

## Emflon® PFRW Filter Cartridges For Sterile Filtration of Gases

Emflon PFRW cartridges are sterilizing grade hydrophobic membrane filters designed for reliable retention of bacteria and high levels of phages in compressed gas and vent applications.

### Description

The filter element features Pall's advanced 0.2 micron rated polytetrafluoroethylene (PTFE) double-layer membranes, pleated with very high area into single open-end cartridges. They are built to withstand demanding *in situ* steaming conditions in either the forward or reverse direction.

Even in the presence of high humidity or moisture, often the case in practice, Emflon PFRW cartridges provide sterile effluent and validated performance, ensuring process security. They are the cartridge of choice for critical sterile gas applications.

### Features and Benefits

Features	Benefits
Strongly hydrophobic 100 % PTFE membranes	<ul style="list-style-type: none"> <li>Prevents wetting out in humid conditions, even after repeated use and steaming cycles, allowing for unimpeded gas throughput</li> </ul>
High area pleated, robust double-layer membranes	<ul style="list-style-type: none"> <li>High throughputs and low pressure drops, with sizing resulting in compressor energy cost savings</li> <li>Excellent resistance to mechanical damage</li> </ul>
Multi-cycle <i>in situ</i> steam challenged in forward and reverse direction	<ul style="list-style-type: none"> <li>Enhanced steaming resistance</li> </ul>
0.2 micron sterilizing grade filters based on liquid bacteria removal	<ul style="list-style-type: none"> <li>Provides sterile effluent even in humid conditions, resulting in optimal protection of product, improved fermentation yields, and increased security in aseptic processes</li> </ul>
Excellent aerosol bacteriophage retention performance	<ul style="list-style-type: none"> <li>Provides superior bacteriophage protection of microbial cultures</li> </ul>
Sodium chloride aerosol challenged for particle removal to 0.003 micron	<ul style="list-style-type: none"> <li>High particle removal efficiency in dry gas</li> </ul>
Water Intrusion Testable (WIT)	<ul style="list-style-type: none"> <li>Enables <i>in situ</i> user integrity testing</li> </ul>
100 % integrity tested prior to dispatch	<ul style="list-style-type: none"> <li>Documented quality</li> </ul>
Individually serialized modules	<ul style="list-style-type: none"> <li>Full traceability to materials and production records</li> </ul>



Emflon PFRW Filter Cartridges

### Materials of Construction

Component	Description
Filter Medium	Double-layer PTFE
Support / Drainage	Polypropylene
Cage, Core, Fin End and End Cap	Polypropylene
Adaptor	Polypropylene with internal stainless steel reinforcing ring
O-ring Seal	Silicone Elastomer Ethylene Propylene Rubber

### Quality

- Cartridges produced in a controlled environment
- Manufactured according to ISO 9001:2008 certified Quality Management System

### Food Contact Compliance

Please refer to the Pall website <http://www.pall.com/foodandbev> for a Declaration of Compliance to specific National Legislation and/or Regional Regulatory requirements for food contact use.

## Technical Information

The technical information provided is based on controlled laboratory tests done on typical production filters at the conditions described, unless otherwise indicated. Actual operating conditions may affect the filter's performance.

Nominal Filter Area: 0.8 m<sup>2</sup> (8.6 ft<sup>2</sup>) per 254 mm (10") module

### Operating Characteristics in Compatible Gases<sup>1</sup>

Maximum Differential Pressure	Operating Temperature
5.3 bard (77 psid) (forward)	≤20 °C (68 °F)
4.1 bard (60 psid) (forward)	≤80 °C (176 °F)

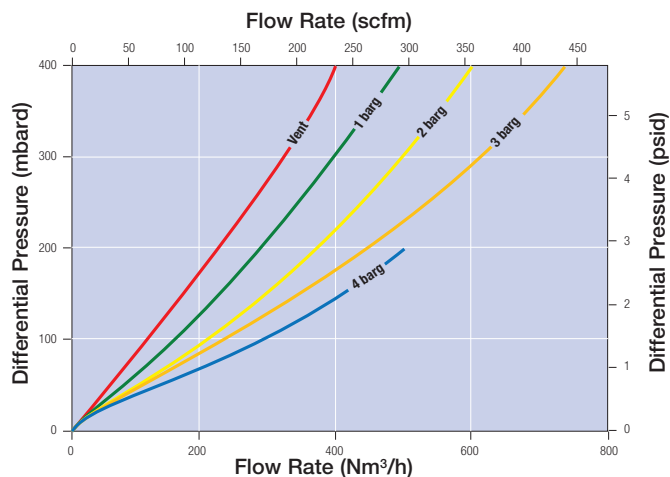
<sup>1</sup> Air, nitrogen, or other compatible gases.

