

## Indirect effects of membrane configuration on MBR sludge filterability

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### ABSTRACT

During a combined pilot-scale study, operating conditions were fixed for three different membrane configurations a multi tube, a hollow fibre and a flat sheet membrane type. Changes in activated sludge filterability were quantified depending on the membrane chambers, the permeate flux of extraction and the membrane chamber aeration. The aim of this study was to provide a better understanding of the interactions between MBR activated sludges and hydraulic circumstances depending on membrane configurations. Two mechanisms can be distinguished from this study: Due to practical arrangements, hydraulic conditions in each membrane unit are different, leading to different total suspended solids concentrations (TSS). These margins in TSS contents cause differences in filtration behaviour. The multi tube configuration did not affect the activated sludge filterability. The activated sludge filterability remained the same in spite of flux and air-lift velocity changes. The flat sheet and the hollow fibre configuration did affect the sludge filterability. The filterability improved significantly at high flux and at low air-lift velocity (from 20% to 90% of improvement). The TSS concentration phenomenon is likely to be responsible for the activated sludge filterability improvement. It might be due to floc structure modifications resulting in a better cake layer porosity. No correlations were found between SMP and filterability.

*Keywords:* Membrane configuration; Filterability; MBR; Pilot scale

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