# Process Filtration
# From Pure to Sterile

# (P)-SRF N

## MAIN FEATURES & BENEFITS:

- **Developed for the sterile filtration of air and gases in compressed gas applications as well as venting applications.**
- **High dirt holding capacity at a low differential pressure and a high flow rate**
- **Excellent dewetting characteristic**
- **Suited for vapour phase hydrogen peroxide (VPHP) sterilization**
- **Approved for Food Contact Use acc. to CFR Title 21 & EEC/1935/2004**

## INDUSTRIES:

- **Dairy**

- **Food & Beverage**

- **Fermentation**

- **Pharmaceutical**

- **Chemical**

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## PRODUCT DESCRIPTION

The P-SRF N filter element is a pleated depth filter element with inner and outer liners and end caps made from stainless steel. The retention rate is > 99.99998 % related to 0,2 µm and > 99.9999998 % related to 0,02 µm. The P-SRF N pleated, three dimensional borosilicate depth media has a large void volume of 95 %. This ensures a high dirt holding capacity at a low differential pressure and a high flow rate. The filter media is inherently hydrophobic.

The P-SRF N was developed for the safe & sterile filtration of compressed air and other process gases. The filter element fulfils the high requirements in food & beverage (dairies, food processing, soft drinks) and pharmaceutical industries and works reliable even under extreme operating conditions.

The depth filter medium is non-fiber releasing and complies with the FDA requirements (Food and Drug Administration 21 CFR 211.72 latest edition) and EC/1935/2004 for indirect Food Contact Use. The sturdy stainless steel construction permits more than 100 possible sterilization cycles at specified conditions and withstands high differential pressures in both flow directions. P-SRF N sterile filter elements ensure a safe and reproducible production.

**The pleated sterile depth filter P-SRF N is designed and developed for the following applications:**

### Filtration of air and gases

- Compressed Air
- Carbon Dioxide
- Fermentation Air
- Tank Ventilation
- Technical Gases

**All products 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 Certificate according to DIN EN 10204 is available upon request.

## PRODUCT SPECIFICATIONS

| Product Specifications | |
|---|---|
| **Retention Rate:** | • > 99,99998 % at 0,2 µm<br>• > 99,9999998 % at 0,02 µm |
| **Filtration Surface:** | • 0,84 $m^2$ per 254 mm element (10”)<br>• For other element sizes see correction factor CF in section “Available end cap configurations”. |
| **Temperature Range:** | • -20°C (-4°F) to 200°C (400°F)<br>• > 150°C (300°F) only for dry air |
| **Maximum Differential Pressure:** | • 5 bar (75 psid)<br>• (-20°C up to 150°C), independent of the system pressure or the flow direction |
| **Typical Continuous Air Service Life Time:** | • 12 months |
| **Typical Vent Service Life Time:** | • 6 months |
| **Cumulative Steaming Time*:** | • 121°C (250° F)<br>o Saturated Steam: 180 cycles (30 minutes)<br>• 131°C (270° F)<br>o Saturated Steam: 150 cycles (20 minutes)<br>• 141°C (290° F)<br>o Saturated Steam: 150 cycles (10 minutes)<br>Independent of flow direction; forward and reversed steam flow possible |
| **VPHP Suitable:** | • 130°C @ > 1.000 ppm $H_2O_2$<br>> 50 hours |

** Figures are based on lab tests to evaluate steaming resistance. Filter elements need to be checked in actual use. Contact Donaldson for recommended Autoclaving/Steaming procedures.*

## MATERIAL COMPLIANCE (US & EU)

- All components of the P-SRF N filter cartridge are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21. Donaldson Filtration Deutschland GmbH confirms that all materials used for the P-SRF element meet regulatory and legislative requirements and guidelines for 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.

| Filter Materials | | CFR Title |
|---|---|---|
| **Filter Matrix:** | Borosilicate | 177.2260 |
| **Coating:** | Polydimethylsiloxane (PDMS) | 177.1520 |
| **Upstream Support:** | Stainless Steel 1.4301 | 211.65 |
| **Downstream Support:** | Stainless Steel 1.4301 | 211.65 |
| **Outer Gard:** | Stainless Steel 1.4301 | 211.65 |
| **Inner Gard:** | Stainless Steel 1.4301 | 211.65 |
| **End Caps:** | Stainless Steel 1.4301 | 211.65 |
| **Bonding Material:** | Silicone | 177.2600 |
| **O-Rings:** | Silicone | 177.2600 |
| **Alternatively:** | Buna | 177.2600 |
| | EPDM | 177.2600 |
| | PTFE over silicone | 177.1550 |
| | PTFE over viton | 177.1550 |

## RETENTION OF MICRO-ORGANISMS

The P-SRF N sterile filter elements were challenged with a specified bacteria and phage aerosol for a defined time. Down stream analysis of the filtered air was done using impactor and impinger.

