

Thermal

The thermal processes available for sea water desalination are basically of two types:

- **Multi Stage Flash**
- **Multiple Effect Distillation**

The two processes are substantially based on the same physical / thermodynamic principles, but differ in some basic aspects and peculiarities.

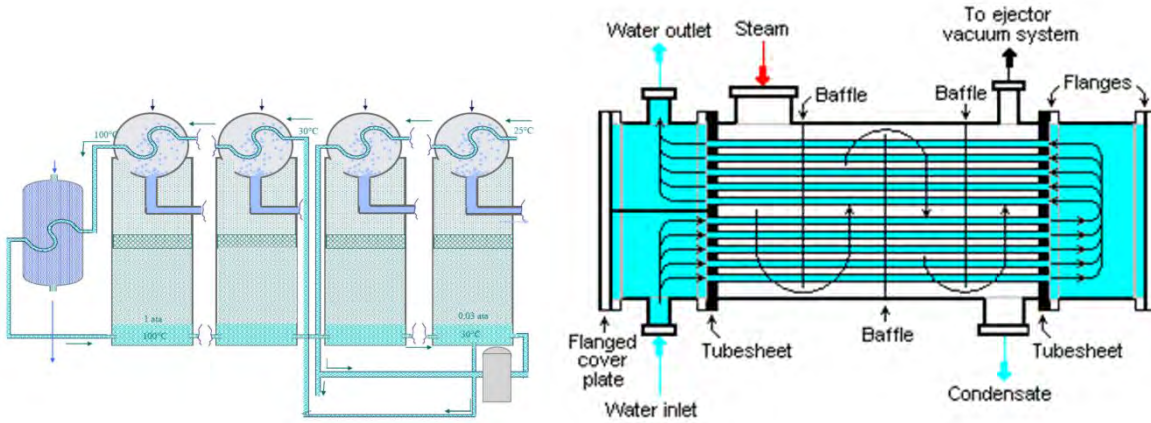
Both technologies are well proven, however MSF is particularly suitable for large installations (most of the recent units presently running have a capacity between 13.3 and 17.5 MIGD), while MED is more suitable for small / medium installations (most of the recent units presently running have a capacity between 5.0 and 8.0 MIGD).

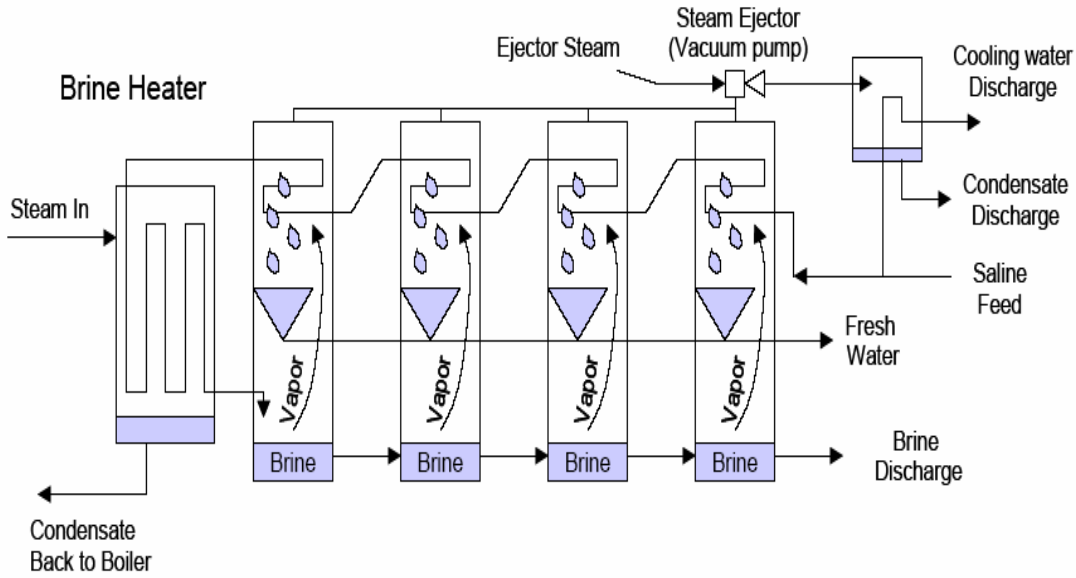
Depending on the specific requirements and availabilities, one technology or the other can be preferable: MED can be efficiently applied in cases when very low pressure steam (≤ 2.0 bara) is available, but if high thermal efficiency are required, MED needs to be fed by MP steam, and to be coupled with a Thermal Vapor Compressor (TVC).

