CRITICAL PROCESS FILTRATION, INC.

PPM Filters

Polypropylene Membrane

PPM cartridge and capsule filters are single layer, polypropylene membrane filters validated for sterilizing in gas and tank vent filtration applications, and in non-aqueous liquids. Pore sizes are from 0.10 to and 0.22 µm and available filter devices scale from laboratory to full production using identical materials to ensure consistent results.

PPM filters are hydrophobic and resist wetting by airborne water droplets, making them ideal for air and gas applications. The broad chemical compatibility of polypropylene makes the filters suitable for aggressive solvents and other non-aqueous liquids. Cartridge modules are 100%integrity tested before release from manufacture.

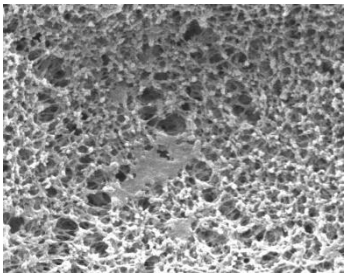
Critical Process provides unrivaled delivery times, technical consulting before purchasing, and very competitively priced high-performance products. Our comprehensive testing & analysis and validation services support your team whenever they need it. Your process experts partnering with our filtration experts is how we deliver your company's solution right the first time.

Sterilizing Filters

Tank Vent & Process Gas

CARTRIDGES – Nominal Dimensions
Length: 5 to 40 in. (12.7 to 101.6 cm)
Outside Diameter: 2.75 in. (7.0cm)

CAPSULES – Nominal Dimensions
Length: 2 to 30 in. (5.1 to 76.2 cm)
Outside Diameter: 3.50 in. (8.9 cm)



PPM sterilizing filters are recommended for:

- Compressed Air
- Gases
- Tank Vents
- Bulk Pharmaceutical Chemicals
- Solvents

Maximum Operating Parameters

	CARTRIDGES	CAPSULES
Liquid Operational Pressure	N/A	80 psi at 68 °F (5.51 bard at 20 °C)
Gases Operational Pressure	N/A	60 psi at 68 °F (4.13 bar at 20 °C)
Operating Temperature (water)	180 °F at 30 psid (82 °C at 2.06 bard)	110 °F at 30 psid (43 °C at 2.06 bard)
Forward Differential Pressure	80 psid at 68 °F (5.51 bard at 20 °C) (Liquid and Gas)	Liquid - 80 psid at 68 °F (5.51 bard at 20 °C) Gas - 60 psi at 68 °F (4.13 bar at 20 °C)
Reverse Differential Pressure	50 psid at 68 °F (3.44 bard at 20 °C)	50 psid at 68 °F (3.44 bard at 20 °C)
Recommended Changeout Pressure	35 psid (2.41 bard)	35 psid (2.41 bard)

Sanitization & Sterilization

Filtered Hot Water*	90 °C (194 °F), 30 minutes, multiple cycles, max 3 psid forward flow	N/A
Inline Steam*	275 °F (135 °C), 30 min, 25+ cycles	N/A
Autoclave*	250 °F (121 °C), 30 min, 25+ cycles	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.	

*Cartridge Filters – For all elevated temperature procedures above, a stainless-steel support ring is required.

Filtration Area

	CAPSULES	CARTRIDGES AND CAPSULES				CARTRIDGES
Length	2”	5”	10”	20”	30”	40”
	5.08cm	12.7cm	25.4cm	50.8cm	76.2cm	101.6cm
Area	1.2 ft^2	3.4 ft^2	7.3 ft^2	14.6 ft^2	21.9 ft^2	29.2 ft^2
	0.11m^2	0.32m^2	0.68m^2	1.36m^2	2.04m^2	2.72m^2

Integrity Testing

PORE SIZE (µm)	AIR DIFFUSION RATE *
0.10	< 30 cc/min @40 psig (2.8 barg)
0.22	> 30 cc/min @ 35 psig (2.4 barg)

* For membrane wetted with 60% IPA / 40% water solution.

Construction Materials

Filtration Media	Polypropylene Membrane
Media Support	Polypropylene
End Caps, Center Core, Outer Support Cage, Capsule Housing	Polypropylene
Sealing Method	Thermal Bonding
O-Rings/Gaskets Cartridges only	Buna, Viton® (or FKM), EPDM, Silicone, FEP Encapsulated Silicone, FEP Encapsulated Viton (or FKM)

Validation

PPM 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 challenge level is a minimum of 10^7 organisms per cm^2 of filter media. CPF filters have > 7-log removal when challenged with the organisms listed below (0.01µm and 0.22µm meet the FDA definition of sterilizing grade filters).

0.10µm: *Brevundimonas diminuta*
0.22µm: *Brevundimonas diminuta*

Validation Guides available upon request.

Endotoxins

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

Extractables

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

TOC and Conductivity

The PPM 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 PPM 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.

