2601 Cannery Avenue
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Microthrix Parvicella

Coagulant Guide

Prevent Outbreaks With DelPAC® 1842

Overview

Microthrix parvicella presents significant challenges in municipal wastewater treatment, primarily due to its characteristic behaviors and environmental preferences that lead to operational complications. *M. parvicella* is a gram-positive, un-branched filamentous bacterium prevalent in bulking sludges and foams across wastewater treatment facilities. It thrives in environments with long Solids Retention Times (SRTs), particularly in Biological Nutrient Removal (BNR) plants, alternating aerated and non-aerated zones, foam trapping conditions, low temperatures (notably in winter and spring), and when Long Chain Fatty Acids (LCFAs) originating from fats, oils, and grease (FOG) are present. These conditions are common in municipal wastewater settings, making *M. parvicella* a persistent issue that impacts the aesthetics and functional capacity of the wastewater facilities and creates breeding grounds for additional filamentous organisms.

Addressing the *M. parvicella* challenge requires a multifaceted approach, as various preventative measures have their own drawbacks and benefits. Strategies include reducing SRTs, adding chlorine or other chemicals, eliminating food sources like FOG, and implementing physical interventions such as surface spraying of foam or digester modifications. Each method has its complications; for example, reducing SRTs or adding chlorine can inhibit nitrification, a crucial process in wastewater treatment. Other measures, like FOG elimination, tackle the cause of *M. parvicella* growth but are difficult to achieve effectively. Advanced techniques, such as adding a high-metal-content Polyaluminium product, such as DelPAC 1842, DelPAC 1525, AlcoPAS™ 1000, or UltraFloc® 1209, aim to target *M. parvicella's* food source directly and have proven to be the most cost-effective solution for outbreak prevention.

DelPAC and AlcoPAS products are used to avoid *M. parvicella's* ability to propagate using lipids; lipids are prevalent in wastewater as fats and oils which coagulants can help remove from the process. On the next page, you will find 2 steps to follow when implementing USALCO products to defeat the propagation of *Microthrix parvicella*.

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Implementation Guide

Step 1
Calculate Remedial Dose

a. [Calculate Al Required and Factor]
60 / SRT = Al required per kg MLSS
b. MLSS / 1000 = Factor A
(Mixed Liquor Suspended Solids)
c. Al Required x Factor A = g/m^3 MLSS
d. $\%Al^{3+}$ / 100 = Concentration of Al Required
e. g/m^3 / Al Required = ppm for Remedial Dose
(Parts per Million)

Step 2
Treatment Conditions

PAC should be administered concurrently with a high oxygen concentration in the aeration basins (above 2.5mg/L) and with the MLSS concentration kept low (below 2.5 g/L) since *M. parvicella* thrives in conditions of low oxygen.

Remedial Formula: 60/SRT = grams of Al^{3+} per kg MLSS
Prevention Dose = ~1/6 of Remedial Dose
g/m^3 = mg/L = ppm

Example

MLSS = 3000 SRT = 25	
DelPAC 1842 = 9.01% Al^{3+} or 0.0901	
Step 1 - Calculate Remedial Dose	
a.	60 / SRT = 2.4 g of Al^{3+} / kg MLSS
b.	MLSS / 1000 = 3
c.	2.4 x 3 = 7.2 g/m^3 of Mixed Liquor
d.	Determine Al^{3+} Based Product $\%Al^{3+}$ / 100 = 0.0901 Al^{3+}
e.	Determine ppm of Product 7.2 / 0.0901 = 79.9 ppm of DelPAC 1842

USALCO Product Name	% Al^{3+}
DelPAC 1525	7.23
DelPAC 1842	9.01
UltraFloc 1209	6.94
AlcoPAS 1000	4.37