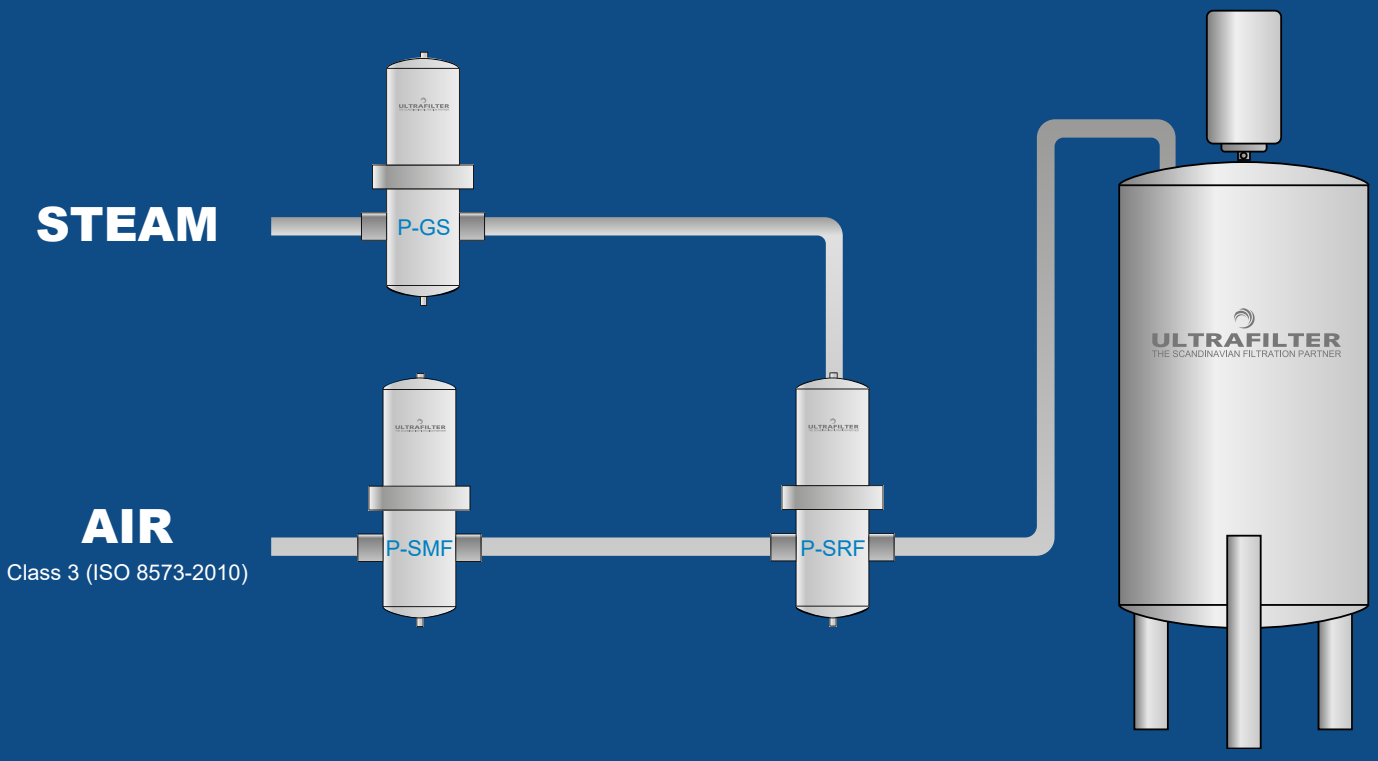
PROCESS AIR


STEAM
AIR
Class 3 (ISO 8573-2010)
P-GS
P-SMF
P-SRF
ULTRAFILTER
THE SCANDINAVIAN FILTRATION PARTNER

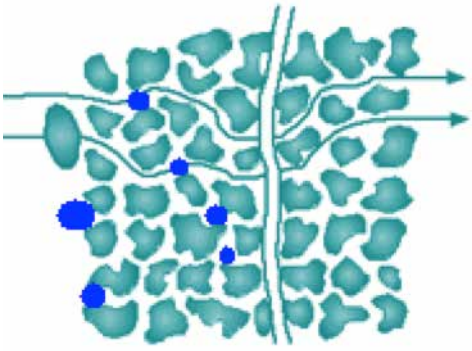
PROCESS AIR

Our sterile filters are all FDA CFR article 21 / EC 1935/2004 validated and approved. “Sterile” means “free of microorganisms that are capable of reproducing itself”.

