

PolyCera® Titan Membranes

**Smart Membrane Products.
More Water. Less Cost.**



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 up to 10-times that of polymeric membranes.

Water Planet, Inc has developed 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

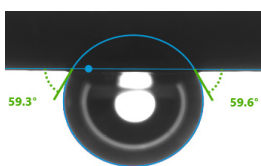
Hydrophilic means more water and lower OPEX. PolyCera membranes are constructed from a material that is intrinsically hydrophilic. This translates to:

- 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.*

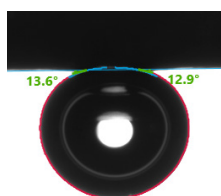
Hydrophilic PVDF



59.5°

Least Hydrophilic

PolyCera Titan



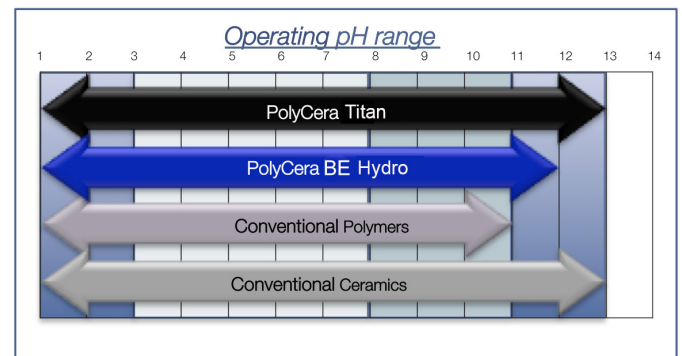
13.3°

Most Hydrophilic

Above: Captive bubble (air bubble in deionized H₂O @ 25°C) with membrane lying horizontally with feed side facing down. Air is perfectly hydrophobic.

2. Robust

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 sub-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	Max TSS mg/L
PolyCera Titan UF	10 (250)	70	120 (8.3)	25 (1.7)	158 (70)	1 - 13.5	500	200
Conventional PAN	5.7 (140)	70	116 (8.0)	5 (0.3)	131 (55)	3 - 10	100	50
Conventional Ceramic	4 (100)	70	116 (8.0)	25 (1.7)	203 (95)	0 - 14	100	150

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
- ✓ Acid mine drainage
- ✓ Refineries
- ✓ Automotive

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.

“In our domestic wastewater, tertiary filtration application, PolyCera has lived up to its billing. Consistent TSS less than 1, all while functioning with relatively little cleaning requirement.”

- Alan Pyle, Chief Executive Officer, WaterFleet, LLC

“Water Planet’s qualifications in that area and the fact they can look independently at a lot of different commercial membrane technologies -- that is what attracted us to them for the membrane treatment side of things.”

- David Pernitsky, Senior Research Engineer Suncor Energy Inc., Calgary, Canada

“Water Planet’s knowledgeable and experienced engineering staff offers a depth of knowledge unmatched in the industry, and they offer such service in the most cost-effective manner we have seen to date.”

- Jung-Chul Kim, Executive Vice President, R&D Division, Hyundai Engineering & Construction (HDEC)

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

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