



# VPS Filters

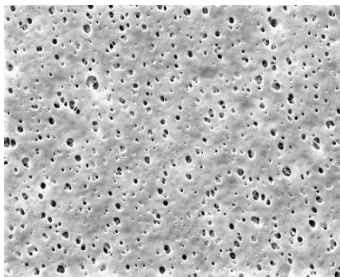
Dual Layered PES Membrane



For removing unwanted organisms from products with high particle loads, VPS filters offer a wide selection of validated, dual layer Polyethersulfone (PES) cartridge and capsule filters for the filtration of consumable liquids. These filters comply with FDA requirements and EC directives for food and beverage manufacturing and food contact. Pore sizes range from 0.22 to 1.2  $\mu\text{m}$  and the filter sizes scale from laboratory to full production using identical materials to ensure consistent results.

The VPS filter's low protein binding characteristics are well suited for filtering fermented beverages. They retain organisms while allowing valuable flavor components to pass through the filter. VPS filters deliver high flow and throughput with compatibility across a wide pH range. They are flushed with high purity water to remove extractables that may affect the taste of the product. Products 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.



VPS is recommended for:

- Wine, Beer
- Juices
- Bottled Water
- Aseptic Packaged Liquids
- Container Wash/Rinse Water
- Process Water

## Bacteria/Yeast/Mold Removal



### 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

	CARTRIDGES	CAPSULES
<b>Liquid Operational Pressure</b>	N/A	80 psi at 68 °F (5.52 bard at 20 °C)
<b>Gases Operational Pressure</b>	N/A	60 psi at 68 °F (4.14 bar at 20 °C)
<b>Operating Temperature (water)</b>	180 °F at 30 psid (82 °C at 2.07 bard)	110 °F at 30 psid (43 °C at 2.07 bard)
<b>Forward Differential Pressure</b>	80 psid at 68 °F (5.52 bard at 20 °C) (Liquid and Gas)	Liquid - 80 psid at 68 °F (5.52 bard at 20 °C) Gas - 60 psi at 68 °F (4.14 bar at 20 °C)
<b>Reverse Differential Pressure</b>	50 psid at 68 °F (3.45 bard at 20 °C)	50 psid at 68 °F (3.45 bard at 20 °C)
<b>Recommended Changeout Pressure</b>	35 psid (2.41 bard)	35 psid (2.41 bard)

## Sanitization & Sterilization

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

	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	0.9 ft <sup>2</sup>	2.5 ft <sup>2</sup>	5.4 ft <sup>2</sup>	10.8 ft <sup>2</sup>	16.2 ft <sup>2</sup>	21.6 ft <sup>2</sup>
	0.08m <sup>2</sup>	0.23m <sup>2</sup>	0.50m <sup>2</sup>	1.00m <sup>2</sup>	1.51m <sup>2</sup>	2.01m <sup>2</sup>

## Integrity Testing

PORE SIZE	DIFFUSION TEST PRESSURE*		BUBBLE POINT MINIMUM*	
	PSIG	BARG	PSIG	BARG
μm				
0.22	35	2.41	50	3.4
0.45	20	1.38	25	1.7
0.65	15	1.03	19	1.3
0.80	12	0.83	15	1.0
1.0	8	0.55	10	0.7
1.2	7	0.48	9	0.6

DIFFUSION SPECIFICATIONS						
Length	2"	5"	10"	20"	30"	40"
mL/min	≤ 4.3	≤ 12.9	≤ 30	≤ 60	≤ 90	≤ 120

\* For water wetted membrane  
 \*\* Test pressure exceeds operational limits of capsule filters.  
 Use the Diffusion Test method.

## Construction Materials

<b>Filtration Media</b>	High Capacity PES membrane on polyester support prefilter layer and Asymmetric PES membrane final filter layer
<b>Media Support</b>	Polypropylene
<b>End Caps, Center Core, Outer Support Cage, Capsule Housing</b>	Polypropylene
<b>Sealing Method</b>	Thermal Bonding
<b>O-Rings Cartridges only</b>	Buna, Viton® (or FKM), EPDM, Silicone, FEP Encapsulated Silicone, FEP Encapsulated Viton (or FKM)

## Validation

VPS 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.