A more scientific definition of sterile is that a filter is defined as “sterilising filter”, when exposed to a concentration of 107 microorganisms (Brevundimonas diminuta) per. cm² filter area and the filtrate is 100% sterile and therefore not containing microorganisms, such as bacteria.

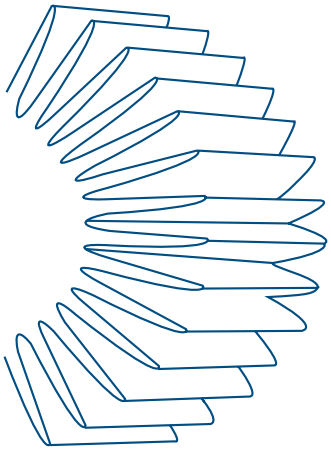
Coli and streptococci typically have a size between 0,3 microns and 9 microns, resulting in that the sterile filter has a Filtration of 0,2 microns or better.

In sterile filtration of compressed air, there are differentiated between two types of filter: the depth filter (P-SRF) and membrane filter (PF-PT and PF-PP).



Depth Filter

A depth filter typically consists of multiple layers of metallic, polymeric or inorganic material - typically used a variety of silicon, called borosilicate. This type of filter is distinguished by a high filtration capacity and high degree of stability during use and sterilisation. This type of filter is about 99,99998% effective compared to a given micron size.



Membrane Filter

A membrane filter is made of polymeric plastic film - typically polypropylene, these filters have less particle retention capacity, which is solved by pre-filtration. The membranes have a 99,999999% retention rate and is available in several filtration degrees.

For the food industry, the recommended standard is a depth filter, and for use in the pharmaceutical, fine chemical or biotech industries, we recommend membrane filters. Both filters are optimally placed close to the point of use.

It is recommended that installed a central desiccant dryer as well as a coalescing micro filter and activated carbon filter, to secure dry and oil-free compressed air at the sterile filters, thereby extending the life of the filter.

PROCESS AIR PREFILTER ELEMENT

P-FF / P-MF / P-SMF / P-AK

Technical Data

Binderfree nanofibres, Pleated cerex

Retention Rate: 0,01 µm

Efficiency: 99,999% - 99,99999%

Temperature: -20°C to 80°C

Differential Pressure: Max. 5 bar @ 20°C

Stainless steel SS304 end caps

Perbunan Gasket (others available)

All our standard coalescing, particulate and activated carbon filters are available as pre-filters for our stainless steel filter housings for critical installations.

Thanks to the unique combination of binder free, non-woven nanofibre filter media and our special pleating techniques, we can achieve a reduction of energy costs up to 70%, at a higher than regular efficiency.

The new nanofibre material from ultrafilter is oleophobic, which means that the oil and water particles are actively rejected in order to keep a low differential pressure drop, and consequently the operating costs are reduced to a minimum compared with a conventional filter element.

All metal components on the prefilter elements are made of stainless steel.

Type	Filtration rate	Efficiency	Residual oil content	Max. differential pressure
P-FF	0,01 µm	99,999%	0,1 mg/m³	5 bar at 20°C
P-MF	0,01 µm	99,99998%	0,03 mg/m³	5 bar at 20°C
P-SMF	0,01 µm	99,99999%	<0,01 mg/m³	5 bar at 20°C
P-AK	Activated Carbon	N/A	0,003 mg/m³	2 bar at 20°C

STERILE DEPTH FILTER ELEMENT

P-SRF

This element is **STERILIZABLE**

See page 44

The P-SRF is a wounded depth filter with inner and outer guard end caps made of stainless steel. Consisting of a three-dimensional borosilicate depth media, the P-SRF achieves a void volume of 95%, ensuring a high containment capacity at high flow rates and low differential pressure. A retention rate of >99.99998% related to 0.2 µm is achieved during operation.

