PROCESS FILTRATION FROM PURE TO STERILE

LifeTec PES-BN

MAIN FEATURES & BENEFITS

- Sterile grade rating of 0.45 µm
- Excellent flow rate
- Highly resistant materials
- Extremely low absorption of proteins
- High thermal and hydrolytic stability
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

The LifeTec PES-BN filter element is a sterile grade rated, pleated high performance Polyethersulfone membrane filter. It provides the greatest assurance of filtration performance, stability and service life for sterile filtration and microbial stabilization of highly colloidal liquids.

The outstanding performance of the LifeTec PES-BN filter element is based on its state-of-the-art filtration media. The Polyethersulfone membrane is inherently hydrophilic and distinguishes itself by having an asymmetrically designed pore structure. The pore size steadily decreases towards the centre of the medium resulting in a highly porous structure. This extremely durable design maintains consistent porosity and impurity retention throughout its service life without shedding or unloading contaminations.

All components meet the EU and USA requirements for Food Contact Use in accordance with CFR (Code of Federal Regulations) Title 21 and 1935/2004/EC and subsequent amendments.

The filter element is manufactured in accordance with the GMP requirements as defined in EC/2023/2006, has no migration of filter media, is non-fibre releasing and is thermally welded.
All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 and EC/65/2011.

INDUSTRIES

- Breweries

- Wineries

- Mineral Water

- Soft Drinks

- Chemical

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APPLICATIONS

The absolute rated LifeTec PES-BN membrane filter is designed and developed for the filtration of highly colloidal liquids:

Clarification and cold sterilization of beverages like:

- Beer
- Beer Mix
- Wine
- Wine Coolers

Clarification and final filtration of:

- Deionized Water
- Chemically treated Water
- High temperature Water
- Process Water
- Ingredient Water
- Soft Drinks
- Bottled Water

QUALITY TEST

All products have been inspected and released by Quality Assurance as having met the following requirements:

- All 10" sterile filter modules are integrity tested to verify compliance with established quality and design specifications and to assure consistent and reliable performance.

- The traceability of each filter element according to EC/1935/2004 is provided by Serial number.

- All LifeTec PES BN filter elements are completely staged, assembled, tested and packaged in Class 100 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

MATERIAL COMPLIANCE USA

All components of the LifeTec PES-BN filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Membrane	Polyethersulfone	§ 177.2240
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PES-BN filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene, Polyethersulfone) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants (B, D1) after flushing or in flow conditions. All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

RETENTION RATES (According to HIMA Challenge per ASTM)

Filter Grade	Microorganism	LRV / cm²
LifeTec PES-BN 0.45 µm	Serratia Marcescens	> 7

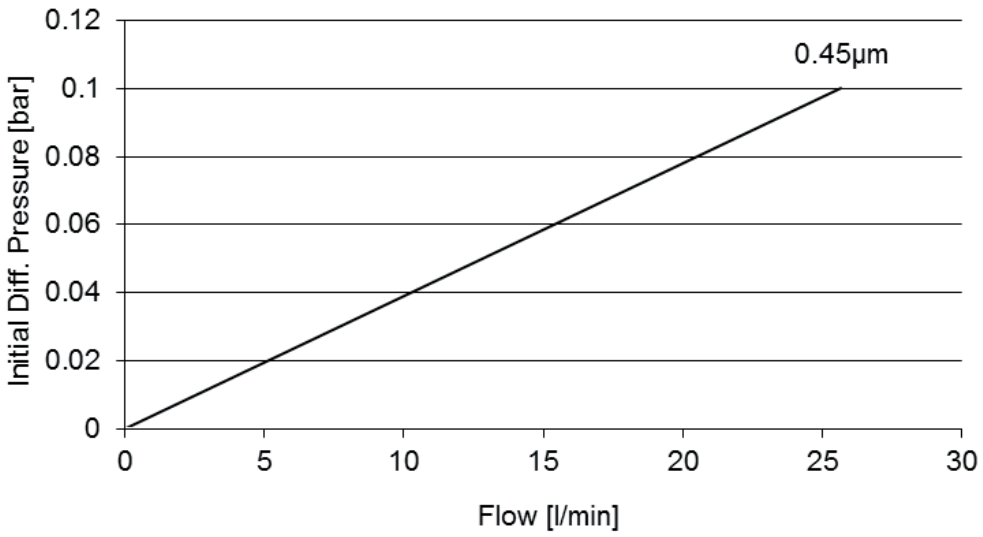
Donaldson® Ultrafilter

PRODUCT SPECIFICATIONS

Product Specifications				
Filter Grade	0.45 µm (Sterile Retention Rate)			
Filtration Surface	0.72 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time*	121°C – 125°C (30 minutes) Saturated Steam (Forward Flow) up to 100 cycles			

* 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.

FLOW CHARACTERISTICS

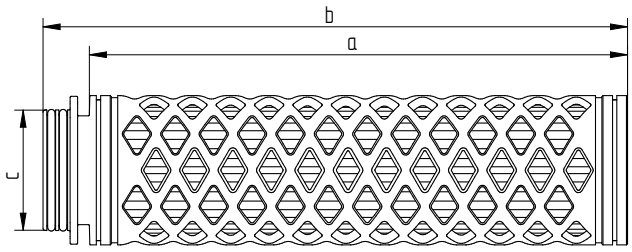


LifeTec PES-BN
10", Deionised water, 20°C

INTEGRITY TESTING

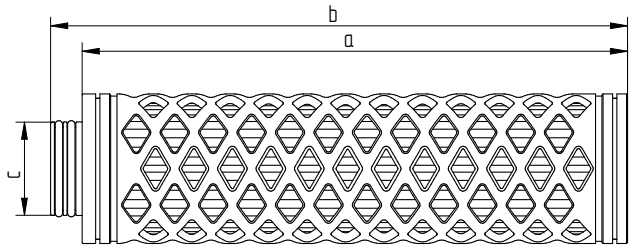
Bubble-Point-Test			Diffusion Test / Forward Flow Test	
Filter Grade	**Minimum Bubble Point**		**Filter Grade**	**Maximum Diffusion Values**
	bar	psi		
0.45 µm	1.38	20	0.45 µm	15 ml/min @ 0.7 bar (10 psi)

Donaldson® Ultrafilter



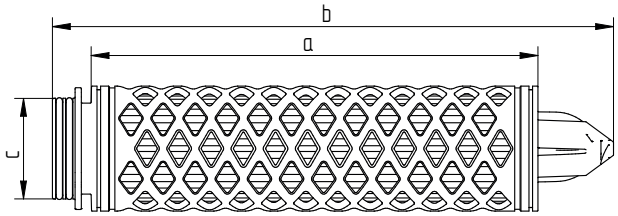
Dimensions (CODE 2 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	253	10.0	274	10.8	56	2.2
20″	495	19.5	516	20.3	56	2.2
30″	737	29.0	758	29.8	56	2.2
40″	979	38.5	1000	39.4	56	2.2

CODE 2: 2 x 226 o-rings, bayonet 2 locking tabs, flat end cap, integrated reinforcement ring



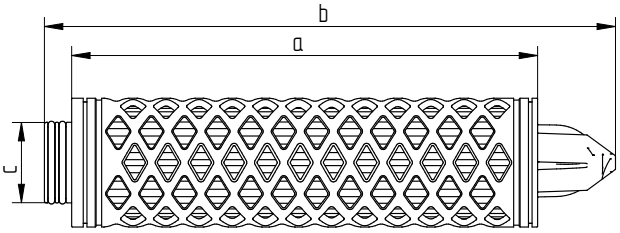
Dimensions (CODE 3 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	256	10.1	271	10.7	44	1.7
20″	498	19.6	513	20.2	44	1.7
30″	740	29.1	755	29.7	44	1.7
40″	982	38.7	997	39.3	44	1.7

CODE 3: 2 x 222 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (CODE 7 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	251	9.9	315	12.4	56	2.2
20″	493	19.4	557	21.9	56	2.2
30″	735	28.9	799	31.5	56	2.2
40″	977	38.5	1041	41.0	56	2.2

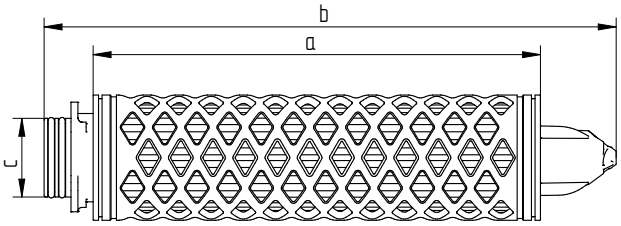
CODE 7: 2 x 226 o-rings, bayonet 2 locking tabs, locating fin, integrated reinforcement ring



Dimensions (CODE 8 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	254	10.0	311	12.2	44	1.7
20″	496	19.5	553	21.8	44	1.7
30″	738	29.1	795	31.3	44	1.7
40″	980	38.6	1037	40.8	44	1.7

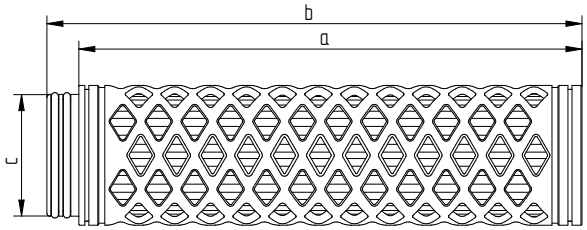
CODE 8: 2 x 222 o-rings, plug connection, locating fin, integrated reinforcement ring

Donaldson® Ultrafilter



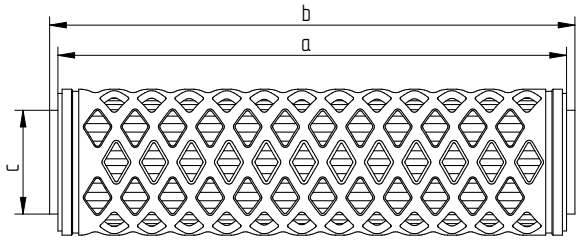
Dimensions (CODE 9 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	250	9.8	320	12.6	44	1.7
20″	492	19.4	562	22.1	44	1.7
30″	734	28.9	804	31.7	44	1.7
40″	976	38.4	1046	41.2	44	1.7

CODE 9: 2 x 222 o-rings, bayonet 3 locking tabs, locating fin, integrated reinforcement ring



Dimensions (UF connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	252	9.9	268	10.6	61	2.4
20″	494	19.4	510	20.1	61	2.4
30″	736	29.0	752	29.6	61	2.4

CODE UF: 2 x 226 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	244	9.6	250	9.8	50	2.0
20″	500	19.7	506	19.9	50	2.0
30″	754	29.7	760	29.9	50	2.0
40″	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- Integrity test to be done by Bubble Point or Forward Flow Test
- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Donaldson® Ultrafilter

Donaldson
FILTRATION SOLUTIONS

PROCESS FILTRATION FROM PURE TO STERILE

LifeTec PES-WN

MAIN FEATURES & BENEFITS

- Sterile grade membrane filters with ratings of 0.2 µm, 0.45 µm & 0.6 µm
- Excellent flow rate
- Highly resistant materials
- Extremely low adsorption of proteins
- High thermal stability, permanently hydrophilic
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

The LifeTec PES-WN filter element is a sterile grade, pleated high performance Polyethersulfone membrane filter. It provides the greatest assurance of filtration performance, stability and service life for sterile filtration and microbial stabilization.

The outstanding performance of the LifeTec PES-WN filter element is based on its state-of-the-art filtration media. The Polyethersulfone membrane is inherently hydrophilic and distinguishes itself by having an asymmetrically designed pore structure. The pore size steadily decreases towards the centre of the medium resulting in a highly porous structure. This extremely durable design maintains consistent porosity and impurity retention throughout its service life without shedding or unloading contaminations.

All components meet the EU and USA requirements for Food Contact Use in accordance with CFR (Code of Federal Regulations) Title 21 and EC/1935/2004 and subsequent amendments.

The filter element is manufactured in accordance with the GMP requirements as defined in EC/2023/2006, has no migration of filter media, is non-fibre releasing and is thermally welded.
All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 and EC/65/2011.

INDUSTRIES

- Bottled Water

- Soft Drinks

- Dairies

- Chemical

Donaldson®
Ultrafilter

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APPLICATIONS

The sterile grade LifeTec PES-WN membrane filter is designed and developed for following applications:

Clarification and sterilization of all types of water:

- Bottled Water
- Mineral Water
- Spring Water
- Table Water
- Potable Water

High quality filtration for a variety of ultrapure water requirements:

- Deionized Water
- Chemically treated Water
- High temperature Water
- Process Water
- Ingredient Water

Sterile filtration of beverages:

- Soft Drinks

QUALITY TEST

All products have been inspected and released by Quality Assurance as having met the following requirements:

- All 10" sterile filter modules are integrity tested to verify compliance with established quality and design specifications and to assure consistent and reliable performance.

- The traceability of each filter element according to EC/1935/2004 is provided by Serial number.

- All LifeTec PESWN filter elements are completely staged, assembled, tested and packaged in Class 100 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

MATERIAL COMPLIANCE USA

All components of the LifeTec PES-WN filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Membrane	Polyethersulfone	§ 177.2240
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PES-WN filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene, Polyethersulfone, EPDM) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants (B, D1) after flushing or in flow conditions.
All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

RETENTION RATES (According to HIMA Challenge per ASTM)

Filter Grade	Microorganism	LRV / cm²
LifeTec PES-WN 0.6 µm	Saccharomyces cerevisiae	> 7
LifeTec PES-WN 0.45 µm	Saccharomyces cerevisiae	> 7
	Serratia Marcescens	> 7
LifeTec PES-WN 0.2 µm	Saccharomyces cerevisiae	> 7
	Serratia Marcescens	> 7
	Brevundimonas diminuta	> 7

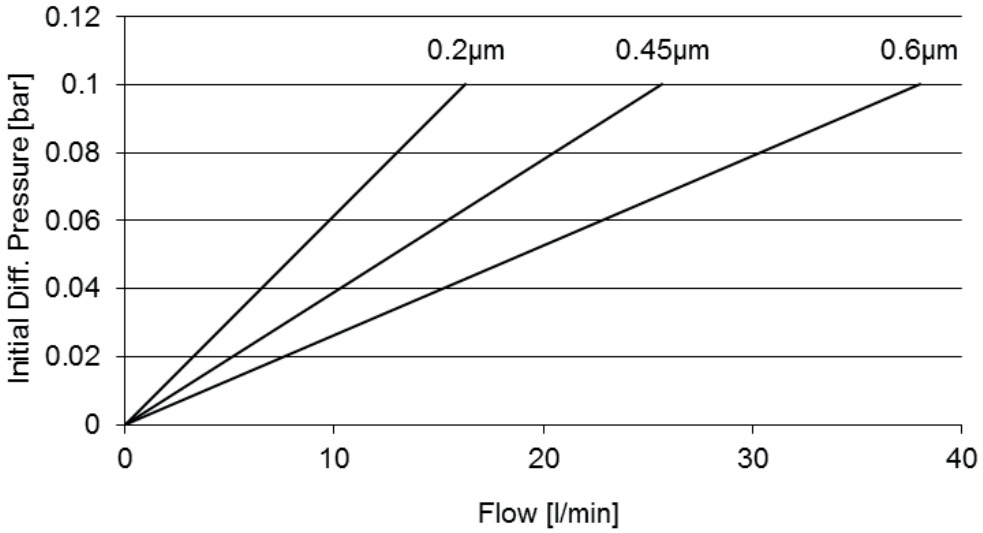
Donaldson® Ultrafilter

PRODUCT SPECIFICATIONS

Product Specifications				
Filter Grade	0.2 µm, 0.45 µm, 0.6 µm (Retention Rates LVR >/= 7 cm²)			
Filtration Surface	0.77 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time*	121°C – 125°C (30 minutes) Saturated Steam (Forward Flow) up to 100 cycles			

* 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.

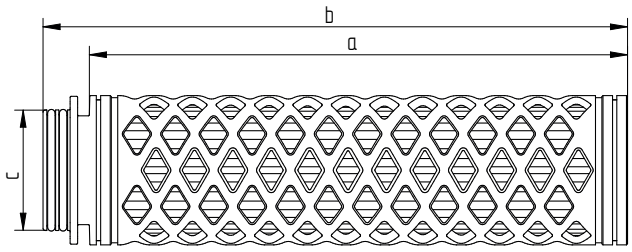
FLOW CHARACTERISTICS



LifeTec PES-WN
10", Deionised water, 20°C

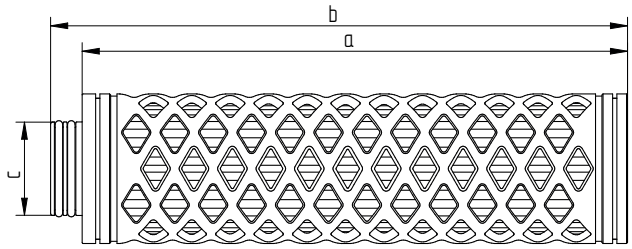
INTEGRITY TESTING

Bubble-Point-Test			Diffusion Test / Forward Flow Test	
Filter Grade	**Minimum Bubble Point**		**Filter Grade**	**Maximum Diffusion Values**
	bar	psi		
0.6 µm	1.24	18	0.6 µm	15 ml/min @ 0.7 bar (10 psi)
0.45 µm	2.21	32	0.45 µm	25 ml/min @ 1.7 bar (25 psi)
0.2 µm	3.03	44	0.2 µm	30 ml/min @ 2.4 bar (35 psi)



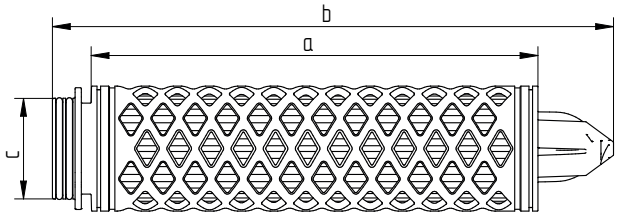
Dimensions (CODE 2 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	253	10.0	274	10.8	56	2.2
20″	495	19.5	516	20.3	56	2.2
30″	737	29.0	758	29.8	56	2.2
40″	979	38.5	1000	39.4	56	2.2

CODE 2: 2 x 226 o-rings, bayonet 2 locking tabs, flat end cap, integrated reinforcement ring



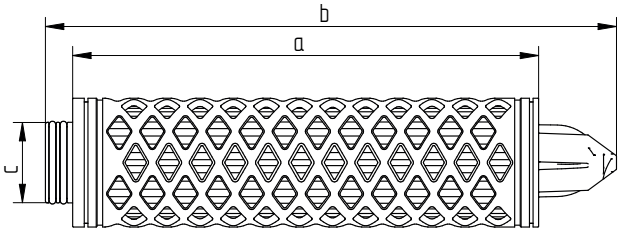
Dimensions (CODE 3 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	256	10.1	271	10.7	44	1.7
20″	498	19.6	513	20.2	44	1.7
30″	740	29.1	755	29.7	44	1.7
40″	982	38.7	997	39.3	44	1.7

