

Protec®



Protec® Filter Cartridge

The Protec® filter is a glass microfiber prefilter optimized to protect downstream sterile filters. The Protec® RF filter contains a single layer of borosilicate glass fiber media in a choice of absolute-rated 0.5 µm or 1 µm. The Protec® RM filter is available in a choice of absolute-rated 0.2 µm, 0.3 µm or 0.5 µm and combines an outer layer of borosilicate glass fiber media with an inner layer of Meissner's proprietary hydrophilic SteriLUX® PVDF membrane.

Protec® filters provide consistent submicron contaminant removal, high dirt-holding capacity and high flow rates, while removing colloids, aggregated and non-product proteins, lipids and other particles. Protec® effectively protects downstream membrane filters and equipment. These filter cartridges are available in lengths of 10, 20, 30 and 40 inches.



Features and Benefits

- RF version can be specified in 0.5 µm and 1 µm absolute-rated
- RM version can be specified in absolute-rated 0.2 µm, 0.3 µm and 0.5 µm
- High flow rates and excellent filtration economics
- High contaminant holding capacity provides a long service life
- All-polypropylene support materials provide wide chemical compatibility and permit use in a broad range of fluids
- Protec® RM combines the retention performance of a PVDF membrane with the high adsorption and contaminant-holding capacity of a glass fiber media

Typical Applications

Protec® filters are ideal for clarification, prefiltration and bioburden reduction in a variety of applications.

- Biological liquids, including serum, plasma fractions and other blood products
- Vaccines
- Tissue and cell culture media
- Protein solutions
- Fermentation media and feeds
- Cell removal from fermentation broths
- Pre-column chromatography
- Biopharmaceuticals

Materials of Construction

Filter Media

RF (single layer):	Borosilicate glass microfiber
RM (double layer):	Borosilicate glass microfiber with SteriLUX® PVDF membrane
Core/Outer Guard:	Polypropylene
End Caps:	Polypropylene
Sealing Method:	Thermal Bonding
O-ring/Gasket Seal:	Buna, EPR, polyethylene, silicone, Teflon® over silicone, Teflon® over Viton®

All materials of construction listed above are FDA approved for food contact use per 21 CFR 177.

Protec® filters are manufactured in conformance to cGMP. Protec® filters meet the requirements as specified in the current USP Class VI plastics, physicochemical, oxidizable substances, and cytotoxicity tests. Protec® filters are non-fiber-releasing as defined in 21 CFR 210.3(b)(6) and 211.72.

Filtration Ratings

<u>Filter Grade</u>	<u>Absolute Particulate Ratings</u>
RF	0.5 µm, 1 µm
RM	0.2 µm, 0.3 µm, 0.5 µm

Cartridge Dimensions (nominal)

Diameter: 2.75" (7 cm)
 Lengths: 10", 20", 30", 40"
 (25 cm, 50 cm, 75 cm, 100 cm)

Typical Microbial Retention per cm²

<u>Grade</u>	<u>Rating</u>	<u>Organism</u>	<u>LRV</u>
RF	0.5 µm	<i>Saccharomyces cerevisiae</i>	6
RM	0.5 µm	<i>Serratia marcescens</i>	5
		<i>Saccharomyces cerevisiae</i>	≥7
RM	0.3 µm	<i>Serratia marcescens</i>	6
RM	0.2 µm	<i>Serratia marcescens</i>	≥7

Sterilization

Steam-in-place (SIP):
 Saturated steam @ 121-135 °C, 30-60 minutes
 [15 psi (1 bar) to 30 psi (2 bar), 30-60 minutes]

Autoclave: 121-135 °C, 30-60 minutes

For applications requiring autoclave/SIP, a stainless steel reinforcement ring must be ordered. See "Reinforcement Ring Option" within Ordering Information.

