For removing unwanted organisms from products with high particle loads, VPS filters offer a wide selection of validated, dual layer Polyethersulfone (PES) cartridge and capsule filters for the filtration of consumable liquids. These filters comply with FDA requirements and EC directives for food and beverage manufacturing and food contact. Pore sizes range from 0.22 to 1.2 µm and the filter sizes scale from laboratory to full production using identical materials to ensure consistent results.

The VPS filter’s low protein binding characteristics are well suited for filtering fermented beverages. They retain organisms while allowing valuable flavor components to pass through the filter. VPS filters deliver high flow and throughput with compatibility across a wide pH range. They are flushed with high purity water to remove extractables that may affect the taste of the product. Products are 100% integrity tested.

Critical Process provides unrivaled delivery times, technical consulting before purchasing, and very competitively priced high-performance products. Our comprehensive testing/analysis and validation services support your team whenever they need it. Your process experts partnering with our filtration experts is how we deliver your company’s solution right the first time.

VPS is recommended for:
- Wine, Beer
- Juices
- Bottled Water
- Aseptic Packaged Liquids
- Container Wash/Rinse Water
- Process Water

**CARTRIDGES – Nominal Dimensions**
Length: 5 to 40 in. (12.7 to 101.6 cm)
Outside Diameter: 2.75 in. (7.0 cm)

**CAPSULES – Nominal Dimensions**
Length: 2 to 30 in. (5.1 to 76.2 cm)
Outside Diameter: 3.50 in. (8.9 cm)
### Maximum Operating Parameters

<table>
<thead>
<tr>
<th></th>
<th>CARTRIDGES AND CAPSULES</th>
<th>CARTRIDGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liquid Operational Pressure</strong></td>
<td>N/A</td>
<td>80 psi at 68 °F (5.52 bar at 20 °C)</td>
</tr>
<tr>
<td><strong>Gases Operational Pressure</strong></td>
<td>N/A</td>
<td>60 psi at 68 °F (4.14 bar at 20 °C)</td>
</tr>
<tr>
<td><strong>Operating Temperature (water)</strong></td>
<td>180 °F at 30 psid (82 °C at 2.07 bar)</td>
<td>110 °F at 30 psid (43 °C at 2.07 bar)</td>
</tr>
<tr>
<td><strong>Forward Differential Pressure</strong></td>
<td>80 psid at 68 °F (5.52 bar at 20 °C) (Liquid and Gas)</td>
<td>Liquid - 80 psid at 68 °F (5.52 bar at 20 °C)</td>
</tr>
<tr>
<td><strong>Reverse Differential Pressure</strong></td>
<td>50 psid at 68 °F (3.45 bar at 20 °C)</td>
<td>50 psid at 68 °F (3.45 bar at 20 °C)</td>
</tr>
<tr>
<td><strong>Recommended Changeout Pressure</strong></td>
<td>35 psid (2.41 bard)</td>
<td>35 psid (2.41 bard)</td>
</tr>
</tbody>
</table>

### Sanitization & Sterilization

<table>
<thead>
<tr>
<th>Sanitization Method</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Filtered Hot Water</strong></td>
<td>90 °C (194 °F), 30 minutes, multiple cycles, max 3 psid forward flow</td>
</tr>
<tr>
<td><strong>Inline Steam</strong></td>
<td>275 °F (135 °C), 30 min, 25+ cycles</td>
</tr>
<tr>
<td><strong>Autoclave</strong></td>
<td>250 °F (121 °C), 30 min, 25+ cycles</td>
</tr>
<tr>
<td><strong>Chemical Sanitization</strong></td>
<td>Performed using industry standard concentrations of hydrogen peroxide, peracetic acid, sodium hypochlorite and other selected chemicals.</td>
</tr>
</tbody>
</table>

*Cartridge Filters – For all elevated temperature procedures above, a stainless-steel support ring is required.