The validation documents are available on request.

**Brevundimonas Diminuta (≥ 0,2 µm)**

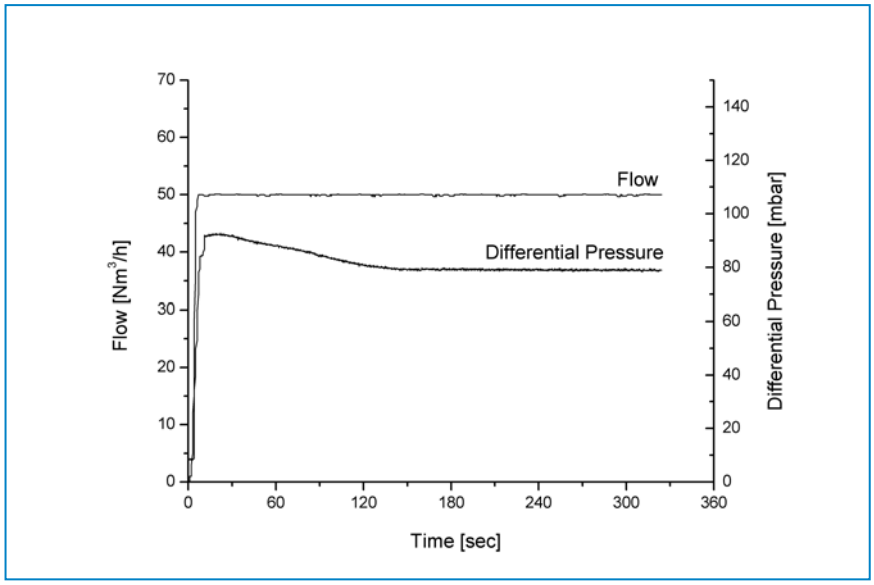
**LRV > 7/cm²**

**MS2 Coliphages (≥ 0,02 µm)**

**LRV > 9/cm²**

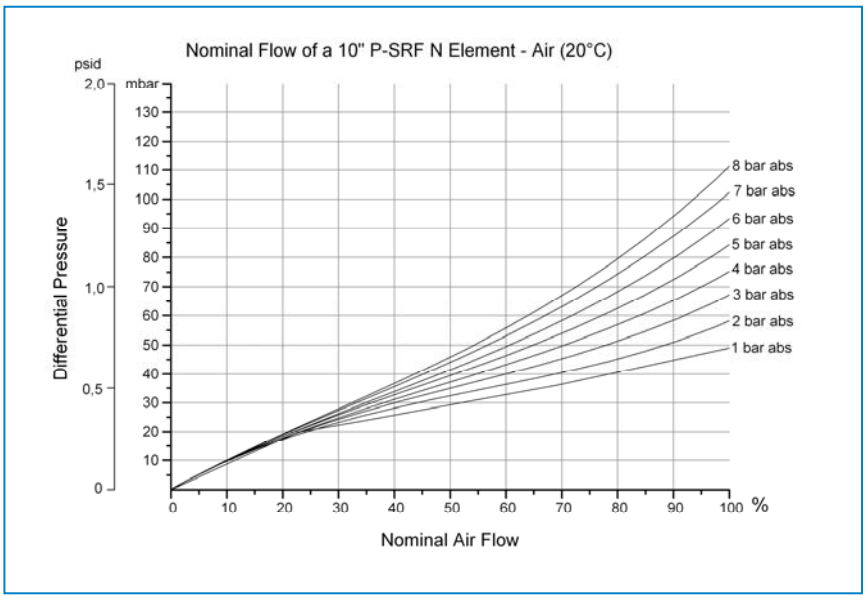
$$LRV = \log10 \left( \frac{\text{Number of organisms in challenge}}{\text{Number of organisms in filtrate}} \right)$$

## DEWETTING CHARACTERISTICS




Dewetting characteristic of a P-SRF N 05/25 after steaming at 1 bar for 30 minutes. Flow is 50 $Nm^3/h$ at 1,2 bar absolute. Normal conditions are reached after ~ 150 seconds.

