

**Sterile depth filter element for sterile filtration of compressed air, process air, technical gases and vent applications.**

The Donaldson® P-SRF sterile depth filter element retention rate is  $\geq 99.99998\%$  for all particles 0.01  $\mu\text{m}$  and larger, 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.



**P-SRF**

FEATURES	BENEFITS
Thirteen sizes 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 100 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	Has 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.
Integrity testable according to HIMA* and 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 accordance with the Code of Federal Regulations (CFR), Title 21.
The filter element is manufactured according to DIN EN ISO 9001	Globally recognized quality management.

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

## APPLICATIONS

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

### Industries

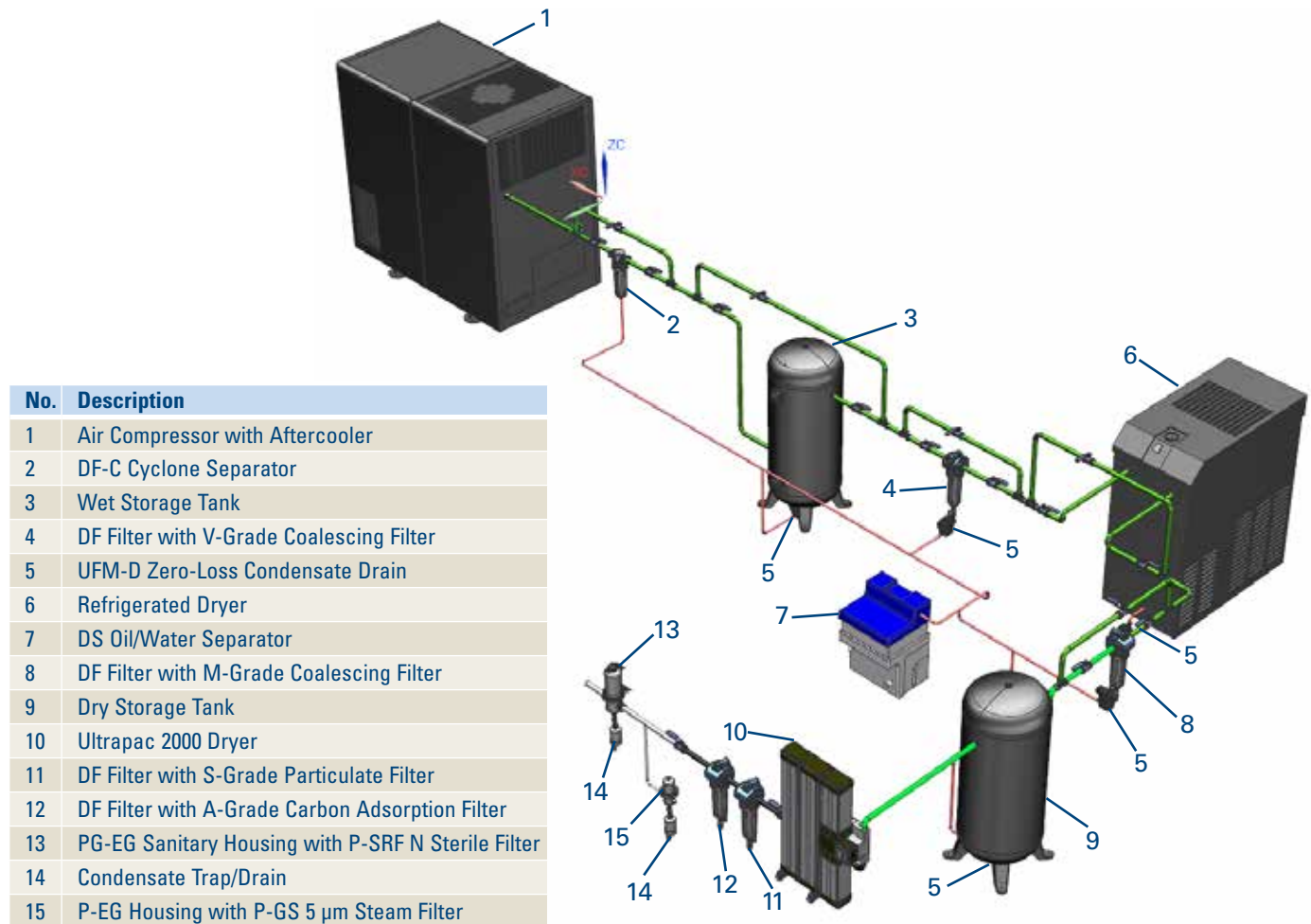
- Food and beverage
- Pharmaceutical
- Health care and biotech
- Aseptic Packaging
- Chemical
- Dairy
- Brewery

### Applications

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

## RECOMMENDED STERILE AIR SYSTEM

Installation with variable compressed air demand



## 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).

$LRV = \text{Log}_{10}$  (quantity of organisms in the challenge minus quantity of organisms after filtration)

