Donaldson
FILTRATION SOLUTIONS

P-SRF X
STERILE AIR PLEATED DEPTH FILTER ELEMENTS

Process Filtration

The P-SRF X filter element is a sterile grade, pleated high-performance PTFE filter element with a stainless steel support structure. The PTFE filter media is inherently hydrophobic with a high porous membrane structure that provides excellent de-wetting and filtration capabilities. The sturdy stainless-steel construction permits more than 250 possible sterilization cycles at specified conditions and can withstand high temperatures and high differential pressures in both flow directions.

The P-SRF X was developed for sterile filtration of compressed air and other process gases. The element is efficient to 99.9999998% at 0.2 µm, 99.999999% at 0.02 µm, and 99.99998% at 0.03 µm particles. The P-SRF X is reliable in extreme conditions and fulfills the stringent requirements of food and beverage industries, as well as the pharmaceutical industry.

The depth filter medium is non-fiber releasing and meets the USA requirements for Food Contact Use in accordance with the latest edition of Code of Federal Regulations (CFR) Title 21 211.72 and the EU requirements for Food Contact Use according to EC/1935/2004 for indirect food contact use.

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

P SRF-X

FEATURES	BENEFITS
Developed for the sterile filtration of air and gases in venting applications where CIP reagents are applied	Suitable for use in most process environments, including where VPHP and Ozone are used.
High retention rate (bacteria, viruses and particles) down to 3 nm (nanometers)	Esures product and process integrity for 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

APPLICATIONS

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

Industries

- Food and beverage
- Breweries
- Pharmaceutical
- Chemical
- Health care and biotech

Applications

- Tank ventilation
- Carbon dioxide
- Fermentation air
- Technical gases
- Aseptic packaging
- Compressed air

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	>99.9999998% at 0.2 µm >99.999999% at 0.02 µm >99.99998% at 0.003 µm
Filtration Surface	5.4 ft^2 per 10 inch element (254 mm) (For other element sizes see Correction Factors Filtration Surface Area)
Operating Temperature	-4°F to 392°F
Maximum Differential Pressure	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 Manufcturers Association, known as AdvaMed.

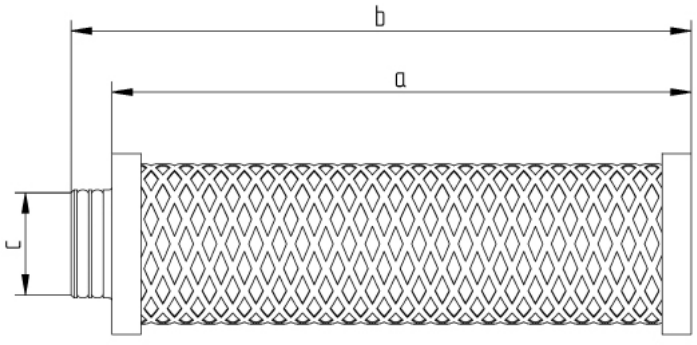
MATERIAL COMPLIANCE (US & EU)

All components of the P-SRF X filter cartridge are FDA listed for food contact use in the Code of Federal egulations (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

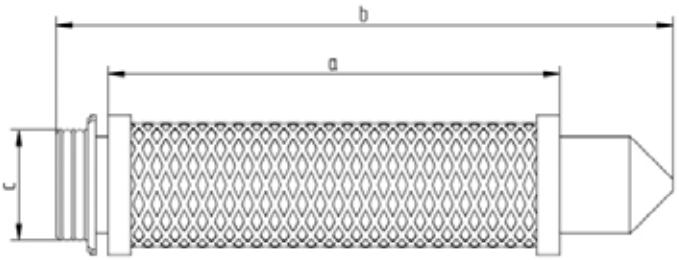


UF PUSH-IN CONNECTION

Element Size	Dimensions (inches)			Correction Factors**
	A	B	C*	
03/10	2.99	3.42	1.18	0.15
04/10	4.09	4.64	1.18	0.20
04/20	4.09	4.64	1.46	0.20
05/20	5.04	5.59	1.46	0.25
05/25	5.04	5.59	1.46	0.34
07/25	7.08	7.64	1.46	0.49
05/30	5.04	5.59	2.40	0.49
07/30	7.08	7.71	2.40	0.70
10/30	10.00	10.63	2.40	1.00
15/30	15.00	15.83	2.40	1.51
20/30	20.00	20.63	2.40	2.02
30/30	30.00	30.63	2.40	3.03

