Innovation in Ceramic Membrane Technology

CeraMem ceramic membranes are best known for exceptional performance in harsh operating environments for industrial applications utilizing microfiltration (MF) and ultrafiltration (UF).

Based on the existing technology platform, a range of silicon carbide (SiC) membranes has been developed to address the challenges membrane filtration faces when employed in systems for treatment of produced water and desalter bottoms in the oil and gas industry as well as the applications involving metal working fluids and other similar harsh operation environments.

Operating at a pH range of 0-14, these membranes are ideal when aggressive alkaline cleaners are the preferred cleaning chemical or strong alkaline process streams are being treated. Similar to other CeraMem membranes, these SiC membranes provide excellent performance in treating process fluids containing oils and greases.

**Design Features**

Similar to the existing CeraMem ceramic membrane offering, the silicon carbide membranes are also suited to high operating temperatures above 150°C and have a high membrane element packing density of up to approximately 800m²/m³.

Available with 2mm or 5mm feed channels with both 0.2µm MF and 50nm UF pore sizes, the silicon carbide membranes feature the following design and performance attributes:

- Suitable for continuous operation across the full pH range of 0 to 14, chemically inert to organic solvents
- Provide highest degree of flexibility in cleaning and regeneration
- Faster restoration / recovery of flux rates
- Increased membrane permeability
- Abrasion resistant

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**About CeraMem® Ceramic Membranes**

CeraMem® ceramic membranes are a proprietary technology platform that combines innovative design features and unique materials of construction to provide ceramic membrane modules with exceptional performance for microfiltration (MF) and ultrafiltration (UF) applications.

This proprietary design allows the utilization of large-diameter ceramic monolith membranes that reduce the overall footprint of installed equipment in harsh operating environments unsuitable for conventional membrane products.

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**Silicon Carbide membranes offer excellent performance in applications requiring aggressive alkaline cleaning methods**
Membrane Type (2mm & 5mm channels) | Water Flux (Typ.), lmh/bar
---|---
0.2µm microfilter (MF), SiC | 1,200 l/(m²-h-bar) @ 25°C
50nm ultafilter (UF), SiC | 800 l/(m²-h-bar) @ 25°C

Performance Data

Retention of Soluble & Colloidal Markers as Function of Marker Size in Solution

Operating Parameters – CeraMem® Silicon Carbide Membranes

<table>
<thead>
<tr>
<th>Operating Parameter</th>
<th>Range</th>
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<tbody>
<tr>
<td>Maximum Temperature</td>
<td>Above 150°C, dependent on seals and housing selection</td>
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<tr>
<td>Maximum Trans-Membrane Pressure</td>
<td>Above 150 psi (10 bar), dependent upon housing selections</td>
</tr>
<tr>
<td>pH Range</td>
<td>0 - 14</td>
</tr>
<tr>
<td>Recommended Crossflow Velocity</td>
<td>9-12 ft/sec (3-4 m/sec)</td>
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<tr>
<td>Volumetric Flow Rate for 12 ft/sec</td>
<td>400 gpm (90 m³/hr)</td>
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<tr>
<td>Pressure Drop at 12 ft/sec for 2mm channel</td>
<td>19 psi (1.3 bar), H₂O @ 25°C</td>
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<tr>
<td>Pressure Drop at 12 ft/sec for 5mm channel</td>
<td>7 psi (0.5 bar), H₂O @ 25°C</td>
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