### Typical Service Life<sup>2</sup> under continuous operating conditions

Continuous gas service	12 months to 60 °C (140 °F)
Vent service	6 months to 80 °C (176 °F)

<sup>2</sup> For continuous gas flow above 60 °C (140 °F), Emflon HTPFRW filters are recommended. Emflon PFRW can be operated at higher temperatures for shorter periods.

### Typical Flow Rates<sup>3</sup>



<sup>3</sup> Typical clean  $\Delta p$  per 254 mm (10") cartridge, air at 20 °C (68 °F). For gases other than air and for multi-round cartridge installations, please contact Pall for proper sizing.

### Autoclave and Steaming<sup>4</sup>

Cumulative Steaming Time	Operating Temperature
165 hours (1-hour cycles, forward)	142 °C (287 °F)
20 hours (1-hour cycles, reverse)	142 °C (287 °F)

Maximum Steaming Conditions	Steaming Temperature
1.0 bard (15 psid) (forward)	125 °C (257 °F)
0.3 bard (4.3 psid) (forward)	142 °C (287 °F)
0.5 bard (7.3 psid) (reverse)	125 °C (257 °F)
0.2 bard (2.9 psid) (reverse)	142 °C (287 °F)

<sup>4</sup> For applications requiring autoclaving and sterilization, Pall recommends the use of Code 2 or Code 7 adaptors to ensure filter sealing after cooling. Cartridges should be cooled to system operating temperature prior to use. Data shown for forward steam flow also indicates autoclave resistance.

## Removal Performance

Emflon PFRW filters have a microbial removal rating of 0.2 micron in liquids and a particulate removal rating of 0.003 micron in dry gases.

- Tested with *Brevundimonas diminuta* liquid challenge at  $\geq 10^7$  cfu/cm<sup>2</sup> effective filtration area, according to ASTM Method 838-05. Provides sterile effluent according to FDA Guidelines (2004)
- Tested for particle removal at 0.003 micron in dry gases by NaCl aerosol CNC particle analysis
- Tested in accordance with ISO Standard for Compressed Air (ISO 8573-4 and test method ISO 12500-3:2009)<sup>5</sup>.

Pall has an excellent history of use of the Emflon PTFE membrane used in the Emflon PFRW filters, see 'Validation Guide for Pall Emflon PFR Filter Cartridges', USTR2114 (2) further demonstrating:

- MS-2 and PP7 bacteriophage aerosol challenge
- *Brevundimonas diminuta* aerosol challenge in forward and reverse direction and under long term challenge conditions in forward direction with humidified air
- *Bacillus subtilis var niger* spores aerosol challenge

<sup>5</sup> For further information, please contact Pall.

## Ordering Information

This information is a guide to the part number structure and possible options. For availability of specific options and housing details, please contact Pall.

Part Number: **AB**  **PFR**  **W**   
Table 1      Table 2      Table 3

Example Part Number: **AB1PFR7WH4**

See bold reference code in tables.

**Table 1: Nominal Length**

Code	Length
05 <sup>6</sup>	127 mm (5")
<b>1</b>	254 mm (10")
2	508 mm (20")
3	762 mm (30")

<sup>6</sup> Available only in Codes 2 and 7.

**Table 3: O-ring Seal Material**

Code	Description
<b>H4</b>	Silicone Elastomer
J	Ethylene Propylene Rubber

**Table 2: Adaptor**

Code	Description
2 <sup>7</sup>	SOE – single open end with flat closed end, 2 locking tabs and external 226 o-rings
3	SOE – single open end with flat closed end and external 222 o-rings
<b>7</b>	SOE – single open end with fin end, 2 locking tabs and external 226 o-rings
8	SOE – single open end with fin end and external 222 o-rings
28	SOE – single open end with fin end, 3 locking tabs and external 222 o-rings

<sup>7</sup> AB05 configurations only.

Pall's Emflon filter family offers a variety of solutions for addressing microbial removal in air and gas applications. Please contact Pall for further information.



Figure 1: Emflon HTPFRW cartridges provide sterilization of high temperature gases and can be considered for use in oxygen-enriched air applications.



Figure 2: Emflon PFW cartridges are designed for sterilization of large volume gases in compact installations.



Figure 3: Emflon PFAW cartridges offer exceptionally high flow rates and are used for less critical bioburden reduction in gases.



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