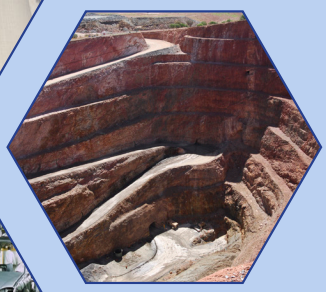
PolyCera®

PolyCera® Titan Membranes

Polymer Economics + Ceramic Performance



www.polyceramembranes.com

POLYCERA® MATERIAL PLATFORM

State-of-the-art polymeric filtration membranes offer a wide range of separation performance at a small footprint and commoditized prices; however, conventional materials have limited chemical and thermal stability and are prone to fouling. These materials require frequent cleaning which increases system downtime, chemical consumption, operating costs and membrane replacement. Alternatively, ceramic membranes offer similar separation performance with much greater stability and fouling resistance, but at a cost of 5 -10 times that of polymeric membranes.

PolyCera is a new generation of polymeric membrane materials, adapted from Nobel Prize-winning chemistry, into breakthrough membrane structures that exhibit unique performance properties unlike conventional polymeric and ceramic membranes. PolyCera membranes bridge the gap between the exceptional performance of ceramic membranes and the low cost of polymeric membranes.

WHAT MAKES POLYCERA BETTER?

1. Hydrophilic

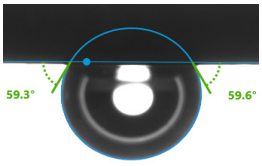
Hydrophilic means more water and lower OPEX. PolyCera membranes are constructed from a material that is intrinsically hydrophilic. This translates to:

- **Maximum sustained flux**
- **Lower energy requirements**
- **Improved fouling resistance**
- **Easy to clean surface and pores**

How hydrophilic is PolyCera?

Captive bubble contact angle measures the extent to which hydrophobic materials will displace water from the membrane surface and stick strongly to the membrane. ***The lower the angle, the more the material favors water, resists fouling and cleans easily.***

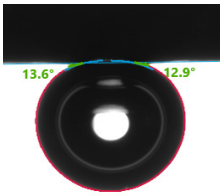
Hydrophilic PVDF



59.5°

Least Hydrophilic

PolyCera Titan



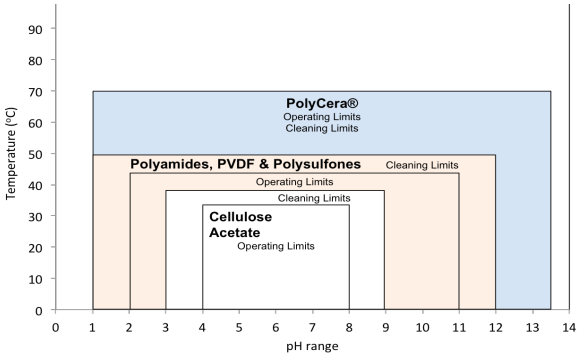
13.3°

Most Hydrophilic

Above: Captive bubble (air bubble in deionized H_2O @ 25°C) with membrane lying horizontally with feed side facing down. Air is perfectly hydrophobic.

2. Robust & Backwashable

Robust means lower OPEX through easier cleaning and extended membrane life. The unique electronic properties of PolyCera behave a lot like metallic and ceramic materials, which are notable for their thermal and chemical robustness.



PolyCera Titan membranes are made from 100% PolyCera polymers by a patented process that gives rise to membranes that rival ceramics in their temperature and chemical stability, but at 10-times lower cost and lower energy operations.

For OEMs, integrators and owner/operators who struggle to apply membrane filtration in industrial wastewater treatment, our PolyCera Titan membrane is a 5 nm pore size UF membrane that delivers next-level oil, hydrocarbon, pH and temperature stability with high sustainable flux operation and ease of cleaning.

POLYCERA® MEMBRANE PRODUCTS

	Pure Water Permeability gfd/psi (lmh/bar)	MWCO kDa	Max Feed Pressure psi (bar)	Max Backwash Pressure psi (bar)	Max Operating Temperature °F (°C)	Max pH Range	Max Oil & Grease mg/L
PolyCera Titan UF	**8 (200)**	**70**	**120 (8.3)**	**25 (1.7)**	**158 (70)**	**1 - 13.5**	**500**
Conventional PAN	5.7 (140)	70	116 (8.0)	5 (0.3)	131 (55)	3 - 10	100
Conventional Ceramic	4 (100)	70	116 (8.0)	25 (1.7)	203 (95)	0 - 14	100

*Pure water permeability performed on flat sheet product

PolyCera 8-inch Spiral Monolith™

BENEFITS

- ✔ Lowers operating cost
- ✔ Low energy demand
- ✔ Less process down-time
- ✔ Maintains high flux
- ✔ Low irreversible fouling
- ✔ Handles challenging waters
- ✔ Reduces chemical demand
- ✔ Minimizes waste

APPLICATIONS

- ✔ Produced Water
- ✔ Mining
- ✔ Refineries
- ✔ Automotive
- ✔ Oily wastewater
- ✔ Anaerobic digestate
- ✔ Power generation

PolyCera Titan Membranes were developed for oily water filtration.

Case Study: PolyCera Titan vs. Ceramic

A field pilot demonstrates the superior performance of PolyCera Titan relative to a leading competitor's ceramic UF membrane used in a centralized produced water treatment facility. PolyCera exhibited ***11% increase*** in water recovery while providing a ***72% decrease*** in specific energy consumption leading to a total operating expenditure ***savings of 70%***.

MORE WATER. LESS COST.

Contact us today to find out how PolyCera® Titan membranes can revolutionize your membrane system

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