



## Analysis of brine desalination with different channels by vacuum membrane distillation

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### ABSTRACT

The fluid flow in a rectangular channel is observed by a high-speed fluid field display system, and the fluid appearances under different operate parameters are presented pictorially. Numerical simulations are performed to investigate brine desalination by vacuum membrane distillation (VMD) with three different channel configurations (rectangular, serpentine and spiral) to compare the effect of channel configuration on the process. The results obtained from simulation are analysed from the viewpoint of field synergy. This study concludes that better field synergy leads to better membrane permeability flux. The spiral channel shows the best performance in enhancing heat transfer and increasing the synergy. Increasing the co-direction component of the multi-field could enhance the transfer process. The numerical simulation results are consistent with experimental results.

*Keywords:* Vacuum membrane distillation; Desalination; Channel configuration

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