



## **P-SRF** **PROCESS STERILE AIR FILTER ELEMENTS**

Compressed Air & Process Filtration



# Think Purity. Think Donaldson.

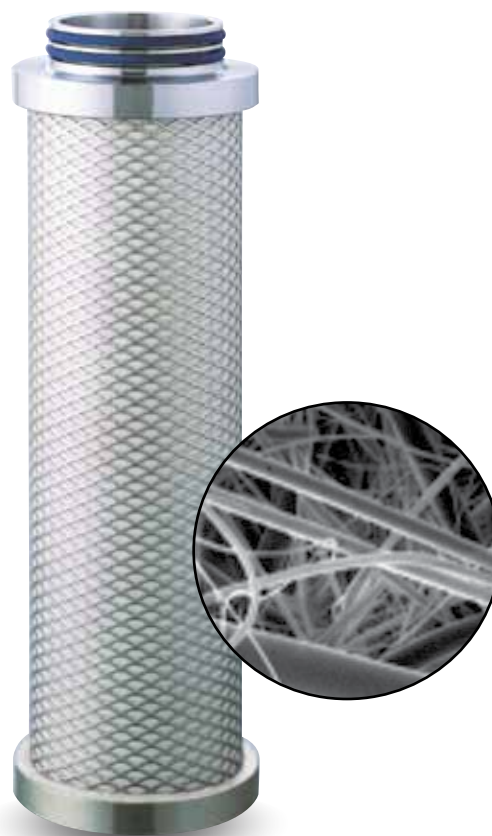
**As one of the world's leading manufacturers** of compressed air purification equipment and process filters, and with over 35 years of expertise, Donaldson has built a comprehensive engineering, manufacturing, and customer support network providing filters that meet the most demanding application requirements.

Donaldson innovative designs focus on energy-efficient operation and reliable performance to minimize operating expenses and reduce downtime. Donaldson provides industrial air, sterile air, culinary steam, tank venting, and liquid filtration products from prefiltration to final, and from low to high capacity, so when you think purity, think Donaldson.

The Donaldson P-SRF sterile wrapped depth filter element is used for sterile filtration of compressed air, process air, technical gases and vent applications. The retention rate is  $\geq 99.99998\%$  related to  $\leq 0.2 \mu\text{m}$  ensuring safe and sterile filtration of process gases. The P-SRF provides low pressure drop, high dirt-holding capacity, great strength, and long service life to dramatically reduce your operating costs.

## FEATURES & BENEFITS

- Thirteen sizes and available connection options meet virtually all air purification application requirements.
- High-quality stainless steel construction ensures excellent mechanical stability, thermal resistance up to 392°F, and more than 100 sterilization cycles possible at specific conditions, and is suited for Vapor Phase Hydrogen Peroxide (VPHP) sterilization.
- Patented three-dimensional binder-free borosilicate depth filter media has large void volume of 95%, is chemically inert and developed specifically for the removal of contaminating bacteria and viruses.
- This inherently hydrophobic media ensures high flow rates, low pressure drop, and excellent dewetting characteristics.
- Integrity testable according to HIMA and validated retention of bacteria and viruses provides high safety for aseptic applications in all industries.
- The depth filter medium is non-fiber releasing and all components meet the FDA requirements for contact with food in accordance with the Code of Federal Regulations (CFR), title 21. The filter element is manufactured according to DIN EN ISO 9001.



## APPLICATIONS

In process filtration applications, “sterile” means “free from live bacteria or other microorganisms.” The Donaldson P-SRF sterile filter element is designed and developed for use in the following:

