

## PolyCera® Hydro Membranes

Polymer Economics + Ceramic Performance



# 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.

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

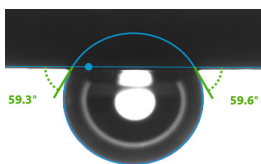
Hydrophilic means more water and lower OPEX. PolyCera membranes are constructed from a material that is intrinsically hydrophilic. This translates to:

- 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.*

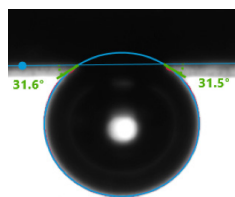
#### Hydrophilic PVDF



59.5°

**Least Hydrophilic**

#### PolyCera Hydro



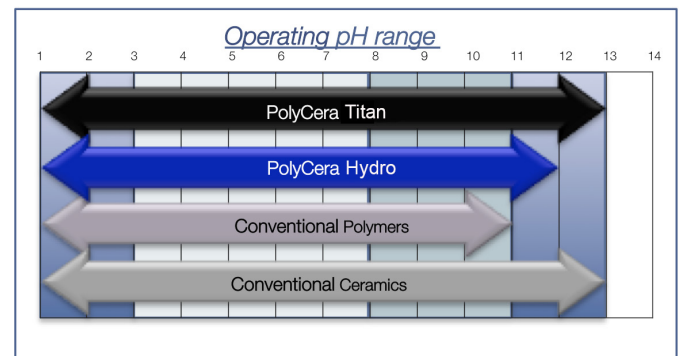
31.6°

**Most Hydrophilic**

**Above:** Captive bubble (air bubble in deionized H<sub>2</sub>O @ 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 Hydro** membranes are made by a patented process of blending PolyCera and commodity polymers, which gives rise to membranes that exhibit robustness of the commodity polymer, but with unrivaled fouling tolerance and ease of cleaning.

For OEMs, integrators and owner/operators who struggle to maintain high water throughput in tap water filtration, our PolyCera Hydro membrane is a sub-20 nm UF membrane that delivers 6:4:3 log removal (bacteria: virus: protozoa) with high sustainable flux operation, fouling tolerance 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 Hydro UF	18 (450)	100	120 (8.3)	25 (1.7)	122 (50)	1 - 12	5
Conventional PVDF	6 (150)	100	120 (8.3)	5 (0.3)	122 (50)	2 - 11	5
Conventional PES	6 (150)	100	120 (8.3)	5 (0.3)	122 (50)	2 - 10	5

\*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

- ✓ POU/POE
- ✓ Surface water
- ✓ Seawater
- ✓ Groundwater
- ✓ Tertiary
- ✓ MBRs

PolyCera Hydro Membranes were developed for drinking water and biological wastewater.

### Case Study: PolyCera Hydro vs. PVDF

A field pilot demonstrates the superior performance of PolyCera Hydro relative to a leading competitor's PVDF membrane used in tertiary filtration of municipal secondary effluent. PolyCera exhibited **23% increase** in water recovery while providing a **20% decrease** in specific energy consumption leading to a total operating expenditure **savings of 38%**.

**MORE WATER. LESS COST.**

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

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A WATER PLANET COMPANY