Technical Data

Media: Borosilicate

Retention Rate: 0,2 µm

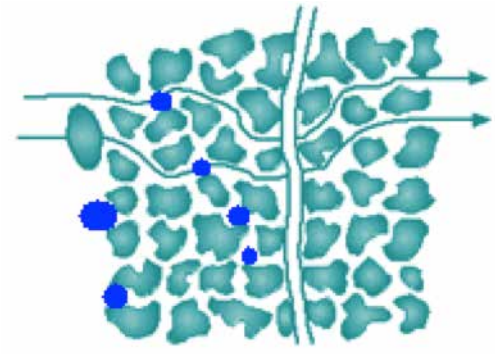
Efficiency: 99,99998%

Temperature: -20°C to 200°C

Max. Differential Pressure: 5 bar

Stainless steel SS304 end caps

Silicone Gasket



Depth Filter

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PROCESS FILTER HOUSING
P-EG

P-EG filter housings in stainless steel, designed for purification of compressed air and other technical gases.

With this filter you can achieve low differential pressure at high flow rates. P-EG Filter housings are available in 18 different sizes from 60 to 19200 Nm³/hour.

The P-EG is our first-choice housing for most process air applications. Such as pre-filtration, sterile filtration and steam filtration.

Technical Data

Material: SS304 or SS316L

Max Temperature: 200°C

EPDM seal (others on request)

Operating Pressure:

0006-0192: 16 bar
0288: 12 bar
0432-1920: 10 bar
25 bar on request

PED

BSP

ASA (weld)

DIN / ANSI

NPT

Model	Flow m³/h	Connection in/out			Filter Element	
		BSP	ASA	DIN	Size	Qty
P-EG 0006	60	R ¼”	DN10	DN10	03/10	1
P-EG 0009	90	R ⅜”	DN10	DN10	04/10	1
P-EG 0012	120	R ½”	DN15	DN15	04/20	1
P-EG 0018	180	R ¾”	DN20	DN20	05/20	1
P-EG 0027	270	R 1”	DN25	DN25	05/25	1
P-EG 0036	360	R 1¼”	DN32	DN32	07/25	1
P-EG 0048	480	R 1½”	DN40	DN40	07/30	1
P-EG 0072	720	R 2”	DN50	DN50	10/30	1
P-EG 0108	1080	R 2”	DN50	DN50	15/30	1
P-EG 0144	1440	R 2½”	DN65	DN65	20/30	1
P-EG 0192	1920	R 3”	DN80	DN80	30/30	1
P-EG 0288	2880	R 3”	DN80	DN80	30/50	1
P-EG 0432	4320	N/A	N/A	DN100	20/30	3
P-EG 0576	5760	N/A	N/A	DN100	30/30	3
P-EG 0768	7680	N/A	N/A	DN150	30/30	4
P-EG 1152	11520	N/A	N/A	DN150	30/30	6
P-EG 1536	15360	N/A	N/A	DN200	30/30	8
P-EG 1920	19200	N/A	N/A	DN200	30/30	10

Correction factor:

Operating pressure	bar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor	K1	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

