

Risk management approach for monitoring UF membrane integrity and experimental validation using MS2-phages

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ABSTRACT

Low-pressure membrane filtration systems, such as microfiltration (MF) and ultrafiltration (UF), have received a great deal of attention in the past 15 years due to their ability for the removal of microbial pathogens, especially *Cryptosporidium* and *Giardia*. The major concern for the application of membrane technology is, however, how to ensure integrity of these barriers, since small defects in membranes could result in significant reduction in pathogen removal efficiency. In order to ensure safe drinking water treatment, number of environmental agencies request to membrane operators to conduct regular direct integrity tests to control the microbial Log Removal Values (LRV) of the membrane plant. Typically, test conditions must be selected to provide information on defects larger than 3 μm to ensure *Cryptosporidium* removal. In that context, the objective of this project was to develop and valid, both at bench-scale and full-scale, a model based on the equations proposed by USEPA and ASTM that uses the air flow rate throughout a defect during the air pressure test for predicting the microbial log removal value.

Keywords: Ultrafiltration; Membrane; Integrity; Pressure decay test

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