CODE 3: 2 x 222 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (CODE 7 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	251	9.9	315	12.4	56	2.2
20″	493	19.4	557	21.9	56	2.2
30″	735	28.9	799	31.5	56	2.2
40″	977	38.5	1041	41.0	56	2.2

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



Dimensions (CODE 8 connection)						
Size	**a**		**b**		**c**	
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20″	496	19.5	553	21.8	44	1.7
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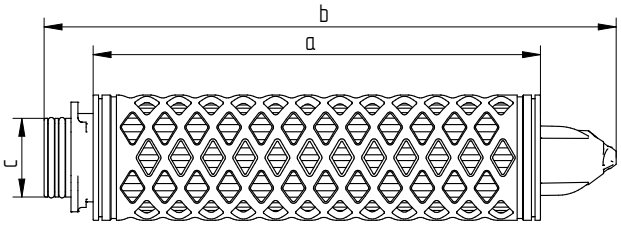
40″	980	38.6	1037	40.8	44	1.7

CODE 8: 2 x 222 o-rings, plug connection, locating fin, integrated reinforcement ring



Dimensions (CODE 9 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	250	9.8	320	12.6	44	1.7
20"	492	19.4	562	22.1	44	1.7
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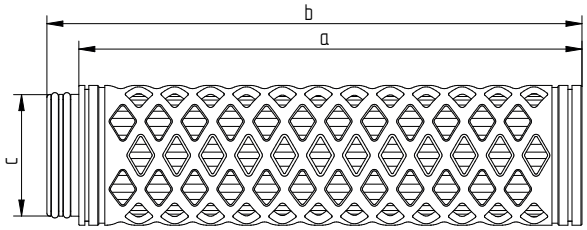
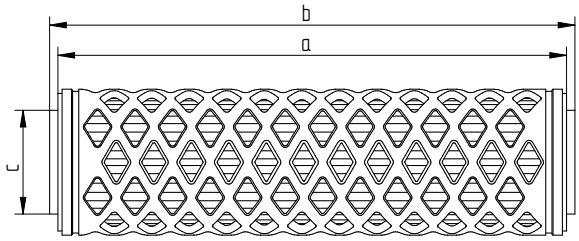
40"	976	38.4	1046	41.2	44	1.7

CODE 9: 2 x 222 o-rings, bayonet 3 locking tabs, locating fin, integrated reinforcement ring



Dimensions (UF connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	252	9.9	268	10.6	61	2.4
20"	494	19.4	510	20.1	61	2.4
30"	736	29.0	752	29.6	61	2.4

CODE UF: 2 x 226 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	244	9.6	250	9.8	50	2.0
20"	500	19.7	506	19.9	50	2.0
30"	754	29.7	760	29.9	50	2.0
40"	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- Integrity test to be done by Bubble Point or Forward Flow Test
- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Donaldson® Ultrafilter

Donaldson
FILTRATION SOLUTIONS

PROCESS FILTRATION FROM PURE TO STERILE
LifeTec PP N

MAIN FEATURES & BENEFITS

- Extremely durable Polypropylene construction
- Outstanding flow rate
- Extremely high dirt holding capacity
- Asymmetrical filter matrix for longer service life
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

Donaldson LifeTec PP N filters are nominal rated depth type filters constructed of 100 % Polypropylene. They contain an asymmetrical Polypropylene microfiber filter medium that provides a graded pore structure. LifeTec PP N filters deliver outstanding flow rates and high throughput, with nominal submicron particulate retention and high dirt holding capacity. Their all-Polypropylene construction provides broad chemical compatibility and low extractable levels in a wide range of fluids and applications.

The LifeTec PP N filter's Polypropylene media is made from a process which produces a self-bonded structure comprised of multiple layers of successively finer fibres and smaller pores. This state-of-the-art design results in a highly porous, tapered pore structure consistent of a controlled absolute rated inner layer and several outer prefilter layers which substantially increase the dirt holding capacity.

All components meet the EU and USA requirements for Food Contact Use in accordance with CFR (Code of Federal Regulations) Title 21 and EC/1935/2004 and subsequent amendments. The filter element is manufactured in accordance with the GMP requirements as defined in EC/2023/2006, has no migration of filter media, is non-fibre releasing and is thermally welded.
All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 and EC/65/2011.

INDUSTRIES


- Food


- Beverages


- Chemical


- Pharmaceutical


- Environmental

Donaldson® Ultrafilter

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DE- 2016/1

APPLICATIONS

The nominal rated LifeTec PP N depth filter is designed and developed as prefilter for coarse contaminations and as cost effective final filter. Typical applications for LifeTec PP N filter elements include:

Clarification and sterilization of all types of water:

- Bottled Water
- Soft Drinks
- Beer
- Wine
- Spirits
- Syrups

High quality filtration for a variety of ultrapure water requirements:

- Cosmetics
- Oils
- Lubricants
- Paints and dyes
- Jet Printer Inks

Sterile filtration of beverages:

- Acids
- Bases
- Alcohols, Aldehydes
- Esters and Ketones
- Photolithographic Liquids

MATERIAL COMPLIANCE USA

All components of the LifeTec PP N filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Filter Material	Polypropylene	§ 177.1520
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PP N filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants (B, D1) after flushing or in flow conditions. All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

QUALITY TEST

All products have been inspected and released by Quality Assurance as having met the following requirements:

- All final filter elements are integrity tested to verify compliance with established quality and design specifications and to assure consistent and reliable performance.
- The traceability of each filter element according to EC/1935/2004 is provided by Lot number and Serial number.
- All filters show no migration of the filter medium and are non-fibre releasing.
- All LifeTec PP N filter elements are completely staged, assembled, tested and packaged in Class 7 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

Donaldson® Ultrafilter

RETENTION

Retention Rate	Percent Removal		
	98 %	90%	80%
0.4	0.5 µm		
1	1 µm	0.5 µm	
3	3 µm	2 µm	1 µm
5	5 µm	3 µm	2 µm
10	10 µm	5 µm	3 µm
30	30 µm	20 - 30 µm	10 - 20 µm

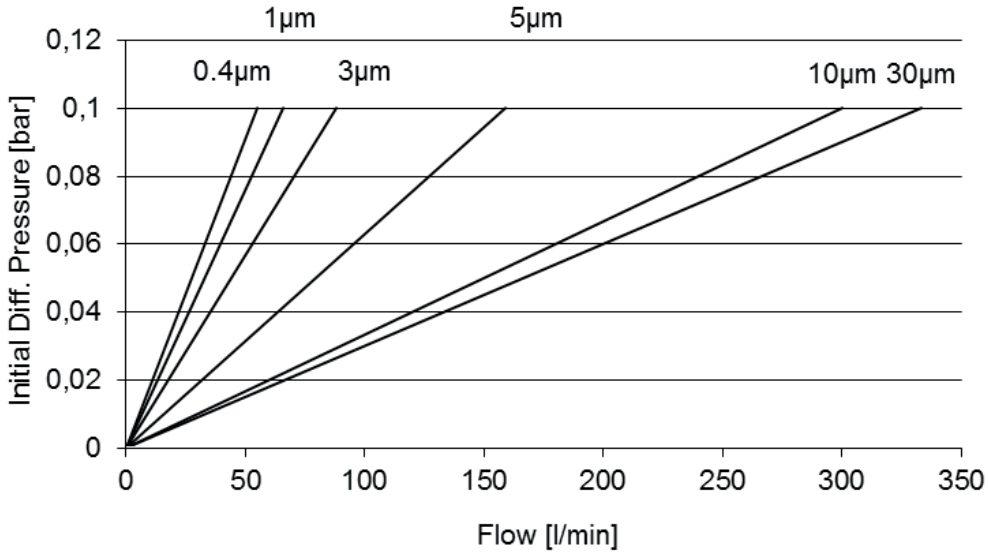
The removal ratings given in this chart represent actual dynamic measurements obtained from a controlled laboratory tests using ISO FTD (5 mg/l) in deionised water at a flow rate of 1 lpm per 95 cm² of the filter matrix.
The particle retention efficiencies were determined with a state-of-the-art liquid particle counter that can accurately measure particles down to 0.5 µm.

PRODUCT SPECIFICATIONS

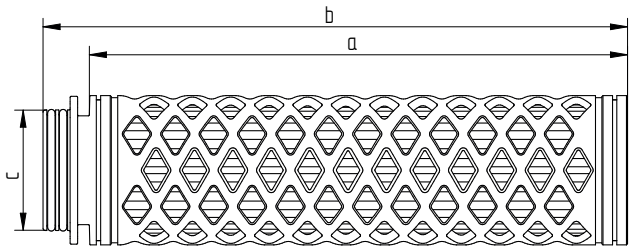
Product Specifications				
Nominal Retention Rates	0.45 µm, 1 µm, 3 µm, 5 µm, 10 µm, 30 µm			
Filtration Surface	> 0.6 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time*	121°C (250° F), Saturated Steam: > 100 cycles (30 minutes)			

* 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.

FLOW CHARACTERISTICS

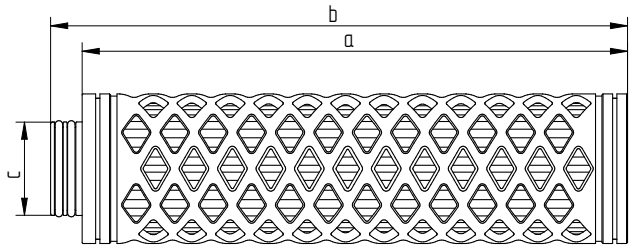


LifeTec PP N
10", Deionised water, 20°C



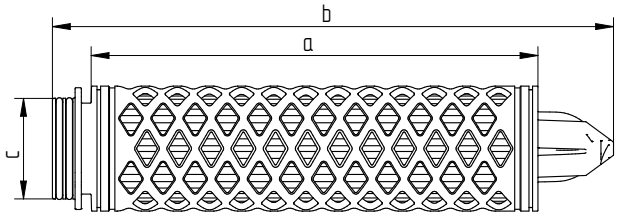
Dimensions (CODE 2 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	253	10.0	274	10.8	56	2.2
20″	495	19.5	516	20.3	56	2.2
30″	737	29.0	758	29.8	56	2.2
40″	979	38.5	1000	39.4	56	2.2

CODE 2: 2 x 226 o-rings, bayonet 2 locking tabs, flat end cap, integrated reinforcement ring



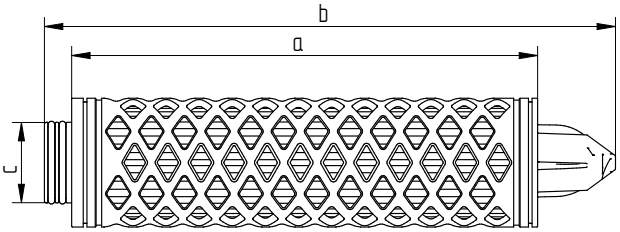
Dimensions (CODE 3 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	256	10.1	271	10.7	44	1.7
20″	498	19.6	513	20.2	44	1.7
30″	740	29.1	755	29.7	44	1.7
40″	982	38.7	997	39.3	44	1.7

CODE 3: 2 x 222 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (CODE 7 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	251	9.9	315	12.4	56	2.2
20″	493	19.4	557	21.9	56	2.2
30″	735	28.9	799	31.5	56	2.2
40″	977	38.5	1041	41.0	56	2.2

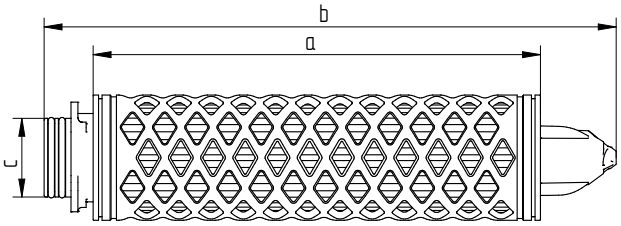
CODE 7: 2 x 226 o-rings, bayonet 2 locking tabs, locating fin, integrated reinforcement ring



Dimensions (CODE 8 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	254	10.0	311	12.2	44	1.7
20″	496	19.5	553	21.8	44	1.7
30″	738	29.1	795	31.3	44	1.7
40″	980	38.6	1037	40.8	44	1.7

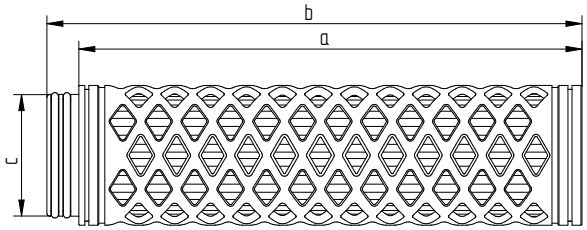
CODE 8: 2 x 222 o-rings, plug connection, locating fin, integrated reinforcement ring

Donaldson® Ultrafilter



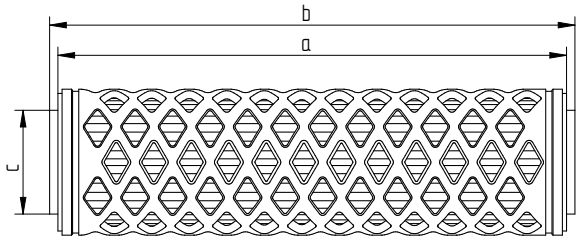
Dimensions (CODE 9 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	250	9.8	320	12.6	44	1.7
20″	492	19.4	562	22.1	44	1.7
30″	734	28.9	804	31.7	44	1.7
40″	976	38.4	1046	41.2	44	1.7

CODE 9: 2 x 222 o-rings, bayonet 3 locking tabs, locating fin, integrated reinforcement ring



Dimensions (UF connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	252	9.9	268	10.6	61	2.4
20″	494	19.4	510	20.1	61	2.4
30″	736	29.0	752	29.6	61	2.4

CODE UF: 2 x 226 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	244	9.6	250	9.8	50	2.0
20″	500	19.7	506	19.9	50	2.0
30″	754	29.7	760	29.9	50	2.0
40″	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Donaldson® Ultrafilter

Donaldson
FILTRATION SOLUTIONS

PROCESS FILTRATION FROM PURE TO STERILE
LifeTec PP100 CN

MAIN FEATURES & BENEFITS

- Absolute removal of Cryptosporidium and Giardia
- Tapered pore structure for longer service life
- Highly durable Polypropylene construction
- Excellent flow rate
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

The Donaldson LifeTec PP100 CN was specifically developed for maximum safety, performance and economics in protecting bottled water and soft drinks from Cryptosporidium and Giardia contamination.

The Donaldson LifeTec PP100 CN filter has been tested and approved per NSF Standard 53 as an absolute barrier to Cryptosporidium and Giardia in potable and drinking water applications. It also complies with the CDC/EPA recommendation for using absolute-rated 1 µm filters to control Cryptosporidium in drinking water.

The 1 µm absolute-rated, Donaldson LifeTec PP100 CN pleated filter element provides unmatched filtration performance. It contains a self-bonded microfiber filter medium composed of multiple layers of successively finer fibres and smaller pores. This highly porous, tapered pore structure provides superior flow rates and high throughputs, while maintaining an extraordinary dirt holding capacity. The filter's rugged, all Polypropylene construction withstands everyday hydraulic challenges in bottling applications.

INDUSTRIES


- Mineral Water


- Soft Drinks


- Dairies


- Breweries


- Wineries


- Environmental

Donaldson®
Ultrafilter

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Fax +49 2129 569 100
CAP-de@donaldson.com
www.donaldson.com

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APPLICATIONS

The Donaldson LifeTec PP100 CN was specifically designed for the following applications:

Cryptosporidium control in:

- Bottled Water
- Mineral Water
- Spring Water
- Table Water
- Process Water
- Ingredient Water
- Potable Water

Filtration of Food and Beverages products:

- Soft Drinks
- Beer
- Wine
- Spirits
- Syrups

QUALITY TEST

All products have been inspected and released by Quality Assurance as having met the following requirements:

- All final filter elements are integrity tested to verify compliance with established quality and design specifications and to assure consistent and reliable performance.

- The traceability of each filter element according to EC/1935/2004 is provided by Lot number and Serial number.

- All LifeTec PP100 CN filter elements are completely staged, assembled, tested and packaged in Class 100 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

MATERIAL COMPLIANCE USA

All components of the LifeTec PP100 CN filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Filter Material	Polypropylene	§ 177.1520
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PP100 CN filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants after flushing or in flow conditions. All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

BACTERIAL RETENTION

The Filter type LifeTec PP100 CN (1 µm absolute) has been tested and approved per NSF Standard 53 as an absolute barrier to Cryptosporidium and Giardia in potable and drinking water applications. It also complies with the CDC/EPA recommendation for using absolute-rated filters to control Cryptosporidium in drinking water.

Retention Rate	Microorganism	Efficiency
1.0 µm	Cryptosporidium	> 99.95 %

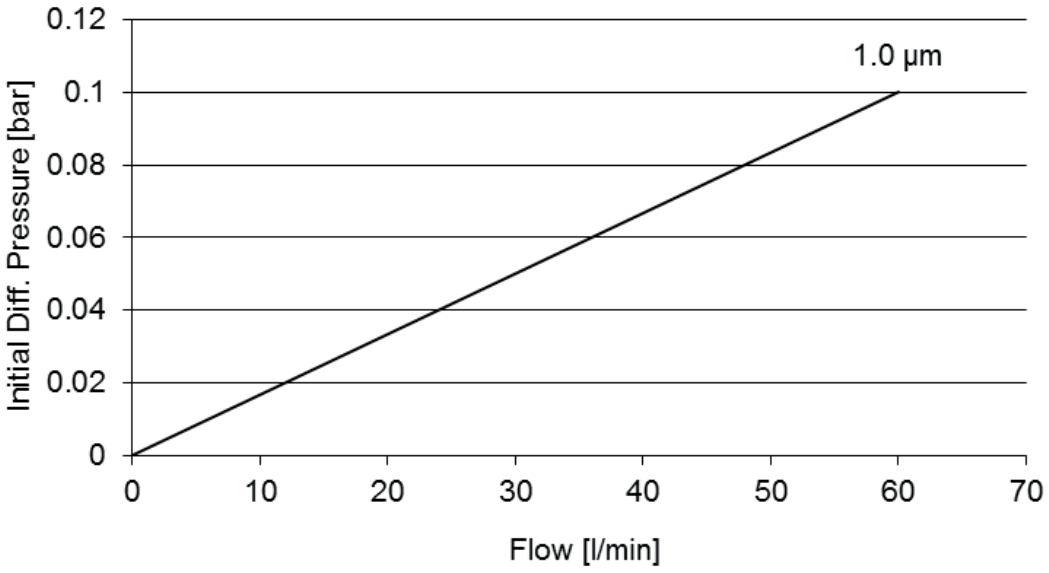
PRODUCT SPECIFICATIONS

Product Specifications				
Absolute Retention Rate*	1 µm absolute: > 99.98 % for particles of 1 µm (ß – value > 5000)			
Filtration Surface	0.6 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time**	121°C (250° F), Saturated Steam: > 100 cycles (30 minutes)			

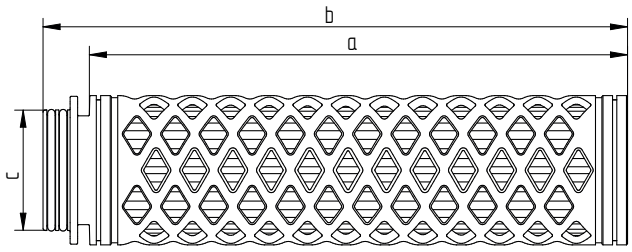
* The removal ratings given in this chart represent actual dynamic measurements obtained from a controlled laboratory tests using FTD in deionised water at a flow rate of 1 l/m (0,2 gpm) per 95 cm² of the filter matrix. The particle retention efficiencies were determined with a state-of-the-art liquid particle counter that can accurately measure particles down to 0.5 µm.

