Case study of Memsys RO-brine concentration plant in Abu Dhabi, UAE

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Project information

In 2013, Masdar – a Mubadala Development Company – launched the Renewable Energy Seawater Desalination Program. In the framework of the Program, Abengoa was selected to develop a cutting edge desalination pilot plant that will employ a more sustainable and energy-efficient process that could eventually be powered by renewable energy, Memsys membrane distillation technology is the key part in this pilot process, which is used in RO brine concentration stage to increase the whole potable water production and save more operational cost.

Project targets:

- **Location: Ghantoot (Abu Dhabi, UAE)**
- **Net potable water output: 1060 m^3/day**
- **Technology: MF+UF+RO+MD**
- **Energy consumption: 3.6 kWh/m^3**
- **Recovery: RO 41% to 85%, MD 40%~50%**

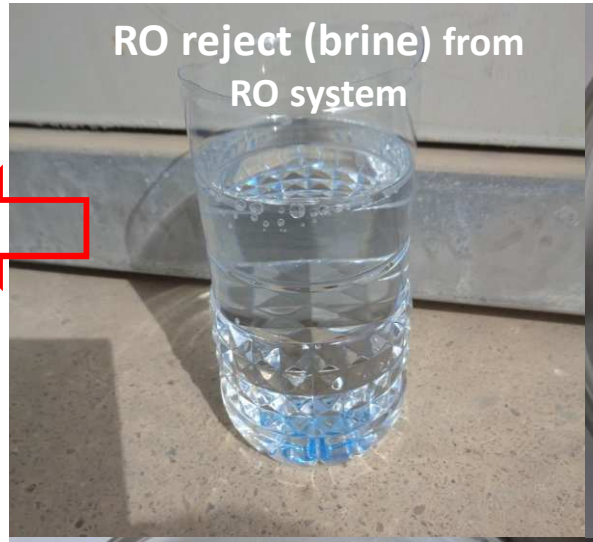
Memsys system configuration

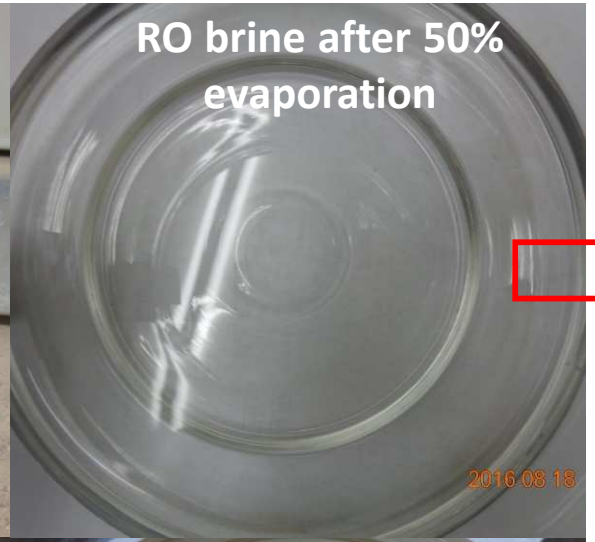
Memsys MD system with 60~70 m^3/day production rate

"Hot" side of Memsys system to receive the driving energy

Feed (RO-Brine) evaporation test for Memsys process

- RO brine is clean and clear from RO system;
- No pre-treatment needed and can feed MD directly





- No scaling formed after 50% evaporation

- Salt residues after full evaporation

- The residues can be fully dissolved in HCl solution, which suggests an easy CIP procedure to MD process

Memsys system testing results

Memsys performance	
Distillate flow	2.5 m^3/hour
Distillate quality	Conductivity < 20 µm/cm
Final brine quality	TDS > 150,000 mg/l
Recovery rate	47 %
Specific thermal consumption	160 kWh/m^3 distillate water
Specific electrical consumption	~3 kWh/m^3 distillate water