperatures as many microorganisms tend to spend their energy on stress-induced cellular maintenance instead of reproduction. Augmenting with MCW 2003 removes this challenge as the microorganisms' reproduction is not restricted.

Performance

In biological treatment systems, cold temperatures impact microbial growth by slowing down the transfer of nutrients across the cell membrane. Bacterial cell membranes contain fatty acids, which may be saturated or unsaturated. Saturated fatty acids congeal at higher temperatures than unsaturated fatty acids. The higher the concentration of saturated fatty acids, the more likely the cell membrane will congeal and become rigid at low temperatures, thereby inhibiting the transfer of nutrients across the cell membrane. The psychrophilic (cold-loving) organisms in MCW 2003 have much higher concentrations of unsaturated fatty acids in the cell membrane. This allows the membrane to stay more fluid at low temperatures and reduces the impact that low temperatures have on nutrient transport.

IFM has formulated MCW 2003 with naturally occurring microorganisms that have been carefully isolated from low-temperature environments and screened not only for survivability but also for the highest activities in degrading a range of typical constituents found in municipal wastewater.

With MCW 2003, wastewater treatment systems can reduce the period of acclimation and ensure that COD removal rates are not lost so that compliance is not jeopardized.

Recommended use

MCW 2003 can be used for multiple applications, including daily dosing to maintain the microbial community's health during the onset of low-temperature conditions, daily dosing to maintain the microbial community's health in year-round cold environments, increased dosing in response to temperature fluctuations, and seeding during cold-weather plant start-ups.

MCW 2003 bioaugmentation programs generally start 1 month prior to the onset of cold weather. Dosing begins before ambient temperatures reach 4 °C (39 °F) or before wastewater temperatures reach 13 °C (55 °F). MCW 2003 is added daily directly to the aerobic treatment units. The microorganisms in MCW 2003 perform within the pH range 6.0–9.0, with an optimum near 7.0.

The dosage rate for MCW 2003 is dependent on the volume of the biological reactor and the BOD or COD loading in the system. During the initial seeding period, an increased dosage is used to quickly establish the microorganisms in the system. When the microbial community is properly grown, regular dosing is necessary to maintain an accelerated level of biological activity and to continue to minimize upsets. Waiting until after cold weather arrives will likely necessitate increased dosing due to slower acclimation and will vary with operating sludge age.

Product characteristics

MCW 2003 is available as a 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.

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