STERILE MEMBRANE FILTER

Ultra-Mem PF-PT / PF-PP

This element is STERILIZABLE See page 44

Technical Data

Materials: ePTFE and Polypropylene

Retention Rates: 0,02 µm, 0,1 µm, 0,2 µm or 0,45 µm

Efficiency: 99,999999%

Temperature: -20°C to 80°C

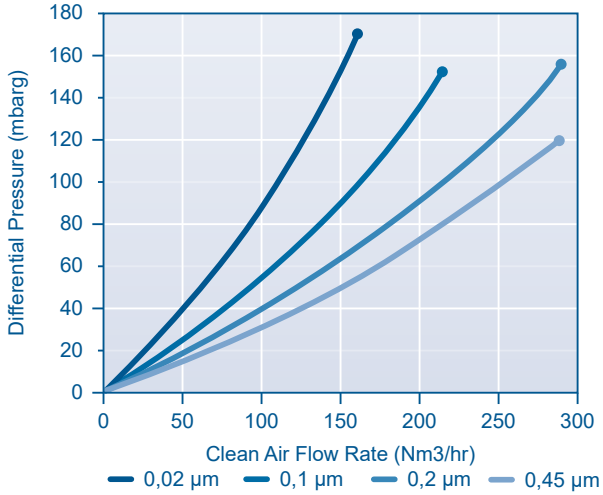
Max. Differential Pressure: 6 bar @ 20°C

Endcap: Code 7 (others available)

Silicone Gasket (others available)

For critical applications in sterile filtration, use of a hydrophobic PTFE membrane is recommended, especially in applications such as pharmaceutical industry and biotechnology. PTFE membranes are also well suited for sterile steam applications.

For certain chemicals and applications, polypropylene membranes are available.



Model	PF-PT	PF-PT PLUS	PF-PP
Filtration rates	0,02 to 0,45 µm	0,2 µm	0,1 to 0,2 µm
Material	ePTFE	ePTFE	Polypropylene
Applications			
Sterile process gases	•	•	•
Fine chemicals and solvents			•
Photoresists and developers			•
Biotechnology	•	•	
Powder handling and tabletting	•	•	•

SANITARY AIR FILTER HOUSING

PG-EG

PG-EG stainless steels have been developed for the purification of compressed air and other technical gases in pharmaceutical, biotechnology and chemical industries.

PG-EG houses are “first choice” in critical applications in sterile filtration.

All PG-EG filter housings to a certain size have been etched and passivated on the inner surface to a quality of Ra 0,8. The outer surface has this quality or better for every PG-EG sanitary filter housing.

Technical Data

Materials: 304 or 316L

Surface: 0,8 (0,4 optional)

Max. Temperature: 200°C

Operating Pressure:

0006-0192: 16 bar

0432-1920: 10 bar

Endcaps: Code Y (UF) or Code 7

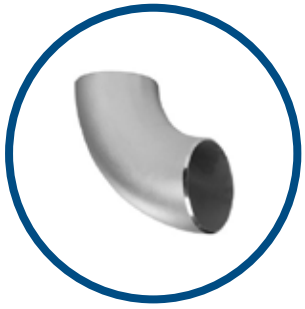
EPDM Gasket (others available)

PED

Tri-clamp ASME

Dairy Union DIN 11851

Flange EN1092-1



Weld End

Model	Flow m³/h	Connection (clamp)	Filter Element	
			Size	Qty
PG-EG 0032	45	DN25	05/30	1
PG-EG 0072	90	DN40	10/30	1
PG-EG 0108	135	DN50	15/30	1
PG-EG 0144	180	DN65	20/30	1
PG-EG 0192	270	DN80	30/30	1
PG-EG 0432	540	DN100	20/30	3
PG-EG 0576	810	DN100	30/30	3
PG-EG 0768	1080	DN150	30/30	4
PG-EG 1152	1620	DN150	30/30	6
PG-EG 1536	2160	DN200	30/30	8
PG-EG 1920	2700	DN200	30/30	10

Correction factor:

Operating pressure	bar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor	K1	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

STEAM FILTER
P-GS

The ultrafilter P-GS filter is designed for removal of particles from gases, liquids and particularly steam.

The P-GS consists of a restorable weldless filter pipe made from sintered stainless steel. The filter is well suited for culinary steam – where contact with production machines and end product is needed.