## FLOW CHARACTERISTICS




| Type SRF N | | Flow at 7 barg [$m^3/h$] | |
|---|---|---|---|
| housing | element | nominal | maximum |
| 0006 | 03/10 | 60 | 90 |
| 0009 | 04/10 | 90 | 120 |
| 0012 | 04/20 | 120 | 180 |
| 0018 | 05/20 | 180 | 270 |
| 0027 | 05/25 | 270 | 360 |
| 0036 | 07/25 | 360 | 480 |
| 0048 | 07/30 | 480 | 720 |
| 0072 | 10/30 | 720 | 1080 |
| 0108 | 15/30 | 1080 | 1440 |
| 0144 | 20/30 | 1440 | 1920 |
| 0192 | 30/30 | 1920 | 2280 |
| 0288 | 30/50 | 2880 | 4320 |

P-SRF N, air, 20°C,1 bar absolute (14,5 psi) to 8 bar absolute (116 psi). The given nominal flow rate in the table represents 100 % Nominal Air Flow in the diagram.

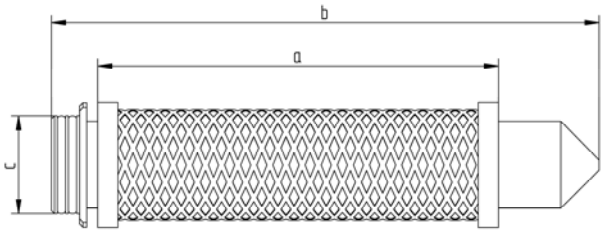
| Pressure [barg] | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Correction Factor | 0,25 | 0,36 | 0,5 | 0,6 | 0,75 | 0,9 | 1 | 1,1 | 1,2 | 1,4 | 1,5 | 1,6 | 1,75 | 1,9 | 2 | 2,1 |

Nominal and maximum Flow for other pressures can be calculated with the above correction factors.

## AVAILABLE END CAPS CONFIGURATION

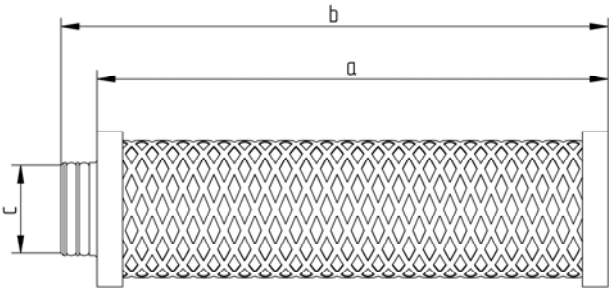
### Dimensions (CODE 7 connection):

| CODE 7 | | | | | | |
|---|---|---|---|---|---|---|
| Size | a | | b | | c | |
| | mm | inch | mm | inch | mm | inch |
| 5” | 125 | 4,92 | 190 | 7,48 | 56,5 | 2,22 |
| 10” | 250 | 9,84 | 315 | 12,40 | 56,5 | 2,22 |
| 20” | 500 | 19,68 | 585 | 22,24 | 56,5 | 2,22 |
| 30” | 750 | 29,53 | 815 | 32,08 | 56,5 | 2,22 |




### Dimensions (uf – plug connection):

| uf – plug Connection | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | a | | b | | C* | | CF** |
| | mm | inch | mm | inch | mm | inch | |
| 03/10 | 76 | 2,99 | 87 | 3,42 | 30 | 1,18 | 0,12 |
| 04/10 | 104 | 4,09 | 118 | 4,64 | 30 | 1,18 | 0,17 |
| 04/20 | 104 | 4,09 | 118 | 4,64 | 37 | 1,46 | 0,17 |
| 05/20 | 128 | 5,04 | 142 | 5,59 | 37 | 1,46 | 0,21 |
| 05/25 | 128 | 5,04 | 142 | 5,59 | 37 | 1,46 | 0,29 |
| 07/25 | 180 | 7,08 | 194 | 7,64 | 37 | 1,46 | 0,42 |
| 07/30 | 180 | 7,08 | 196 | 7,71 | 61 | 2,40 | 0,7 |
| 10/30 | 254 | 10 | 270 | 10,63 | 61 | 2,40 | 1 |
| 15/30 | 381 | 15 | 397 | 15,63 | 61 | 2,40 | 1,28 |
| 20/30 | 510 | 20 | 526 | 20,63 | 61 | 2,40 | 2,00 |
| 30/30 | 764 | 30 | 780 | 30,63 | 61 | 2,40 | 2,56 |




** Plug- type connection with double-o-ring*

*** Correction Factor Filtration Surface*

*Other end cap configurations available on request.*