Critical flux determination by flux-stepping

In membrane filtration related scientific literature, often step-by-step determined critical fluxes are reported. Using a dynamic microfiltration device, it is shown that critical fluxes determined from two different flux-stepping methods are dependent upon operational parameters such as step length, step height, and flux start level. Filtrating 8 kg/m(3) yeast cell suspensions by a vibrating 0.45 x 10(-6) m pore size microfiltration hollow fiber module, critical fluxes from 5.6 x 10(-6) to 1.2 x 10(-5) m/s have been measured using various step lengths from 300 to 1200 seconds. Thus, such values are more or less useless in itself as critical flux predictors, and constant flux verification experiments have to be conducted to check if the determined critical fluxes call predict sustainable flux regimes. However, it is shown that using the step-by-step predicted critical fluxes as start guesses, in our case, in constant flux verification experiments for 5 and 112 hours, a sustainable flux was identifiable.

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