** 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.

FLOW CHARACTERISTICS

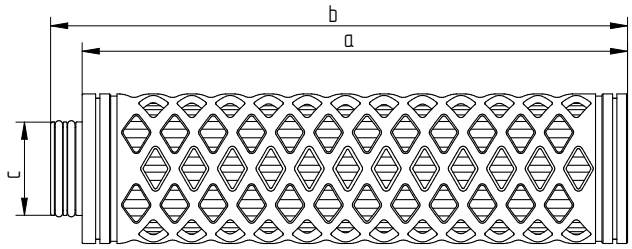


LifeTec PP100 CN
10", Deionised water, 20°C



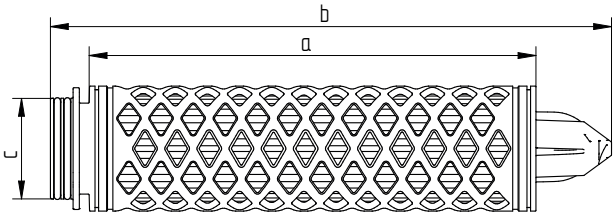
Dimensions (CODE 2 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	253	10.0	274	10.8	56	2.2
20"	495	19.5	516	20.3	56	2.2
30"	737	29.0	758	29.8	56	2.2
40"	979	38.5	1000	39.4	56	2.2

CODE 2: 2 x 226 o-rings, bayonet 2 locking tabs, flat end cap, integrated reinforcement ring



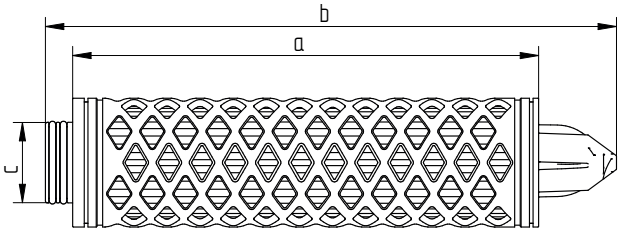
Dimensions (CODE 3 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	256	10.1	271	10.7	44	1.7
20"	498	19.6	513	20.2	44	1.7
30"	740	29.1	755	29.7	44	1.7
40"	982	38.7	997	39.3	44	1.7

CODE 3: 2 x 222 o-rings, plug connection, flat end cap, integrated reinforcement ring



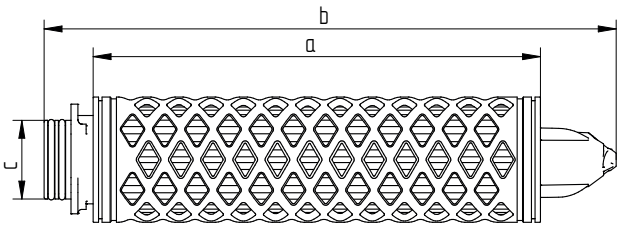
Dimensions (CODE 7 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	251	9.9	315	12.4	56	2.2
20"	493	19.4	557	21.9	56	2.2
30"	735	28.9	799	31.5	56	2.2
40"	977	38.5	1041	41.0	56	2.2

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



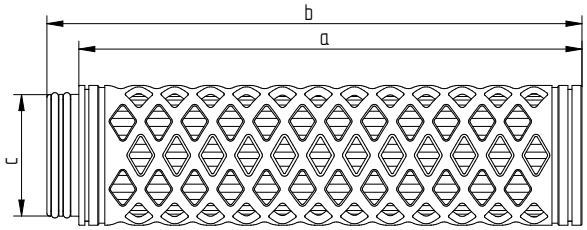
Dimensions (CODE 8 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	254	10.0	311	12.2	44	1.7
20"	496	19.5	553	21.8	44	1.7
30"	738	29.1	795	31.3	44	1.7
40"	980	38.6	1037	40.8	44	1.7

CODE 8: 2 x 222 o-rings, plug connection, locating fin, integrated reinforcement ring



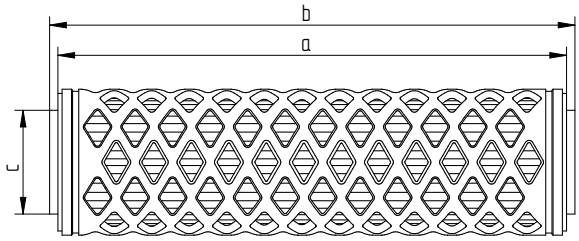
Dimensions (CODE 9 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	250	9.8	320	12.6	44	1.7
20"	492	19.4	562	22.1	44	1.7
30"	734	28.9	804	31.7	44	1.7
40"	976	38.4	1046	41.2	44	1.7

CODE 9: 2 x 222 o-rings, bayonet 3 locking tabs, locating fin, integrated reinforcement ring



Dimensions (UF connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	252	9.9	268	10.6	61	2.4
20"	494	19.4	510	20.1	61	2.4
30"	736	29.0	752	29.6	61	2.4

CODE UF: 2 x 226 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10"	244	9.6	250	9.8	50	2.0
20"	500	19.7	506	19.9	50	2.0
30"	754	29.7	760	29.9	50	2.0
40"	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- Integrity test of this element to be done by DOP Test
- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Donaldson® Ultrafilter

Donaldson
FILTRATION SOLUTIONS

PROCESS FILTRATION FROM PURE TO STERILE
LifeTec PP100 N

MAIN FEATURES & BENEFITS

- Absolute particle removal
- Asymmetrical pore structure for longer service life
- Highly durable Polypropylene construction
- Excellent flow rate
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

Donaldson LifeTec PP100 N filters are absolute rated depth type filters constructed of 100 % Polypropylene. They contain a graded density Polypropylene microfiber filter medium that provides a tapered pore structure. LifeTec PP100 N filters deliver superior flow rates and high throughput, with absolute micron & submicron particulate retention and high dirt holding capacity. Their all-Polypropylene construction provides broad chemical compatibility and low extractable levels in a wide range of fluids and applications.

The LifeTec PP100 N filter's Polypropylene media is made from a process which produces a self-bonded structure comprised of multiple layers of successively finer fibres and smaller pores. This state-of-the-art design results in a highly porous, tapered pore structure consistent of a controlled absolute rated inner layer and several outer prefilter layers which substantially increase the dirt holding capacity.

All components meet the EU and USA requirements for Food Contact Use in accordance with CFR (Code of Federal Regulations) Title 21 and EC/1935/2004 and subsequent amendments. The filter element is manufactured in accordance with the GMP requirements as defined in EC/2023/2006, has no migration of filter media, is non-fibre releasing and is thermally welded.
Al materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 and EC/65/2011.

INDUSTRIES


- Mineral Water


- Soft Drinks


- Chemical


- Breweries


- Wineries


- Environmental

Donaldson®
Ultrafilter

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APPLICATIONS

The absolute rated LifeTec PP100 N depth filter is designed and developed as prefilter in front of membrane filters or as low cost alternative to membrane – based final filters. Typical applications for LifeTec PP100 N filter elements include:

Purification of Food and Beverage products:

- Bottled Water
- Soft Drinks
- Beer
- Wine
- Spirits
- Syrups

Purification of chemicals:

- Acids
- Bases
- Complexing agents
- Alcohols, Aldehydes
- Etchants
- Chlorinated and fluorinated solvents
- Esters and Ketones
- Photolithographic Liquids

MATERIAL COMPLIANCE USA

All components of the LifeTec PP100 N filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Filter Material	Polypropylene	§ 177.1520
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PP100 N filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants (B, D1) after flushing or in flow conditions. All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

QUALITY TEST

All products have been inspected and released by Quality Assurance as having met the following requirements:

- All final filter elements are integrity tested to verify compliance with established quality and design specifications and to assure consistent and reliable performance.
- The traceability of each filter element according to EC/1935/2004 is provided by Serial number.
- All filters show no migration of the filter medium and are non-fibre releasing.
- All LifeTec PP100 N filter elements are completely staged, assembled, tested and packaged in Class 100 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

RETENTION

Retention Rate	Percent Removal		
	99.98 %	99%	90%
0.6	0.6µm		
0.8	0.8µm		
1	1.0µm	< 0.5µm	
2.4	2.4µm	2µm	> 0.5µm
5	5µm	> 1µm	< 0.5µm
10	10µm	< 6µm	> 2µm

The removal ratings given in this chart represent actual dynamic measurements obtained from a controlled laboratory tests using ISO FTD (5 mg/l) in deionised water at a flow rate of 1lpm per 95 cm² of the filter matrix.

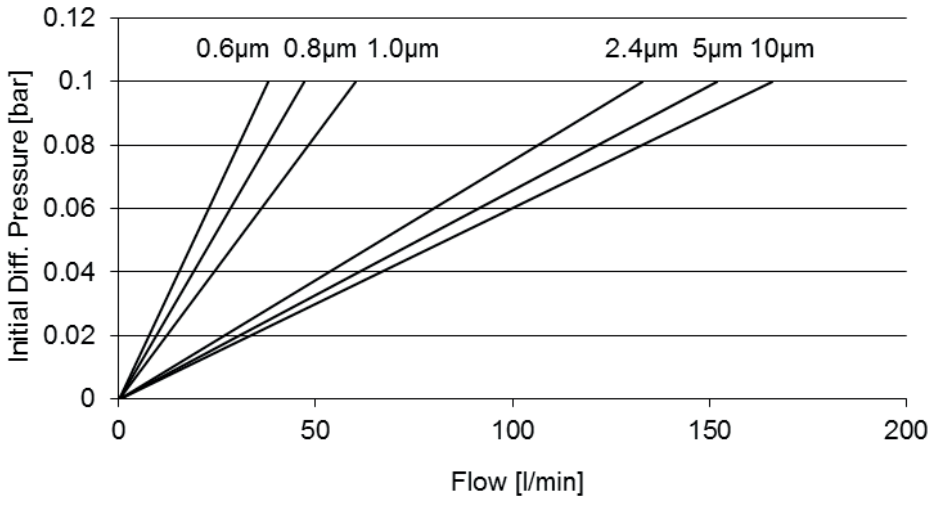
The particle retention efficiencies were determined with a state-of-the-art liquid particle counter that can accurately measure particles down to 0.5 µm.

PRODUCT SPECIFICATIONS

Product Specifications				
Absolute Retention Rates	0.6 µm, 0.8 µm, 1 µm, 2.4 µm, 5 µm, 10 µm			
Filtration Surface	>/= 0.6 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time*	121°C (250° F), Saturated Steam: > 100 cycles (30 minutes)			

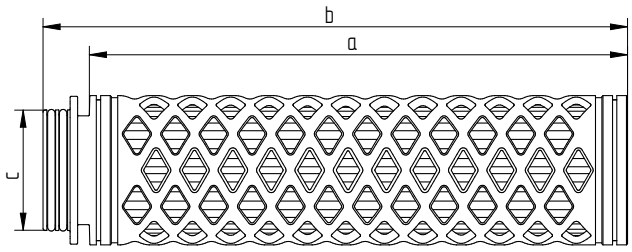
* Figures are based on lab tests to evaluate steaming resistance. Filter elements need to be checked in actual use. Contact Donaldson for recommended Autoclaving/Steaming procedures.

FLOW CHARACTERISTICS



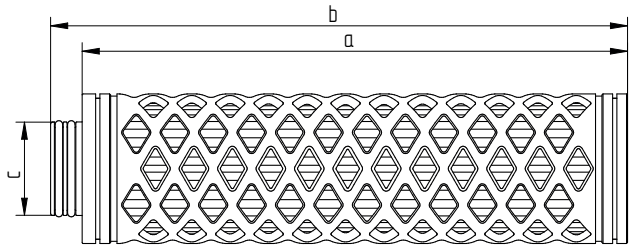
LifeTec PP100 N
10", Deionised water, 20°C

Donaldson® Ultrafilter



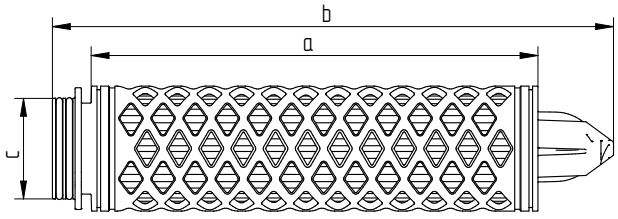
Dimensions (CODE 2 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	253	10.0	274	10.8	56	2.2
20″	495	19.5	516	20.3	56	2.2
30″	737	29.0	758	29.8	56	2.2
40″	979	38.5	1000	39.4	56	2.2

CODE 2: 2 x 226 o-rings, bayonet 2 locking tabs, flat end cap, integrated reinforcement ring



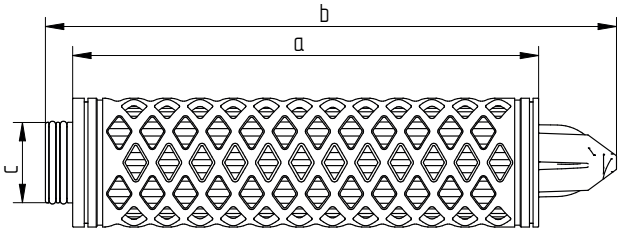
Dimensions (CODE 3 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	256	10.1	271	10.7	44	1.7
20″	498	19.6	513	20.2	44	1.7
30″	740	29.1	755	29.7	44	1.7
40″	982	38.7	997	39.3	44	1.7

CODE 3: 2 x 222 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (CODE 7 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	251	9.9	315	12.4	56	2.2
20″	493	19.4	557	21.9	56	2.2
30″	735	28.9	799	31.5	56	2.2
40″	977	38.5	1041	41.0	56	2.2

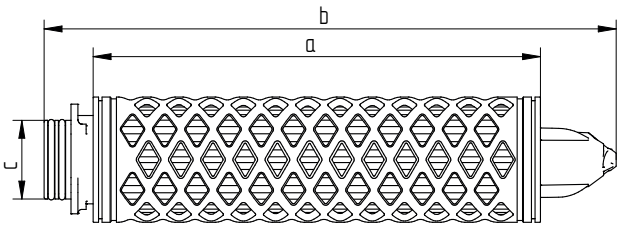
CODE 7: 2 x 226 o-rings, bayonet 2 locking tabs, locating fin, integrated reinforcement ring



Dimensions (CODE 8 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	254	10.0	311	12.2	44	1.7
20″	496	19.5	553	21.8	44	1.7
30″	738	29.1	795	31.3	44	1.7
40″	980	38.6	1037	40.8	44	1.7

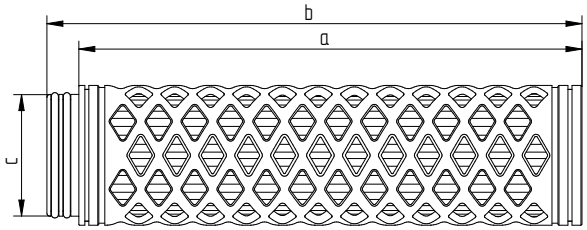
CODE 8: 2 x 222 o-rings, plug connection, locating fin, integrated reinforcement ring

Donaldson® Ultrafilter



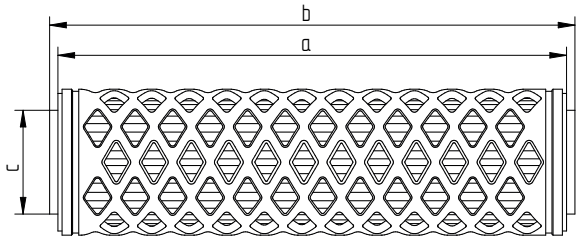
Dimensions (CODE 9 connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	250	9.8	320	12.6	44	1.7
20″	492	19.4	562	22.1	44	1.7
30″	734	28.9	804	31.7	44	1.7
40″	976	38.4	1046	41.2	44	1.7

CODE 9: 2 x 222 o-rings, bayonet 3 locking tabs, locating fin, integrated reinforcement ring



Dimensions (UF connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	252	9.9	268	10.6	61	2.4
20″	494	19.4	510	20.1	61	2.4
30″	736	29.0	752	29.6	61	2.4

CODE UF: 2 x 226 o-rings, plug connection, flat end cap, integrated reinforcement ring



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	244	9.6	250	9.8	50	2.0
20″	500	19.7	506	19.9	50	2.0
30″	754	29.7	760	29.9	50	2.0
40″	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- Integrity test of this element to be done by DOP Test
- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Donaldson® Ultrafilter

Donaldson
FILTRATION SOLUTIONS

PROCESS FILTRATION FROM PURE TO STERILE

LifeTec PP-TF N

MAIN FEATURES & BENEFITS

- Extremely high dirt holding capacity
- Excellent flow rate
- Regenerable
- Highly robust construction
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

Donaldson LifeTec PP-TF N filters are nominal rated depth type filters constructed of 100 % Polypropylene. LifeTec PP-TF N filters deliver outstanding flow rates and high throughput, with nominal particulate retention from 1 µm up to 50 µm and high dirt holding capacity.

Ther all-Polypropylene construction provides broad chemical compatibility and low extractable levels in a wide range of fluids and applications.

This extremely durable design maintains consistent porosity and impurity retention throughout its service life without shedding or unloading contaminations.

All components meet the EU and USA requirements for Food Contact Use in accordance with CFR (Code of Federal Regulations) Title 21 and EC/1935/2004 and subsequent amendments. The filter element is manufactured in accordance with the GMP requirements as defined in EC/2023/2006, has no migration of filter media, is non-fibre releasing and is thermally welded.

All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 and EC/65/2011.