The P-GS is suited for use in temperatures ranging from -20°C to 210°C and has a maximal differential pressure tolerance of 5 bar.

Technical Data

Media: Sintered steel SS316L

Retention Rates: 1 µm, 5 µm or 25 µm

Efficiency: 98 (steam) / 100% (gasses)

Temperature: -20°C to 210°C

Max. Differential Pressure: 5 bar

Stainless steel SS304 end caps

EPDM gasket(others available)

OPTIONS

Viton Seal
-15 / +200°C

PTFE Seal
-200 / +260°C

Silicone Seal
-55 / +200°C

Welded End Caps

Applications	1 µm	5 µm	25 µm
Food Contact	•		
General use of steam		•	
Pre-filtration of steam			•

FILTER HOUSING FOR STEAM

P-EG

For our PG-S steam filters we use our P-EG filter housing with flange connections.

With this filter you can achieve low differential pressure at high flow rates. P-EG Filter housings are available in 12 different sizes, in either 304 or 316 stainless steel.

For particularly high quality demands, we offer our sanitary filter housing PG-EG for steam filtration.

Technical Data

Material: SS304 or SS316L

Surface: 1,2 Ra

Max. Temperature: 200°C

Operating Pressure:

0006-0192:	16 bar
0288:	12 bar
0432-1920:	10 bar

25 bar on request

EPDM seal (others available)

PED

Model	Flow (kg/h)			Connection DIN	Filter Housing	Element Size
	1 µm	5 µm	25 µm			
P-GS 0006	6	19	30	DN10	P-EG 0006	03/10
P-GS 0009	8	25	40	DN10	P-EG 0009	04/10
P-GS 0012	12	37	59	DN15	P-EG 0012	04/20
P-GS 0018	18	58	93	DN20	P-EG 0018	05/20
P-GS 0027	23	75	120	DN25	P-EG 0027	05/25
P-GS 0036	28	88	141	DN32	P-EG 0036	07/25
P-GS 0048	31	100	160	DN40	P-EG 0048	07/30
P-GS 0072	42	135	216	DN50	P-EG 0072	10/30
P-GS 0108	77	245	392	DN50	P-EG 0108	15/30
P-GS 0144	103	330	528	DN65	P-EG 0144	20/30
P-GS 0192	163	520	832	DN80	P-EG 0192	30/30
P-GS 0288	250	800	1280	DN80	P-EG 0288	30/50

Flow rate at 121°C saturated steam

Correction factor:

Operating pressure	bar	1	2	4	6	10
Saturated steam temp.	°C	100	121	140	160	180
Correction factor	K1	0,5	1	2	3	5

STERILISATION PROCEDURE

Both depth and membrane sterile filters can be sterilised in-line with steam or externally by autoclave. It is recommended to sterilise a sterile filter after every production batch or at least after 14 days.

Sterilisation temperature is between 110°C - 140°C, respectively for 30 and 10 min.

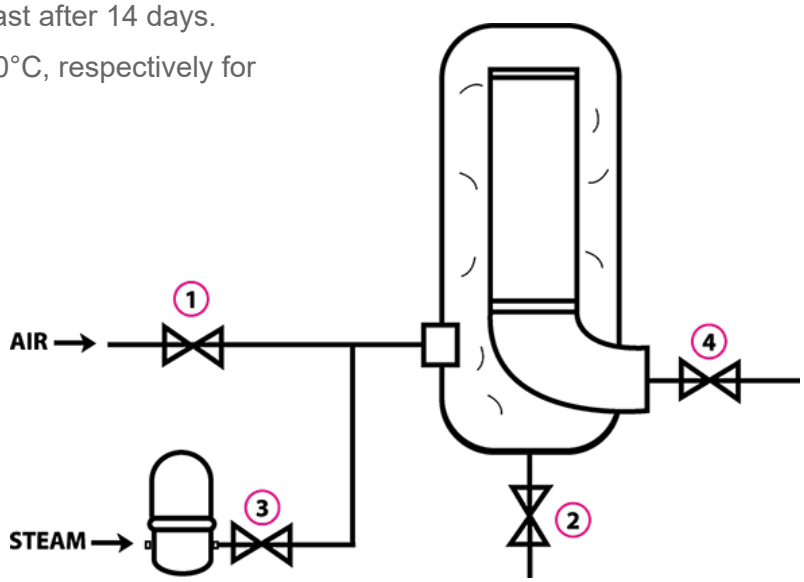
1. Valve (1) and valve (4) closes.

