# Process Filtration
# From pure to sterile
LifeTec™ (P)-SRF X

## MAIN FEATURES & BENEFITS

- Developed for the sterile filtration of air and gases under extreme application and sterilization conditions
- High retention rate (bacteria, viruses and particles) down to 3 nm (nanometers) to ensure product and process integrity
- High temperature and mechanical resistance for outstanding performance, minimizes production down time and maintenance costs
- Suitable for extreme sterilization, using VPHP and ozone - this leads to reduced total cost of ownership

## PRODUCT DESCRIPTION

The LifeTec™ (P)-SRF X filter element is a sterile grade, pleated high performance PTFE filter element with inner and outer liners and end caps made from stainless steel. The retention rate is ≥99.9999998% related to 0.2µm and ≥99.999999% related to 0.02µm. The retention for nano-sized particles (3nm) is equal to or larger than 99.99998%, which was verified according to SEMI F38-0699.

The PTFE filter medium is inherently hydrophobic with a highly porous membrane structure. The LifeTec™ **(P)-SRF X** was developed for e**x**treme sterile filtration of compressed air and other process gases. The filter element fulfils the high requirements in food and 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) No. 1935/2004 for indirect food contact use.

The sturdy stainless steel construction permits more than 250 possible sterilization cycles at specified conditions and withstands high differential pressures in both flow directions. LifeTec™ (P)-SRF X sterile filter elements ensure a safe and reproducible production.

## INDUSTRIES

- Dairies

- Food

- Breweries

- Pharmaceutical

- Chemical

LIQUID
AIR
STEAM

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Technical alterations reserved (08/2019)

## PRODUCT SPECIFICATIONS

| Features | Specifications |
|---|---|
| Retention rate | ≥ 99.9999998 % at 0.2 µm<br>≥ 99.999999 % at 0.02 µm<br>≥ 99.99998 % at 0.003 µm (acc. to SEMI F38-0699) |
| Filtration surface | 0.5 m² per 10" element (254 mm)<br>For other element sizes see correction factor CF in section "Available end cap configurations" |
| Operating Temperature | -20°C (-4°F) to +200°C (+392°F) |
| Maximum differential pressure | 5 bar (73 psid)<br>for -20°C (-4°F) up to +200°C (392°F), independent of the system pressure or flow direction |
| Typical compressed air service life time | 12 months |
| Sterilisation cycles* | 121°C (250° F) saturated steam: >250 cycles (30 minutes)<br>131°C (270° F) saturated steam: >250 cycles (20 minutes)<br>141°C (290° F) saturated steam: >250 cycles (10 minutes)<br>Independent of flow direction; forward and reversed steam flow possible |
| VPHP suitable | 130°C @ > 5000 ppm $H_2O_2$ > 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.

## APPLICATIONS

The pleated sterile membrane filter LifeTec™ (P)-SRF X is designed and developed for the following applications:

### Filtration of air and gases

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

## QUALITY ASSURANCE

**All products have been inspected and released by quality assurance as having met the following requirements:**

- All filters are fabricated without the use of chemical additives.
- All sterile filters are integrity tested according to ASTM D 2986-91 and EN 1822 to verify compliance with established quality and design specifications and to assure consistent and reliable performance
- A test certificate (3.1) according to DIN EN 10204 is available upon request.

## MATERIAL DECLARATION (US & EU)

All components of the LifeTec™ (P)-SRF X 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 LifeTec™ (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.

| Filter materials | | CFR Title 21 |
|---|---|---|
| End caps | Stainless steel 1.4301 | 211.65 |
| Inner and outer liner | Stainless steel 1.4301 | 211.65 |
| Filter medium | PTFE | 177.1550 |
| Support medium | PTFE | 177.1550 |
| Support layer | Stainless steel 1.4301 | 211.65 |
| Pre-Filter | Borosilicate | 177.2420 |
| Potting material | Silicone | 177.2600 |
| O-rings | Silicone | 177.2600 |
| Alternative O-rings | EPDM<br>FEP over silicone<br>FEP over viton | 177.2600<br>177.1550<br>177.1550 |

## RETENTION OF MIKROORGANISMS

The LifeTec™ (P)-SRF X 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 or impinger.

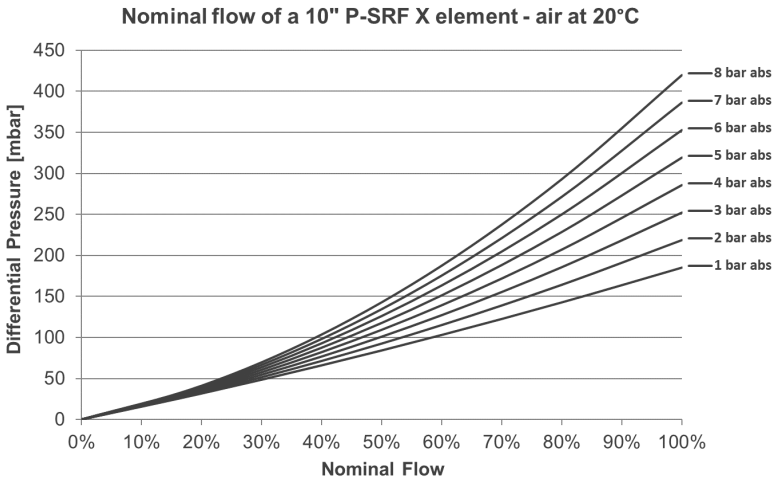
$$LRV = log10\left(\frac{Number\ of\ organisms\ in\ challenge}{Number\ of\ organisms\ in\ filtrate}\right)$$