***Brevundimonas diminutas* ( $\geq 0.2 \mu\text{m}$ )    LRV > 7**

**MS2 Coliphage ( $\geq 0.02 \mu\text{m}$ )    LRV > 9**

## SPECIFICATIONS

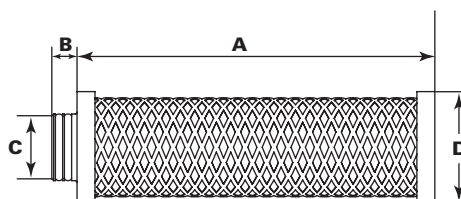
Temperature Range	-4°F to 392°F ( $\geq 302^\circ\text{F}$ only for dry compressed air)
Effective Filtration Area (nominal)	0.5 ft <sup>2</sup> per 10 inch element (For other element sizes see Correction Factors Filtration Surface Area)
Absolute Retention Rate	$\geq 99.99998\%$ at $\geq 0.01 \mu\text{m}$
Bacterial/Viral Retention	Scientifically validated by an independent institute via: <i>Brevundimonas diminutas</i> 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 $\geq 100$ 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		CFR TITLE 21
Filter Media	Borosilicate	177.2660
Upstream Support	PTFE	177.1550
Downstream Support	PTFE	177.1550
Outer Guard	304 SS	211.65
Inner Guard	304 SS	211.65
End Caps	304 SS	211.65
Poting Compound	Silicone	177.2600
O-Rings Standard	Silicone	177.2600
O-Rings Optional	Buna	177.2600
	EPDM	177.2600
	PTFE over silicone	177.1550
	PTFE over Viton®*	177.1550

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

## UF PUSH-IN CONNECTION

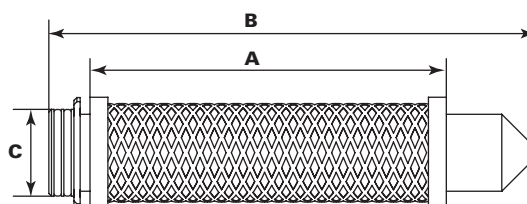
Element Size	Dimensions (inches)					Correction Factors**
	A	B	C (I.D.)*	C (O.D.)*	D	
03/10	3.0	0.43	0.79	1.20	1.65	0.12
04/10	4.1	0.43	0.79	1.20	1.65	0.17
04/20	4.1	0.55	0.98	1.46	2.05	0.19
05/20	5.0	0.55	0.98	1.46	2.05	0.25
05/25	5.0	0.55	0.98	1.46	2.44	0.32
07/25	7.1	0.55	0.98	1.46	2.44	0.47
05/30	5.0	0.55	2.00	2.40	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.

## FLOW CHARACTERISTICS P-SRF FILTER ELEMENT

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

For most compressed air applications, Donaldson recommends choosing the P-SRF filter size that produces a differential pressure (pressure drop) of less than 3 psi. This will ensure a favorable balance between initial cost, energy savings, and dirt holding capacity.

1. Divide flow rate in SCFM by the correction factor corresponding to operating pressure.
2. Divide desired pressure drop in PSI by the answer obtained in step 1. Use the table below to choose the element size whose correction factor most closely matches this answer.

OPERATING PRESSURE (PSIG)	CORRECTION FACTOR
0	1.0
15	2.0
30	3.1
45	4.1
60	5.1
75	6.2
90	7.2
100	7.9
150	11.3
200	14.8
250	18.2
300	21.7

CORRECTION FACTOR	OPTIMAL FILTER ELEMENT SIZE
0.384	03/10
0.271	04/10
0.243	04/20
0.184	05/20
0.144	05/25
0.098	07/25
0.100	05/30
0.068	05/30
0.046	10/30
0.030	15/30
0.022	20/30
0.014	30/30
0.008	30/50

### *For example:*

Flow rate: 100 SCFM  
 System pressure: 75 psig  
 Optimal pressure drop: 3 psi

1.  $100/6.2 = 16.12$
2.  $3/16.12 = 0.186$
3. 0.186 closely aligns with the 05/20 element

## AUTOCLAVING/STEAM 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/steam sterilization procedures.

For more information on sterile air, please refer to Donaldson's 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.

## AUTOCLAVE

- Generally, the only 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.

### Important Notice

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, specifications, availability and data are subject to change without notice, and may vary by region or country.



Donaldson Company, Inc.  
Process Filtration  
PO Box 1299  
Minneapolis, MN  
55440-1299 U.S.A.

Tel 800-543-3634 (USA)  
Tel 800-343-3639 (within Mexico)  
Fax 952-885-4791  
processfilters@donaldson.com  
donaldsonprocessfilters.com



F117011 04-2017 ENG P-SRF Sterile Air Depth Filter Elements

© 2010 Donaldson Co., Inc. All Rights Reserved. Donaldson and the color blue are marks of Donaldson Company, Inc. All other marks belong to their respective owners.  
{Contains Donaldson proprietary technology.}