0.22µm: *Brevundimonas diminuta*

0.45µm: *Serratia marcescens*

0.65µm: *Saccharomyces cerevisiae*

## Extractables

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

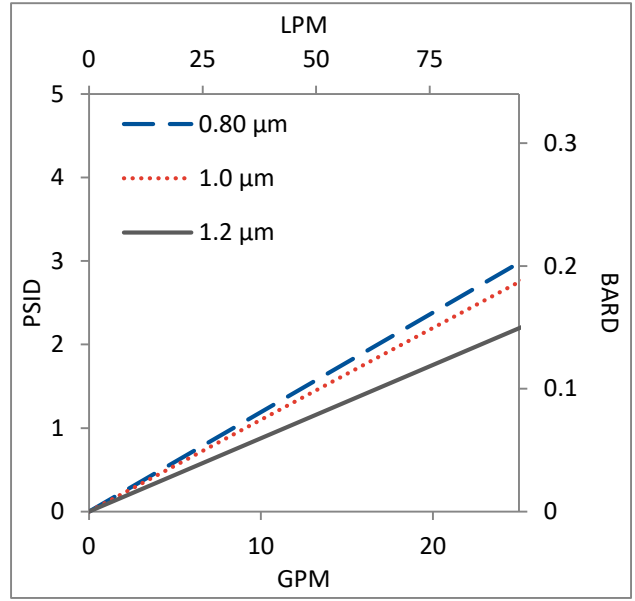
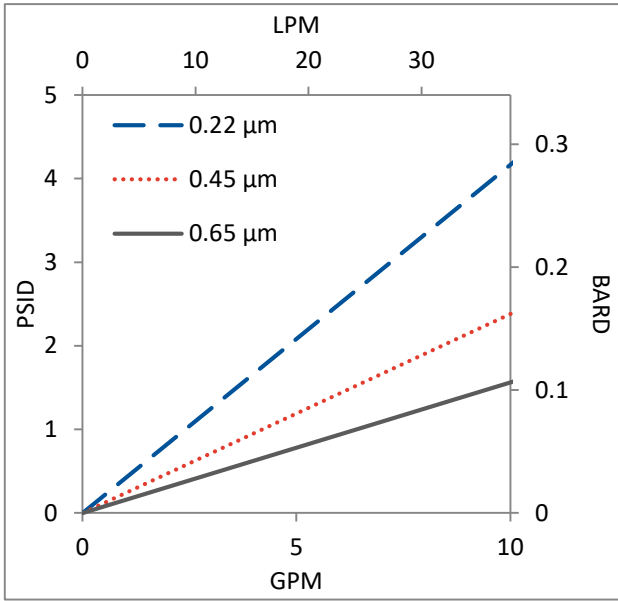
## Non-Fiber Releasing

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

## FDA and EC Compliance

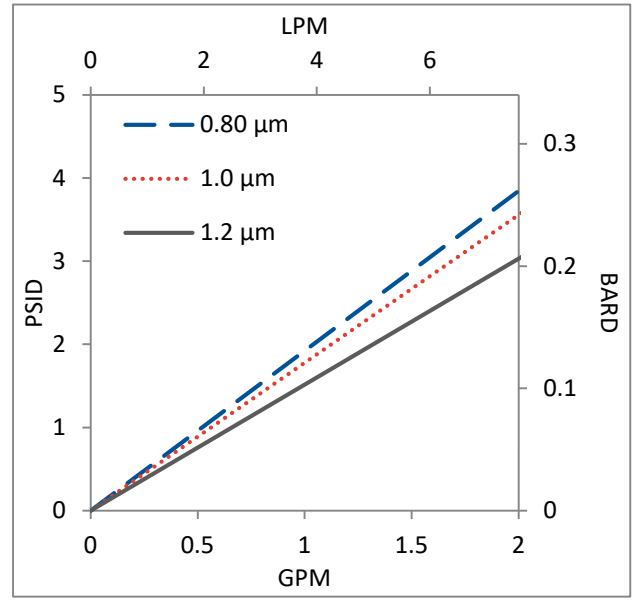
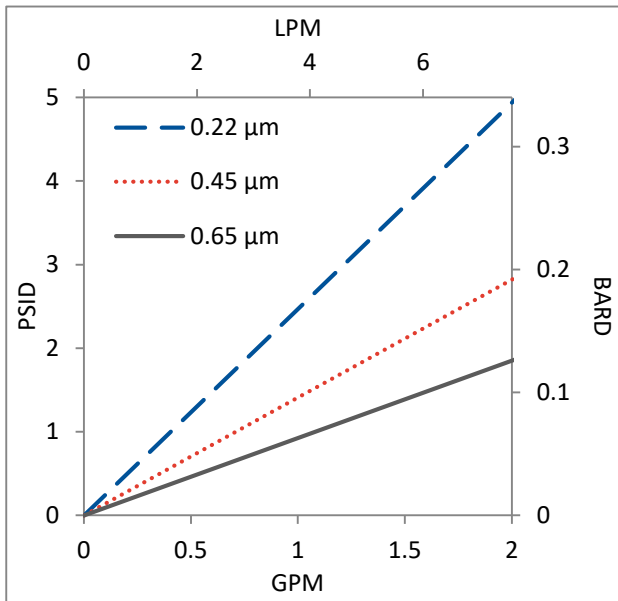
Materials meet the requirements listed by the FDA as appropriate for use in articles intended for repeated food contact as specified in Title 21 CFR sections 174.5, 177.1500, 177.1520, 177.1630, 177.2440, and 177.2600 as applicable. All materials used to make the filters are listed in European Commission Regulation EU/10/2011, Annex 1.

