Donaldson
FILTRATION SOLUTIONS

P-SRF X

STERILE AIR PLEATED MEMBRANE FILTER ELEMENTS

Process Filtration

Donaldson's P-SRF X series of pleated sterile membrane filters offer exceptional filtration performance for compressed air and technical gases within the processed food and beverage industry. These elements provide:

- Hydrophobic Tetratex® ePTFE media with excellent de-wetting characteristics
- Log 9 reduction for 0.2 micron contaminants
- Stainless steel construction that permits up to 250 steam sterilization cycles and resistance to extreme operating conditions
- Compatibility with VPHP and ozone sterilization process
- Non-fiber releasing filter medium that is compliant with CFR title 21 and EC/1935/2004

The P-SRF X sterile filter elements are a premier option to help protect your product and process integrity.

P SRF-X

FEATURES	BENEFITS
Robust stainless steel construction with Tetratex® ePTFE media	Suitable for use in harsh environments where high temperature steam, vapor phase hydrogen peroxide (VPHP) or Ozone are used for sterilization
High retention rate of contaminants that are 3 nanometers or larger	Helps ensure product and process integrity in critical applications
High temperature and mechanical resistance for outstanding performance	Minimizes production down time and maintenance costs
Reduced de-wetting time for faster drying post-sterilization cycle	Leads to reduced total cost of ownership
Rated for up to 250 steam sterilization cycles	Provides longer service life and fewer annual change outs

INDUSTRIES AND APPLICATIONS

The P-SRF X pleated sterile membrane filter is designed and developed for the following industries and applications:

Industries

- Food & beverage
- Breweries
- Food ingredients
- Dairy
- Distilled spirits
- Wine

Applications

- Ingredient carbon dioxide
- Fermentation air
- Nitrogen blanketing
- Aseptic packaging
- PET bottle blowing

RETENTION OF MICROORGANISMS

The procedure for microbiological evaluation is outlined by HIMA*. The filter element was challenged with a minimum of 10^7 viable *Brevundimonas diminuta* microorganisms to each square centimeter of effective filtration area. The bacterial challenge is quantified by expressing the filter element efficiency to remove the challenge organism from the challenge suspension as a Log Reduction Value (LRV).

LRV = Log_{10} (quantity of organisms in the challenge minus quantity of organisms after filtration)

Brevundimonas diminutas (>/= 0.2 µm) ***LRV > 9***

MS2 Coliphage (>/= 0.02 µm) ***LRV > 8***

SPECIFICATIONS

Retention Rate	>99.9999999998% at 0.2 µm >99.999999998% at 0.02 µm >99.99999998% at 0.003 µm
Filtration Surface	5,017 cm^2 per 254 mm element (5.4 ft^2 per 10 inch element) (For other element sizes see Correction Factors Filtration Surface Area)
Operating Temperature	-20° C to 200° C (-4° F to 392° F)
Maximum Differential Pressure	5 bar; 20° C to 200° C (73 psid; -4° F to 392° F), regardless of the system pressure or flow direction
Typical Compressed Air Service Life	12 months

* HIMA - Health Industry Manufacturers Association, known as AdvaMed.

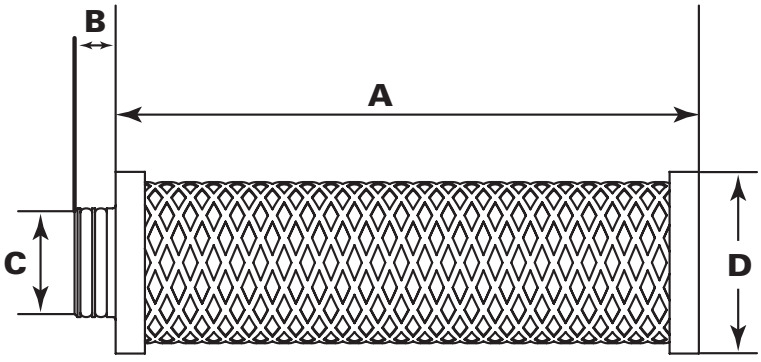
MATERIAL COMPLIANCE (US & EU)

All components of the P-SRF X filter cartridge are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21. Donaldson confirms that all materials used for the P-SRF X elements meet regulatory and legislative requirements and guidelines for indirect food contact as detailed in European Regulation (EC) Number 1935/2004. These articles are intended for indirect food use in filtration of gases, therefore migration testing has been limited to an atmospheric and watery environment.