INDUSTRIES

- Chemical

- Food

- Beverages

- Environmental

Donaldson®
Ultrafilter

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Fax +49 2129 569 100
CAP-de@donaldson.com
www.donaldson.com

DE- 2016/1

APPLICATIONS

The nominal rated PP-TF N depth filter is designed and developed as prefilter with high dirt hold capacity for coarse contaminations and particles. Typical applications for LifeTec PP-TF N filter elements include:

Purification of Food and Beverage (pre) products:

- Well Water
- Tap Water
- Mineral Water
- Soft Drinks

Purification and Filtration of:

- Cosmetics
- Oils
- Lubricants
- Paints and Dyes
- Jet Printer Inks

Purification Sterile filtration of beverages:

- Acids
- Bases
- Alcohols, Aldehydes
- Esters and Ketones
- Photolithographic Liquids

MATERIAL COMPLIANCE USA

All components of the LifeTec PP-TF N filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Filter Material	Polypropylene	§ 177.1520
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PP-TF N filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants after flushing or in flow conditions. All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

QUALITY TEST

All products have been inspected and released by Quality Assurance as having met the following requirements:

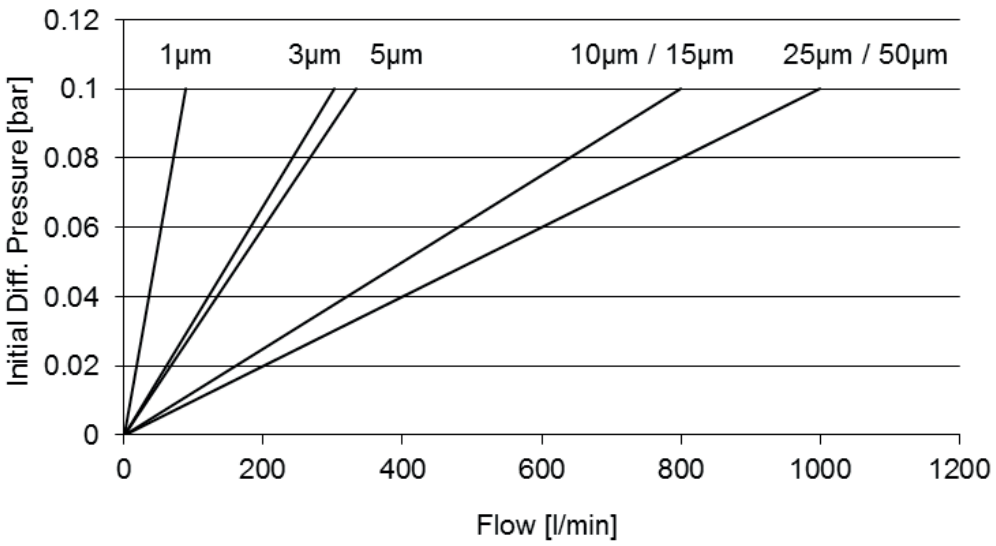
- The traceability of each filter element according to EC/1935/2004 is provided by the Serial number.
- All filters show no migration of the filter medium and are non-fibre releasing.
- All LifeTec PP N filter elements are completely staged, assembled, tested and packaged in Class 7 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

Donaldson® Ultrafilter

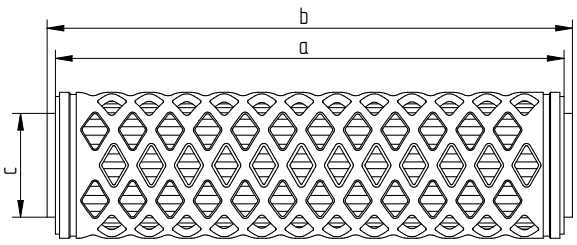
PRODUCT SPECIFICATIONS

Product Specifications				
Nominal Retention Rates	1 µm, 3 µm, 5 µm, 10 µm, 15µm, 25µm, 50µm			
Filtration Surface	> 0.6 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time	For this element type steaming is not recommended			

FLOW CHARACTERISTICS



LifeTec PP-TF N
10", Deionised water, 20°C



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	244	9.6	250	9.8	50	2.0
20″	500	19.7	506	19.9	50	2.0
30″	754	29.7	760	29.9	50	2.0
40″	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Donaldson® Ultrafilter

Process Filtration
From Pure to Sterile

P-EG

MAIN FEATURES & BENEFITS:

- High quality stainless steel design
- Extremely low differential pressure
- Various connection types
- From 60 m^3/h up to 19.200 m^3/h

INDUSTRIES:

- Food & Beverage

- Engineering

- Chemical Industry

- Pharmaceutical Industry

- Automotive

Donaldson Filtration Deutschland GmbH
Büssingstr. 1
42781 Haan
Germany

Web: www.donaldson.com

Donaldson®
Ultrafilter

PRODUCT DESCRIPTION

P-EG filter housings have been developed for the purification of compressed air and other technical gases in industrial ranges of application. Due to the optimized construction they offer low differential pressure at high flow rates. Numerous different sizes of housings with various connections make it possible to adopt the filter system to exactly the needed requirements.

This product series contains 18 different sizes of housings for operating volume flows of 60 to 19.200 Nm3/h related to 7 bar(g). The Donaldson plug connection guarantees that the elements remain safely fixed at all times. Due to the modular design different element types can be installed into the housing, resulting in a highly flexible filtration system.

The P-EG housing is designed and developed for the following applications:

Filtration of air and gases

- Compressed Air
- Carbon Dioxide
- Technical Gases

Filtration of Steam

DIRECTIVES

All P-EG housings are designed in accordance with

- FDA CFR Code of Federal Regulations Title 21
- Pressure Equipment Directive 2014/68/EU

PRODUCT SPECIFICATIONS

Product Specifications	
Inner Surface Finish:	• **0006-0288: etched and passivated Ra 1,6*** • **0432-1920: etched and passivated**
Outer Surface Finish:	• 0006-0288: etched, passivated and polished Ra 1,6* • 0432-1920: etched and passivated
Maximum Operating Pressure:	• 0006-0192: 16 bar • 0288: 12 bar • 0432-1920: 10 bar
Maximum operating temperature:	• -25 / +150°C
Connection types:	• BSP thread connection (Standard for 0006-0288 single housings) • DIN flange (standard starting at 0432multiple housing) • Welded ends

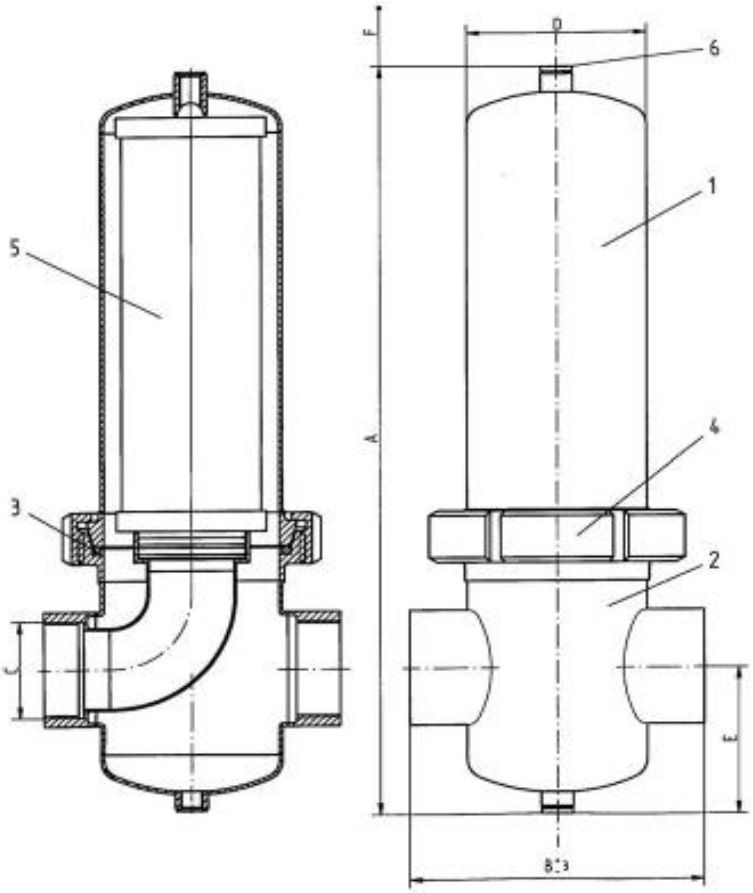
*Ra-values don't apply to welding seams

HOUSING TYPE P-EG 0006-0288 WITH THREAD CONNECTION

Pos.	Piece	Description
6	2	plug ¼“
5	1	filter element
4	1	nut
3	1	housing gasket
2	1	lower housing bowl
1	1	upper housing bowl

Max. Operating Pressure:		
0006-0192:	16 bar	
0288:	12 bar	
Test pressure:		
	1.4301	1.4404
0006-0192	29.3 bar	27.0 bar
0288:	22.0 bar	20.2 bar
Max. Operating Temperature:	-25 / +150°C	
Material Housing:	1.4301 or 1.4404/1.4435	
Attaching Parts:	1.4301	
Surface Finish:		
inside R_a 1,6*; etched and passivated		
outside R_a 1,6*; etched, passivated and polished		

*Ra-values don’t apply to welding seams

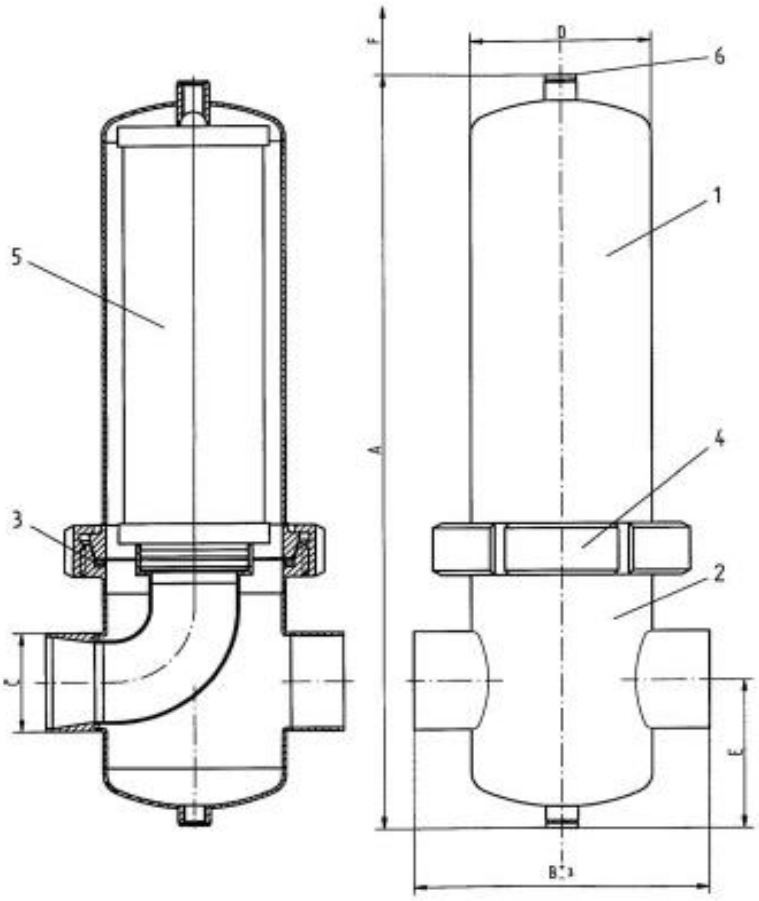


Classification acc. To 2014/68/EU for fluids group 2	
P-EG 0006-0048	Art. 4, par. 3
P-EG 0072-0288	Cat. I

Size	Volume (l)	Weight (kg)	A mm	B mm	C	ØD mm	E mm	F mm	Element
0006	0,55	1,7	215	108	G ¼	70	55	90	03/10
0009	0,65	1,9	245	108	G ⅜	70	55	120	04/10
0012	0,65	1,9	245	108	G ½	70	55	120	04/20
0018	0,75	2,0	270	125	G ¾	70	55	150	05/20
0027	1,0	2,6	295	125	G 1	85	75	150	05/25
0036	1,25	3,0	345	140	G 1¼	85	75	200	07/25
0048	2,3	4,3	390	170	G 1½	104	100	200	07/30
0072	3,3	4,8	465	170	G 2	104	100	280	10/30
0108	4,3	5,3	590	170	G 2	104	100	450	15/30
0144	8,0	9,0	735	216	G 2½	129	110	580	20/30
0192	11,1	10,8	1000	216	G 3	129	110	850	30/30
0288	16,5	16,2	1025	240	G 3	154	120	850	30/50

HOUSING TYPE P-EG 0006-0288 WITH WELDED ENDS FOR ISO- PIPE

Pos.	Piece	Description
6	2	plug ¼“
5	1	filter element
4	1	nut
3	1	housing gasket
2	1	lower housing bowl
1	1	upper housing bowl



Max. Operating Pressure:		
0006-0192:	16 bar	
0288:	12 bar	
Test pressure:		
	1.4301	1.4404
0006-0192	29.3 bar	27.0 bar
0288:	22.0 bar	20.2 bar
Max. operating temperature:	-25 / +150°C	
Material housing:	1.4301 or 1.4404/1.4435	
Attaching parts:	1.4301	
Surface finish:		
inside R_a 1,6*; etched and passivated		
outside R_a 1,6*; etched, passivated and polished		

*Ra-values don’t apply to welding seams

Classification acc. To 2014/68/EU for fluids group 2	
P-EG 0006-0048	Art. 4, par. 3
P-EG 0072-0288	Cat. I

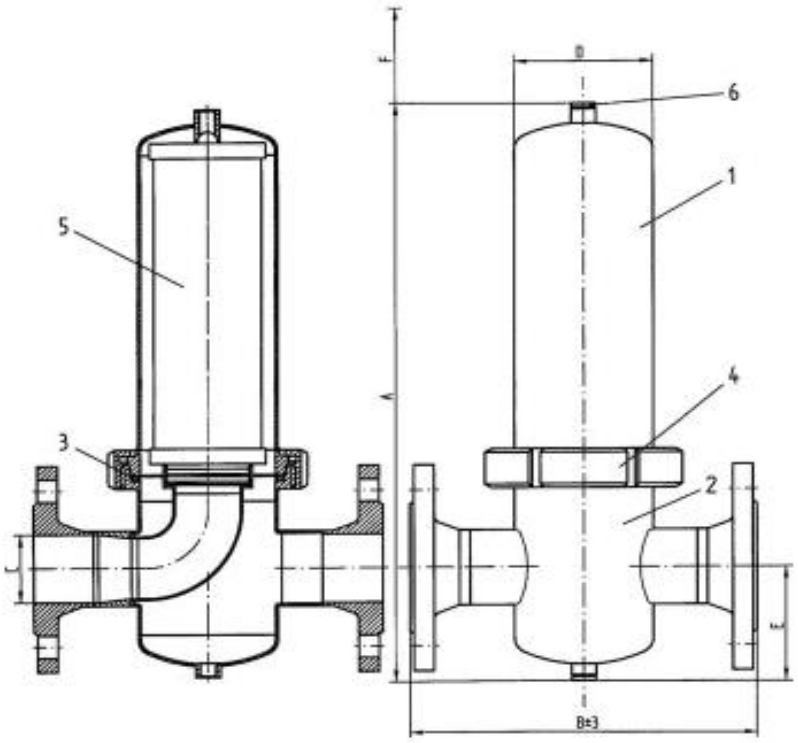
Size	Volume (l)	Weight (kg)	A mm	B mm	C	ØD mm	E mm	F mm	Element
0006	0,55	1,7	215	108	17,2/DN 10	70	55	90	03/10
0009	0,65	1,9	245	108	17,2/DN 10	70	55	120	04/10
0012	0,65	1,9	245	108	21,3/DN15	70	55	120	04/20
0018	0,75	2,0	270	125	26,9/DN 20	70	55	150	05/20
0027	1,0	2,6	295	135	33,7/DN 25	85	75	150	05/25
0036	1,25	3,0	345	140	42,4/DN 32	85	75	200	07/25
0048	2,3	4,3	390	170	48,3/DN 40	104	100	200	07/30
0072	3,3	4,8	465	170	60,3/DN 50	104	100	280	10/30
0108	4,3	5,3	590	170	60,3/DN 50	104	100	450	15/30
0144	8,0	9,0	735	200	76,1/DN 65	129	110	580	20/30
0192	11,1	10,8	1000	200	88,9/DN 80	129	110	850	30/30
0288	16,5	16,2	1025	240	88,9/DN 80	154	120	850	30/50

HOUSING TYPE P-EG 0006-0288 WITH FLANGE CONNECTION

Pos.	Piece	Description
6	2	plug ¼“
5	1	filter element
4	1	nut
3	1	housing gasket
2	1	lower housing bowl
1	1	upper housing bowl

Max. Operating Pressure:		
0006-0192:	16 bar	
0288:	12 bar	
Test Pressure:		
	1.4301	1.4404
0006-0192	29.3 bar	27.0 bar
0288:	22.0 bar	20.2 bar
Max. Operating temperature:	-25 / +150°C	
Material Housing:	1.4301 or 1.4404/1.4435	
Attaching Parts:	1.4301	
Surface Finish:		
inside R_a 1,6*; etched and passivated		
outside R_a 1,6*; etched, passivated and polished		

*Ra-values don’t apply to welding seams

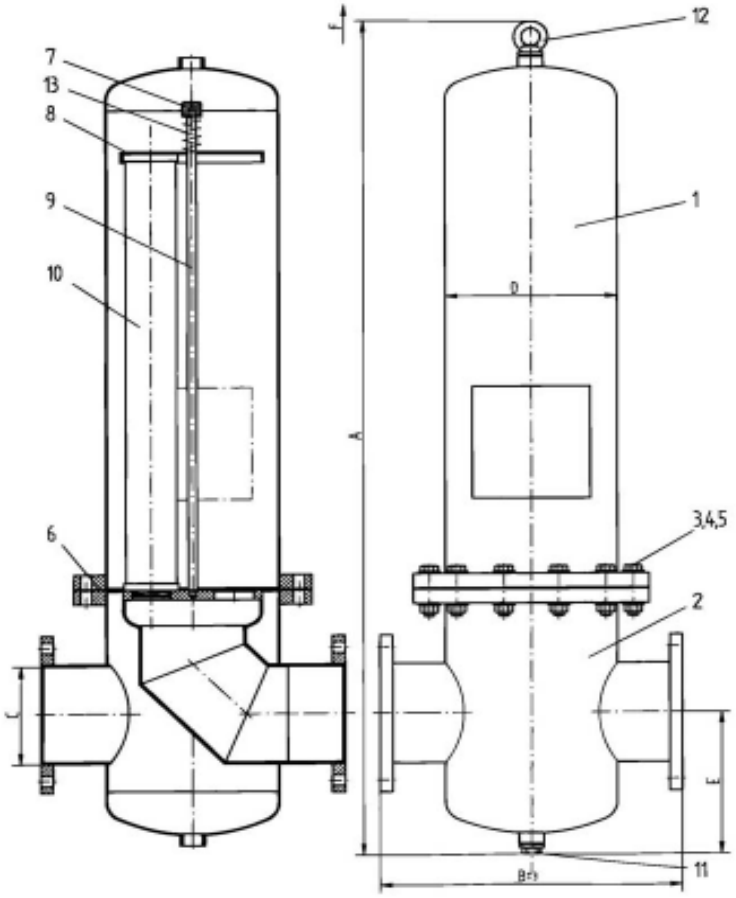


Classification acc. To 2014/68/EU for fluids group 2	
P-EG 0006-0048	Art. 4, par. 3
P-EG 0072-0288	Cat. I

