

**SIEMENS**

*Ingenuity for life*

## Revive™ oily water membrane systems for Produced Water Treatment

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*Do you need to meet challenging surface discharge, reuse/reinjection or IX/RO feedwater requirements? Are you facing higher water cuts resulting in increased water disposal costs? Do you want to eliminate expensive, continuous-use chemicals required for flotation units?*

If so, consider membrane treatment instead of flotation, filtration and polishing steps, for better produced water treatment results.

With over 30 years of produced water treatment experience in over 23 countries and with more than 600 systems installed worldwide, Siemens Water Solutions has the expertise to address your specific needs.

### **Why membranes?**

Siemens' Revive™ oily water membrane systems replace both filtration and flotation with a single step, eliminating the need for polymers and allowing for better oil recovery. Revive™ systems can achieve Oil & Grease and Total Suspended Solids levels of <1 mg/L, and Silt Density Index of <3.

Revive™ treatment systems are also robust enough to handle high-temperature applications, and they can be used as a pre-treatment step for boiler feed water, cooling tower

make-up and process water use, in addition to pre-treatment for irrigation, surface discharge or reinjection.

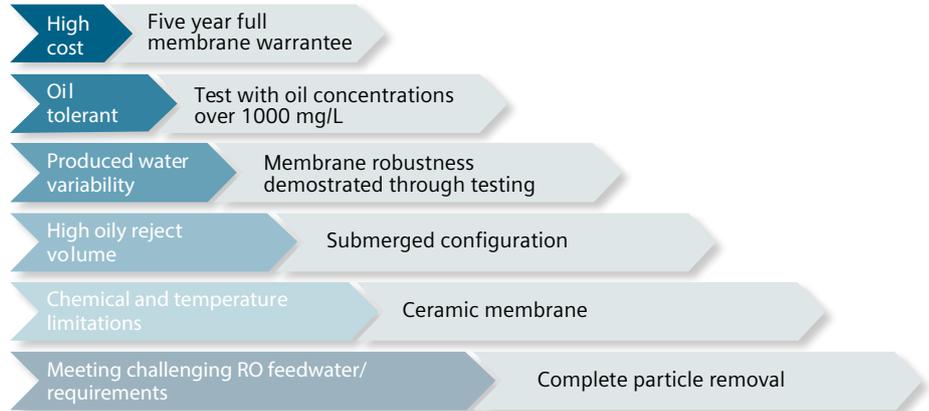
And while there have been concerns of cost, oil tolerance and produced water variability with using membranes in produced water treatment applications, Revive™ oily water membrane treatment systems effectively address those challenges with a five-year membrane warranty and by using flat sheet ceramic membranes in a submerged configuration. The submerged configuration significantly reduces the amount of oil in contact with the membrane to reduce fouling. It also enables over 99% water recovery without the need for large and expensive recirculation pumps, resulting in floating oil that can be recovered to improve your bottom line.

**Benefits of using Revive™ oily water membrane treatment systems:**

- Superior effluent quality in a single treatment step
- Greater oil removal efficiency including oil-coated solids and emulsified oil removal
- No consumable media
- Increased water recovery / reduced reject volume
- Increased oil recovery with free floating oil
- No proprietary chemicals
- Submerged ultrafiltration membranes superior to tubular ceramic membranes
  - Five-year, non-prorated membrane warranty
  - Better-suited for large flow rates
  - Oil coalescence minimizes oil contact with membranes
  - Over 99% water recovery with further oil recovery of floating oil
  - Low pressure operation
  - No high pressure vessels and tighter module packing
  - Simpler system layout

**Challenges of membrane treatment, and the Siemens advantage**

**Challenge | Siemens' Soution**



Feed, MOS tank and effluent samples from a system using Revive™ oily water membranes.

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