Donaldson
FILTRATION SOLUTIONS

P-SRF V

STERILE AIR PLEATED DEPTH FILTER ELEMENTS

Process Filtration

The P-SRF V filter element is a sterile grade, pleated depth filter element in a stainless-steel body. The improved media configuration provides excellent de-wetting capabilities and exceptionally low differential pressure drop. The sturdy stainless-steel construction permits more than 150 sterilization cycles at specified conditions and withstands high differential pressures in both flow directions.

The P-SRF V was developed for the safe and sterile filtration of air and other process gases in venting and process applications. The element is efficient to 99.99999995% at 0.2 µm and 0.02 µm, and 99.999999991% at 0.003 µm particles. The P-SRF V 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 Code of Federal Regulations (CFR) Title 21 211.72 latest edition and the EU requirements for Food Contact Use according to EC/1935/2004 for indirect food contact use.

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

P SRF-V

FEATURES	BENEFITS
Thirteen lengths and multiple connection options	These meet virtually all purification application requirements.
High-quality stainless steel construction ensures excellent mechanical stability, thermal resistance up to 392°F	More than 150 sterilization cycles possible at specific conditions, and is suited for Vapor Phase Hydrogen Peroxide (VPHP) sterilization.
Proprietary three-dimensional binder-free borosilicate depth filter media	Large void volume 95%, is chemically inert and developed specifically for the removal of bacteria and viruses.
Inherently hydrophobic media	Ensures high flow rates, low pressure drop, and excellent dewetting characteristics.
Validated retention of bacteria and viruses	Provides quality assurance control for aseptic applications.
Depth filter medium is non-fiber releasing	All components meet FDA requirements for contact with food in acordance with the Code of Federal Regulations (CFR), Title 21.
The filter element is manufactured according to DIN EN ISO 9001	Globally recognized quality management.
Polydimethylsiloxane (PDMS) coating	Element is caustic-resistant, hydrophobic and fast drying.

APPLICATIONS

The P-SRF V pleated sterile air depth filter element is designed and developed for the following industries and applications:

Industries

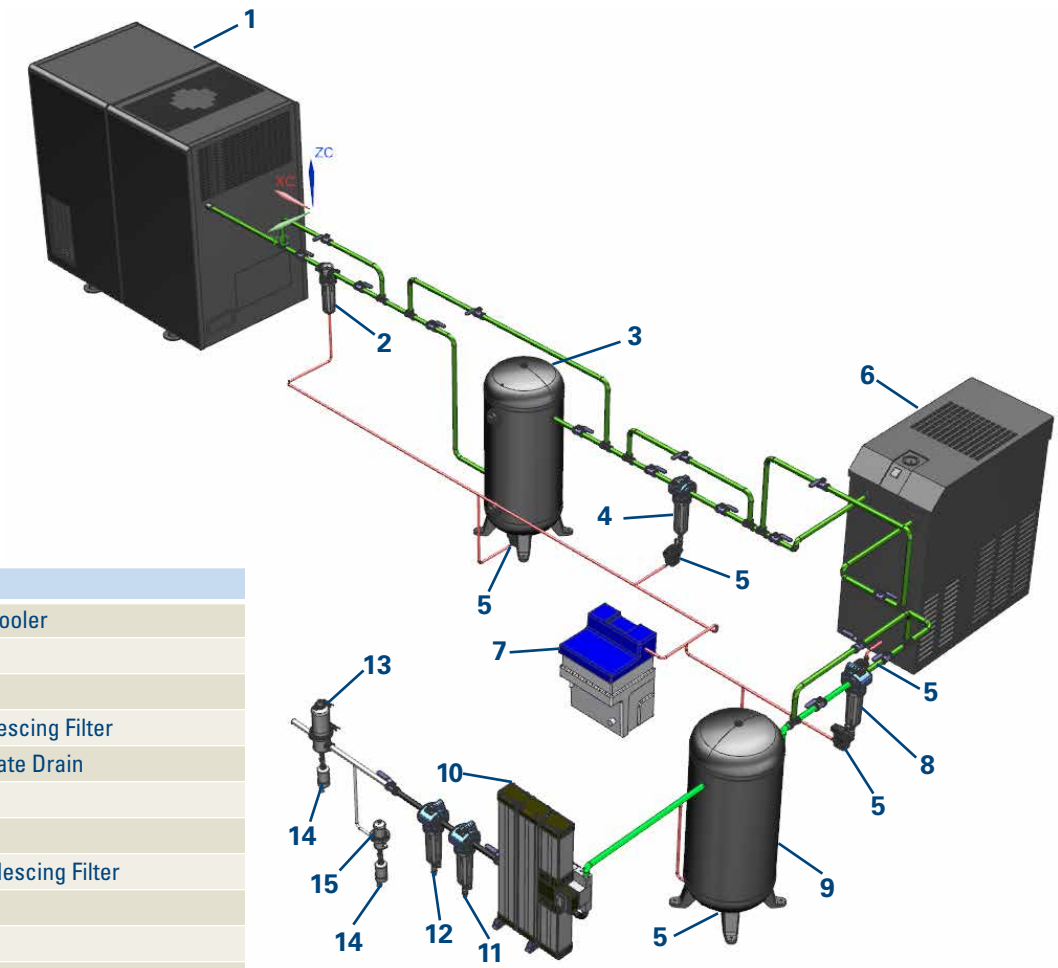
- Food and beverage
- Breweries
- Pharmaceutical
- Chemical
- Health care and biotech