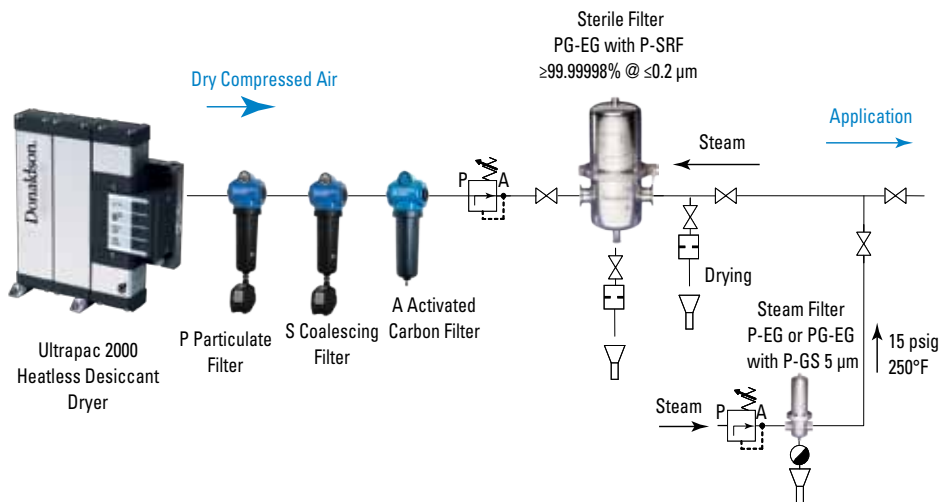
### Industries

Food & Beverage	Chemical
Pharmaceutical	Dairies
Health Care & Biotech	Breweries
Aseptic Packaging	

### Applications

Compressed Air	Tank Ventilation
Carbon Dioxide	Technical Gases
Fermentation Air	

## RECOMMENDED STERILE AIR INSTALLATION



## 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).

$$\text{LRV} = \log_{10} (\text{quantity of organisms in the challenge}) / (\text{quantity of organisms after filtration})$$

This test was completed with the P-SRF N pleated depth filter element that has the filter matrix made of only three layers of borosilicate. The P-SRF wrapped depth filter element has three additional support layers of polytetrafluoroethylene (PTFE) with no impact on microbiological retention efficiency. The retention efficiency of the P-SRF is equal to or better than the retention efficiency of the P-SRF N.

***Brevundimonas Diminutas* ( $\geq 0.2 \mu\text{m}$ )     $\text{LRV} > 7/\text{cm}^2$**

***MS2 Coliphagae* ( $\geq 0.02 \mu\text{m}$ )     $\text{LRV} > 9/\text{cm}^2$**

\* HIMA = Health Industry Manufacturers Association, known as AdvaMed.

## PRODUCT SPECIFICATIONS

Temperature Range	-4°F to 392°F (≥302°F only for dry compressed air)
Effective Filtration Area (nominal)	0.5 ft² per 10 inch element (For other element sizes see Correction Factors Filtration Surface Area)
Absolute Retention Rate	≥99.99998% at ≤0.2 µm
Bacterial/Viral Retention	Scientifically validated by an independent institute via: Brevundimonas diminutas aerosol challenge and MS2 Coliphage aerosol challenge
Integrity Test Values	DOP Test according to HIMA > 99.99998%
Configurations	UF: Push-in connection and flat end cap P7: 2 x 226 o-rings, 2 bayonet locking tabs and locating fin Other connections available upon request
Maximum Differential Pressure	75 psid (-4°F to 302°F), regardless of the system pressure or flow direction
Typical Continuous Air Service Life	12 months recommended changeout cycle
Typical Vent Service Life	6 months recommended changeout cycle
Cumulative Steam Time	250°F, Saturated Steam ≥100 cycles (30 minutes) Figures based on steaming resistance lab tests. Filter elements must be checked in actual use. Contact Donaldson for recommended Autoclaving/Steaming procedures.

## MATERIALS

Filter Media	Borosilicate glass fiber	CFR Title 21: 177.2660
Upstream Support	PTFE	CFR Title 21: 177.1550
Downstream Support	PTFE	CFR Title 21: 177.1550
Outer Guard	Stainless Steel 1.4301 (304 SS)	CFR Title 21: 211.65
Inner Guard	Stainless Steel 1.4301 (304 SS)	CFR Title 21: 211.65
End Caps	Stainless Steel 1.4301 (304 SS)	CFR Title 21: 211.65
Potting Compound	Silicone	CFR Title 21: 177.2600
O-Rings Standard	Silicone	CFR Title 21: 177.2600
O-Rings Optional	Buna EPDM PTFE over silicone PTFE over Viton®*	CFR Title 21: 177.2600 CFR Title 21: 177.2600 CFR Title 21: 177.1550 CFR Title 21: 177.1550

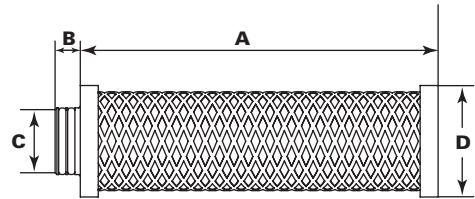
\* Viton is a registered trademark of DuPont Performance Elastomers L.L.C.

