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# OXYPHEN TRACK- ETCHED MEMBRANES

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Precise control over pore size and pore density

## What Are Track-Etched Membranes?

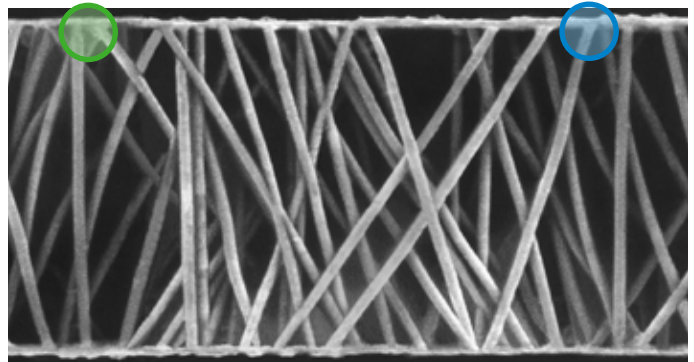
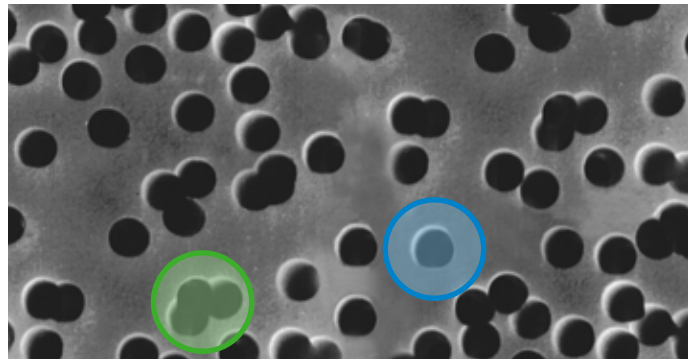
Track-etched membranes feature a unique pore structure that offers the smallest tolerances regarding pore sizes and pore density on the market. The unique two-step process allows Oxyphen to target specific customer requirements regarding pore size and density that affect air- or media flow and water entry pressure (in case of hydrophobic/oleophobic treatment). Due to their smooth surface, track-etched membranes are a perfect surface filter with reversible (backflush) and self-cleaning functionality for hydrophobic, oleophobic, and hydrophilic applications.

The technology to produce our track-etched membranes follows two key steps:

- Ion bombardment of polymer films with heavy ions to create distinct tracks
- Subsequent chemical etching of polymer films

The two-step process enables complete control of both pore size and pore density independently from one another to ensure precise pore diameter and controlled pore density to meet customer-specific requirements.

**100% PFOA Free:** Compliant with (EC) 1907/2006 REACH / Regulation (EU) 2019/1021 POP



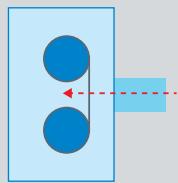
Very regular pore sizes and densities due to the angled pore structure that divides multiple pores on one side to a single on the other side

Multiple pores

Single pore

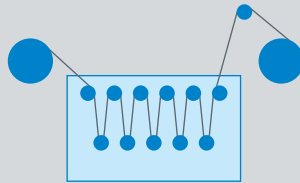
## Track-Etched Membrane Manufacturing Process

Heavy ion beaming of polymer film



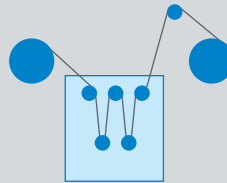
Pore Density

Etching of membrane



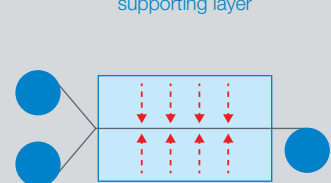
Pore Size

Optional application of surface treatment

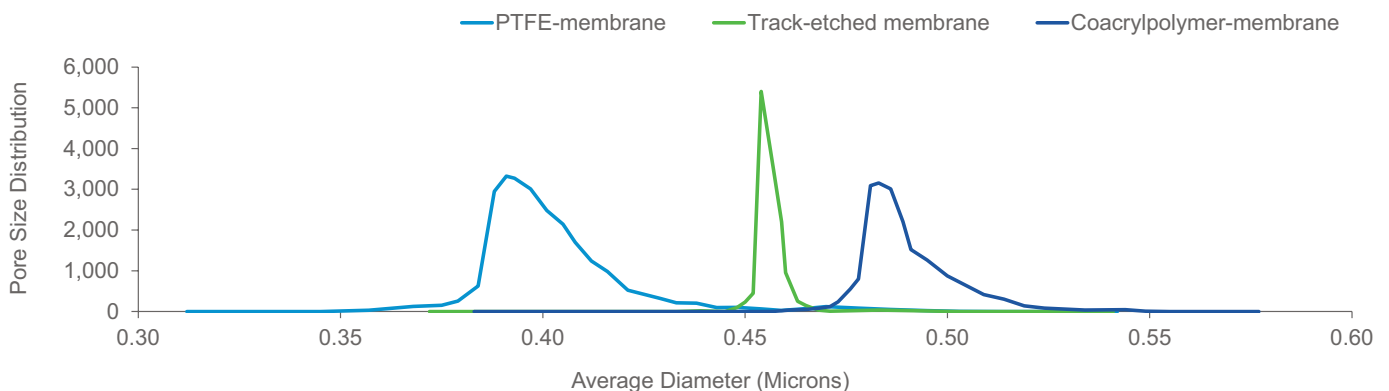


Functionality of the surface

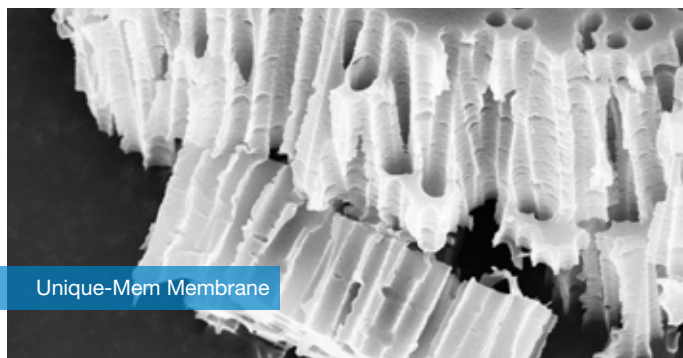
Optional lamination of membrane using a supporting layer