Size	Volume (l)	Weight (kg)	A mm	B mm	C	ØD mm	E mm	F mm	Element
0006	0,55	2,7	215	180	DN 10	70	55	90	03/10
0009	0,65	2,9	245	180	DN 10	70	55	120	04/10
0012	0,65	3,4	245	180	DN15	70	55	120	04/20
0018	0,75	4,0	270	202	DN 20	70	55	150	05/20
0027	1,0	4,8	295	212	DN 25	85	75	150	05/25
0036	1,25	6,4	345	220	DN 32	85	75	200	07/25
0048	2,3	8,0	390	254	DN 40	104	100	200	07/30
0072	3,3	10,0	465	260	DN 50	104	100	280	10/30
0108	4,3	10,5	590	260	DN 50	104	100	450	15/30
0144	8,0	15,0	735	290	DN 65	129	110	580	20/30
0192	11,1	18,2	1000	300	DN 80	129	110	850	30/30
0288	16,5	23,6	1025	340	DN 80	154	120	850	30/50

HOUSING TYPE P-EG 0432-19220 WITH FLANGE CONNECTION

Pos.	Description
13	spring
12	lifting eye bolt
11	plug
10	filter element
9	anchor bolt
8	bracket plate
7	bracket bolt
6	gasket
5	nut
4	washer
3	hexagon bolt
2	lower housing bowl
1	upper housing bowl



Max. Operating Pressure:	10 bar
Test Pressure:	18.3 bar
Max. Operating Temperature:	-25 / +150°C
Material Housing:	1.4301
Attaching Parts:	1.4301
Surface Finish: etched and passivated	

Classification acc. to 2014/68/EU for fluids group 2

P-EG 0432-0768	Cat. II
P-EG 1152-1920	Cat. III

Size	Volume (l)	Weight (kg)	A mm	B mm	C	ØD mm	E mm	F mm	Element
0432	36	43	1090	410	DN 100	219.1	200	580	3x 20/30
0576	54	44	1350	410	DN 100	219.1	200	850	3x 30/30
0768	77	70	1410	480	DN 150	273	240	850	4x 30/30
1152	110	80	1460	540	DN 150	323.9	250	850	6x 30/30
1536	190	135	1600	660	DN 200	406.4	300	850	8x 30/30
1920	190	135	1600	660	DN 200	406.4	300	850	10x 30/30

Technical alterations reserved 04/2009

- **For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at www.donaldson.com!**

(Rev11 -0617)

Donaldson. FILTRATION SOLUTIONS

Process Filtration
From Pure to Sterile

P-KG

MAIN FEATURES & BENEFITS:

- Highly durable all-Polypropylene design
- Built-in ventilation valve
- Resistant towards hydraulic shocks
- Up to 76 l/min

INDUSTRIES:

- Photo Industry

- Food and Beverage Industry

- Chemical Industry

- Electronics Industry

- Engineering

- Environmental

Donaldson Filtration Deutschland GmbH
Büssingstr. 1
42781 Haan
Germany

Web: www.donaldson.com

PRODUCT DESCRIPTION

The Donaldson plastic housing P-KG is a particularly economic solution for the filtration of liquid media. The filter distinguishes itself by a robust construction that is insusceptible to shock. An air-release valve on the inlet is standard.

Donaldson offers 2 versions. The version with brass screw-in thread and EPDM sealings at housing-connections find its application e.g. in the water-filtration. The ventilation is realised with a brass plug.

The version with connection-threads made of PP-plastic and sealings made of Viton, has been conceived for the filtration in critical areas. In this version, a polypropylene ventilation-valve is installed.

The dimensions of the respective types are identical.

TECHNICAL DATA

Technical Data	
Materials Filter Housing:	break resistant polypropylene
Materials Housing Gasket:	EPDM O-ring (connections made of brass) Viton O-ring (connections made of plastic)
Maximum Operating Pressure:	8 bar at 50°C
Adapters:	The P-KG housings can only be used with filter elements with DOE (double open end) connections.

Type P-KG	Maximum Flow rate*	Element Length	Dimensions			Weight
			Height	Locating Distance	Connection	
0072	38 l/min	254 mm	294 mm	122 mm	G ¾	0,7 kg
0144	76 l/min	508 mm	570 mm	122 mm	G1	1,2 kg

* no element inside / housing only

- **For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at www.donaldson.com!**

(Rev02 – 07/10)

Donaldson
FILTRATION SOLUTIONS

PROCESS FILTRATION FROM PURE TO STERILE

LifeTec PP-TF N

MAIN FEATURES & BENEFITS

- Extremely high dirt holding capacity
- Excellent flow rate
- Regenerable
- Highly robust construction
- Approved for Food Contact Use acc. to CFR Title 21 & EC/1935/2004

PRODUCT DESCRIPTION

Donaldson LifeTec PP-TF N filters are nominal rated depth type filters constructed of 100 % Polypropylene. LifeTec PP-TF N filters deliver outstanding flow rates and high throughput, with nominal particulate retention from 1 µm up to 50 µm and high dirt holding capacity.

Ther all-Polypropylene construction provides broad chemical compatibility and low extractable levels in a wide range of fluids and applications.

This extremely durable design maintains consistent porosity and impurity retention throughout its service life without shedding or unloading contaminations.

All components meet the EU and USA requirements for Food Contact Use in accordance with CFR (Code of Federal Regulations) Title 21 and EC/1935/2004 and subsequent amendments. The filter element is manufactured in accordance with the GMP requirements as defined in EC/2023/2006, has no migration of filter media, is non-fibre releasing and is thermally welded.

All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 and EC/65/2011.

INDUSTRIES

- Chemical

- Food

- Beverages

- Environmental

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DE- 2016/1

APPLICATIONS

The nominal rated PP-TF N depth filter is designed and developed as prefilter with high dirt hold capacity for coarse contaminations and particles. Typical applications for LifeTec PP-TF N filter elements include:

Purification of Food and Beverage (pre) products:

- Well Water
- Tap Water
- Mineral Water
- Soft Drinks

Purification and Filtration of:

- Cosmetics
- Oils
- Lubricants
- Paints and Dyes
- Jet Printer Inks

Purification Sterile filtration of beverages:

- Acids
- Bases
- Alcohols, Aldehydes
- Esters and Ketones
- Photolithographic Liquids

MATERIAL COMPLIANCE USA

All components of the LifeTec PP-TF N filter element are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21:

Filter Materials		CFR Title 21
Filter Material	Polypropylene	§ 177.1520
Upstream Support	Polypropylene	§ 177.1520
Downstream Support	Polypropylene	§ 177.1520
Outer Guard	Polypropylene	§ 177.1520
Core	Polypropylene	§ 177.1520
End Caps	Polypropylene	§ 177.1520
O-Rings	EPDM	§ 177.2600
	Silicone	§ 177.2600
Sealing Method	Thermal Bonding	

MATERIAL COMPLIANCE EU

The Donaldson LifeTec PP-TF N filter element meets the guideline for Food Contact Use as given in European Regulation (EC) Number 1935/2004. All polymeric components (Polypropylene) meet the requirements of EU Directive EC/10/2011 relating to plastic materials and articles intended to come into contact with foodstuffs. Migration tests have been carried out in simulants after flushing or in flow conditions. All materials used do not contain any Substances of very high concern (SVHC) as defined in EC/1907/2006 (REACH Guideline) and EC/65/2011 (RoHS Guideline) and are free of any Latex-based components. Furthermore the materials do not contain any Animal derived ingredient (ADI-free) and thus bear no risk of transmitting TSE and BSE.

QUALITY TEST

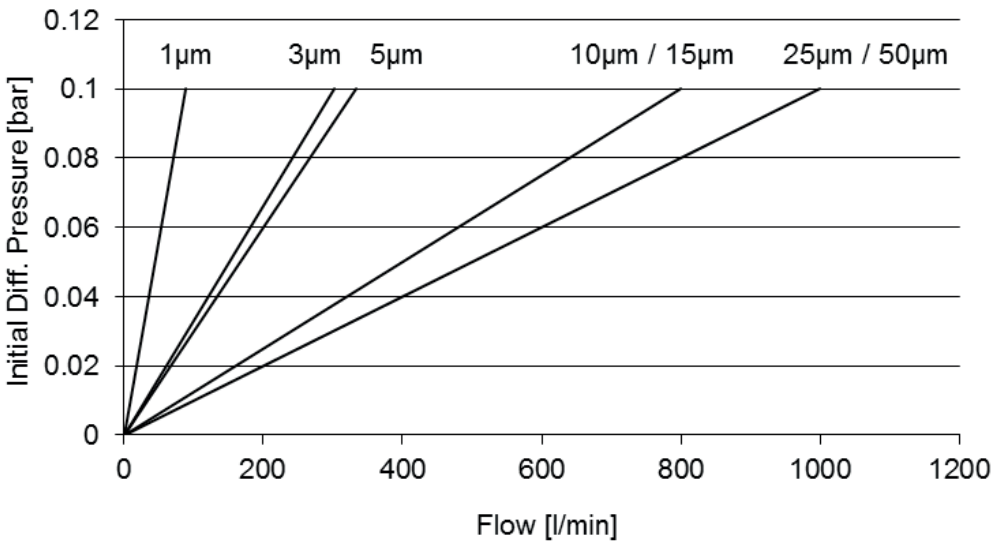
All products have been inspected and released by Quality Assurance as having met the following requirements:

- The traceability of each filter element according to EC/1935/2004 is provided by the Serial number.
- All filters show no migration of the filter medium and are non-fibre releasing.
- All LifeTec PP N filter elements are completely staged, assembled, tested and packaged in Class 7 clean room facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO 9001 Quality Systems Standard.

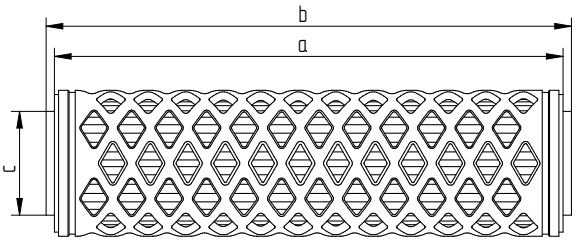
PRODUCT SPECIFICATIONS

Product Specifications				
Nominal Retention Rates	1 µm, 3 µm, 5 µm, 10 µm, 15µm, 25µm, 50µm			
Filtration Surface	> 0.6 m² per 250 mm element (10")			
Maximum Differential Pressure	Operating temperature		Differential pressure	
	°C	°F	bar	psi
	38	100	5.5	80
	66	150	4.1	60
	82	180	2.1	30
Cumulative Steaming Time	For this element type steaming is not recommended			

FLOW CHARACTERISTICS



LifeTec PP-TF N
10", Deionised water, 20°C



Dimensions (DOE connection)						
Size	**a**		**b**		**c**	
	mm	inch	mm	inch	mm	inch
10″	244	9.6	250	9.8	50	2.0
20″	500	19.7	506	19.9	50	2.0
30″	754	29.7	760	29.9	50	2.0
40″	1008	39.7	1014	39.9	50	2.0

DOE: Double open end with EPDM gaskets

Other end cap configurations on request.

- For information on test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at **www.donaldson.com**!

Process Filtration
From Pure to Sterile

Sterile Air Unit P-SLF

MAIN FEATURES & BENEFITS:

- **Mobile unit for sterile filtration of ambient air**
- **Volume flows up to 900 m^3/h**
- **Sterilisable with saturated steam**

INDUSTRIES:

- **Dairy**

- **Food and Beverage**

- **Pharmaceutical**

- **Chemical**

Donaldson Filtration Deutschland GmbH
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Germany

Web: www.donaldson.com

PRODUCT DESCRIPTION

In the processing of perishable or sensitive products the demands for hygiene are usually very high. The ambient air is polluted and can ruin even the cleanest production process if it comes in contact with the end product without being purified. Bacteria, viruses, phages, oil mist, water and dust in the ambient air are the main reasons for the microbiological spoilage of the products. Sterile air creates aseptic conditions in pressurized and in open storage or mixing tanks and in filling machines. A continuous exchange of the air cushion and a slight overpressure in this critical area reduces the risk of a secondary contamination with ambient air.

Especially for these production processes where bacteria and phage free air is required Donaldson developed the autarkic sterile air unit P-SLF. With eight different sizes from 30 m3/h to 900 m^3/h it is possible to produce sterile air in the most cost efficient way. The P-SLF sterile air unit is available in a mobile and a stationary version and can be sanitized with saturated steam. The P-SLF sterile air unit is used in applications within the food and beverage, the chemical, the pharmaceutical and the cosmetic industry.

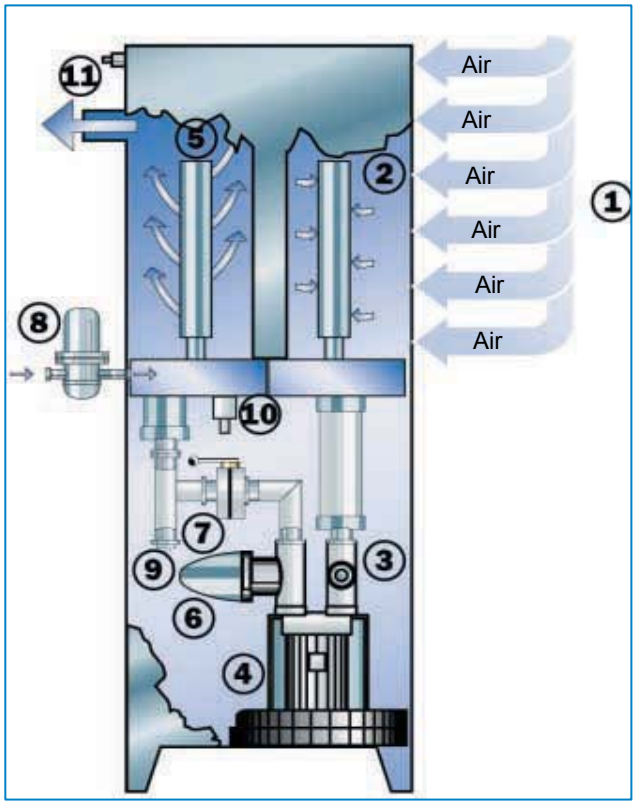
The filtration system is a compact unit consisting of a pre- and sterile filter with a low pressure blower. With a very low overpressure the sterile air is transported into the storage tank. This constant air exchange prevents the growth of bacteria, viruses and phages which the ambient air contains.

FUNCTION

The blower sucks the dry polluted ambient air (r.H. < 95 %) via the air intake (1) into the chamber (2). The air is cleaned with the prefilter at the upstream side of the blower. The retained particles cause an increase in the differential pressure. To maintain to protect the blower (4) a vacuum relieve valve (3) is installed. The blower (4) “compresses” the air at about 0.1 bar. The compressed air is fed into the sterile chamber (5).

During sterilization of the sterile chamber and the sterile filter elements, the disc valve (7) needs to be closed to prevent steam entering the blower. To maintain a good steam quality the steam filter (8) is standard on the P-SLF sterile air unit. After sterilization the condensate can be drained out the discharge valve (9 +10).
(Also see sterilisation instructions).

The sterile filter retains micro-organisms and all kinds of bacteria and/or other contaminants. To protect the blower there is also a pressure relief valve which opens if the sterile filter is blocked. At the outlet (11) the sterile air is fed to the tank or another point of use.



TECHNICAL DATA

Type P-SLF	Capacity at m³/h		Power kW*	Filter Elements	
	Δp= 100mbar	Δp= 200mbar		Size	Type
0288-0	75	35**	0,85	2x20/30 2x20/30 1x05/20	FF BE P-GS
0432-0	130	65	1,6	3x20/30 3x20/30 1x05/20	FF BE P-GS
0576-0	210	110	2,2	3x30/30 3x30/30 1x05/25	FF BE P-GS
0768-0	260	210	2,2	4x30/30 4x30/30 1x05/25	FF BE P-GS
1152-0	410	300	4,0	6x30/30 6x30/30 1X05/25	FF BE P-GS
1536-0	450	390	7,5	8x30/30 8x30/30 1x07/30	FF BE P-GS
2304-0	800	620	11	12x30/30 12x30/30 1x07/30	FF BE P-GS
3072-0	900	790	13	16x30/30 16X30&30 1X10/30	FF BE P-GS

Note: All P-SLF sterile air units are also available in PN 4 version. This means it can be sterilized with saturated steam up to 4 bar or a steam temperature of 140 °C. The name of such a sterile air unit would e.g. be P-SLF 0576-4.

*** Standard:**

220 V/ 380 V⅄, 50 Hz
(P-SLF 0288-0 to 1152-0)

380 V/ 660 V⅄, 50 Hz
(P-SLF 1536-0 to 3072-0)

**** max 0.17 bar total difference of the blower**

Other voltage or frequencies are available on request.

