BTM cartridge and capsule filters are constructed with a Polytetrafluoroethylene (PTFE) membrane and are used for bioburden control in non-aqueous liquids, process gases and tank vent filtration. Pore sizes range from 0.10 to 5.0 µm and filter sizes scale from laboratory to full production using identical materials to ensure consistent results.

These single layer, hydrophobic filters are optimized for flow and throughput, and resist wetting by airborne water droplets, making them ideal for air and gas applications. BTM bioburden control filters protect processes and extend the life of sterilizing filters. Each cartridge module is individually 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.

BTM bioburden control filters are recommended for:
- Compressed Air
- Pressurized Gases
- Fermentation Air
- Solvents
- Tank Vents
Maximum Operating Parameters

<table>
<thead>
<tr>
<th></th>
<th>CARTRIDGES</th>
<th>CAPSULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Operational Pressure</td>
<td>N/A</td>
<td>80 psi at 68 °F (5.52 bard at 20 °C)</td>
</tr>
<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 (water)</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) (Liquid and Gas)</td>
<td>Liquid - 80 psid at 68 °F (5.52 bard at 20 °C) Gas - 60 psi at 68 °F (4.14 bar at 20 °C)</td>
</tr>
<tr>
<td>Reverse Differential Pressure</td>
<td>50 psi at 68 °F (3.45 bard at 20 °C)</td>
<td>50 psi 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>Sanitization Method</th>
<th>Description</th>
<th>CARTRIDGES</th>
<th>CAPSULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtered Hot Water*</td>
<td>90 °C (194 °F), 30 minutes, multiple cycles, max 3 psid forward flow</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Inline Steam*</td>
<td>275 °F (135 °C), 30 min, 25+ cycles</td>
<td>N/A</td>
<td></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>
<td></td>
</tr>
</tbody>
</table>

Chemical Sanitization
Performed using industry standard concentrations of hydrogen peroxide, peracetic acid, sodium hypochlorite and other selected chemicals.

*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>CAPSULES</th>
<th>CARTRIDGES AND CAPSULES</th>
<th>CARTRIDGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>5.08cm</td>
<td>12.7cm</td>
<td>25.4cm</td>
</tr>
<tr>
<td>5&quot;</td>
<td>25.4cm</td>
<td>50.8cm</td>
<td>76.2cm</td>
</tr>
<tr>
<td>10&quot;</td>
<td>7.0 ft²</td>
<td>14.0 ft²</td>
<td>21.0 ft²</td>
</tr>
<tr>
<td>20&quot;</td>
<td>3.3 ft²</td>
<td>6.5 ft²</td>
<td>1.30 ft²</td>
</tr>
<tr>
<td>30&quot;</td>
<td>0.65m²</td>
<td>1.95m²</td>
<td>2.60m²</td>
</tr>
</tbody>
</table>

Integrity Testing

<table>
<thead>
<tr>
<th>PORE SIZE</th>
<th>BUBBLE POINT MINIMUM*</th>
</tr>
</thead>
<tbody>
<tr>
<td>µm</td>
<td>PSIG</td>
</tr>
<tr>
<td>0.10</td>
<td>21</td>
</tr>
<tr>
<td>0.22</td>
<td>15</td>
</tr>
<tr>
<td>0.45</td>
<td>9</td>
</tr>
<tr>
<td>1.0</td>
<td>6</td>
</tr>
<tr>
<td>3.0</td>
<td>2</td>
</tr>
<tr>
<td>5.0</td>
<td>1</td>
</tr>
</tbody>
</table>

* Bubble Point for membrane wetted with 60% IPA / 40% water solution.
**Construction Materials**

<table>
<thead>
<tr>
<th>Category</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtration Media</td>
<td>Polytetrafluoroethylene (PTFE) Membrane</td>
</tr>
<tr>
<td>Media Support</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>End Caps, Center Core, Outer Support Cage, 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 configuration is available.

**Validation**

BTM 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.

- 0.10μm: *Brevundimonas diminuta*
- 0.22μm: *Brevundimonas diminuta*
- 0.45μm: *Serratia marcescens*

**Endotoxins**

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

**Extractables**

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

**Toxicity Compliance**

The materials used to construct BTM 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**

BTM 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.
Flow Rates for BTM Cartridges by Pore Size

Water

Flow rates for Cartridge filters are per 10-inch length. The test fluid is water or compressed air at ambient temperature.
Flow Rates for BTM Capsules by Pore Size

Water

Air

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.
### Cartridge Filters

**BTM 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](#).

**Pore Size Code**
-10 = 0.10 μm  
-20 = 0.22 μm  
-40 = 0.45 μm  
1-0 = 1.0 μm  
3-0 = 3.0 μm  
5-0 = 5.0 μm

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

**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

*Additional end configurations available

### Capsule Filters

**Pore Size Code**
-10 = 0.10 μm  
-20 = 0.22 μm  
-40 = 0.45 μm  
1-0 = 1.0 μm  
3-0 = 3.0 μm  
5-0 = 5.0 μm

**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” Sanitary  
G = Hose Barb*  
H = 1 ½” Sanitary with side vent  
I = ½ Single Stepped Barb with 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

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

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Data Sheet BTMDS Rev B