



Donaldson.  
FILTRATION SOLUTIONS

# Process Filtration From Pure to Sterile

## Small Flow Elements

### MAIN FEATURES & BENEFITS:

- Ready-to-use filter units
- Sterilizable and regenerable
- Highly durable Polypropylene construction
- Excellent flow rate
- Approved for Food Contact Use acc. to CFR Title 21 & 1935/2004/EC



### INDUSTRIES:



- Food & Beverage



- Biotech



- Chemical



- Pharmaceutical & Health Care



- Cosmetics

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**Ultrafilter**

## PRODUCT DESCRIPTION

Donaldson small flow elements are ready-to-use elements for limited flow rates up to 11 l/min (3gpm). They are ideal for use in smallbatch and critical point-of-use applications, in liquid or gas service. Donaldson small flow elements incorporate the full range of Donaldson filtration media and removal ratings in compact, reliable assemblies. They provide high flow rates, low extractables and a broad chemical compatibility to satisfy numerous applications.

Donaldson small flow elements have high mechanical strength to withstand hydraulic shocks, back pressurization, multiple sterilizations and rigorous daily use. These elements are available in nominal lengths of 5 inch (12,7cm) and 2,5 inch (6,4cm) with a 116 internal o-ring in the outlet end cap.

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**. All Donaldson Small Flow Elements have passed the USP Class VI tests for plastics. The filter elements are manufactured in accordance with the manufacturing requirements, have no migration of filter media, are non-fibre releasing and are thermally welded without the use of binders or other chemical additives.

## GENERAL PRODUCT SPECIFICATIONS

### General Product Specifications

#### Operating Temperature Range

- 0°C – 90°C (32°F – 194°F)

#### Maximum Differential Pressure

Operating temperature [°C / °F]	Differential pressure [bar / psi]
38 / 100	5,5 / 80
66 / 150	4,1 / 60
82 / 180	2,1 / 30

#### Cumulative Steaming Time (In-line sterilization or autoclave)\*

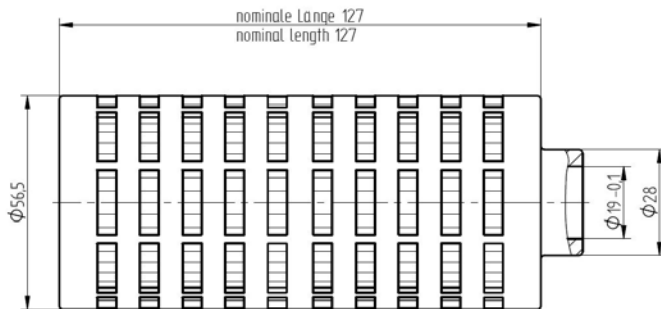
- 121°C – 125°C (30 minutes) Saturated Steam (Forward Flow) up to 100 cycles\*

\*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.

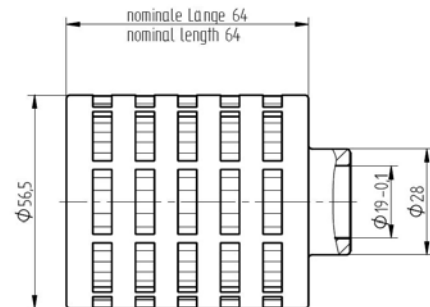
## GENERAL DIMENSION INFORMATION

Donaldson small flow elements are available in nominal lengths of 5 inch (12,7 cm, SFE-L) and 2,5 inch (6,4 cm, SFE-S) with a 116 internal o-ring in the outlet end cap.

### SFE-L



### SFE-S



## MATERIAL COMPLIANCE EU

The Donaldson Small Flow filter elements meet the guideline for Food Contact Use as given in **European Regulation (EC) Number 1935/2004**. All polymeric components (Polypropylene, Polyethersulfone, PTFE) meet the requirements of EU Directive 2002/72/EC 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.