MATERIALS		CFR TITLE 21
Filter Media	PTFE	177.2660
Upstream Support	304 SS	211.65
Downstream Support	304 SS	211.65
Outer Liner	304 SS	211.65
Inner Liner	304 SS	211.65
Up- and downstream support media	PTFE	177.1550
End Caps	304 SS	211.65
Poting Compound	Silicone	177.2600
O-Rings Standard	Silicone	177.2600
O-Rings Optional	EPDM FEP over silicone FEP over Viton®*	

* Viton is a registered trademark of DuPont Performance Elastomers L.L.C.

DIMENSIONS

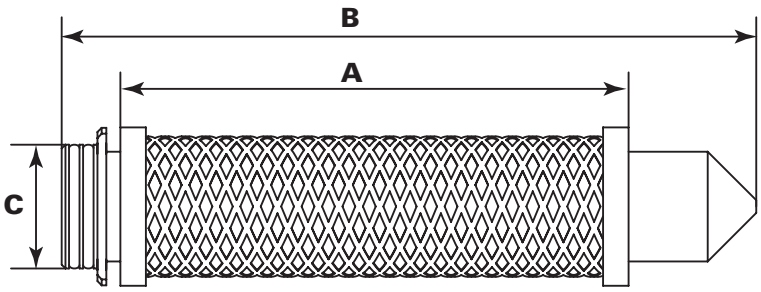


UF PUSH-IN CONNECTION

Element Size	Dimensions						Correction Factors**
	A		B		C*		
	mm	in.	mm	in.	mm	in.	
03/10	76	2.99	87	3.42	30	1.18	0.15
04/10	104	4.09	118	4.64	30	1.18	0.20
04/20	104	4.09	118	4.64	37	1.46	0.20
05/20	128	5.04	142	5.59	37	1.46	0.25
05/25	128	5.04	142	5.59	37	1.46	0.34
07/25	180	7.08	194	7.64	37	1.46	0.49
05/30	128	5.04	142	5.59	61	2.40	0.49
07/30	180	7.08	196	7.71	61	2.40	0.70
10/30	254	10.00	270	10.63	61	2.40	1.00
15/30	381	15.00	402	15.83	61	2.40	1.51
20/30	508	20.00	524	20.63	61	2.40	2.02
30/30	762	30.00	778	30.63	61	2.40	3.03

* UF plug connection with double O-Ring. ** Correction factors filtration surface area

DIMENSIONS



CODE 7 CONNECTION

Element Size		Dimensions					
		A		B		C	
mm	in.	mm	in.	mm	in.	mm	in.
127	5	125	4.92	190	7.48	56	2.22
254	10	250	9.84	315	12.40	56	2.22
508	20	500	19.68	565	22.24	56	2.22
762	30″	750	29.53	815	32.08	56	2.22

Code 7: 2 x 226 O-Rings, 2 bayonet locking tabs, locating fin
Other end cap configurations available upon request

QUALITY ASSURANCE

All P-SRF X elements have been inspected and released by Quality Assurance as having met the following requirements:

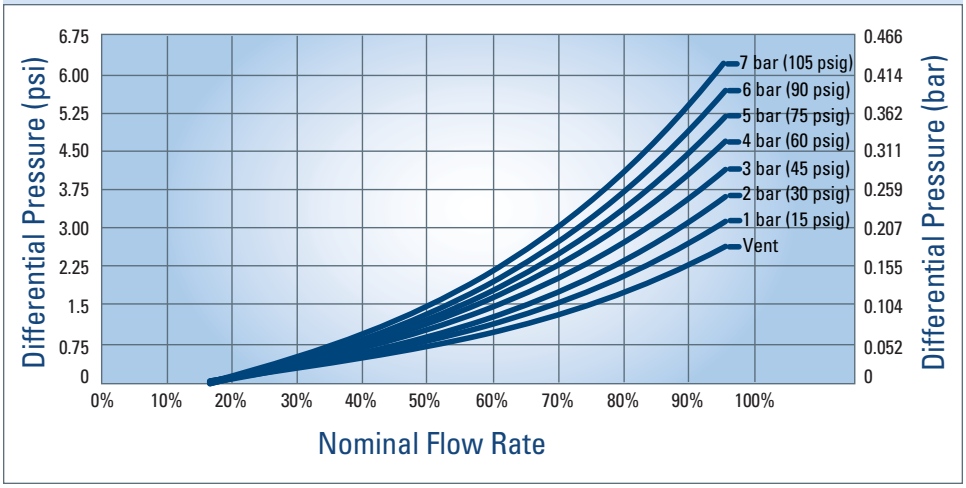
- All filters are fabricated without the use of binders, adhesives, additives or surface active agents.
- All sterile filters are integrity tested according to ASTM D 2986-91 and DIN EN 1822 to verify compliance with established quality and design specifications and to assure consistent and reliable performance.
- A Factory Test Certification according to DIN EN 10204 is available upon request.