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

(Rev01 – 07/10)

Donaldson
FILTRATION SOLUTIONS

Donaldson
FILTRATION SOLUTIONS

P-SRF
STERILE AIR DEPTH FILTER ELEMENTS

Process Filtration

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 ≥99.99998% for all particles 0.01 µm 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

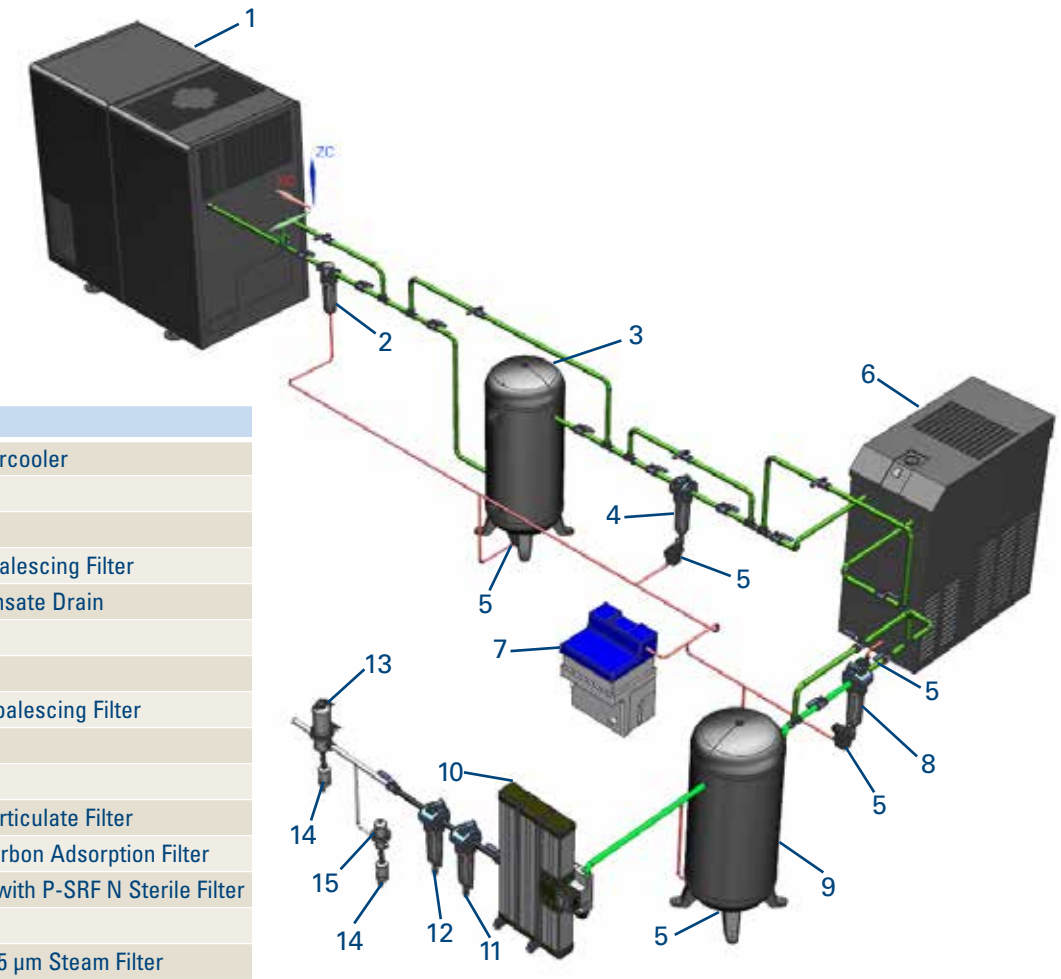
- Food and beverage
- Phamaceutical
- Health care and biotech
- Aseptic Packaging
- Chemical
- Dairy
- Brewery

Applications

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

RECOMMENDED STERILE AIR SYSTEM

Installation with variable compressed air demand



No.	Description
1	Air Compressor with Aftercooler
2	DF-C Cyclone Separator
3	Wet Storage Tank
4	DF Filter with V-Grade Coalescing Filter
5	UFM-D Zero-Loss Condensate Drain
6	Refrigerated Dryer
7	DS Oil/Water Separator
8	DF Filter with M-Grade Coalescing Filter
9	Dry Storage Tank
10	Ultrapac 2000 Dryer
11	DF Filter with S-Grade Particulate Filter
12	DF Filter with A-Grade Carbon Adsorption Filter
13	PG-EG Sanitary Housing with P-SRF N Sterile Filter
14	Condensate Trap/Drain
15	P-EG Housing with P-GS 5 µm Steam Filter

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 = Log_{10} (quantity of organisms in the challenge minus quantity of organisms after filtration)

***Brevundimonas diminutas* (≥ 0.2 µm) LRV > 7**

MS2 Coliphage (≥ 0.02 µm) LRV > 9

SPECIFICATIONS

Temperature Range	-4°F to 392°F (≥302°F only for dry compressed air)
Effective Filtration Area (nominal)	0.5 ft^2 per 10 inch element (For other element sizes see Correction Factors Filtration Surface Area)
Absolute Retention Rate	≥99.99998% at ≥0.01 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.

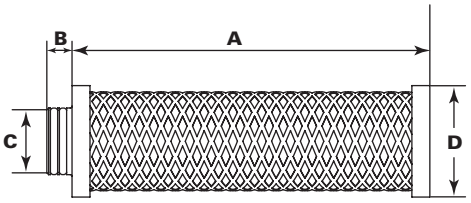
* Viton is a registered trademark of DuPont Performance Elastomers L.L.C.

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 EPDM PTFE over silicone PTFE over Viton®*	177.2600 177.2600 177.1550 177.1550

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

UF PUSH-IN CONNECTION

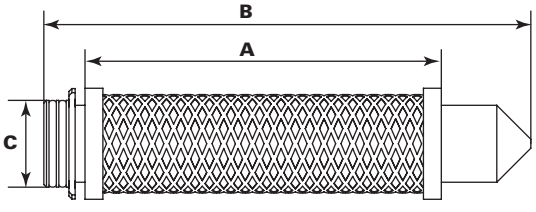
Element Size	Dimensions (inches)					Correction Factors**
	A	B	C (I.D.)*	C (O.D)*	D	
03/10	3.0	0.43	0.79	1.20	1.65	0.12
04/10	4.1	0.43	0.79	1.20	1.65	0.17
04/20	4.1	0.55	0.98	1.46	2.05	0.19
05/20	5.0	0.55	0.98	1.46	2.05	0.25
05/25	5.0	0.55	0.98	1.46	2.44	0.32
07/25	7.1	0.55	0.98	1.46	2.44	0.47
05/30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

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

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.

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 excesss 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.

Donaldson
FILTRATION SOLUTIONS

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donaldsonprocessfilters.com

Registered: Quality Management System 9001:2008 ISO

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

Donaldson
FILTRATION SOLUTIONS

FILTERS FOR STERILE AIR, STEAM AND LIQUIDS

Solutions for sterile Requirements

Donaldson - Global Partner for sterile Requirements

High-quality filter housings

Donaldson is a leading global manufacturer of filtration systems. The company, founded in 1915, is strongly technology-oriented and has set itself the goal of implementing the needs of global customers for filtration solutions through innovative research and development. The application-oriented know-how of Donaldson relies on the global presence and the knowledge of more than 10,000 employees in more than 100 offices and manufacturing facilities.

Reliable Process Solutions

Donaldson offers a complete filtration portfolio of innovative solutions for air & gas, steam and liquids. All products are designed to reach maximum purity standards and fulfil highest quality requirements.

Reliable Product Quality

All filter elements are produced, packaged and shipped under strict controls in an exact manner and meet the quality and performance data that are stored in the product specification.

For indirect and direct food contact according to FDA CFR - Code of Federal Regulations, Title 21	FDA
For indirect and direct food contact in accordance with Regulation (EC) No 1935/2004	
3-A Sanitary Standards for the United States	
Manufactured according to DIN EN ISO 9001	
Manufactured according to the specifications of the Pressure Equipment Directive 97/23/EC	CE

Product Portfolio

Air and gas filters	Steam filters	Liquid filters
Housings	Housings	Housings
Membrane filters	Sintered steel filters	Membrane filters
Depth filters	Steel-mesh filters	Depth filters

The illustrated colour scheme displays the various applications for a quick and easy overview on the following pages.

Typical Application Areas

Dairies

Water & Soft Drinks

Breweries

Wineries

Pharmaceutical

Food

Cost-effective Solutions in Industrial Quality

Air and Gas Filter Housings

High-quality Stainless Steel Housings in Industrial Quality

P-EG housing

P-EG filter housings have been developed for the purification of compressed air. Due to the optimised construction, they offer low differential pressures at high flow rates. The filter housings are suitable for operating flow rates of 60 m^3/h to 19,200 m^3/h.

P-EG housings comply with the applicable guidelines:	
Compliant according to	FDA
Manufactured by	SGS CE

Technical Data P-EG Housings

Size	Capacity [m^3/h] at 7 bar operating pressure*	Element	Connection size	Connections			Materials	
				BSP standard thread	Flange	Welded ends	Filter housings	Housing gasket
				Single				
0006	60	03/10	G 1/4"	Standard	Available	Available	Stainless steel 1.4301 (304) or 1.4404 (316L)	EPDM
0009	90	04/10	G 3/8"					
0012	120	04/20	G 1/2"					
0018	180	05/20	G 3/4"					
0027	270	05/25	G 1"					
0036	360	07/25	G 1 1/4"					
0048	480	07/30	G 1 1/2"					
0072	720	10/30	G 2"					
0108	1080	15/30	G 2"					
0144	1440	20/30	G 2 1/2"					
0192	1920	30/30	G 3"					
0288	2880	30/50	G 3"					
				Multiple				
0432	4320	3x20/30	DN 100	–	Standard	Available	Stainless steel 1.4301 (304) or 1.4404 (316L)	Blue Gard Style 3000
0576	5760	3x30/30	DN 100					
0768	7680	4x30/30	DN 150					
1152	11520	6x30/30	DN 150					
1536	15360	8x30/30	DN 200					
1920	19200	10x30/30	DN 200					

Size	Surface finish		Dimensions** [mm]		Volume [L]	Weight** [kg]	Maximum operating pressure [bar]	Maximum operating temperature [°C]
	Inside	Outside	Height	Width				
				Single				
0006	Etched and passivated Ra < 1.6	Etched, passivated and polished Ra < 1.6	215	108	0.55	1.70	16	-25/+150
0009			245	108	0.65	1.90		
0012			245	108	0.65	1.90		
0018			270	125	0.75	2.00		
0027			300	125	1.00	2.60		
0036			350	140	1.25	3.00		
0048			380	170	2.30	4.30		
0072			455	170	3.30	4.80		
0108			580	170	4.30	5.30		
0144			762	216	8.00	9.00		
0192			1015	216	11.10	10.80		
0288			1035	240	16.50	16.20	12	
				Multiple				
0432	Etched and passivated Ra < 1.6	Etched and passivated Ra < 1.6	1090	410	36.00	43.00	10	-25/+150
0576			1350	410	45.00	44.00		
0768			1410	480	77.00	70.00		
1152			1460	540	110.00	80.00		
1536			1600	660	190.00	135.00		
1920			1600	660	190.00	135.00		

Operating pressure (bar)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Conversion factor	0.25	0.36	0.50	0.60	0.75	0.90	1.00	1.10	1.20	1.40	1.50	1.60	1.75	1.90	2.00	2.10

* [m^3/h] at 1 bar at 20 °C, for other operating pressures see table of conversion factors
** Dimensions are valid for the standard connection
Larger housings are available on request

Economical Solutions in Sanitary Quality

Air and Gas Filter Housings

High Quality Stainless Steel Housings in Sanitary Quality

PG-EG housing

PG-EG stainless steel housings are used for the purification of compressed air and other technical gases. Combined with the different filter elements they provide an optimised solution for nearly any application. The standard model series PG-EG (Single and Multiple) each consists of six different housing sizes for operating flow rates of 7.5 m^3/h to 270 m^3/h and for operating flow rates of 540 m^3/h to 2,700 m^3/h (at 1 bar absolute).

Donaldson PG-EG sanitary filter housings (Single, clamp connection) are 3-A certified as standard.

PG-EG housings comply with the applicable guidelines:	
Compliant according to	FDA, 3-A ***
Manufactured according to	SGS, CE

Technical Data PG-EG Housings

Size	Capacity [m³/h] at operating pressure of 1 bar at 20 °C*	Element	Connection size	Connections			Materials	
				Clamp	Flange	Welded ends	Filter housings	Housing gasket
Single								
0006	7,5	03/10	DN 10	Standard	Available	Available	Stainless steel 1.4404 (316L)	EPDM
0018	22,5	05/20	DN 10					
0032	45	05/30	DN 25					
0072	90	10/30	DN 40					
0144	180	20/30	DN 50					
0192	270	30/30	DN 65					
Multiple								
0432	540	3x20/30	DN 100	–	Standard	Available	Stainless steel 1.4301 (304)	Blue Gard Style 3000
0576	810	3x30/30	DN 100					
0768	1080	4x30/30	DN 150					
1152	1620	6x30/30	DN 150					
1536	2160	8x30/30	DN 200					
1920	2700	10x30/30	DN 200					

Size	Surface finish	Dimensions** [mm]		Volume [L]	Weight** [kg]	Maximum operating pressure [bar]	Maximum operating temperature [°C]
		Height	Width				
Single							
0006	Etched, passivated and electro-polished, Ra < 0.8 inside and outside	267	120	0.60	1.50	16	-25/+150
0018		319	120	0.80	1.70		
0032		379	162	1.80	2.10		
0072		506	162	3.20	2.90		
0144		789	206	5.40	4.50		
0192		1043	206	7.40	5.70		
Multiple							
0432	Etched, passivated and electro-polished, Ra < 0.8 inside and outside	1155	410	36.00	43.00	10	-25/+150
0576		1410	410	45.00	44.00		
0768		1475	480	77.00	70.00		
1152		1530	540	110.00	80.00		
1536		1665	660	190.00	135.00		
1920		1665	660	190.00	135.00		

Operating pressure (bar)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Conversion factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

* Please use the conversion factor for other operating pressures
** Dimensions are valid for the standard connection
*** The 3-A certification is valid for Single-PG-EG standard housings with clamp connection
Larger housings are available on request

Innovative, sterile Aeration and Deaeration

Air and Gas Filter Housings

Filter Housings for the Aeration and Deaeration of Storage Tanks and Bulk Tanks

P-BE housing

Filter housings for venting of product series P-BE are used to ensure 100% sterility in the storage of pharmaceutical products, containers of demineralised water, food, chemicals or the deaeration of fermenters. The user-friendly two-piece housing has a splash protection to help prevent liquids coming into contact with the filter medium.

P-BE housings comply with the applicable guidelines:	
Compliant according to	FDA
Manufactured according to	SGS

Filter housings for the aeration on storage tanks

Technical Data P-BE Housings

Size	Capacity [m³/h]*		Element	Connection size	Connections			Materials	
	△p = 20 mbar	△p = 40 mbar			Milk pipe DIN 11851	Flange	Clamp	Filter housings	Fasteners
					Single				
0006	4.5	9	03/10	DN 32	Standard	Available	Available	Stainless steel 1.4301 (304) or 1.4404 (316L) on request	Stainless steel 1.4301 (304) or 1.4404 (316L) on request
0027	12	24	05/25	DN 40					
0032	17	35	05/30	DN 50					
0072	35	70	10/30	DN 50					
0144	70	140	20/30	DN 80					
0192	105	210	30/30	DN 80					
					Multiple				
0432	210	420	3x20/30	DN 100	Available	Standard	Available	Stainless steel 1.4301 (304) or 1.4404 (316L) on request	Stainless steel 1.4301 (304) or 1.4404 (316L) on request
0576	315	630	3x30/30	DN 100					
0768	420	840	4x30/30	DN 150					
1152	630	1260	6x30/30	DN 150					
1536	840	1680	8x30/30	DN 200					
1920	1050	2010	10x30/30	DN 200					

Size	Dimensions [mm]**		Weight [kg]**	Maximum operating temperature [°C]
	Height	Diameter		
			Single	
0006	110	85.00	1.50	+200
0027	168	104.00	2.20	
0032	186	114.30	2.40	
0072	312	114.30	3.30	
0144	550	154.00	9.20	
0192	805	154.00	11.60	
			Multiple	
0432	670	219.10	14.50	+200
0576	925	219.10	17.50	
0768	950	273.00	30.00	
1152	950	323.90	30.00	
1536	960	406.40	43.00	
1920	960	406.40	43.00	

* [m³/h] relative to 1 bar at 20 °C
** Dimensions are valid for the standard connection

Sterile Filtration of Air and Gases

Air and Gas Filter Elements

Suitable for temperatures up to +200 °C

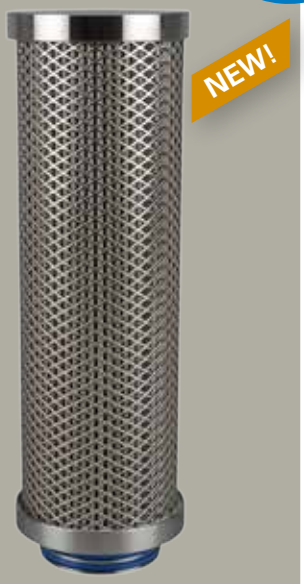
Sterile Filter (P)-SRF C/V/X

The new (P)-SRF filter in the versions C (=Compressed Air), V (=Venting), and X (=Extreme) is mainly used for safe sterile air and gas filtration. The sterile filters meet the high demands of the food and beverage industry as well as the pharmaceutical industry and works reliably even under extreme operating conditions. High filtration rates, e.g. for bacteria, viruses, and particles of down to 3 nm, increase product and process integrity. The sturdy construction of the filter with its stainless steel liners allows for a high number of steam sterilization cycles as well as for sterilization processes, using VPHP and ozone. It is ideal for fermentation applications.

Temperature resistance and mechanical stability ensure a high degree of operational safety, reducing the total cost of ownership. This helps to avoid production downtimes and reduces maintenance costs.

Outstanding Features

- High filtration rate:
  LRV for bacteria and MS2 coliphagae up to > 9,
  for nano-scaled particles up to > 10
- Suitable for sterilization, using hydrogen peroxide (VPHP) and ozone
- Low differential pressure at high flow rates
- Filter elements are reverse-flow sterilizable
- For indirect food contact according to CFR Title 21 & 1935/2004/EC
- Excellent dewetting characteristics
- Mechanical stability for high operational safety

Filter element	(P)-SRF C
	
Filter media	Borosilicate
Retention rates [µm]	0.2 µm; sterile LRV > 9
Support liner	1.4301 (304)
End caps	1.4301 (304)
O-rings (others on request)	Silicone
Element size	03/10; 04/10; 04/20; 05/20; 05/25; 07/25; 05/30; 07/30; 10/30; 15/30; 30/30
Connections	uf, P7
Recommended housings	PG-EG, P-EG, P-BE
Conformity	FDA
Operating temperature	Up to + 200 °C
Maximum differential pressure	5 bar (in flow direction)
Application examples	Sterile filtration of compressed air and gases, tank ventilation