## UF PUSH-IN CONNECTION

Element Size	Dimensions (inches)					Correction Factors**
	A	B	C (I.D.)*	C (O.D.)*	D	
03/10	3.0	0.43	0.79	1.20	1.65	0.12
04/10	4.1	0.43	0.79	1.20	1.65	0.17
04/20	4.1	0.55	0.98	1.46	2.05	0.19
05/20	5.0	0.55	0.98	1.46	2.05	0.25
05/25	5.0	0.55	0.98	1.46	2.44	0.32
07/25	7.1	0.55	0.98	1.46	2.44	0.47
05/30	5.0	0.55	0.98	1.46	3.39	0.46
07/30	7.1	0.63	2.09	2.40	3.39	0.68
10/30	10.0	0.63	2.09	2.40	3.39	1.00
15/30	15.0	0.63	2.09	2.40	3.39	1.55
20/30	20.0	0.63	2.09	2.40	3.39	2.10
30/30	30.0	0.63	2.09	2.40	3.39	3.28
30/50	30.0	0.63	3.20	3.50	5.50	5.89

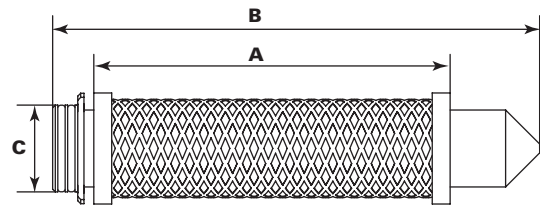
\* Plug-type connection with double o-ring

\*\* Correction factors filtration surface area



## P7 CONNECTION

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



## QUALITY ASSURANCE

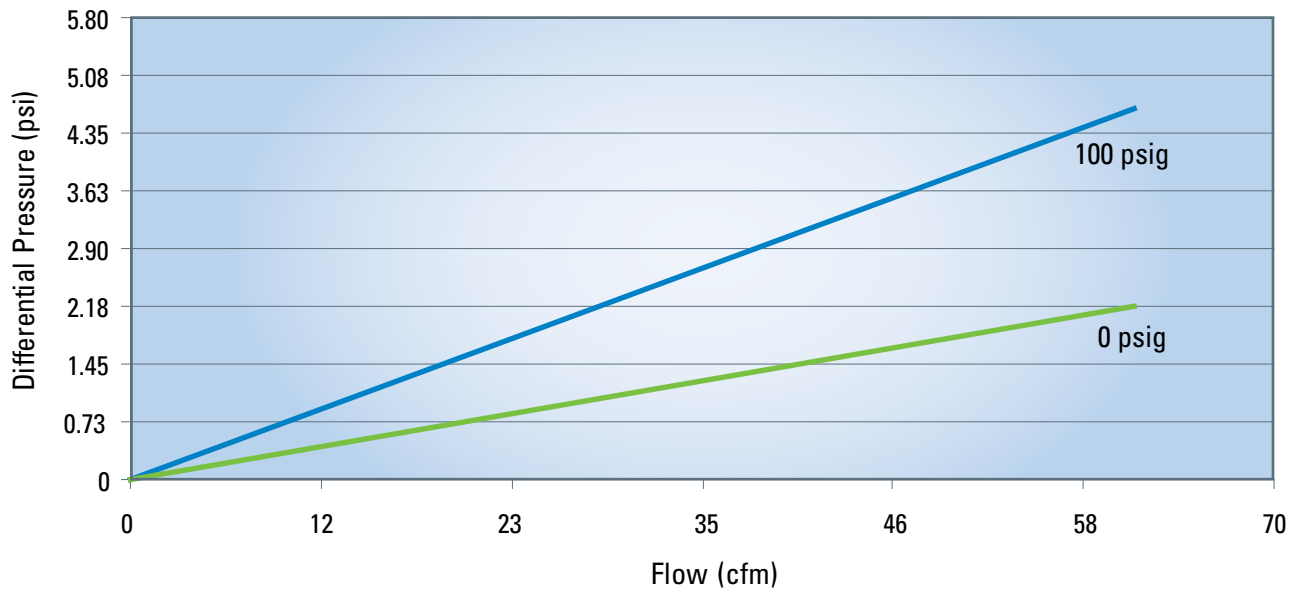
All P-SRF sterile air filter elements are 100% integrity tested during manufacture and are marked with type and lot number. All P-SRF elements have been inspected and released by Quality Assurance as having met the following requirements:

