

Filtration characterization methods in MBR systems: A practical comparison

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ABSTRACT

Three different methods for filtration characterization in membrane bioreactor (MBR) systems were compared. These were the Delft filtration characterization method (DFCm), the Berlin Filtration Method (BFM) and an *ex situ* side-stream filtration test cell for the determination of the critical flux. The *ex situ* filtration test cell and the DFCm filter activated sludge from a tank, while the BFM works *in situ* with a test cell directly submerged into the biological tank at similar operational conditions to a typical MBR plant. The mixed liquor of four different MBR units was characterised several times with the three filtration methods. The three tested methods seemed to agree in the classification of the tested mixed liquors in terms of filterability except for one of the tested activated sludges. Additionally, three critical flux protocols were studied using the BFM filtration test cell. The first consisted in the classical flux-step method, the second included relaxation between filtration steps and in the third protocol, 2 min filtration at a fixed flux were performed before every filtration step. The last protocol was selected as the most representative of full scale MBR operation and the most interesting one for giving valuable information about the irreversibility of the fouling.

Keywords: Membrane bioreactors (MBR); Filterability; Fouling

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