- **Brevundimonas Diminuta (≥ 0.2 µm):**
  **LRV > 9**
- **MS2 Coliphagen (≥ 0.02 µm):**
  **LRV > 8**

## FLOW CHARACTERISTICS

| Type LifeTec™ (P)-SRF X | | Flow at 7 barg [m³/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 | 1920 | 2280 |

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



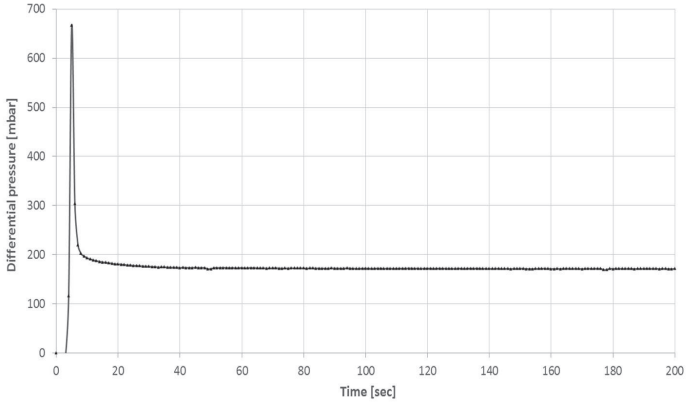

| Pressure [barg] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Correction Factor [-] | 0.13 | 0.25 | 0.38 | 0.50 | 0.63 | 0.75 | 0.88 | 1.00 | 1.13 | 1.25 | 1.38 | 1.50 | 1.63 | 1.75 | 1.88 | 2.00 | 2.13 |

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

$$\dot{V}_{corrected} = \frac{\dot{V}_{nominal}}{Correction\ Factor}$$

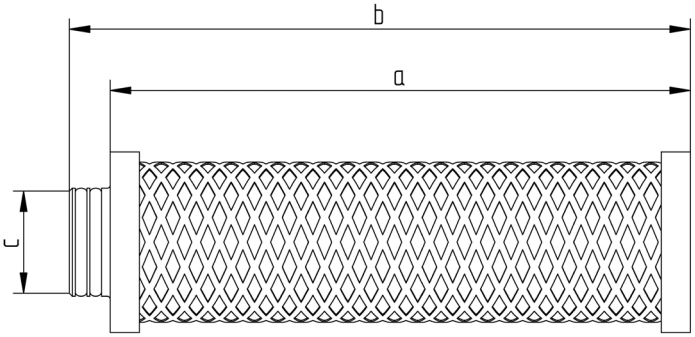
## DE-WETTING CHARACTERISTICS

De-wetting characteristic of a LifeTec™ (P)-SRF X 10/3 after steaming at 1 barg (121°C) for 30 minutes.
Flow is 140 Nm³/h at 2 bar absolute.
Normal operating conditions are reached after several seconds.



## AVAILABLE END CAP CONFIGURATIONS

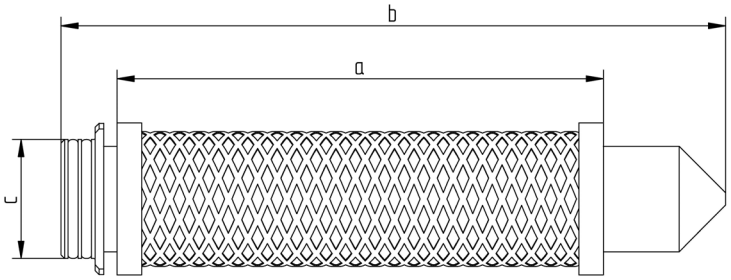
| Dimensions uf-plug connection | | | | | | | |
|---|---|---|---|---|---|---|---|
| | a | | b | | c* | | |
| Size | mm | inch | mm | inch | mm | inch | CF** |
| 03/10 | 76 | 2.99 | 87 | 3.42 | 30 | 1.18 | 0.15 |
| 04/10 | 104 | 4.09 | 118 | 4.64 | 30 | 1.18 | 0.20 |
| 04/20 | 104 | 4.09 | 118 | 4.64 | 37 | 1.46 | 0.20 |
| 05/20 | 128 | 5.04 | 142 | 5.59 | 37 | 1.46 | 0.25 |
| 05/25 | 128 | 5.04 | 142 | 5.59 | 37 | 1.46 | 0.34 |
| 07/25 | 180 | 7.08 | 194 | 7.64 | 37 | 1.46 | 0.49 |
| 05/30 | 128 | 5.04 | 142 | 5.59 | 61 | 2.40 | 0.49 |
| 07/30 | 180 | 7.08 | 196 | 7.71 | 61 | 2.40 | 0.70 |
| 10/30 | 254 | 10 | 270 | 10.63 | 61 | 2.40 | 1.00 |
| 15/30 | 381 | 15 | 397 | 15.63 | 61 | 2.40 | 1.51 |
| 20/30 | 510 | 20 | 526 | 20.63 | 61 | 2.40 | 2.02 |
| 30/30 | 764 | 30 | 780 | 30.63 | 61 | 2.40 | 3.03 |




* Uf-plug connection with double-o-ring

** Correction factor filtration surface

| Dimensions Code 7 connection | | | | | | |
|---|---|---|---|---|---|---|
| | a | | b | | c | |
| Size | 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 |




CODE 7: 2 x 226 o-rings, bayonet 2 locking tabs, locating fin

### Other end cap configurations on request

- For more information, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!