

## Steady state and dynamic models of multistage flash desalination: A review

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### ABSTRACT

This article focuses on a review of literature studies on steady state and dynamic modeling of the multistage flash desalination process (MSF). The review shows that both steady state and dynamic models are based on lumped parameter approach. Differences in literature models are found in the assumptions used to model the flashing stage in addition to the correlations used to determine the heat transfer coefficients, thermodynamic losses, thermodynamic and transport properties. Interestingly, literature indicates a rapid progress made in software used for coding and solution of the model equations. The review shows a limited number of literature models for the internals of the flashing stage, which includes the brine orifice, the demister, and the condenser tube bundle. The review of models for lumped analysis and the process internals focuses on evaluation of the quality of the predictions of these models, their functionality and suitability to perform the desired process simulation. A special section of this review focuses on the current status of MSF simulators, which includes modular and equation oriented simulators. This evaluation focuses on simulator simplicity and flexibility in order to take into account possible different process elements.

*Keywords:* Desalination; Multistage flashing; Modeling; Steady state; Dynamics; Control

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