

WATER DESALINATION REPORT

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Company News

BATCH RO READY FOR COMMERCIAL LAUNCH

Stories on batch RO processes usually begin by explaining that it is a ‘theoretical’ or ‘promising’ approach to reducing RO energy consumption, and over the last few years, the evidence has continued to grow. Last year, a university team’s prototype batch RO won a wave-powered competition. And just last month, another university team won a US Bureau of Reclamation’s pilot competition with its batch RO design.

Last week, Salinity Solutions—a UK-based spinoff of the University of Birmingham funded by a crowdfunding campaign—told *WDR* that it was ready to commercialize its Sealed Loop RO technology. The move follows several successful field trials of the patented process, including an application in which its SAM50 unit achieved a 7X concentration of a lithium-rich groundwater for Cornish Lithium in far southwest England.

A typical RO system operates as a continuous process, where the entire feed stream is pressurized to overcome the highest osmotic pressure that occurs along the length of the pressure vessel. However, a batch RO system gradually concentrates a fixed volume of feed in direct proportion to its increasing osmotic pressure. To accomplish this, Salinity Solutions has developed a piston-type pressure exchanger that acts as a variable-volume tank to accommodate the hydraulic circuit’s diminishing volume as permeate exits the system.



The SAM50 – A 26 m³/d batch RO in a 20-foot container

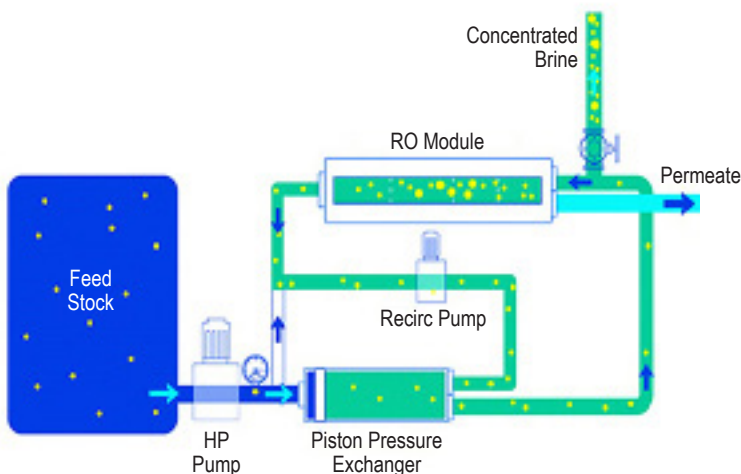
“Being a batch process, it’s non-continuous, with two stages of operation: a pressurization step, where fresh water is produced as saline water is recirculated and concentrated, and a purge-and-refill step where the system is flushed of brine from the previous batch and refilled for the next pressurization phase. The downtime is about 5% of each operational cycle, and the result is a very energy-efficient process with a footprint that is 50% less than a conventional system,” explained company co-founder, Tim Naughton,

“In one recent customer field trial on brackish water UPW application, we achieved a 95% recovery rate and concentrated brine to a 13X concentration factor while producing a permeate quality of less than 10µS/cm [5 ppm], at a specific energy consumption of 0.5 kWh/m³ [1.89 kWh/kgal]. The technology is easily capable of treating seawater at 35,000 ppm TDS and above.”

The company has developed a market-ready SAM50 unit with a production capacity of 26 m³/d (6,900 GPD), and which fits comfortably within a 20-foot container. According to commercial director Steve Dunn, the system is modular and entirely scalable, with a full supply chain in place. Pre- and post-treatment systems can be included.

Although the technology is said to be easily capable of treating seawater at 35,000 mg/L TDS and above, Salinity Solutions will initially target agriculture, mineral extraction, food processing and electroplating applications where the company has already seen significant interest. It is also seeking potential OEM partners and process licensees.

Visit <https://vimeo.com/747210737/5826820810> to view a video further describing the process.



The pressurization cycle of Salinity Solutions batch RO process