PTR filters are validated Polytetrafluoroethylene (PTFE) membrane cartridge and capsule filters used for sterilizing process gas applications and tank vents. The PTR membrane has a pore size of 0.22 µm and the filter sizes scale from laboratory to full production using identical materials to ensure consistent results.

These hydrophobic PTR filters have high air flow and low pressure drops. Each cartridge module is individually integrity tested using the water intrusion method before it is released from manufacture.

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.

PTR filters are recommended for:
- Tank Vents
- Compressed Air
- Pressurized Gases
- Fermentation Air

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

Sanitization & Sterilization

<table>
<thead>
<tr>
<th>Method</th>
<th>CARTRIDGES</th>
<th>CAPSULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inline Steam*</td>
<td>275 °F (135 °C), 30 min, 25+ cycles</td>
<td>N/A</td>
</tr>
<tr>
<td>Autoclave*</td>
<td>250 °F (121 °C), 30 min, 25+ cycles</td>
<td>250 °F (121 °C), 30 min, 5+ cycles</td>
</tr>
<tr>
<td>Chemical Sanitization</td>
<td>Performed using industry standard concentrations of hydrogen peroxide, peracetic acid, sodium hypochlorite and other selected chemicals.</td>
<td></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></th>
<th>CAPSULES</th>
<th>CARTRIDGES AND CAPSULES</th>
<th>CARTRIDGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>2”</td>
<td>5”</td>
<td>10”</td>
</tr>
<tr>
<td></td>
<td>5.08cm</td>
<td>12.7cm</td>
<td>25.4cm</td>
</tr>
<tr>
<td>Area</td>
<td>1.5 ft²</td>
<td>4.1 ft²</td>
<td>8.7 ft²</td>
</tr>
<tr>
<td></td>
<td>0.14m²</td>
<td>0.38m²</td>
<td>0.81m²</td>
</tr>
</tbody>
</table>

Integrity Testing

<table>
<thead>
<tr>
<th>PORE SIZE</th>
<th>WATER INTRUSION TEST PRESSURE</th>
<th>BUBBLE POINT MINIMUM*</th>
</tr>
</thead>
<tbody>
<tr>
<td>µm</td>
<td>PSIG</td>
<td>BARG</td>
</tr>
<tr>
<td>0.22</td>
<td>35</td>
<td>2.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WATER INTRUSION SPECIFICATIONS (mL/10 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
</tr>
<tr>
<td>0.22µm</td>
</tr>
</tbody>
</table>

* Bubble Point for membrane wetted with 60% IPA / 40% water
Critical Process Filtration, Inc.

Validation

PTR cartridges are validated using test procedures that comply with the intent of BFE protocols for the determination of bacterial retention in filters used for air and gas filtration. The challenge level for the 0.22 μm filter membrane is 7.5 x 10^7 organisms per cm^2 of filter media of Brevundimonas diminuta (ATCC 19146).

PTR filters are also 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 challenge level is a minimum of 10^7 Brevundimonas diminuta organisms per cm^2 of filter media. CPF filters have > 7-log removal when challenged with the Brevundimonas diminuta (0.22 μm meets the FDA definition of sterilizing grade filters).

Validation Guides available upon request.

Endotoxins

The levels of bacterial endotoxins in aqueous extracts from PTR filters are below current USP limits as specified for water for injection.

Extractables

PTR filters typically exhibit low levels of non-volatile residues.

TOC and Conductivity

The PTR filters conform with TOC standards of USP <643> and the water conductivity standards of USP <645> after an appropriate flush with purified water.

Toxicity Compliance

Materials used to construct the PTR filters are non-toxic and meet the requirements for the MEM Elution Cytotoxicity Test and the requirements for Biological Reactivity Tests in the current version of the United States Pharmacopeia (USP) for Class VI - 121 °C Plastics.

Non-Fiber Releasing

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

FDA 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.

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### Construction Materials

<table>
<thead>
<tr>
<th>Filtration Media</th>
<th>Polytetrafluoroethylene (PTFE) Membrane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Support*</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>End Caps, Center Core, Outer Support Cage, Capsule Core, Outer Support Cage, Capsule Cage, Capsule End Caps, Outer Support Capsule Housing*</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>Sealing Method</td>
<td>Thermal Bonding</td>
</tr>
<tr>
<td>O-Rings/Gaskets Cartridges only</td>
<td>Buna, Viton® (or FKM), EPDM, Silicone, FEP Encapsulated Silicone, FEP Encapsulated Viton (or FKM)</td>
</tr>
</tbody>
</table>

*High Temperature Cartridge configurations are also available.
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 or compressed air at ambient temperature. Flow rates for larger capsules will scale with filtration area. Rates will vary based on end configuration of the capsule.
Air/Gas Flow Rates for PTR Cartridges by Pore Size

Flow rates for Cartridge filters are per 10-inch length. The test fluid is compressed air at ambient temperature.

Air/Gas Flow Rates for PTR Capsules by Pore Size

Flow rates for Capsule filters are tested using a 2” capsule filter with 1” sanitary inlet and outlet ports. The test fluid is water or compressed air at ambient temperature. Flow rates for larger capsules will scale with filtration area. Rates will vary based on end configuration of the capsule.
### PTR 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](mailto:contactus@criticalprocess.com).

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### Cartridge Filters

**Pore Size Code**
-20 = 0.22 μm

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

**Length**
- 05 = 5 in. (12.7 cm)
- 07 = 9.75 in. (24.8 cm)
- 01 = 10 in. (25.4 cm)
- 02 = 20 in. (50.8 cm)
- 03 = 30 in. (76.2 cm)
- 04 = 40 in. (101.6 cm)

**O-Ring/Gasket Code**
- S = Silicone
- B = Buna
- V = Viton (or FKM)
- T = FEP Encapsulated Viton (or FKM)
- E = EPDM
- R = FEP Encapsulated Silicone

**End Cap Code**
- 0 = Flat Gasket, DOE
- 1 = Flat Gasket/Plug
- 2 = 2-222 O-ring/Plug
- 3 = 213/119 Internal O-ring DOE
- 4 = 213/119 Internal O-ring/Plug
- 5 = 2-222 O-ring/Flat
- 6 = 2-226 O-ring/Flat
- 7 = 020 O-ring/Plug
- 8 = 2-222 O-ring/Spear
- 9 = 2-226 O-ring/Spear
- 21 = 2-223 O-ring/Flat
- 22 = 2-223 O-ring/Spear
- 23 = 2-222 O-ring 3 Tab/Flat
- 24 = 2-222 O-ring 3 Tab/Spear
- 25 = Short 2-222/Plug

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### Capsule Filters

**Pore Size Code**
-20 = 0.22 μm

**Pre-Sterilized or Not**
S = Pre-Sterilized
N = Not Sterilized

**Length**
- A = 2”
- B = 5”
- 1 = 10”
- 2 = 20”
- 3 = 30”

**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 ½” 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”-1½” Sanitary with side vent
- G = Hose Barb*
- H = 1 ½” Single Stepped Barb with filling bell and side vent
- IB = ½” Single Stepped Barb with filling bell and side vent

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

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

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*Additional End Configurations Available

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

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