Food


Dairies


Breweries


Pharmaceutical


Chemical

When it has to be pure and sterile

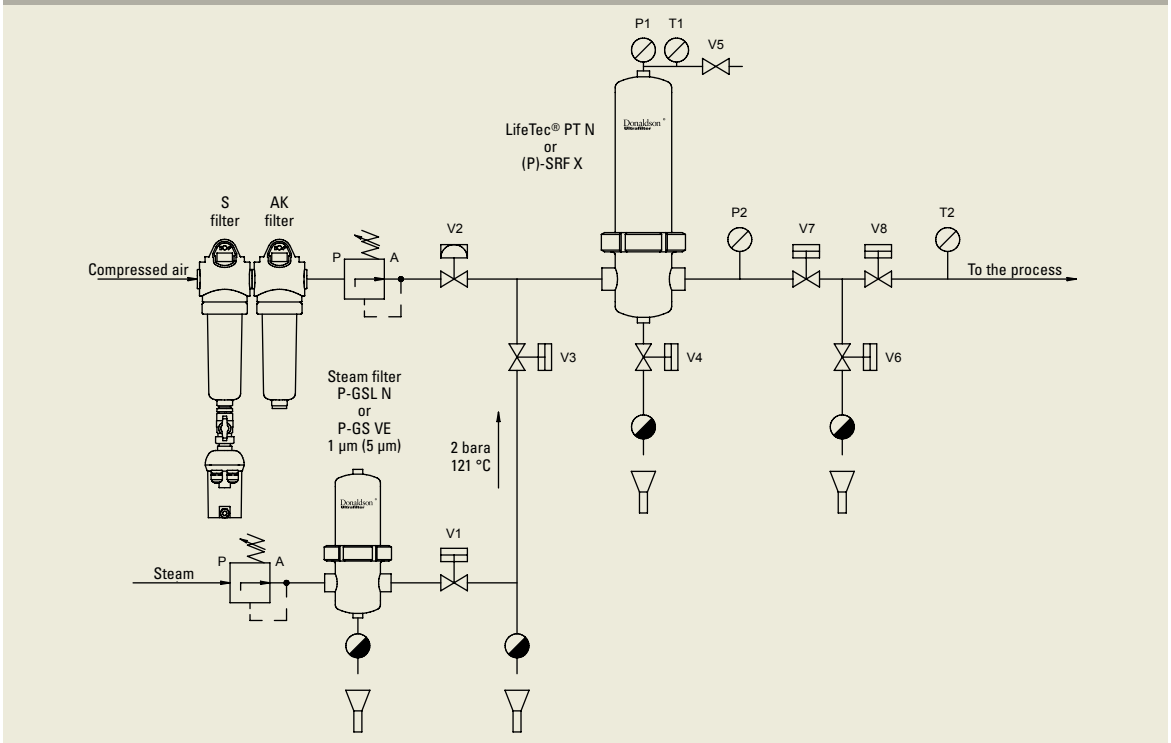
Air and Gas Filter Elements

Filter element	(P)-GSL N	(P)-SRF V	(P)-SRF X	LifeTec PT N
		 NEW!	 NEW!	 NEW!
Filter media	Stainless steel fiber or stainless steel mesh 1.4301 (304)	Borosilicate	Borosilicate	Pleated PTFE membrane
Retention rates [µm]	1; 5; 25; 50; 100; 250 absolute*	0.2; sterile LRV > 9	0.2; sterile LRV > 9	0.2; sterile LRV > 7
Support liner	1.4301 (304)	1.4301 (304)	1.4301 (304)	Polypropylene
End caps	1.4301 (304)	1.4301 (304)	1.4301 (304)	Polypropylene
O-rings (others on request)	EPDM	Silicone	Silicone	EPDM
Element sizes	03/10; 04/10; 04/20; 05/20; 07/20; 05/30; 07/30; 10/30; 15/30; 30/30; 30/50	03/10; 04/10; 04/20; 05/20; 05/25; 07/25; 05/30; 07/30; 10/30; 15/30; 30/30; 30/50	03/10; 04/10; 04/20; 05/20; 05/25; 07/25; 05/30; 07/30; 10/30; 15/30; 30/30	10"; 20"; 30"; 40"
Connections	uf, P7	uf, P7	uf, P7	P2, P3, P7, P8, P9, uf, DOE
Recommended housings	P-EG, PG-EG	PG-EG, P-EG	PG-EG, P-EG, P-BE	PG-EG, P-EG, P-BE
Conformity	FDA	FDA	FDA	FDA
Operating temperature	Up to +200 °C	Up to +200 °C	Up to +200 °C	Up to +82 °C
Maximum differential pressure	10 bar	5 bar (regardless of the flow direction)	5 bar (regardless of the flow direction)	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction
Application examples	Prefilter for compressed air and gases, tank ventilation	Venting of tanks which are cleaned under using CIP reagents	Sterile filtration of compressed air and gases under extreme application and sterilization conditions	Sterile filtration of compressed air and gases
Industries	 Food  Paints/Coatings  Environment  Pharmaceutical  Chemical	 Food  Dairies  Breweries  Pharmaceutical  Chemical	 Food  Dairies  Breweries  Pharmaceutical  Chemical	 Food  Water & Soft Drinks  Dairies  Pharmaceutical  Chemical

* Retention rates in air

Steam Sterilisation Instructions for Air Filters

Work Flow: Sterilisation Instructions for Air Filter in Flow Direction



(1) Open valves V4, V5, V6, and V7.

(2) Open valve V1 and allow the steam condensate to drain until the steam trap below valve V3 closes.

(3) Slowly open V3 allowing steam into the system: this will flow across the filters and through valve V4 and V5. This will allow the heating of the housing, the filters and associated piping without generating a significant differential pressure across the filters.

(4) When 'live' steam flows from valve V5, close valve V5. This will direct the steam through the heated filter.

(5) Observe the pressure gauges P1 and P2, control the steam flow rate at valve V3 and set the sterilisation steam pressure to approx. 300 mbar above the required saturated steam pressure (P1).

(6) Ensure the differential pressure across the filter does not exceed 0.2 to 0.3 bar g.

(7) When the steam trap below valve V6 closes, the steam pressure will begin to rise.

(8) Ensure the steam pressure/temperature does not exceed the maximum allowable pressure/temperature for the cartridge type being steamed. If reading from pressure gauges it is recommended the maximum steam pressure is 3.0 bar g in the forward direction.

(9) Steam sterilise the cartridges for the time specified ensuring the conditions stated in steps 5 to 7 are followed.

(10) On completion of the Sterilisation-In-Place (SIP) cycle, close V4, V6, V3 and V1 in that order.

(11) Fully open V5 to flash-dry the filter (or step 12).

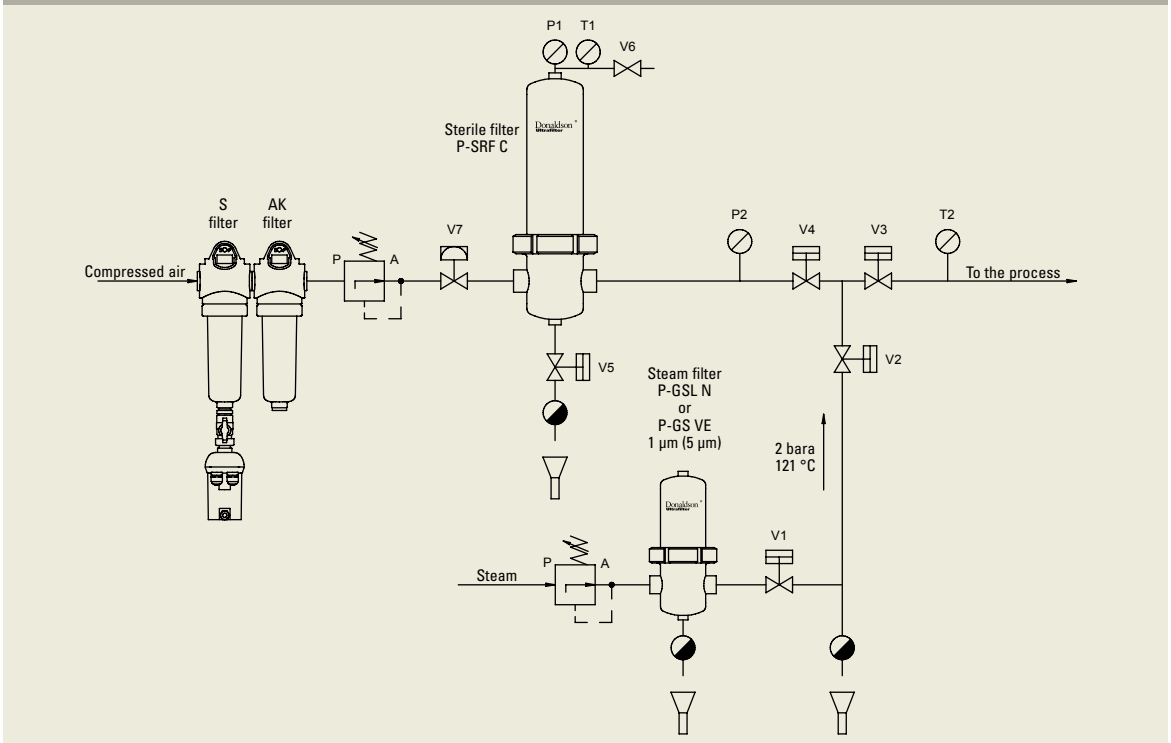
(12) Open V2 to allow compressed air into the system. The air pressure should be no more than 0.5 bar g above the steam pressure.

(13) Allow the system to cool for 15 minutes, then close V5 (flash-dry only).

See our sterilisation guide for additional information!

Steam Sterilisation Instructions for Air Filters

Work Flow: Sterilisation Instructions for Air Filters in Reverse Direction



(1) Open valves V4, V5 and V6.

(2) Open valve V1 and allow the steam condensate to drain until the steam trap below valve V2 closes.

(3) Slowly open V2 allowing steam into the system.

(4) Observe the pressure gauges P1 and P2 and control the steam flow rate at valve V2 to ensure the differential pressure across the filter does not exceed 0.1 bar g*. If it exceeds 100 mbar stop the sterilisation procedure and rectify the cause of the differential pressure before proceeding with the sterilisation routine.

(5) When 'live' steam flows from valve V6, close valve V6. When the steam trap below valve V5 closes, the steam pressure will begin to rise.

(6) Ensure steam pressure/temperature does not exceed the maximum allowable pressure/temperature for the cartridge type being steamed. Continue to monitor the differential pressure using gauges P1 and P2. If it exceeds 100 mbar stop the sterilisation procedure.

(7) On completion of the sterilisation cycle time, close V4, V2, V1 in that order.

(8) Rapidly open V6 to flash dry the filter (or step 9).

(9) Open V7 slowly to allow air into the system. The pressure of the air should be no more than 0.5 bar g above the steam pressure.

(10) Allow the system to cool for 15 minutes then close V6 (flash-dry only).

Comments for Sterilisation Instructions for Air Filters:

A double downstream valve is recommended so that under the cartridge steaming protocol the valves sealing faces of V7 can be effectively sterilised. The sealing valve faces of V8 can be similarly sterilised when the tank is steamed. When steam sterilizing the tank, V7 would be closed and V6 and V8 open. Normally the tank would be steamed separately before steaming the filter. If the filter is steamed before steaming the tank it is recommended that valve V7 is closed in the post Sterilisation-In-Place settings to maintain sterility. The valve V7 must be closed during Step 9. Valve V7 should be installed horizontally and valve V6 / steam trap installed immediately downstream of V7. All drains should be fitted vertically to allow liquid removal.

* Pressure gauge display
See our sterilisation guide for additional information!

Steam Filter Housings

High-quality Stainless Steel Housings in Industrial Quality

P-EG housing

Together with the (P)-GS VE and the (P)-GSL N filter elements, the Donaldson P-EG filter housings are used in a variety of steam filtration applications. Equipped with a variety of connections, the P-EG housings are designed for low differential pressures and high flow rates.

P-EG housings comply with the applicable guidelines:	
Compliant according to	FDA
Manufactured according to	CE

Technical Data P-EG Housings

Size	Capacity [kg/h] at 2 bar abs. at 121 °C saturated steam	Element	Connection size	Connections			Materials	
				BSP standard thread	Flange	Welded ends	Filter housing	Housing gasket
Single								
0006	7.5	03/10	G ¼"	Standard	Available	Available	Stainless steel 1.4301 (304) or 1.4404 (316L)	EPDM
0009	11.25	04/10	G ⅜"					
0012	15.0	04/20	G ½"					
0018	22.5	05/20	G ¾"					
0027	33.75	05/25	G 1"					
0036	45	07/25	G 1 ¼"					
0048	60	07/30	G 1 ½"					
0072	90	10/30	G 2"					
0108	135	15/30	G 2"					
0144	180	20/30	G 2 ½"					
0192	240	30/30	G 3"					
0288	360	30/50	G 3"					
Multiple								
0432	540	3x20/30	DN 100	–	Standard	Available	Stainless steel 1.4301 (304) or 1.4404 (316L)	Blue Gard Style 3000
0576	720	3x30/30	DN 100					
0768	960	4x30/30	DN 150					
1152	1440	6x30/30	DN 150					
1536	1920	8x30/30	DN 200					
1920	2400	10x30/30	DN 200					

Size	Surface finish		Dimensions* [mm]		Volume [L]	Weight* [kg]	Maximum operating pressure [bar]	Maximum operating temperature [°C]
	Inside	Outside	Height	Width				
Single								
0006	Etched and passivated Ra < 1.6	Etched, passivated and polished Ra < 1.6	215	108	0.55	1.70	16	-25/+150
0009			245	108	0.65	1.90		
0012			245	108	0.65	1.90		
0018			270	125	0.75	2.00		
0027			300	125	1.00	2.60		
0036			350	140	1.25	3.00		
0048			380	170	2.30	4.30		
0072			455	170	3.30	4.80		
0108			580	170	4.30	5.30		
0144			762	216	8.00	9.00		
0192			1015	216	11.10	10.80		
0288			1035	240	16.50	16.20	12	
Multiple								
0432	Etched and passivated Ra < 1.6	Etched and passivated Ra < 1.6	1090	410	36.00	43.00	10	-25 /+150
0576			1350	410	45.00	44.00		
0768			1410	480	77.00	70.00		
1152			1460	540	110.00	80.00		
1536			1600	660	190.00	135.00		
1920			1600	660	190.00	135.00		

* Dimensions are valid for the standard connection
Larger housings are available on request

and for low Differential Pressures

Steam Filter Housings

High Quality Stainless Steel Housings in Sanitary Quality

PG-EG housing

PG-EG stainless steel housings are used for steam filtration at the highest hygienic requirements. In combination with the various Donaldson filter elements, they offer the optimal solution for each application. Donaldson PG-EG sanitary filter housings (Single, clamp connection) are 3-A certified as standard, can be equipped with a variety of connections and are available in 12 different sizes. In addition, the entire series is designed for a low differential pressure and for a high throughput.

PG-EG housings comply with the applicable guidelines:	
Compliant according to	FDA, 3-A **
Manufactured according to	SGS, CE

Technical Data PG-EG Housings

Size	Capaciity [kg/h] at 2 bar abs. at 121 °C saturated steam	Element	Connection size	Connections			Materials	
				Clamp	Flange	Welded ends	Filter housing	Housing gasket
Single								
0006	7.5	03/10	DN 10	Standard	Available	Available	Stainless steel 1.4404 (316L)	EPDM
0018	22.5	05/20	DN 10					
0032	45	05/30	DN 25					
0072	90	10/30	DN 40					
0144	180	20/30	DN 50					
0192	270	30/30	DN 65					
Multiple								
0432	540	3x20/30	DN 100	–	Standard	Available	Stainless steel 1.4301 (304)	Blue Gard Style 3000
0576	810	3x30/30	DN 100					
0768	1080	4x30/30	DN 150					
1152	1620	6x30/30	DN 150					
1536	2160	8x30/30	DN 200					
1920	2700	10x30/30	DN 200					

Size	Surface finish	Dimensions* [mm]		Volume [L]	Weight* [kg]	Maximum operating pressure [bar]	Maximum operating temperature [°C]
		Height	Width				
Single							
0006	Etched, passivated and electro-polished, Ra < 0.8 inside and outside	267	120	0.60	1.50	16	-25/+150
0018		319	120	0.80	1.70		
0032		379	162	1.80	2.10		
0072		506	162	3.20	2.90		
0144		789	206	5.40	4.50		
0192		1043	206	7.40	5.70		
Multiple							
0432	Etched, passivated and electro-polished, Ra < 0.8 inside and outside	1155	410	36.00	43.00	10	-25 /+150
0576		1410	410	45.00	44.00		
0768		1475	480	77.00	70.00		
1152		1530	540	110.00	80.00		
1536		1665	660	190.00	135.00		
1920		1665	660	190.00	135.00		

* Dimensions are valid for the standard connection
** The 3-A certification is valid for Single-PG-EG standard housings with clamp connections
Larger housings are available on request

Steam Filtration with high Flow Rates

Steam Filter Elements

Retention rate down to 0.01 µm in saturated steam

Steam Filter (P)-GSL N

The (P)-GSL N filter element removes contaminants such as particles, abrasion of valve, seatings and seals as well as rust. An improved steam quality ensures longer service life of the filters to be sterilised and therefore increases the efficiency of the entire process. In addition, the (P)-GSL N filter element is a particularly efficient filtration product since the filter medium can be regenerated by ultrasonic bath or by back washing. This is especially important where there is a particularly high particle load. The pleated stainless steel filter media provides high particle or dirt-holding capacity and a high flow rate at low differential pressures.

Outstanding Features

- High dirt-holding capacity at a low differential pressure and a high flow rate
- Can be regenerated by back washing and ultrasonication
- Retention rate > 99.996 at 0.01 µm
- Suitable for temperatures from -20 °C up to +200 °C
- Also available as 5 µm grade for culinary steam
- Suitable for food contact use according to CFR Title 21 & 1935/2004/EC

Filter element	(P)-GSL N 
Filter media	Stainless steel fiber or stainless steel mesh 1.4301 (304)
Retention rates [µm]	1 nominal; 5; 25; 50; 100; 250 absolute*
Support liner	1.4301 (304)
End caps	1.4301 (304)
O-rings (others on request)	EPDM
Element sizes	03/10; 04/10; 04/20; 05/20; 07/20; 05/30; 07/30; 10/30; 15/30; 30/30; 30/50
Connections	uf, P7
Recommended housings	P-EG, PG-EG
Conformity	FDA
Operating temperature	Up to +200 °C
Maximum differential pressure	10 bar
Application examples	Filter for liquids, gases and steam

* Retention rates in steam


Food


Dairies


Paints and Coatings


Pharmaceutical


Industrial Machinery

High Process Safety

Steam Filter Elements

Filter element	(P)-GS VE	(P)-GS N
		
Filter media	Sintered stainless steel 1.4404 (316L)	Stainless steel fibre or stainless steel mesh 1.4301 (304)
Retention rates [µm]	1; 5; 25 absolute for gases, nominal for steam	1; 5; 25 absolute for steam and gases
Support liners	–	1.4301 (304)
End caps	1.4301 (304)	1.4301 (304)
O-rings (others on request)	EPDM	EPDM
Element sizes	03/10; 04/10; 04/20; 05/20; 05/25; 07/25; 05/30; 07/30; 10/30; 15/30; 30/30; 30/50	03/10; 04/20; 05/20; 05/30; 07/30; 10/30; 15/30; 30/30
Connections	uf, P7	uf, P7
Recommended housings	P-EG, PG-EG	P-EG, PG-EG
Conformity	FDA	–
Operating temperature	Up to +200 °C	Up to +160 °C
Maximum differential pressure	5 bar (regardless of the flow direction)	5 bar (in flow direction)
Application examples	Filter for gases and steam	Filter for gases and steam
Industries	 Food  Dairies  Pharmaceutical  Chemical	 Paints/Coating  Environment  Industrial Machinery  Automotive  Chemical

General Guidelines for the Design of Steam Filtration Installations

The type of the steam filter and the retention rate to be selected depends on the quality of the steam which is required for the specific application. To prevent rapid clogging of the steam filter, it is important to consider the particle load in the pipes. This may require the use of pre- and fine filters.

In addition, the flow rate of the steam in an installation should not exceed 25 m/s. In special circumstances, velocities up to 40 m/s are okay, but the resulting turbulent currents and higher differential pressures must be taken into account.

The differential pressure in a new steam filter installation should be within a range of 0.1 bar to 0.3 bar. Higher temperatures (> 150 °C) require special higher temperature O-rings.