2. Drain valve (2) opens.

3. Valve (3) opens and steam flow into the filter housing.

4. After reaching a temperature of 100 ° C, the steam begins to condense at the same time that there is only opened to the valve (2), the pressure being built up to the desired steriliation temperature.

5. After reaching the steam temperature starts the actual sterilisation within the ages:



• Saturated steam 121 ° C - 30 minutes

• Saturated steam 131 ° C - 20 minutes

• Saturated steam 141 ° C - 10 minutes

When sterilisation rounded cast of valve (2), after which valve (3) & (1) open slowly and valve (4) closes slowly - and then start the process over again.

STERILE TANK FILTER

P-BE

This element is **STERILIZABLE**

See page 44

Technical Data

Media: Borosilicate

Housing: stainless steel

Retention Rate: 0,2 µm

Efficiency: 99,999%

Temperature: -20°C to 200°C

Stainless steel SS304 end caps

Silicone Gasket (others available)

P-BE filter are used to ensure 100% sterility in the storage vessels of pharmaceutical products, chemicals, food or of fermenters. The filter acts as sterile breather for the content of the vessel. The P-BE is a depth filter and works both ways, and protects the surrounding area from exposure to the contents of the vessel.

The two-part housing is user-friendly designed and has a splash protection to prevent liquids coming in contact with the filter media.

The filter element can be sterilised for continuous use up to 100 times. Regeneration is done by in-line steam or externally in autoclave.

Model	Flow (m^3/h)		Connection*	Filter Element	
	Δp = 20 mbar	Δp = 40 mbar		Size	Qty
P-BE 0006	5	9	DN32	03/10	1
P-BE 0027	12	24	DN40	05/25	1
P-BE 0032	17	35	DN50	05/30	1
P-BE 0072	35	70	DN50	10/30	1
P-BE 0144	70	140	DN80	20/30	1
P-BE 0192	105	210	DN80	30/30	1
P-BE 0432	210	420	DN100	20/30	3
P-BE 0576	315	630	DN100	30/30	3
P-BE 0768	420	840	DN150	30/30	4
P-BE 1152	630	1260	DN150	30/30	6
P-BE 1536	840	1680	DN200	30/30	8
P-BE 1920	1050	2010	DN200	30/30	10

*Milk Pipe fitting acc. DIN 11851 or flange acc. DIN 2633

VENT FILTER PTFE

Ultra-Vent

Technical Data

Materials: ePTFE and Polypropylene

Retention Rate: 0,1 µm or 0,2 µm

Efficiency: 99,99998%

Max. Temperature: 80°C

Max. Differential Pressure: 6 bar @ 20°C

½" BSP male thread

Silicone Gasket (others available)

2,5" or 5"

Our PTFE Vent filter cartridges are manufactured using a highly hydrophobic ePTFE membrane and are designed for autoclave venting and small vessel venting. The enhanced ePTFE membrane offers exceptionally high gas flow rates at low pressure differentials.

The vent filter cartridges are designed with a ½" BSP male thread for autoclave and small vessel venting applications, and the hydrophobic characteristics of the ePTFE membrane makes the Vent filter cartridge particularly suitable for rapid vacuum breaks in autoclaves.

Model	Filtration Rate	Connection	Dimensions (mm)	
			Length	Diameter
Ultra-Vent 2,5"	0,2 µm	1/2"	64	70
Ultra-Vent 5,0"	0,2 µm	1/2"	127	70