

PolyCera® Titan

UF membranes demonstrate superior performance against ceramic membranes in commercial produced water treatment application

Overview

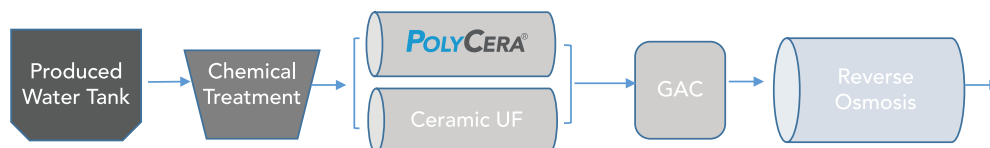
- Membrane technology is gaining increasing attention in upstream oil and gas produced water management and beneficial reuse applications. Market drivers for water treatment in the industry include stringent environmental regulations, increasing produced water volumes and fluctuations in water composition.
- California oil and gas producers are seeking reliable and affordable solutions to treat produced water for reuse due to diminishing fresh water reserves and increasing disposal costs.
- PolyCera Titan robust UF membranes, designed for produced water treatment, offer improved fouling resistance, lower energy requirements and less intensive cleaning to maintain sustainable and reliable operation.

Demonstration

- PolyCera Titan UF Spiral Monolith® elements were selected for a three-week demonstration to treat reuse produced water for a supermajor oil producer in California.
- The innovative PolyCera Titan membranes were benchmarked against conventional titanium — aluminum oxide ceramic membranes.
- Key economic drivers evaluated were specific energy consumption (SEC), process recovery (i.e., total filtrate to feed flow) and net recovery (accounts for the sum of all waste and backwash streams.)



Process Flow Diagram



**PolyCera®
Titan**

**~99%
O&G and
Turbidity
Removal**

**0.046
kWh/bbl
SEC**

**90%
Recovery**

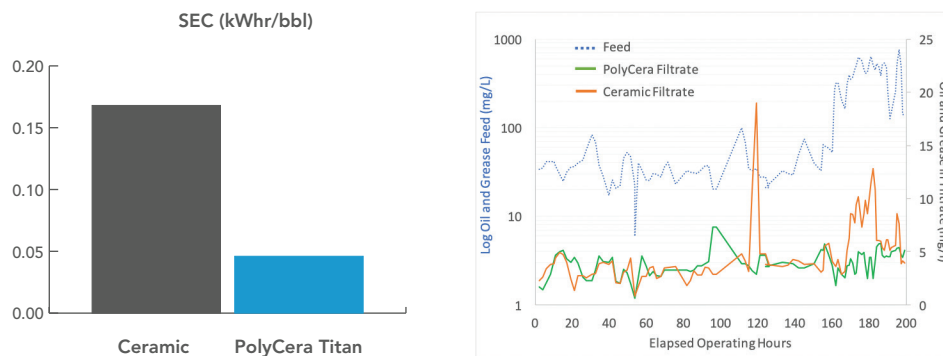
**73%
Lower SEC**

**13%
Lower
Backwash
Frequency**

Results

- Over the course of operation, an average feed oil and grease concentration of ~50 mg/l, with spikes up to 500 ppm, and average turbidity of 36 NTU was measured. At these conditions, PolyCera Titan membranes retained similar performance to ceramics but required only 1/3 of the energy.
- Lower flux decline and more stable operation was observed for Titan membranes, with 13% lower backwash frequency, contributing to higher recovery – 90% for PolyCera Titan vs. 88% for ceramic membranes.
- Significant SEC reduction was exhibited by the PolyCera Titan membrane, attributed to lower recirculation rate, lower pressure drop, as well as less frequent and intensive cleaning.

Figure 1. SEC of ceramic and PolyCera membranes (left). O&G in the membranes feed and filtrates (right).



Value Proposition

- PolyCera Titan membranes provide ceramic performance with polymeric economic and deliver more water at a lower cost.
- PolyCera Titan UF membranes provide effective and reliable pretreatment before advanced treatment technologies, including desalination, in water reuse applications.
- PolyCera Titan membranes are made from a polymer material that has a superior threshold for withstanding highly fouling prone waters (e.g., free O&G), while exhibiting high cleanability and complete flux recovery after fouling.

PolyCera, Inc.
721 S Glasgow Ave.
Unit D
Los Angeles, CA 90301

T +1.424.331.7700
W www.polyceramembranes.com
E info@polyceramembranes.com

© 2018 PolyCera, Inc. All rights reserved.

Titan.OG.C.12.18