- All filters are fabricated without the use of binders, adhesives, additives or surface active agents.
- All filter components based on plastics are non-toxic and are certified bio-safe in accordance with current USP Class VI Tests for Plastics.
- 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.

Proper sizing and component selection of sterile air filtration systems is essential to assuring that your application is operating as effectively and efficiently as possible.

### FLOW CHARACTERISTICS P-SRF FILTER ELEMENT

Measured differential pressure for P-SRF 10/30 element, air, 68°F, 0 psig and 100 psig.  
The actual differential pressure may vary depending on the on-site conditions.



### PRESSURE CORRECTION FACTORS

Flow for other pressures can be calculated with the correction factors below.

Pressure (psig)	15	29	58	87	100	116	145	174	203	232
Correction Factor	0.25	0.36	0.6	0.9	1.0	1.1	1.4	1.6	1.9	2.1

## AUTOCCLAVING/STEAMING/STERILIZATION

Sterilization Temperature (°F)	Time (minutes)			
	Heating Phase	Sterilization Phase	Cooling Phase	Entire Sterilization Cycle
250 - 257	15	30	15	60
268 - 275	15	15	15	45
286	15	10	15	40

Note: Figures are based on steam resistance lab test. Filter elements need to be checked in actual use. Contact Donaldson for recommend autoclaving/steaming/sterilization procedures.

For more information on sterile air, please refer to the Sterile Air brochure.

## 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 or 250°F 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 excess stress on the filter element.

## AUTOCCLAVE

- 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.



# think **PURITY** think **DONALDSON**

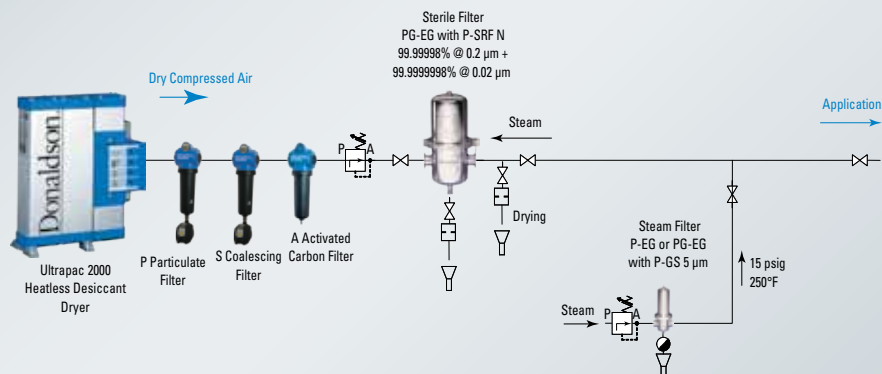


## LEADING TECHNOLOGY



- Over 1,000 engineers and scientists worldwide
- Over 1,500 issued, active and pending patents
- Proprietary media for durability and performance

## FILTRATION SOLUTIONS



- Energy saving, reliable filters and dryers
- Industrial air, sterile air, culinary steam, tank venting and process liquid filtration

## KNOWLEDGEABLE SERVICE



- Ready-to-ship filters and POU dryers within 24 hours
- Technical expertise and support



\* PF-EG & PG-EG single filter element housings meet 3-A Sanitary Standards.



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P-SRF Brochure (10/10)

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