FLOW CHARACTERISTICS P-SRF X FILTER ELEMENT

Type P-SRF X		7 bar (100 psig)			
		Nominal*		Maximum	
Housing	Element	m^3/hr	scfm	m^3/hr	scfm
0006	03/10	59	35	90	53
0009	04/10	90	53	121	71
0012	04/20	121	71	180	106
0018	05/20	180	106	270	159
0027	05/25	270	159	360	212
0036	07/25	360	212	481	283
0048	07/30	481	283	720	424
0072	10/30	720	424	1081	636
0108	15/30	1081	636	1441	848
0144	20/30	1441	848	1922	1,131
0192	30/30	1922	1,131	2882	1,696

* The given nominal flow rate in the table represents 100%

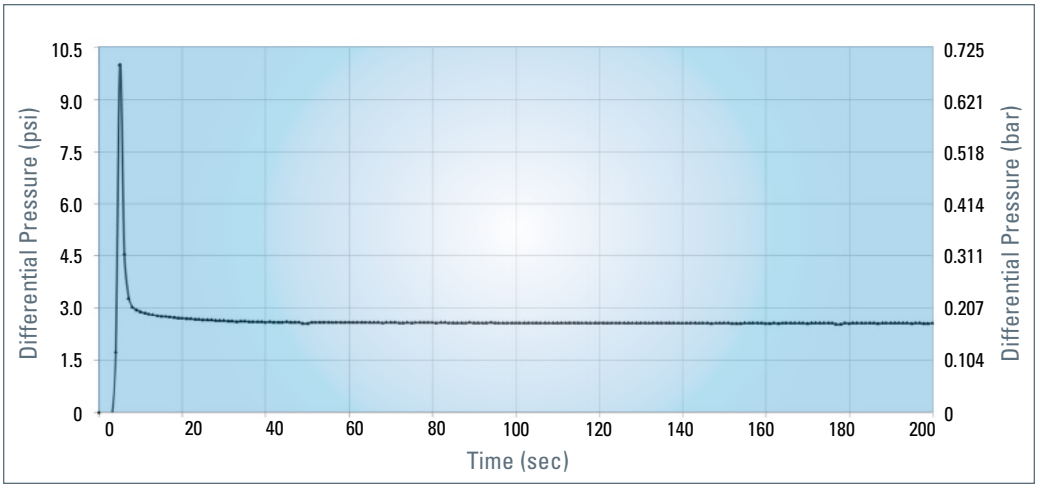
P-SRF X NOMINAL FLOW X 10/30 21° C (70° F)



Pressure: bar	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pressure: psig	0	15	30	45	60	75	90	100	115	130	145	160	175	190	205	220	232
Correction Factor [-]	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13

DE-WETTING CHARACTERISTICS

De-wetting characteristics of a SRF X 10/3 P7 after steaming at 1 bar at 121° C (15 psig at 250° F) for 30 minutes. Flow is 136 m^3/hr at 2 bar (80 scfm at 30 psi) absolute.
Normal conditions are reached after ~ 50 seconds.



AUTOCLAVING/STEAM STERILIZATION

Cumulative Steaming Time	121° C (250° F), Saturated Steam: 250 cycles (30 minutes) 132° C (270° F), Saturated Steam: 250 cycles (20 minutes) 143° C (290° F), Saturated Steam: 250 cycles (10 minutes) Independent of flow direction; forward and reverse steam flow possible
Vapor Phase Hydrogen Peroxide (VPHP) Suitable	130° C (266° F) @ > 5,000 ppm H_2O_2 , > 50 hours

STERILIZE-IN-PLACE (SIP) PROCEDURE

- With SIP, the filter element and housing remain in place and steam is used to sterilize the filtration system without the need for disassembly.
- The steam used for SIP must be free of rust and other particles.
- Steam pressure must not be allowed to fall below 1 bar (15 psig) throughout the SIP process.
- Condensate must be drained from the system during sterilization.
- Any air trapped in the housing must be vented.
- Upstream and downstream pressure gauges must be used to ensure differential pressure across the filter does not exceed 0.5 bar (7 psid) during SIP.
- After sterilization, pressurize the system with process air or gas up to the steam pressure used and allow the system to cool until ready for use.
- Always use the lowest possible sterilization temperature to avoid excess stress on the filter element.

AUTOCLAVE

- Generally, only the filter element is sterilized in an autoclave, but both the housing and element can be sterilized if removed from the process, disassembled and put in the autoclave.
- In addition to the cycle times given above, follow the specific procedures provided with the autoclave in use.

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