### Filtration Area (Nominal)

<table>
<thead>
<tr>
<th>Length</th>
<th>CARTRIDGES</th>
<th>CAPSULES</th>
<th>CARTRIDGES AND CAPSULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2”</td>
<td>5.08cm</td>
<td>5.08cm</td>
<td>5.08cm</td>
</tr>
<tr>
<td>5”</td>
<td>12.7cm</td>
<td>12.7cm</td>
<td>12.7cm</td>
</tr>
<tr>
<td>10”</td>
<td>25.4cm</td>
<td>25.4cm</td>
<td>25.4cm</td>
</tr>
<tr>
<td>20”</td>
<td>50.8cm</td>
<td>50.8cm</td>
<td>50.8cm</td>
</tr>
<tr>
<td>30”</td>
<td>76.2cm</td>
<td>76.2cm</td>
<td>76.2cm</td>
</tr>
<tr>
<td>40”</td>
<td>101.6cm</td>
<td>101.6cm</td>
<td>101.6cm</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.9 ft²</td>
<td>2.5 ft²</td>
<td>2.5 ft²</td>
<td>2.5 ft²</td>
</tr>
<tr>
<td>0.08m²</td>
<td>0.23m²</td>
<td>0.23m²</td>
<td>0.23m²</td>
</tr>
<tr>
<td>0.50m²</td>
<td>1.00m²</td>
<td>1.00m²</td>
<td>1.00m²</td>
</tr>
<tr>
<td>1.51m²</td>
<td>2.01m²</td>
<td>2.01m²</td>
<td>2.01m²</td>
</tr>
</tbody>
</table>

### Integrity Testing

<table>
<thead>
<tr>
<th>PORE SIZE</th>
<th>DIFFUSION TEST PRESSURE*</th>
<th>BUBBLE POINT MINIMUM*</th>
</tr>
</thead>
<tbody>
<tr>
<td>µm</td>
<td>PSI/G</td>
<td>BARG</td>
</tr>
<tr>
<td>0.22</td>
<td>35</td>
<td>2.41</td>
</tr>
<tr>
<td>0.45</td>
<td>20</td>
<td>1.38</td>
</tr>
<tr>
<td>0.65</td>
<td>15</td>
<td>1.03</td>
</tr>
<tr>
<td>0.80</td>
<td>12</td>
<td>0.83</td>
</tr>
<tr>
<td>1.0</td>
<td>8</td>
<td>0.55</td>
</tr>
<tr>
<td>1.2</td>
<td>7</td>
<td>0.48</td>
</tr>
</tbody>
</table>

### DIFFUSION SPECIFICATIONS

<table>
<thead>
<tr>
<th>Length</th>
<th>2”</th>
<th>5”</th>
<th>10”</th>
<th>20”</th>
<th>30”</th>
<th>40”</th>
</tr>
</thead>
<tbody>
<tr>
<td>mL/min</td>
<td>≤ 4.3</td>
<td>≤ 12.9</td>
<td>≤ 30</td>
<td>≤ 60</td>
<td>≤ 90</td>
<td>≤ 120</td>
</tr>
</tbody>
</table>

* For water wetted membrane
** Test pressure exceeds operational limits of capsule filters. Use the Diffusion Test method.
Validation
VPS filters are validated using test procedures that comply with ASTM F 838-15(ae1) protocols for the determination of bacterial retention in filters used for liquid filtration. The filters are challenged with the organisms listed below.

- 0.22μm: *Brevundimonas diminuta*
- 0.45μm: *Serratia marcescens*
- 0.65μm: *Saccharomyces cerevisiae*

Extractables
VPS filters typically exhibit low levels of non-volatile residues.

Non-Fiber Releasing
VPS filters comply with Title 21 CFR sections 210.3(b)(6) and 211.72, for non-fiber releasing filters.

FDA and EC Compliance
Materials meet the requirements 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 applicable. All materials used to make the filters are listed in European Commission Regulation EU/10/2011, Annex 1.
Flow rates for Cartridge filters are per 10-inch length. The test fluid is water at ambient temperature.