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

DIMENSIONS



CODE 7 CONNECTION

Element Size	Dimensions (inches)		
	A	B	C
5″	4.92	7.48	2.22
10″	9.84	12.40	2.22
20″	19.68	22.24	2.22
30″	29.53	32.08	2.22

Code 7: 2 x 226 O-Rings, 2 bayonet locking tabs, locating fin

Other end cap configurations available upon request

QUALITY ASSURANCE

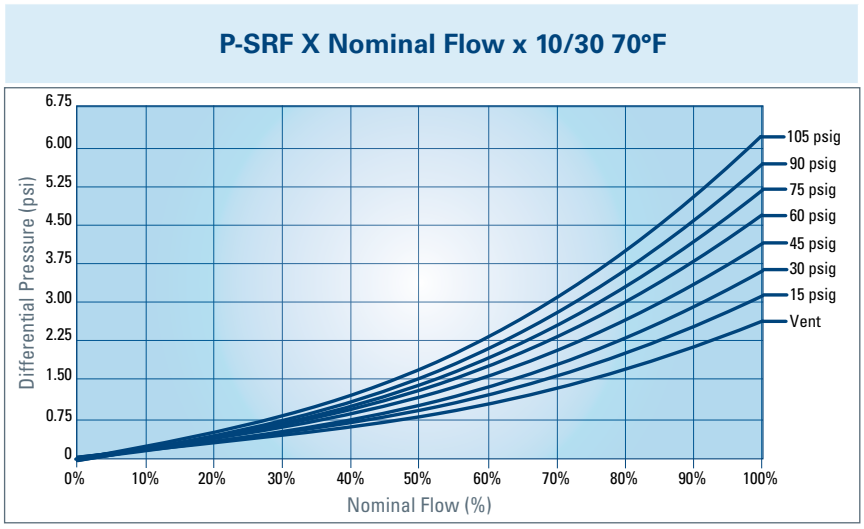
All P-SRF X elements have been inspected and released by Quality Assurance as having met the following requirements:

- 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		100 PSIG (SCFM)	
HOUSING	ELEMENT	NOMINAL*	MAXIMUM
0006	03/10	35	53
0009	04/10	53	71
0012	04/20	71	106
0018	05/20	106	159
0027	05/25	159	212
0036	07/25	212	283
0048	07/30	283	424
0072	10/30	424	636
0108	15/30	636	848
0144	20/30	848	1,131
0192	30/30	1,131	1,696

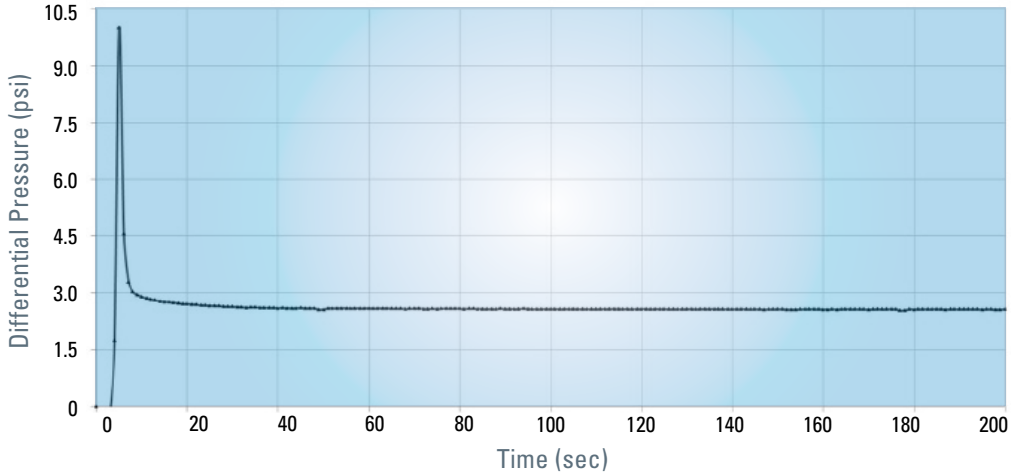
*The given nominal flow rate in the table represents 100%



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 15 psig (250°F) for 30 minutes. Flow is 80 scfm at 30 psi absolute. Normal conditions are reached after ~ 50 seconds.



AUTOCLAVING/STEAM STERILIZATION

Cumulative Steaming Time	250°F, Saturated Steam: 250 cycles (30 minutes) 270°F, Saturated Steam: 250 cycles (20 minutes) 290°F, Saturated Steam: 250 cycles (10 minutes) Independent of flow direction; forward and reverse steam flow possible
Vapor Phase Hydrogen Peroxide (VPHP) Suitable	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 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 5 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 excesss 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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