## MATERIAL COMPLIANCE USA

All components of the Donaldson small flow elements are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21

Filter Materials	CFR Title	
<b>Filter Medium / Membrane:</b>	Polyethersulfone	177.2240
	Polypropylene	177.1520
	Poly-Tetra-Fluor-Ethylene (PTFE)	177.1550
<b>Upstream Support:</b>	Polypropylene	177.1520
<b>Downstream Support:</b>	Polypropylene	177.1520
<b>Outer Guard:</b>	Polypropylene	177.1520
<b>Core:</b>	Polypropylene	177.1520
<b>End Caps:</b>	Polypropylene	177.1520
<b>O-Rings: Alternatively</b>	EPDM	177.2600
	Silicone	177.2600
	Buna N	177.2600
	PTFE over silicone	177.1550
	PTFE over viton	177.1550
<b>Sealing Method:</b>	Thermal Bonding	

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

- All filters are fabricated without the use of binders, adhesives, additives or surface-active agents.
- Bacterial endotoxin levels in aqueous extracts of all small flow filter elements are less than 0,5 EU/ml, as determined using the limulus ameobocyte lysate (LAL) test.
- All filters show no migration of the filter medium and are non-fibre releasing.
- All filter components based on plastics are non-toxic and are certified bio-safe in accordance with current USP Class VI Tests for Plastic.

## SPECIFICATIONS SMALL FLOW ELEMENT TYPE SFE - PF – PES “W”

► Small flow membrane filter for Food & Beverage applications

**Membrane Material**

- Polyethersulfone

**Absolute Retention Ratings**

- 0,2 µm, 0,45 µm, 0,6 µm

**Effective Filtration Area**

- SFE-L : 0,31 m<sup>2</sup> (3,3 ft<sup>2</sup>)
- SFE-S : 0,15 m<sup>2</sup> (1,6 ft<sup>2</sup>)

**Bacterial Retention (ASTM F838-83 Challenge, Brev. diminuta)**

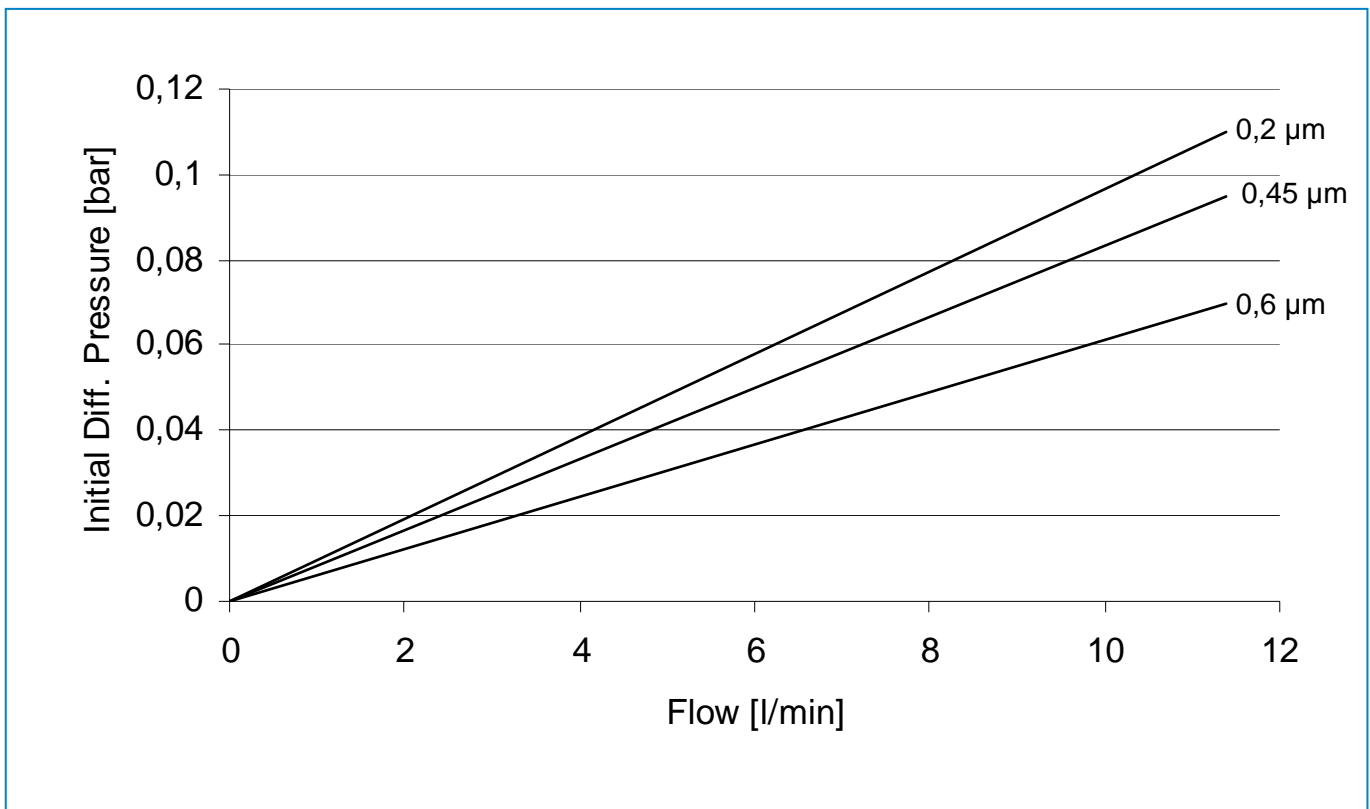
SPE – PF – PES “W”, 0,2 µm LRV > 7/cm<sup>2</sup>