On the other hand, MSF can only be applied in cases when low pressure steam is available at $p \geq 2.5$ bara, but can reach high thermal efficiencies independently from LP steam pressure, at lower installation costs and without any need of additional equipment.

The environmental constraints on sea water temperature rise are relevant to the whole plant, thus depending only on plant capacity and thermal efficiency. Hence, for a fixed thermal efficiency, the sea water requirement is exactly the same for MSF and MED.

Multi Stage Flash





Multiple Effect Distillation

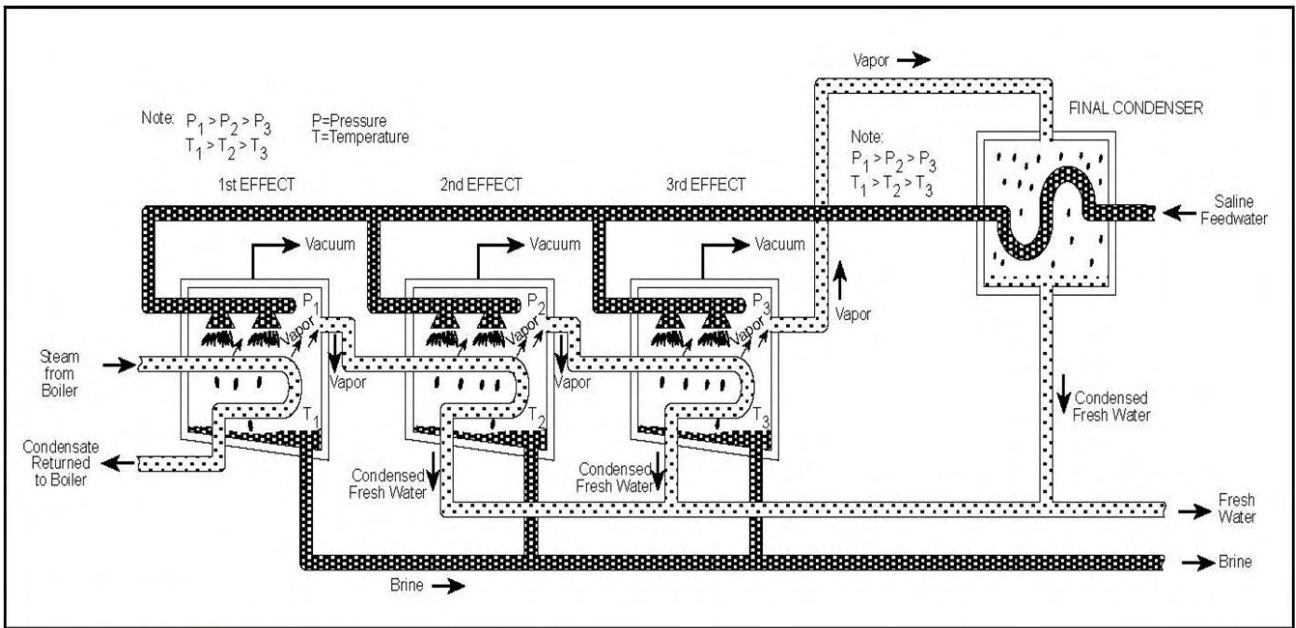


Diagram of a Multi-Effect plant with horizontal tubes.

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