Applications

- Tank ventilation
- Carbon dioxide
- Fermentation air
- Technical gases
- Aseptic packaging
- Container aeration

RECOMMENDED STERILE AIR SYSTEM

Installation with variable compressed air demand



No.	Description
1	Air Compressor with Aftercooler
2	DF-C Cyclone Separator
3	Wet Storage Tank
4	DF Filter with V-Grade Coalescing Filter
5	UFM-D Zero-Loss Condensate Drain
6	Refrigerated Dryer
7	DS Oil/Water Separator
8	DF Filter with M-Grade Coalescing Filter
9	Dry Storage Tank
10	Ultrapac 2000 Dryer
11	DF Filter with S-Grade Particulate Filter
12	DF Filter with A-Grade Carbon Adsorption Filter
13	PG-EG Sanitary Housing with P-SRF V Sterile Filter
14	Condensate Trap/Drain
15	P-EG Housing with P-GS 5 µm Steam Filter

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 > 9***

SPECIFICATIONS

Retention Rate	>99.99999995% at 0.2 µm >99.99999995% at 0.02 µm >99.999999991% at 0.003 µm
Filtration Surface	3.34 ft² per 10 inch element (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
Typical Vent Service Life	6 months

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

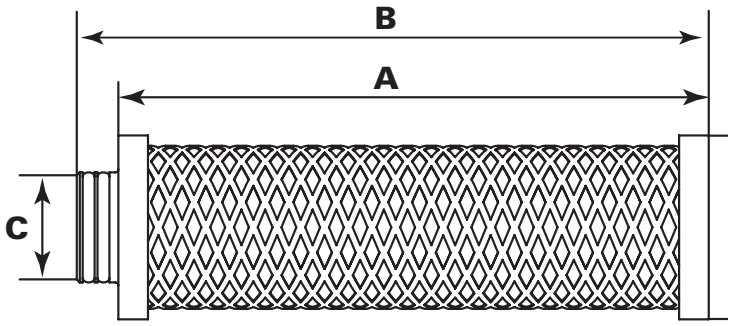
MATERIAL COMPLIANCE (US & EU)

All components of the P-SRF V 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 V elements meet regulatory and legislative requirements and guidelines for indirect food contact as detailed in European Regulation (EC) Number 1935/2004.

MATERIALS		CFR TITLE 21
Filter Media	Borosilicate	177.2660
Impregnation	PTFE	177.1520
Upstream Support	304 SS	211.65
Downstream Support	304 SS	211.65
Outer Liner	304 SS	211.65
Inner Liner	304 SS	211.65
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.

