PTR/HT filters are validated Polytetrafluoroethylene (PTFE) membrane cartridge filters assembled with high temperature polypropylene components. They are used for sterilizing in process gas applications and tank vents operated at elevated temperatures (up to 221°F). The PTR/HT membrane has a pore size of 0.22 µm.

These hydrophobic PTR/HT 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/HT filters are recommended for:
- Tank Vents
- Compressed Air
- Pressurized Gases
- Fermentation Air

Operated at elevated temperatures
### Maximum Operating Parameters

<table>
<thead>
<tr>
<th>CARTRIDGES</th>
<th>5”</th>
<th>10”</th>
<th>20”</th>
<th>30”</th>
<th>40”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>221 °F (105 °C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Forward Differential Pressure</strong></td>
<td>80 psid at 68 °F (5.52 barg at 20 °C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reverse Differential Pressure</strong></td>
<td>50 psid at 68 °F (3.45 barg at 20 °C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recommended Maximum Service Life</strong></td>
<td>1 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sanitization & Sterilization

- **Inline Steam**: 275 °F (135 °C), 30 min, 25+ cycles
- **Autoclave**: 250 °F (121 °C), 30 min, 25+ cycles
- **Chemical Sanitization**: Performed using industry standard concentrations of hydrogen peroxide, peracetic acid, sodium hypochlorite and other selected chemicals.

### Filtration Area (Nominal)

<table>
<thead>
<tr>
<th>CARTRIDGES</th>
<th>5”</th>
<th>10”</th>
<th>20”</th>
<th>30”</th>
<th>40”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>12.7cm</td>
<td>25.4cm</td>
<td>50.8cm</td>
<td>76.2cm</td>
<td>101.6cm</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td>3.8 ft²</td>
<td>8.2 ft²</td>
<td>16.4 ft²</td>
<td>24.6 ft²</td>
<td>32.8 ft²</td>
</tr>
<tr>
<td></td>
<td>0.36 m²</td>
<td>0.76 m²</td>
<td>1.52 m²</td>
<td>2.29 m²</td>
<td>3.05 m²</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><strong>Length</strong></td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>0.22µm</td>
</tr>
</tbody>
</table>

* Bubble Point for membrane wetted with 60% IPA / 40% water
Water Flow Rates for PTR/HT Cartridges by Pore Size

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

Air/Gas Flow Rates for PTR/HT Cartridges by Pore Size

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

Validation
PTR/HT 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 $7.5 \times 10^7$ organisms per cm$^2$ of filter media of Brevundimonas diminuta (ATCC 19146).

PTR/HT 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 (0.22μm meets the FDA definition of sterilizing grade filters).

Validation Guides available upon request.

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

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

TOC and Conductivity
The PTR/HT 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/HT 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/HT 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>High Temperature Polypropylene</td>
</tr>
<tr>
<td>End Caps, Center Core, Outer Support Cage</td>
<td>High Temperature Polypropylene</td>
</tr>
<tr>
<td>Sealing Method</td>
<td>Thermal Bonding</td>
</tr>
<tr>
<td>O-Rings/Gaskets</td>
<td>Buna, Viton® (or FKM), EPDM, Silicone, FEP Encapsulated Silicone, FEP Encapsulated Viton (or FKM)</td>
</tr>
</tbody>
</table>

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PTR/HT Filters Ordering Information

All Critical Process filters are configurable to meet customer specifications. 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 Ext. 106, or send an email to sales@criticalprocess.com

Cartridge Filters

Pore Size Code
-20 = 0.22 μm

Length
05 = 5 in. (12.7 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
2 = 2-222 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

Housings

CPF offers Model CSH sanitary housings in Single-Round (Inline and T-Style) and Multi-Round (3, 6, 8, 12 and 21-round) configurations.