FPVWL Capsule Filters
High Capacity PVDF Membrane

Remove bacterial and particles from wine, beer, bottled water and juices
Ultra-low product adsorption to preserve flavor

Applications
- Wine
- Beer
- Juices
- Bottled Water
- Aseptically Packaged Liquids

FPVWL Capsules are hydrophilic and manufactured using high capacity polyvinylidene fluoride (PVDF) membrane. The proprietary membrane casting process creates a thick membrane with high capacity for holding contaminants, excellent retention characteristics, high flow rates and low protein binding. PVDF membrane provides excellent throughput and is available in multiple retention ratings to help protect product quality and assure consumer safety.

Applications for FPVWL capsule filters are removal of organic contaminants from beer, wine, bottled water, and aseptically packaged products like juices. Our food & beverage grade PVWL membrane capsules are used in aseptic filling applications to protect the critical final filters that remove spoilage organisms and keep products safe.

PVDF membrane is particularly suited for filtration of products that contain elements that can adsorb to media, such as proteins. The very low binding characteristics of PVDF make it an especially good choice for filtration of beer and wine.

Maximum Operating Parameters
- Liquid Operational Pressure: 80 psi (5.5 bar) at 20 °C (68 °F)
- Gases Operational Pressure: 60 psi (4.1 bar) at 20 °C (68 °F)
- Operating Temperature: 43 °C (110 °F) at 30 psi (2.1 bar) in water
- Forward Differential Pressure: 50 psid (3.4 bard) at 20 °C (68 °F)
- Reverse Differential Pressure: 40 psid (2.7 bard) at 20 °C (68 °F)
- Recommended Changeout Pressure: 35 psid (2.4 bard)

Flow Rate / Filtration Area
The following table represents typical water flow at a one psi (69 mbar) pressure differential across a single 2 inch capsule with 1.0 ft² (930 cm²) of media with 1/2" FNPT ports. The test fluid is water at ambient temperature. Higher pressure drops are acceptable, but as flows increase the pressure drop of the housing becomes more apparent.

<table>
<thead>
<tr>
<th>Pore Size</th>
<th>0.22 μm</th>
<th>0.45 μm</th>
<th>0.65 μm</th>
<th>0.85 μm</th>
<th>1.0 μm</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPM</td>
<td>0.18</td>
<td>0.23</td>
<td>0.42</td>
<td>0.67</td>
<td>1.17</td>
</tr>
<tr>
<td>LPM</td>
<td>0.68</td>
<td>0.87</td>
<td>1.59</td>
<td>2.54</td>
<td>4.43</td>
</tr>
</tbody>
</table>

* For approximate flow rates for 5” through 30” capsules, refer to the appropriate cartridge data sheet

Construction Materials
- Housing: Polypropylene
- Filtration Media: High Capacity Polyvinylidene fluoride (PVDF) Membrane
- Media Support: Polypropylene
- End Caps: Polypropylene
- Center Core: Polypropylene
- Outer Support Cage: Polypropylene
- Sealing Method: Thermal Bonding

FPVWL Capsule Filters - Filtration Area

<table>
<thead>
<tr>
<th>Media</th>
<th>2”</th>
<th>5”</th>
<th>10”</th>
<th>20”</th>
<th>30”</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Capacity PVDF Membrane</td>
<td>1.0 ft² (930 cm²)</td>
<td>3.0 ft² (2788 cm²)</td>
<td>6.0 ft² (5574 cm²)</td>
<td>12.0 ft² (11148 cm²)</td>
<td>18.0 ft² (16722 cm²)</td>
</tr>
</tbody>
</table>
Total Performance
Critical Process Filtration, Inc. is a vertically integrated manufacturer of filtration products to industries in which filtration is considered a critical part of the manufacturing process. We supply a complete line of products and services to help you cost effectively satisfy all your filtration requirements from a single source.

Sanitization/Sterilization
**Autoclave**.......................... 250° F (121° C), 30 min, multiple cycles
**Chemical Sanitization** ........ Industry standard concentrations of hydrogen peroxide, paracetic acid, sodium hypochlorite and other selected chemicals.
**Note**......................... FPVWL capsules are not to be used in steam.

FDA and EC Compliance
All Critical Process Filtration capsule filters are designed to meet the FDA requirements for processing food and beverage products. The materials used to construct food & beverage grade filters are listed by the FDA as appropriate for use in articles intended for repeated food contact as specified in Title 21 CFR sections 174.5, 177.1500, 177.1520, 177.1630, 177.2440 and 177.2600 as appropriate. Membrane filters comply with Title 21 CFR sections 210.3 (b)(6) and 211.72, for non-fiber releasing filters All materials used to make the filters are listed in European Commission Regulation EU/10/2011, Annex 1.

Extractables
Food & beverage grade filters typically exhibit low levels of non-volatile residues.

Quality Assurance and Standards
Critical Process Filtration uses state of the art computer controlled equipment to consistently produce high quality products as well as significantly reduce hand operations that can compromise quality. All manufacturing and testing is continuously monitored in real time so that data can be quickly and easily analyzed to facilitate improvements in both quality and cost.

The Critical Process Filtration manufacturing and quality systems meet rigorous ISO 9001:2008 standards. Each operation, including assembly, testing, cleaning, drying and packaging, is done in an appropriately rated clean room. Manufacturing is controlled using a sophisticated manufacturing system that networks work stations, manufacturing centers and inspection points. During the manufacturing and inspection processes, data is collected in real time to allow continuous quality monitoring and full traceability of all materials and processes.

Representative capsule filter assemblies from each manufacturing lot are integrity tested before lot release.

Ordering Information
Capsule order number example: Food & Beverage Grade High Capacity PVDF Membrane, 0.22 Micron Rating, Non-Sterile, 10” Length, Sanitary Inlet, Sanitary Outlet = CPFPVWL-20N0001FF.

Hose Barb Diameter Ranges*

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Diameters</td>
<td>11/32” (8.6mm)</td>
</tr>
<tr>
<td>Inner Diameters</td>
<td>5/32” (4.0mm)</td>
</tr>
</tbody>
</table>

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