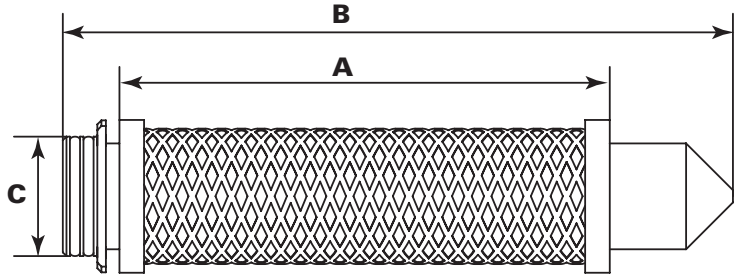
DIMENSIONS



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
30/50	30.00	30.63	3.50	3.03

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



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 V elements have been inspected and released by Quality Assurance as having met the following requirements:

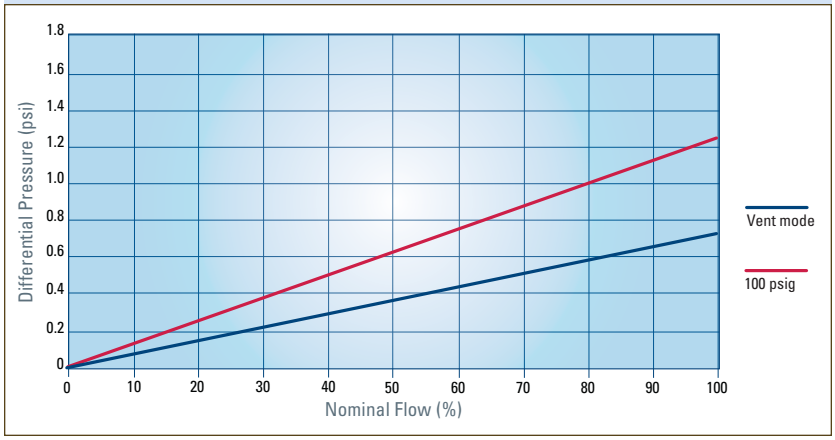
- All filters are fabricated without the use of binders, adhesives, additives or surface active agents.
- All sterile filters are integrity tested according to ASTM D 2986-91 and DIN EN 1822 to verify compliance with established quality and design specifications and to assure consistent and reliable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

FLOW CHARACTERISTICS P-SRF V FILTER ELEMENT

TYPE P-SRF V		FLOW AT 7 PSIG (CFM)	
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
0288	30/50	1,696	2,544

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

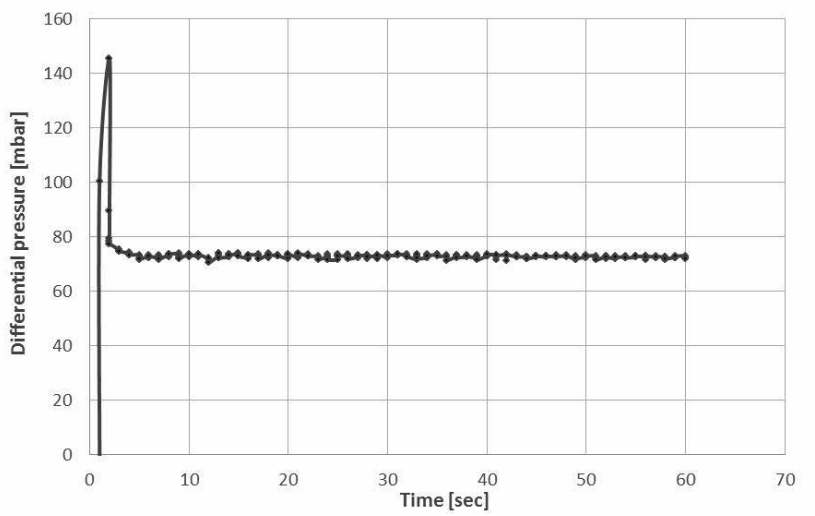
P-SRF V 10/30 Nominal Flow



PRESSURE (PSIG)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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 V 10/3 P7 after steaming at 15 psig (250°F) for 30 minutes. Flow is 82 cfm at 15 psig absolute. Normal conditions are reached within 10 seconds.



AUTOCLAVING/STEAM STERILIZATION

Cumulative Steaming Time	250°F, Saturated Steam: 160 cycles (30 minutes) 270°F, Saturated Steam: 160 cycles (20 minutes) 290°F, Saturated Steam: 160 cycles (10 minutes) Independent of flow direction; forward and reverse steam flow possible
Vapor Phase Hydrogen Peroxide (VPHP) Suitable	266°F @ > 5,000 ppm H2O2 , > 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.

Donaldson
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