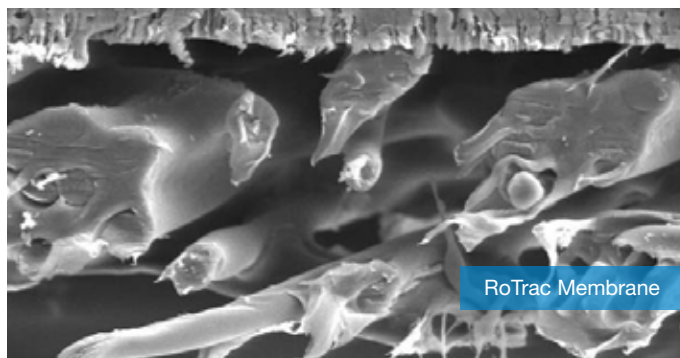
Mechanical stability



Low variation of pore size enables greater precision and control



Unique-Mem Membrane



RoTrac Membrane

## Unique-Mem® Track-Etched Membranes

Unique-Mem® track-etched membranes are characterized by cylindrical shaped pores penetrating the membrane in different angles, as well as a smooth flat surface and well-determined flow rates. They are available either as hydrophilic or hydrophobic membranes.

### Key Benefits

Unique-Mem® track-etched membranes consist of a single, unsupported membrane layer and are available either as hydrophilic or hydrophobic version. They can be transparent or translucent depending on pore density.

#### Hydrophilic features used for filtration applications:

- 100% Free of PFOA: Compliant with (EC) 1907/2006 REACH / Regulation (EU) 2019/1021 POP
- Biological inert
- Low protein binding
- High chemical resistance
- Resistant to gamma-ray and X-ray sterilization
- Extended hydrophilic coating available

#### Hydrophobic features used for venting applications:

- High chemical resistance
- Resistant to gamma-ray and X-ray sterilization
- Self-cleaning and reversible function through minimal pressure difference

## RoTrac® Track-Etched Membranes

RoTrac® track-etched membranes are Unique-Mem® membranes that are supported with nonwovens (PP or PET) to create a more robust membrane. They are also available as either hydrophilic and hydrophobic membranes.

### Key Benefits

For better handling, a Unique-Mem® track-etched membrane can be supported with nonwovens (PP or PET) to create a more robust RoTrac® track-etched membrane.

- 100% Free of PFOA: Compliant with (EC) 1907/2006 REACH / Regulation (EU) 2019/1021 POP
- Distinct air flow rates with low variability enables customers to decrease scrap rate through end of line leakage test with exact parameter setting hence making them more productive
- Excellent welding characteristics for high automated and cost-effective processing
- For application-temperature range between – 40°C and 140°C
- Self-cleaning and reversible function through minimal pressure difference to recover functionality during the application. This is due to the extremely smooth surface of the membrane.

## Technical Specifications

	Unique-Mem	RoTrac
<b>Air Flow</b>	Up to 800 l / (bar cm <sup>2</sup> min)	Up to 37 l / (bar cm <sup>2</sup> min)
<b>Pore Size</b>	0.1µm to 10µm	0.2µm to 3.0µm
<b>Pore Density</b>	10 <sup>5</sup> to 10 <sup>9</sup> pores per cm <sup>2</sup>	2M to 320M pores per cm <sup>2</sup>
<b>Thickness</b>	8µm to 50µm	90µm to 220µm
<b>Temperature Range</b>	– 40°C and 160°C (for special application < 200°C)	– 40°C and 130°C (for special application < 160°C)
<b>Hydrophilic Treatments</b>	Various hydrophilic treatments increase water flow rate and wetting abilities of the membrane (example: PVP treatment)	Various hydrophilic treatments increase water flow rate and wetting abilities of the membrane (example: PVP treatment)
<b>Hydrophobic / Oleophobic Version</b>	<ul style="list-style-type: none"> <li>• WEP: Up to 3 bar</li> <li>• Chemical Resistance: LV124/ISO16750-5 tested</li> </ul>	<ul style="list-style-type: none"> <li>• WEP: Up to 3 bar</li> <li>• Chemical Resistance: LV124/ISO16750-5 tested</li> </ul>
<b>Materials Used</b>	<ul style="list-style-type: none"> <li>• PET – naturally slightly hydrophilic</li> <li>• PC – naturally slightly hydrophobic</li> </ul>	<ul style="list-style-type: none"> <li>• PET-Membrane/ PET-Nonwoven – this is harder</li> <li>• PET-Membrane/ PP-Nonwoven – this is softer</li> </ul>



## Related Products

- Rollstock membrane
- OxyDisc® membrane discs
- OxyPad® self-adhesive membrane pads
- OxySeal® pressure compensation units
- Assemblies & modules



Rollstock membrane



OxySeal pressure compensation units

## Related Applications



Automotive Headlight Venting



Automotive Sensor and Battery Venting



Healthcare Venting



Industrial Venting



Cell Culture Inserts



IV Infusion Filters for Drug Delivery