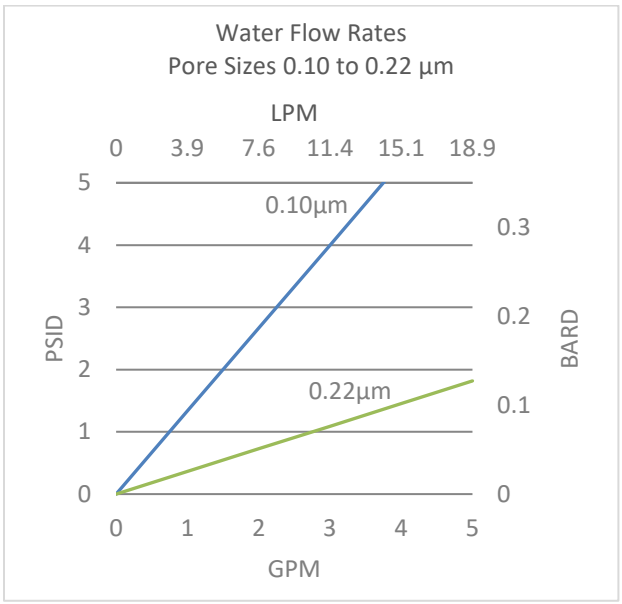
Non-Fiber Releasing

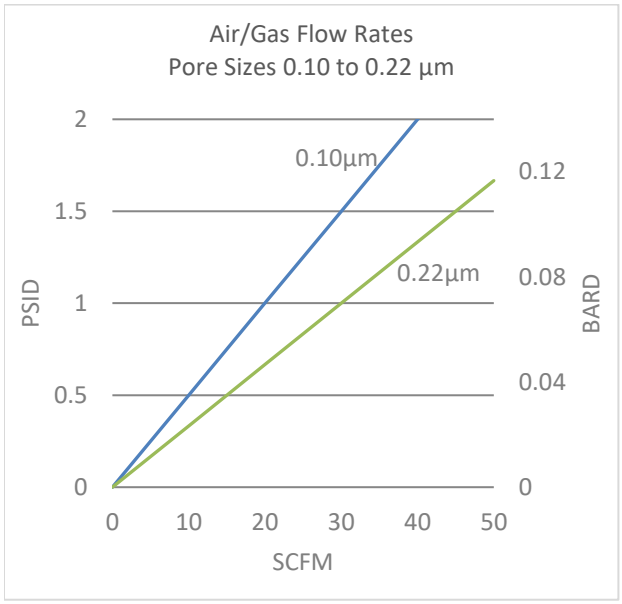
PPM filters comply with Title 21 CFR sections 210.3 (b)(6) and 211.72, for non-fiber releasing filters.

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.

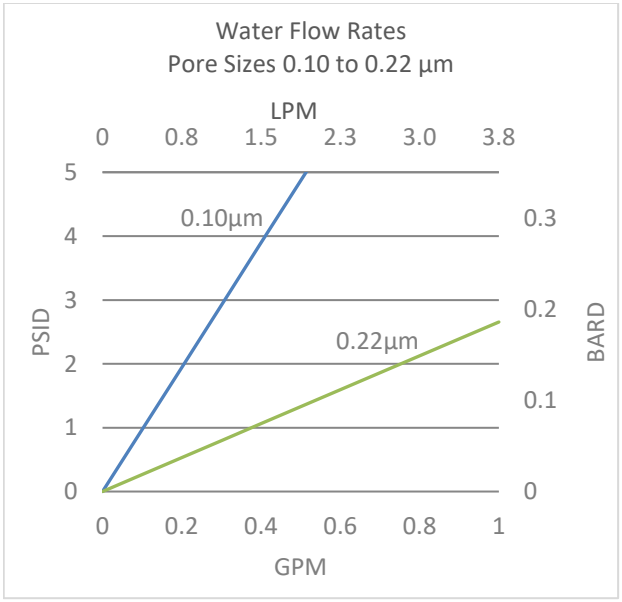
Flow Rates for PPM Cartridges

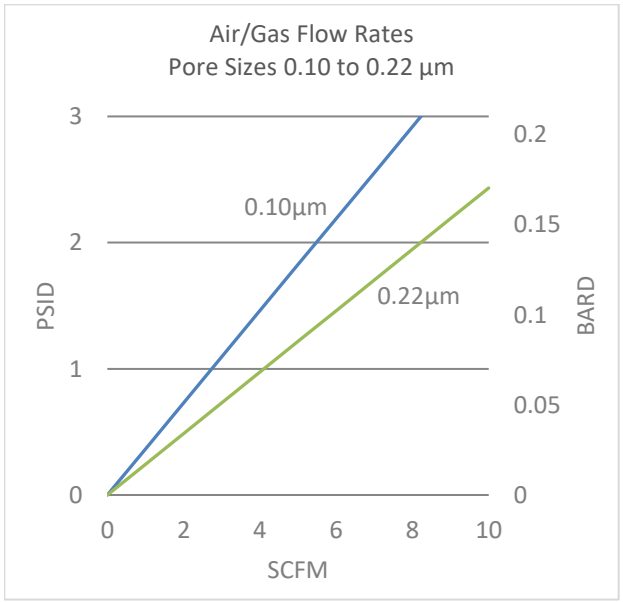




Flow rates for Cartridge filters are per 10-inch length. The test fluid is water or compressed air at ambient temperature.

Flow Rates for PPM Capsules





Flow rates for Capsule filters are per square foot of membrane area. The test fluid is water or compressed air at ambient temperature. Flows are tested using a 2" capsule filter with ½" FNPT inlet and outlet ports. Rates will vary based on end configuration of the capsule.

PPM 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) 880-4220 Ext. 106, or send an email to sales@criticalprocess.com

Cartridge Filters

PPM [ ] [ ] 000 [ ] [ ] [ ]

Pore Size Code
-10 = 0.1 µm
-20 = 0.22 µm

304 SS Ring
S = Ring
N = No Ring

Length
05 = 4.875 in. (12.4 cm)
97 = 9.75 in. (24.8 cm)
01 = 10 in. (25.4 cm)
19 = 19.5 in. (49.5 cm)
02 = 20 in. (50.8 cm)
29 = 29.25 in. (74.3 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
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

Capsule Filters

CP PPM [ ] N 000 [ ] [ ] [ ]

Pore Size Code
-10 = 0.1 µm
-20 = 0.22 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”-1½” Sanitary
G - Hose Barb*

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”-1½” Sanitary
G - Hose Barb*

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.

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Data Sheet PPMDS0919 Rev-