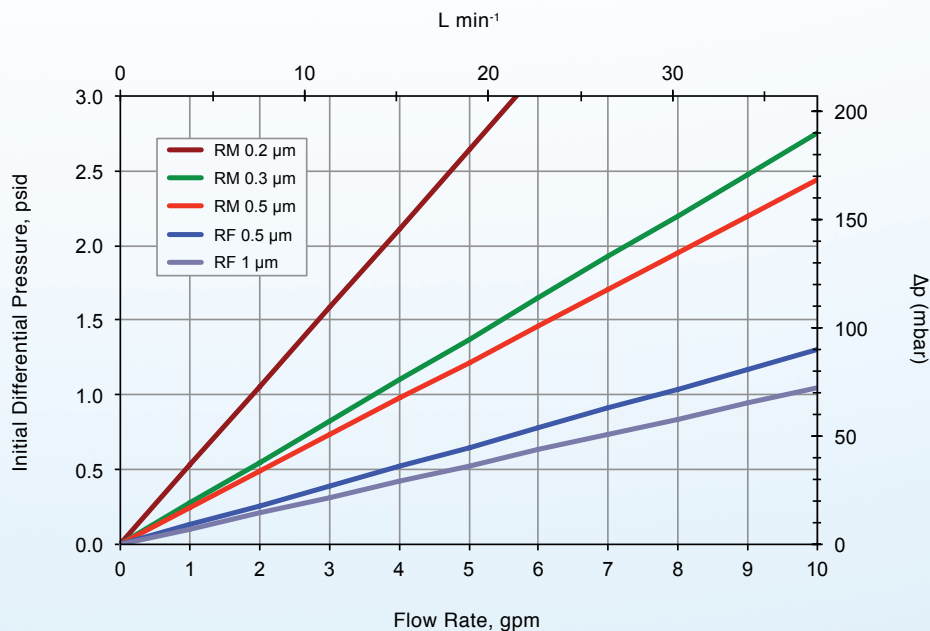
Maximum Operating Temperatures & Pressures

Δp 80 psi @ 32 °F to 100 °F
 (Δp 5,5 bar @ 0 °C to 38 °C)

Δp 60 psi @ 150 °F
 (Δp 4,1 bar @ 66 °C)

Δp 30 psi @ 180 °F
 (Δp 2,1 bar @ 82 °C)

Typical Water Flow Rates per 10" Cartridge



End Cap Configuration



-226 O-ring

External -226 O-rings with locking tabs; open end for C6 and F6 SOE configurations



-222 O-ring

External -222 O-rings; open end for C2 and F2 SOE configurations



-226 nO-Ring®

External -226 nO-Ring® with locking tabs; open end for C5 and F5 SOE configurations



-222 nO-Ring®

External -222 nO-Ring®, open end for C1 and F1 SOE configurations



Flat Gasket

Flat Gasket; open end for GS and GL DOE configurations



Internal O-ring

Internal O-ring; open end for DN and DA DOE or RN and RA SOE configurations



Button Cap

Button Cap; closed end for C1, C2, C5 and C6 SOE configurations



Alignment Fin

Alignment Fin; closed end for F1, F2, F5 and F6 SOE configurations



Recessed Cap

Recessed Cap; closed end for RN and RA SOE configurations

DOE = Double Open End
SOE = Single Open End

Ordering Information

Filter Grade	Absolute Rating (µm)	Cartridge Length	End Cap Configuration	Reinforcement Ring Option	Seal Material (O-ring or Gasket)
RM	0.2	— 3	F2	R	S
<p>RF = Borosilicate glass microfiber media (single layer)</p> <p>RM = Borosilicate glass microfiber media (outer layer) combined with a hydrophilic PVDF membrane (inner layer)</p>	<p>0.5, 1</p> <p>0.2, 0.3, 0.5</p>	<p>1 = 10" (25 cm)</p> <p>2 = 20" (50 cm)</p> <p>3 = 30" (75 cm)</p> <p>4 = 40" (100 cm)</p>	<p>GS = DOE; flat gaskets (9.75", 19.5", 29.25", 39" length filters)</p> <p>GL = DOE; flat gaskets (20", 30", 40" length filters)</p> <p>C1 = SOE; -222 nO-Ring®, button cap end</p> <p>C2 = SOE; -222 O-rings, button cap end</p> <p>F1 = SOE; -222 nO-Ring®, fin end</p> <p>F2 = SOE; -222 O-rings, fin end</p> <p>C5 = SOE; -226 nO-Ring®, button cap end</p> <p>C6 = SOE; -226 O-rings, button cap end</p> <p>F5 = SOE; -226 nO-Ring®, fin end</p> <p>F6 = SOE; -226 O-rings, fin end</p> <p>DN = DOE; internal -120 O-rings</p> <p>RN = SOE; internal -120 O-ring, recessed cap end</p> <p>DA = DOE; internal -213 O-rings</p> <p>RA = SOE; internal -213 O-ring, recessed cap end</p>	<p>(Blank) = Standard - no reinforcement ring</p> <p>R = Reinforcement ring; required for autoclave/SIP applications</p>	<p><u>O-ring Seal</u></p> <p>B = Buna</p> <p>E = EPR</p> <p>S = Silicone</p> <p>T = Teflon® over silicone</p> <p>V = Viton®</p> <p>X = Teflon® over Viton®</p> <p><u>Gasket Seal</u></p> <p>B = Buna</p> <p>E = EPR</p> <p>P = Polyethylene</p> <p>S = Silicone</p> <p>T = Teflon®</p> <p>V = Viton®</p>