**Integrity Test: Minimum Bubble Point (Water)**

Filter Grade	Minimum Bubble Point [bar / psi]
0,6µm	1,24 bar / 18 psi
0,45µm	2,21 bar / 32 psi
0,2µm	3,03 bar / 44 psi

## FLOW CHARACTERISTICS

### Flow Characteristics – Deionised Water, 25°C, SFE-L



## PRODUCT SPECIFICATIONS SMALL FLOW FILTER ELEMENT TYPE SFE - PF - PT

► Small flow membrane filter for aggressive solvents or gas and vent applications

**Membrane Material**

- Poly-Tetra-Fluor-Ethylene

**Absolute Retention Rating**

- 0,2 µm

**Effective Filtration Area**

- SFE-L : 0,23 m<sup>2</sup> (2,5 ft<sup>2</sup>)
- SFE-S : 0,11 m<sup>2</sup> (1,2 ft<sup>2</sup>)

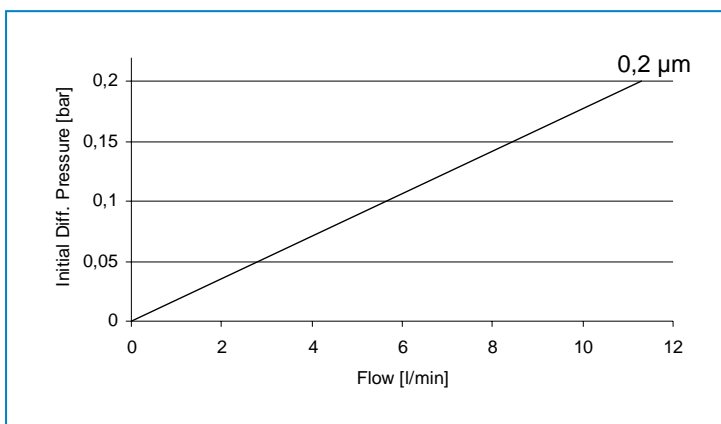
**Bacterial Retention (ASTM F838-83 Challenge, Brev. diminuta)**

- SFE - PF - PT, 0,2µm LRV > 7/cm<sup>2</sup>

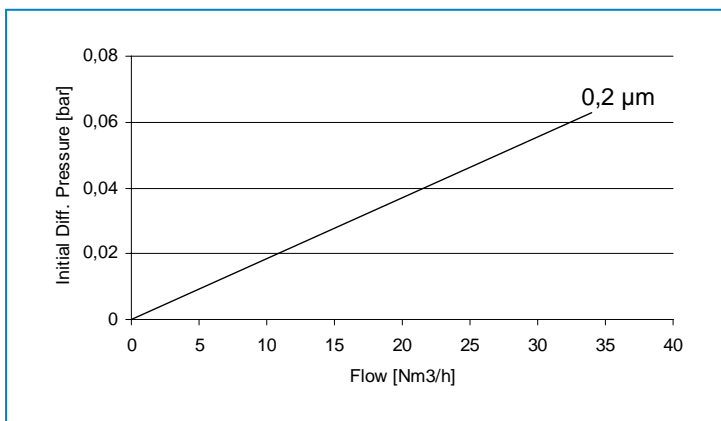
**Integrity Test: Minimum Bubble Point (IPA / Water : 60 % / 40 %)**