Choice of Steam Filters

Culinary steam	Operating steam
Filters for culinary steam should retain > 95% of 2 µm particles (3-A standard 609-01)	Operating steam not for direct food contact, but for indirect heating

Particles ≤ 1 µm		Particles ≥ 5 µm	
Sintered (P)-GS VE 1 µm	Pleated (P)-GSL N 1-5 µm	Sintered (P)-GS VE 5-25 µm	Pleated (P)-GSL N 5-250 µm (P)-GS N 5-25 µm

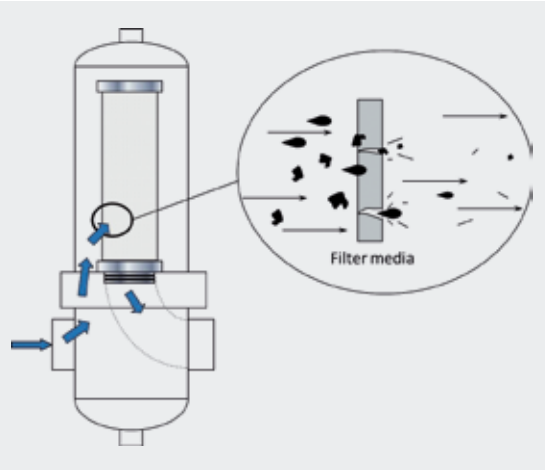
Recommendations for the Design of Steam Filter Systems

(1) Recommendations Installation

- The flow through the membrane filter during the steam sterilisation may only occur from the upstream side (see figure on page 8).
- In a steam sterilisation, the flow through a sterile depth filter is possible from the upstream as well as in the reverse process (see figure on page 9).
- The pressure difference between the filter inlet and outlet should not exceed 0.3 bar g (pressure gauge reading). The steam flow rate in the filter element must be limited to a minimum value. The temperature and differential pressure during sterilisation must be measured and controlled.
- A vent valve must be mounted at the top of the housing, since the system must be vented prior to sterilisation. Residual air trapped in the system causes a decrease in temperature in the filter housing, which can prevent a complete destruction of micro-organisms.

(2) Steam Pretreatment Recommendations

- Vapour filters protect the sterile filter efficiently against damage e.g. corrosion particles.
- Filtered boiler feed water is a prerequisite for particle-free steam.
- The steam generator must be serviced regularly. The systems (pipelines, etc.) should preferably made of stainless steel.

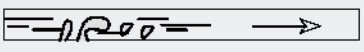


At a vapour velocity of 20 m/sec in the pipe, particle or particles (e.g. corrosion particles) impact the sterile filter medium at a speed of 72 km/h. (30 m/sec correspond to a speed of 108 km/h).

(3) Recommendations Condensate Removal

- Condensate traps or drains in the housing should be installed upstream and downstream on the lowest points in the overall system.
- All piping must be installed in the flow direction at a slight slope (1-2%), so that steam condensate can collect into a condensate drain/trap by gravity.
- Filter housings must be installed vertically (with the housing opening facing down) so that the condensate cannot accumulate inside the housing/filter element.
- Filters must be installed at the top of tanks if they must be sterilised simultaneously with the tank.
- After a SIP process, as much steam as possible must be drained from the system to prevent the development of large quantities of condensate.
- The cooling of the filter elements according to a SIP process must be controlled so that these do not become 'blinded' by the condensate (especially important for hydrophobic gas filters).

A

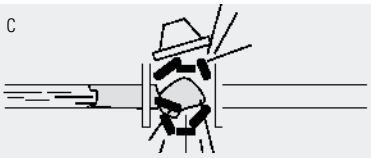


Condensate collects on the pipe surface and forms droplets.

B

A surge of water is released from the pipe surface.

C



A surge of water contacts a valve or some other stationary system element and causes it to explode.

Condensate must be prevented in the entire system and removed immediately to prevent the risk of exploding valves.

See our sterilisation guide for additional information!

Economical Filtration Solutions

Liquid Filter Housings

Stainless Steel Housings for Liquids

PF-EG housing

PF-EG stainless steel housing (PF-EG Standard series and PF-EG Superplus series) have been developed for the filtration of liquids. In combination with various Donaldson code 7 filter cartridges all liquid filter housings can be used within different application areas. The standard series PF-EG Single consists of six different housing sizes for flow rates from 3 to 75 l/min – the series PF-EG Multiple of 17 housing sizes for flow rates of 150 to 3,000 l/min. Donaldson PF-EG Superplus filter housings (Single, clamp connection) are certified 3-A as standard.

PF-EG housings comply with the applicable guidelines:	
Compliant according to	FDA, 3-A ***
Manufactured according to	SGS, CE

Technical Data PF-EG Housings

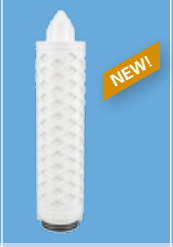
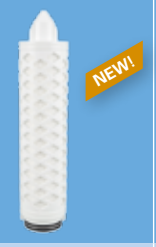
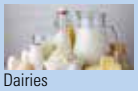
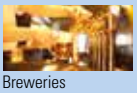
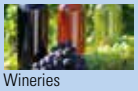
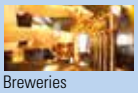
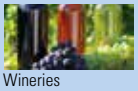
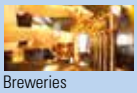
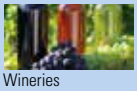
Size	Capacity [l/min.]* 5 µm	Element	Connection size	Dimensions** [mm]		Volume [L]	Weight** [kg]	Maximum operating pressure [bar]		Maximum operating temperature [°C]
				Height	Width			For fluids of 50 °C	For saturated steam of 150 °C	
Single										
0003	3	03/10	DN 10	280	140	0.30	1.20	10	3.7	-25/+150
0008	8	05/20	DN 10	333	140	0.40	1.40			
0012	12	5/3 Code 7	DN 25	406	250	1.50	4.40			
0025	25	10/3 Code 7	DN 25	541	250	2.50	5.10			
0050	50	20/3 Code 7	DN 25	795	250	4.50	6.70			
0075	75	30/3 Code 7	DN 25	1049	250	6.60	7.70			
Multiple										
0320	150	3x20/3 Code 7	DN 40	1065	426	12.6	19.4	10	4	-25/+150
0330	225	3x30/3 Code 7	DN 40	1314	426	17.8	21.4			
0340	300	3x40/3 Code 7	DN 40	1564	426	23.1	23.4			
0520	250	5x20/3 Code 7	DN 50	1075	490	20	20			
0530	375	5x30/3 Code 7	DN 50	1325	490	29.1	22			
0540	500	5x40/3 Code 7	DN 50	1575	490	38.2	24			
0820	400	8x20/3 Code 7	DN 50	1096	516	35.5	30			
0830	600	8x30/3 Code 7	DN 50	1345	516	49.7	33			
0840	800	8x40/3 Code 7	DN 50	1596	516	63.9	36			
1230	900	12x30/3 Code 7	DN 65	1430	627	88	66			
1240	1200	12x40/3 Code 7	DN 65	1680	627	112	70			
1830	1350	18x30/3 Code 7	DN 65	1450	644	115	68			
1840	1800	18x40/3 Code 7	DN 65	1700	644	146	74			
2430	1800	24x30/3 Code 7	DN 65	1470	698	151	105			
2440	2400	24x40/3 Code 7	DN 65	1720	698	190	114			
3030	2250	30x30/3 Code 7	DN 80	1500	820	235	109			
3040	3000	30x40/3 Code 7	DN 80	1750	820	293	117			

Connections		Materials		Surface finish	
Standard	Superplus	Filter housing	Housing gasket	Standard	Superplus
Single					
Milk pipe	Clamp	Stainless steel 1.4404 (316L)	EPDM gaskets (other gaskets on request)	Interior and exterior stained & passivated	Interior and exterior electro-polished Ra < 0.8
Multiple					
Milk pipe	Milk pipe	Stainless steel 1.4404 (316L)	EPDM gaskets (other gaskets on request)	Interior and exterior stained & passivated	Interior and exterior electro-polished Ra < 0.8

* Capacity based on water
** Dimensions vaild for milk pipe connections
*** The 3-A certification is valid for the PF-EG Superplus Single housing with clamp connection; PF-EG Multiple housings in 3-A quality are also available on request
Larger housings are available on request

Best Quality for your Process

Liquid Filter Elements

Category	Sterile Membrane Filters		Absolute Membrane Filters	Absolute Depth Filters		
Filter element	LifeTec PT N	LifeTec PES WN	LifeTec PES BN	LifeTec PP 100 N	LifeTec PP 100 CN	(P)-SM N
						
Filter media	Pleated PTFE membrane	Pleated polyether-sulfone membrane	Pleated polyether-sulfone membrane	Pleated polypropylene	Pleated polypropylene	Stainless steel fibre or stainless steel mesh 1.4301 (304)
Retention rates [µm]	0.2 sterile LRV > 7	0.2 sterile; 0.45; 0.6 LRV > 7	0.45 absolute	0.6; 0.8; 1; 2.4; 5; 10 absolute	1 absolute, Crypto retentive acc. to NSF/ANSI 53 §7	1; 5; 25; 50; 100; 250 absolute
Support liner	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	1.4301 (304)
End caps	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	1.4301 (304)
O-rings (others on request)	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM
Element sizes	10"; 20"; 30"; 40"	10"; 20"; 30"; 40"	10"; 20"; 30"; 40"	10"; 20"; 30"; 40"	10"; 20"; 30"; 40"	10"; 20"; 30"
Connections	P2, P3, P7, P8, P9, uf, DOE	P2, P3, P7, P8, P9, uf, DOE	P2, P3, P7, P8, P9, uf, DOE	P2, P3, P7, P8, P9, uf, DOE	P2, P3, P7, P8, P9, uf, DOE	P7, uf
Recommended housings	PF-EG	PF-EG	PF-EG	PF-EG	PF-EG	PF-EG
Conformity	FDA	FDA	FDA	FDA	FDA	FDA
Operating temperature	Up to +82 °C	Up to +82 °C	Up to +82 °C	Up to +82 °C	Up to +82 °C	Up to +150°C
Maximum differential pressure	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	5 bar (in flow direction)
Application examples	Sterile filtration of liquids	Sterile filter for water and soft drinks	Final filter for beer and wine	Fine filter for liquids	Fine filter for liquids	Fine filter for liquids
Industries	 Food  Dairies  Pharmaceutical  Chemical	 Food  Beverages  Water & Soft Drinks  Chemical  Dairies	 Breweries  Wineries  Water & Soft Drinks  Chemical	 Breweries  Wineries  Environment  Water & Soft Drinks  Chemical	 Breweries  Wineries  Environment  Water & Soft Drinks  Dairies	 Food  Beverages  Paints & Coatings  Environment  Pharmaceutical  Chemical

Hygiene at the highest Level

Liquid Filter Elements

Category	Absolute Depth Filters	Nominal Depth Filters			
Filter element	PP-FC100 T 	LifeTec PP N 	LifeTec PP-TF N 	(P)-GSL N 	PP-FC T 
Filter media	Polypropylene	Pleated polypropylene	Pleated polypropylene	Stainless steel fibre or stainless steel mesh 1.4301 (304)	Polypropylene
Retention rates [µm]	0.5; 1; 3; 5; 10; 20 absolute 30; 50; 75; 100; 150; 180 nominal	0.4; 1; 3; 5; 10; 30 nominal	1; 3; 5; 10; 15; 25; 50 nominal	1 nominal; 5; 25; 50; 100; 250 absolute*	1; 3; 5; 10; 20; 50 ; 75; 100; 150 nominal
Support liner		Polypropylene	Polypropylene	1.4301 (304)	
End caps		Polypropylene	Polypropylene	1.4301 (304)	
O-rings (others on request)	EPDM	EPDM	EPDM	EPDM	EPDM
Element sizes	10"; 20"; 30"; 40"	10"; 20"; 30"; 40"	10"; 20"; 30"; 40"	10"; 20"; 30"	10"; 20"; 30"; 40"
Connections	P7, no end caps	P2, P3, P7, P8, P9, uf, DOE	DOE	P7, uf	P7, no end caps
Recommended housings	PF-EG, P-KG	PF-EG, P-KG	P-KG	PF-EG	PF-EG, P-KG
Conformity	FDA	FDA	FDA	FDA	FDA
Operating temperature	Up to +80 °C	Up to +82 °C	Up to +82 °C	Up to +200 °C	Up to +80 °C
Maximum differential pressure	2 bar	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	5.5 bar (<+35 °C), 2 bar (<+80 °C) in flow direction	10 bar	2 bar
Application examples	Fine filter for liquids	Prefilter for liqids	Prefilter for liquids	Prefilter for liquids	Coarse and prefilter for liquids
Industries	 Food  Beverages  Industrial Machinery  Environment  Chemical	 Food  Beverages  Environment  Pharmaceutical  Chemical	 Food  Beverages  Environment  Chemical	 Food  Beverages  Paints & Coatings  Environment  Pharmaceutical  Chemical	 Food  Beverages  Industrial Machinery  Environment  Chemical

* Retention rates in water

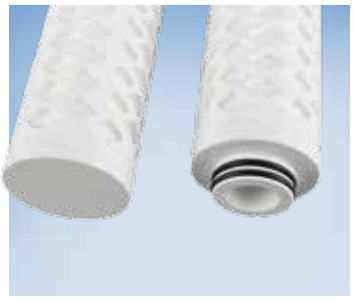
Efficient Cleaning

Liquid Filter Connections

Connections

Donaldson also supplies elements with different types of adapters that fit into the housings of other manufacturers.

P2
226 O-rings
bayonet 2 locking tabs
flat end cap

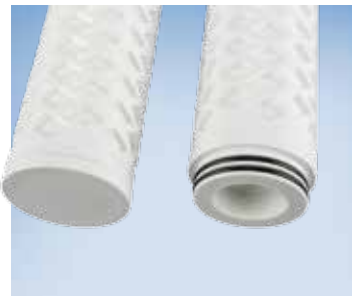


P3
222 O-rings
plug connection
flat end cap

P7
226 O-rings
bayonet 2 locking tabs
locating fin

P8
222 O-rings
plug connection
locating fin

P9
222 O-rings
bayonet 3 locking tabs
locating fin

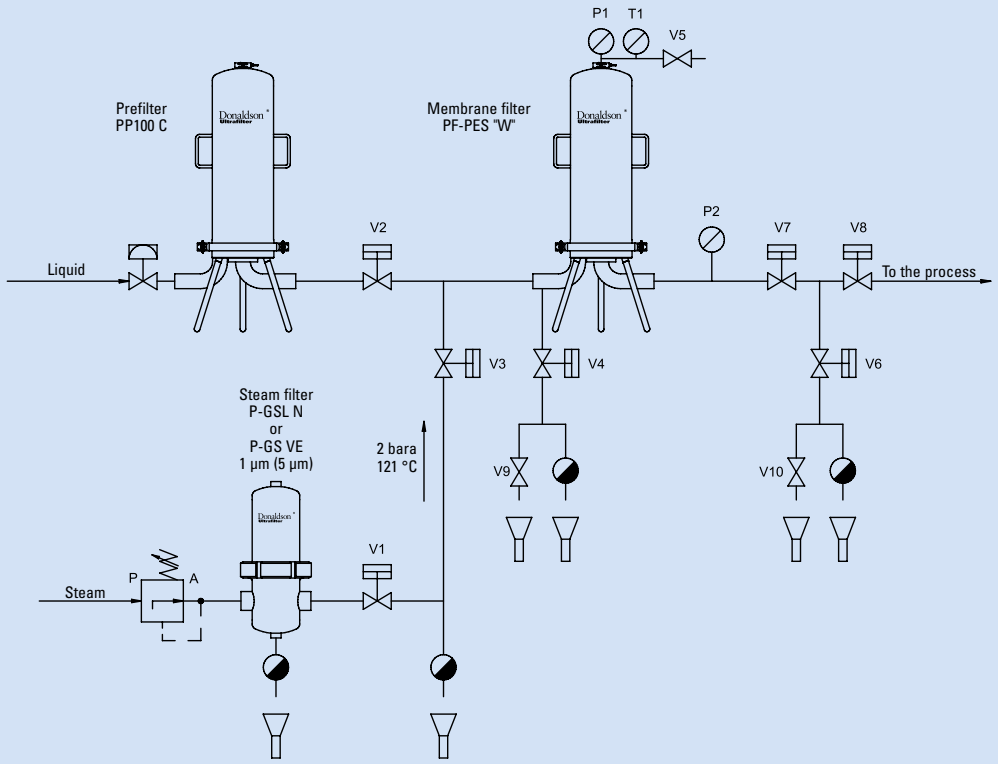


uf (ultrafilter)
226 O-rings
plug connection
flat end cap

DOE
Double open end with EPDM gaskets

Steam Sterilisation Instructions for Liquid Filters

Work Flow: Sterilisation Instructions for Liquid Filters in Flow Direction



(1) Open valves V4, V6, V7, V9 and V10.

(2) Drain the product from the filter system and associated piping. Opening valve V5 will aid this process.

(3) Open valve V1 and allow the steam condensate to drain until the steam trap below valve V3 closes. Close valve V9.

(4) Slowly open V3 allowing steam into the system: this will flow across the filters and through valve V4 and V5. This will allow the heating of the housing, the filters and associated piping without generating a significant differential pressure across the filters.

(5) When 'live' steam flows from valve V5 and T1 shows sterilisation temperature, close valve V5. This will direct the steam through the heated filter. Close valve V10.

(6) Observe the pressure gauges P1 and P2, control the steam flow rate at valve V3 and set the sterilisation steam pressure to approx. 300 mbar above the required saturated steam pressure (P1).

(7) Ensure that the differential pressure between P1 and P2 does not exceed 0.2-0.3 bar g.

(8) When the steam trap below valve V6 closes, the steam pressure will begin to rise.

(9) Steam sterilise the cartridges for the time specified ensuring the conditions of temperature and pressure stay at a constant level.

(10) On completion of the Sterilisation-In-Place cycle, close V4, V6, V3 and V1 in that order.

(11) Slowly open V10 to release the steam pressure from the filter system and associated piping. When the pressure on P2 reads 0.1 bar g pressure close valve V10. Fully open valve V9 to release the remaining steam pressure from the filter system. When the pressure on P1 reads 0.1 bar g pressure, close valve V9.

See our sterilisation guide for additional information!

Integrity Test Devices

Services by Donaldson

Donaldson offers a wide range of services around the different filter elements and their installation. There are various integrity test devices available, which are characterized by a quick and easy operation and can be purchased.

Membra-Check for Membrane Filters

The Membra-Check is used for the integrity measurement of membrane filters. In addition, unknown volumes can be measured or it can be used as a calibration measuring instrument for checking pressure transducers.

Filter Test Center (FTC) for Depth Filters

The integrity of depth filter elements is checked in the area of critical particle sizes via a test aerosol with the aid of the FTC.

Membra-Check

Filter Test Center (FTC)

Donaldson® Ultrafilter

Compressed Air Filtration · Filters for Sterile Air, Steam and Liquids · Refrigerant Drying · Adsorption Drying · Condensate Drains · Condensate Purification Systems · Process Air and Gas Processing

Donaldson FILTRATION SOLUTIONS

Total Filtration Management

Donaldson offers a wide variety of solutions to reduce your energy costs, improve your productivity, guarantee production quality and help protect the environment.

Total Filtration Service

A comprehensive range of services keeps your production at peak performance and at the lowest total cost of ownership.

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