Flow rates for Capsule filters are tested using a 2” capsule filter with 1” sanitary inlet and outlet ports. The test fluid is water at ambient temperature. Flow rates for larger capsules will scale with filtration area. Rates will vary based on end configuration of the capsule.
VPS Filters Ordering Information

Fill in the corresponding codes in the boxes below to build your Part Number.

To consult with one of our technical team members, request a quote or place an order: call (603) 880-4420 or contact us here.

Cartridge Filters

- **Prefilter Pore Size Code**
  - -20 = 0.2 μm
  - -50 = 0.5 μm
  - -80 = 0.8 μm
  - 1-0 = 1.0 μm

- **Final Layer Pore Size Code**
  - -10 = 0.10 μm
  - -20 = 0.22 μm
  - -40 = 0.45 μm
  - -60 = 0.65 μm
  - -80 = 0.80 μm
  - 1-0 = 1.0 μm
  - 1-2 = 1.2 μm

- **SS Ring**
  - S = Ring
  - N = No Ring

- **Length**
  - 05 = 5 in. (12.7 cm)
  - 97 = 9.75 in. (24.8 cm)

- **Inlet**
  - A = 1/4" Female NPT
  - B = 5"
  - 1 = 10"
  - 2 = 20"
  - 3 = 30"

- **Outlet**
  - 0 = Flat Gasket, DOE
  - 2 = 2-222 O-ring/Plug
  - 4 = 213/119 Internal O-ring/Plug
  - 5 = 2-222 O-ring/Flat
  - 6 = 2-226 O-ring/Flat
  - 8 = 2-222 O-ring/Spear
  - 9 = 2-226 O-ring/Spear

- **End Cap Code**
  - 0 = Flat Gasket, DOE
  - 2 = 2-222 O-ring/Plug
  - 4 = 213/119 Internal O-ring/Plug
  - 5 = 2-222 O-ring/Flat
  - 6 = 2-226 O-ring/Flat
  - 8 = 2-222 O-ring/Spear
  - 9 = 2-226 O-ring/Spear

- **Side Vent Options**
  - 1 = Luer Lock
  - 2 = Bleed Valve

Capsule Filters

- **Prefilter Pore Size Code**
  - -20 = 0.2 μm
  - -50 = 0.5 μm
  - -80 = 0.8 μm
  - 1-0 = 1.0 μm

- **Final Layer Pore Size Code**
  - -10 = 0.10 μm
  - -20 = 0.22 μm
  - -40 = 0.45 μm
  - -60 = 0.65 μm
  - -80 = 0.80 μm
  - 1-0 = 1.0 μm
  - 1-2 = 1.2 μm

- **Inlet**
  - A = 1/4" Female NPT
  - B = 1/4" Male NPT
  - C = 3/8" Female NPT
  - D = 1/2" Female NPT
  - E = 1/2" Male NPT
  - F = 1" Sanitary
  - G = Hose Barb*
  - H = 1 ¼" Sanitary with side vent
  - I = ½" Single Stepped Barb with side vent

- **Outlet**
  - A = 1/4" Female NPT
  - B = 1/4" Male NPT
  - C = 3/8" Female NPT
  - D = 1/2" Female NPT
  - E = 1/2" Male NPT
  - F = 1" Sanitary
  - G = Hose Barb*
  - H = 1 ¼" Sanitary with side vent
  - I = ½" Single Stepped Barb with side vent

- **Pre-Sterilized or Not**
  - S = Pre-Sterilized
  - G = Gamma Stable
  - N = Not Sterilized

- **Side Vent Options**
  - 1 = Luer Lock
  - 2 = Bleed Valve

- **O-Rings**
  - (Bleed Valves Only)
  - S = Silicone
  - E = EP
  - V = Viton
  - B = Buna
  - K = FFKM

*Additional end configurations available

*Fits hoses/tubes with inner diameter 11/32 to 9/16 inches