Filter Grade	Minimum Bubble Point [bar / psi]
SFE – PF - PT, 0,2 µm	> 1,0 bar / 14 psi

## FLOW CHARACTERISTICS



Flow Characteristics – Deionised Water, 25°C, SFE-L



Flow Characteristics – Air, 25°C, SFE-L

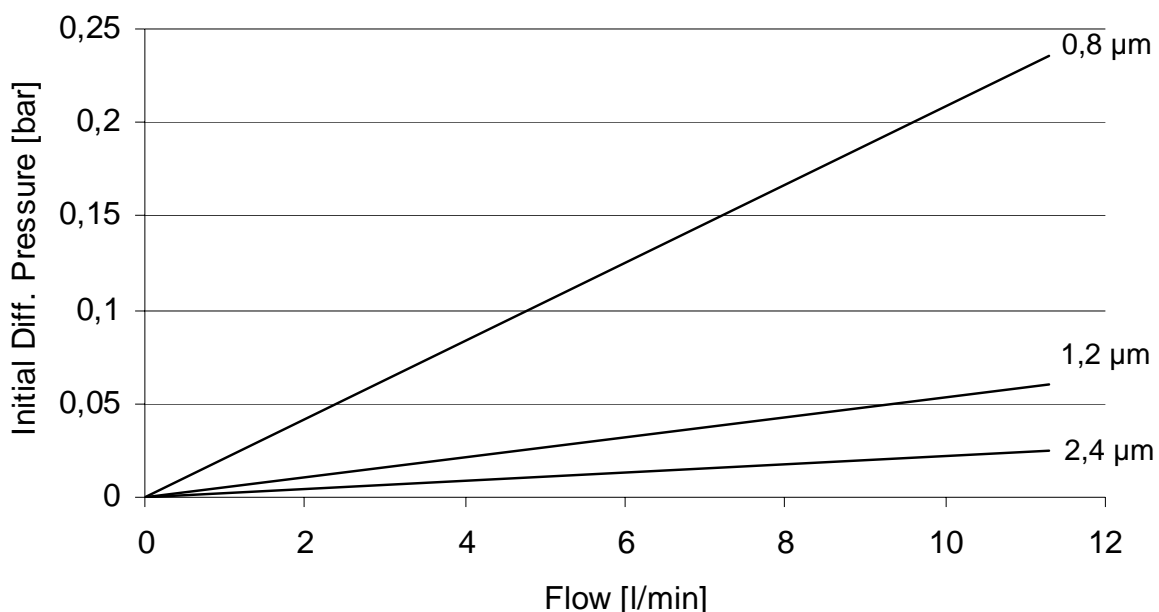
## PRODUCT SPECIFICATIONS SMALL FLOW FILTER ELEMENT TYPE SFE – PP100

- ▶ Small flow absolute rated depth filter for applications in Food & Beverage, Pharma or chemical industries

<b>Filter Material</b>	• Polypropylene			
<b>Absolute Retention Rating</b>	• 0,8 µm, 1,2 µm, 2,4 µm, 5 µm, 7 µm, 10 µm			
<b>Effective Filtration Area</b>	• SFE-L : 0,19 m <sup>2</sup> (2 ft <sup>2</sup> ) • SFE-S : 0,09 m <sup>2</sup> (1 ft <sup>2</sup> )			
<b>Particle Retention</b>		Percent Removal		
	Retention Grade	100 %	99 %	90 %
	0,8	0,80	0,72	0,50
	1,2	1,20	1,10	0,70
	2,4	2,40	2,30	2,00
	5	5,00	4,50	3,00
	7	7,00	6,50	5,00
	10	10,00	9,50	7,50