## Flow Rates for VPS Cartridges by Pore Size



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

## Flow Rates for VPS Capsules by Pore Size



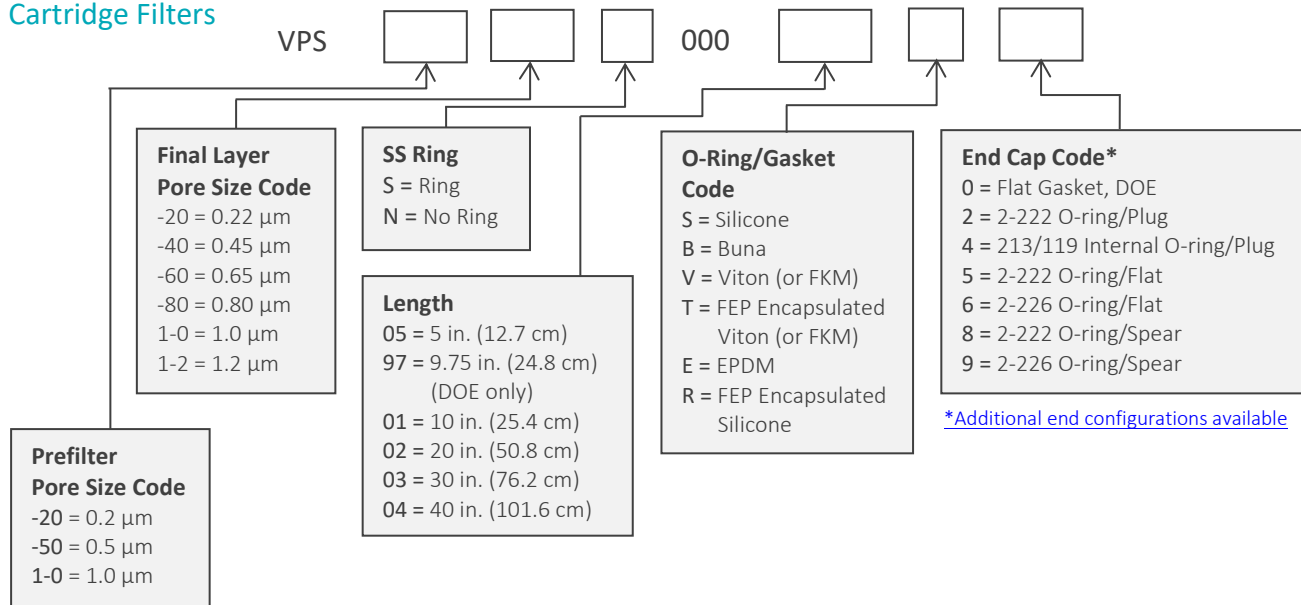
Flow rates for Capsule filters are tested using a 2" capsule filter with 1" sanitary inlet and outlet ports. The test fluid is water at ambient temperature. Flow rates for larger capsules will scale with filtration area. Rates will vary based on end configuration of the capsule.

## VPS Filters Ordering Information

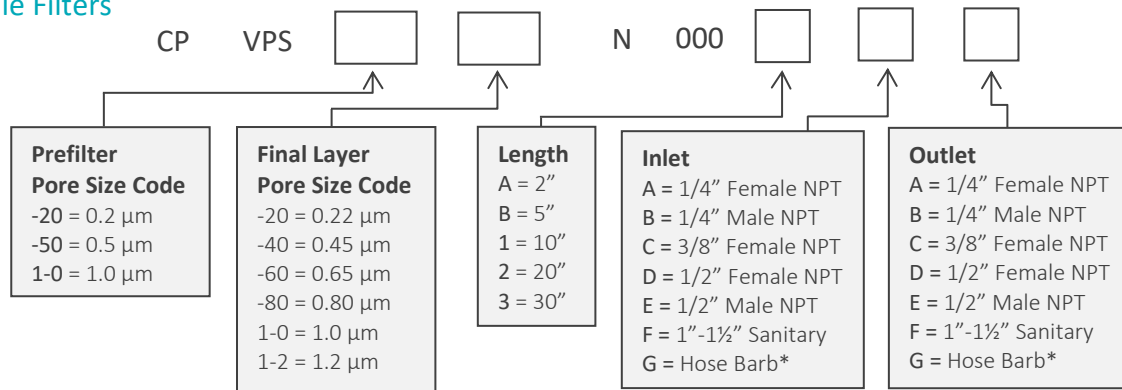
All Critical Process filters are configurable to meet customer specifications.  
Fill in the corresponding codes in the boxes below to build your Part Number.

To consult with one of our technical team members, request a quote or place an order:  
call (603) 880-4420 Ext. 106, or send an email to [sales@criticalprocess.com](mailto:sales@criticalprocess.com)

### Cartridge Filters



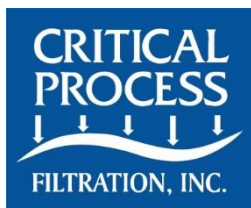
### Capsule Filters



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

### 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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