FNM Filters
Nylon 6,6 Membrane

FNM cartridge and capsule filters are constructed with long-proven, absolute rated, Nylon 6,6 membrane. Designed to comply with all FDA requirements for the food industry, these high purity filters are used for removing organisms in non-fermenting liquids and cleaning water. Pore sizes range from 0.10 to 0.65 µm and the filter sizes scale from laboratory to full production using identical materials to ensure consistent results.

FNM filters are: optimized for flow and high retention; flushed to reduce extractables; and 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.

FNM filters are recommended for:
- Syrups
- Soft Drinks
- Bottled Water
- 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</th>
<th>CAPSULES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liquid Operational Pressure</strong></td>
<td>N/A</td>
<td>80 psi at 68 °F (5.52 bard 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 bard)</td>
<td>110 °F at 30 psid (43 °C at 2.07 bard)</td>
</tr>
<tr>
<td><strong>Forward Differential Pressure</strong></td>
<td>80 psid at 68 °F (5.52 bard at 20 °C)</td>
<td>Liquid - 80 psid at 68 °F (5.52 bard at 20 °C)</td>
</tr>
<tr>
<td><strong>Gas</strong></td>
<td>Gas - 60 psi at 68 °F (4.14 bar at 20 °C)</td>
<td></td>
</tr>
<tr>
<td><strong>Reverse Differential Pressure</strong></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><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

- **Filtered Hot Water**
  - 90 °C (194 °F), 30 minutes, multiple cycles, max 3 psid forward flow
- **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, 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></th>
<th>CAPSULES</th>
<th>CARTRIDGES AND CAPSULES</th>
<th>CARTRIDGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>2”</td>
<td>5”</td>
<td>10”</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td>5.08cm</td>
<td>12.7cm</td>
<td>25.4cm</td>
</tr>
<tr>
<td></td>
<td>1.2 ft²</td>
<td>3.3 ft²</td>
<td>7.0 ft²</td>
</tr>
<tr>
<td></td>
<td>0.11m²</td>
<td>0.31m²</td>
<td>0.65m²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.30m²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.95m²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.60m²</td>
</tr>
</tbody>
</table>

### Integrity Testing

<table>
<thead>
<tr>
<th>PORE SIZE</th>
<th>DIFFUSION TEST PRESSURE*</th>
<th>BUBBLE POINT MINIMUM*</th>
<th><strong>DIFFUSION SPECIFICATIONS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>µm</td>
<td>PSIG</td>
<td>BARG</td>
<td>PSIG</td>
</tr>
<tr>
<td>0.10</td>
<td>48</td>
<td>3.31</td>
<td>**</td>
</tr>
<tr>
<td>0.22</td>
<td>35</td>
<td>2.41</td>
<td>50</td>
</tr>
<tr>
<td>0.45</td>
<td>20</td>
<td>1.38</td>
<td>25</td>
</tr>
<tr>
<td>0.65</td>
<td>15</td>
<td>1.03</td>
<td>19</td>
</tr>
</tbody>
</table>

* All specifications are for water wetted membrane
** Test pressure exceeds operational limits of capsule filters.
Use the Diffusion Test method.
Filtration Media
Nylon 6.6 Membrane with polyester support

Media Support
Polypropylene

End Caps, Center Core, Outer Support Cage, Capsule Housing
Polypropylene

Sealing Method
Thermal Bonding

O-Rings/Gaskets
Buna, Viton® (or FKM), EPDM, Silicone, FEP Encapsulated Silicone, FEP Encapsulated Viton (or FKM)

Validation
FNM 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.

0.10\(\mu\)m: *Brevundimonas diminuta*
0.22\(\mu\)m: *Brevundimonas diminuta*
0.45\(\mu\)m: *Serratia marcescens*
0.65\(\mu\)m: *Saccharomyces cerevisiae*

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

Non-Fiber Releasing
FNM 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.
FNM 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

- Pore Size Code
  - -10 = 0.10 μm
  - -20 = 0.22 μm
  - -40 = 0.45 μm
  - -60 = 0.65 μm
- SS Ring
  - S = Ring
  - N = No Ring
- 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)
- O-Ring/Gasket Code
  - S = Silicone
  - B = Buna
  - V = Viton (or FKM)
  - T = FEP Encapsulated Viton (or FKM)
  - E = EP
  - R = FEP Encapsulated Silicone
- 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

Capsule Filters

- Pore Size Code
  - -10 = 0.10 μm
  - -20 = 0.22 μm
  - -40 = 0.45 μm
  - -60 = 0.65 μm
- Pre-Sterilized or Not
  - S = Pre-Sterilized
  - G = Gamma Stable
  - 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” Sanitary
  - G = Hose Barb*
  - H = 1 ½” Sanitary with side vent
  - I = ½” Single Stepped Barb with side vent
- Side Vent Options
  - 1 = Luer Lock
  - 2 = Bleed Valve
- O-Ring (Bleed Valves Only)
  - S = Silicone
  - E = EP
  - V = Viton
  - B = Buna
  - K = FFKM

*Additional end configurations available

*Fits hoses/tubes with inner diameter 1/32 to 9/16 inches