## FLOW CHARACTERISTICS

### Flow Characteristics - Deionised Water, 25°C, SFE-L



## PRODUCT SPECIFICATIONS SMALL FLOW FILTER ELEMENT TYPE SFE - PP

- ▶ Small flow nominal rated depth filter with outstanding life time and excellent flow rate

**Membrane Material**

- Polypropylene

**Nominal Retention Rating**

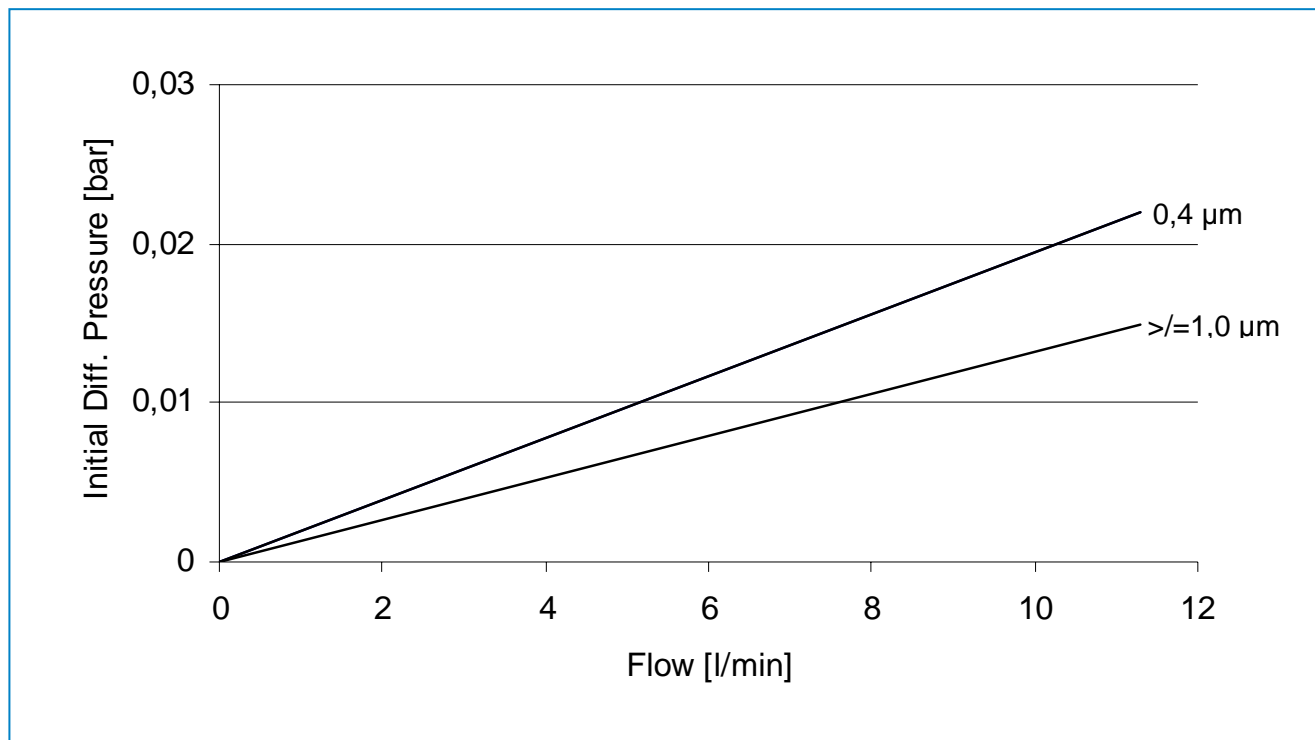
- 0,4 µm, 1 µm, 3 µm, 5 µm, 10 µm, 30 µm

**Effective Filtration Area**

- SFE-L : 0,19 m<sup>2</sup> (2 ft<sup>2</sup>)
- SFE-S : 0,09 m<sup>2</sup> (1 ft<sup>2</sup>)

## FLOW CHARACTERISTICS

## Flow Characteristics – Deionised Water, 25°C, SFE-L



Technical alterations reserved 04/2009

- For information on integrity test equipment or test services, please contact your Donaldson Sales Engineer and visit our website at [www.donaldson.com](http://www.donaldson.com)!

