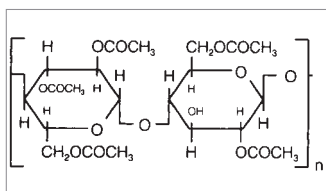
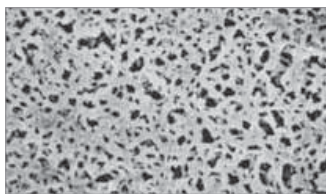




# Filtration

Low Adsorption Cellulose Acetate Membrane Filters, Type 111, for the Filtration of Aqueous Solutions	20	25 mm Glass Holder for the Filtration of Small Volumes	48	Stainless Steel Holder with 2 Liter Capacity	91
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Re-usable 13 mm Syringe Filter Holders	41	Sartopore® 2 XLG 0.2 µm Sterilizing Grade MidiCaps®	72	Sartofluor® Mini Cartridges for Sterile Venting	113
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## Low Adsorption Cellulose Acetate Membrane Filters, Type 111, for the Filtration of Aqueous Solutions



Cellulose acetate membranes combine high flow rates and thermal stability with very low adsorption characteristics, and are therefore excellently suited for use in pressure filtration devices. The 0.2  $\mu\text{m}$  membrane is the filter of choice for sterile filtration of aqueous solutions, such as nutrient media, buffers and sera.

The results of publications on adsorption are difficult to correlate, as mostly different test substances, conditions and detection methods were used, and the membranes were tested without previous sterilization.

### Typical Performance for Cellulose Acetate Membrane Filters

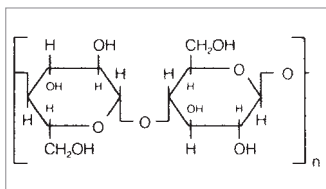
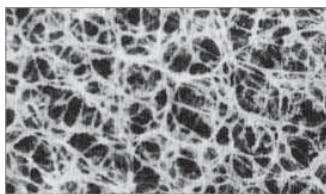
Adsorption	Bovine serum albumin <10 $\mu\text{g}/\text{cm}^2$
Bubble point acc. DIN 58355	Minimum value for 0.2 $\mu\text{m}$ > 2.9 when measured with an automatic integrity tester, for 0.45 $\mu\text{m}$ = 1.9 bar   190 kPa   27.5 psi, for 0.65 $\mu\text{m}$ = 1.3 bar   130 kPa   18.9 psi, for 0.8 $\mu\text{m}$ = 0.8 bar   80 kPa   11.6 psi
Chemical compatibility	Resistant to aqueous solutions, pH 4–8, against most alcohols, hydrocarbons and oils
Extractables with water	Less than 1%
Flow rate for water acc. DIN 58355	Average value per $\text{cm}^2$ area at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ : 24 ml/min for 0.2 $\mu\text{m}$ , 69 ml/min for 0.45 $\mu\text{m}$ , 130 ml/min for 0.65 $\mu\text{m}$ , 200 ml/min for 0.8 $\mu\text{m}$ pore size
Material	Cellulose acetate
Sterilization	By autoclaving at 121 $^\circ\text{C}$ or 134 $^\circ\text{C}$ with $\gamma$ -radiation, dry heat or ethylene oxide
Sterilizing filtration	Filters with 0.2 $\mu\text{m}$ pore sizes are validated by Bacteria Challenge Tests.
Thermal stability	Max. 180 $^\circ\text{C}$
Thickness acc. DIN 53105	Average value 120 $\mu\text{m}$

### Order Numbers for Cellulose Acetate Membrane Filters, Type 111

13 mm diameter	11104--13-----N	0.8 µm, pack of 100
	11106--13-----N	0.45 µm, pack of 100
	11107--13-----N	0.2 µm, pack of 100
25 mm diameter	11104--25-----N	0.8 µm, pack of 100
	11105--25-----N	0.65 µm, pack of 100
	11106--25-----N	0.45 µm, pack of 100
	11107--25-----N	0.2 µm, pack of 100
30 mm diameter	11106--30-----N	0.45 µm, pack of 100
	11107--30-----N	0.2 µm, pack of 100
47 mm diameter	11104--47-----N	0.8 µm, pack of 100
	11105--47-----N	0.65 µm, pack of 100
	11106--47-----N	0.45 µm, pack of 100
	11107--47-----N	0.2 µm, pack of 100
50 mm diameter	11104--50-----N	0.8 µm, pack of 100
	11105--50-----N	0.65 µm, pack of 100
	11106--50-----N	0.45 µm, pack of 100
	11107--50-----N	0.2 µm, pack of 100
	11107--50----ACN	0.2 µm, pack of 100 individually, sterile packed
85 mm diameter	11106--85-----N	0.45 µm, pack of 100
90 mm diameter	11106--90-----G	0.45 µm, pack of 25
	11107--90-----G	0.2 µm, pack of 25
100 mm diameter	11106-100-----G	0.45 µm, pack of 25
	11106-100-----N	0.45 µm, pack of 100
	11107-100-----G	0.2 µm, pack of 25
	11107-100-----N	0.2 µm, pack of 100
142 mm diameter	11104-142-----G	0.8 µm, pack of 25
	11104-142-----N	0.8 µm, pack of 100
	11105-142-----G	0.65 µm, pack of 25
	11106-142-----G	0.45 µm, pack of 25
	11106-142-----N	0.45 µm, pack of 100
	11107-142-----G	0.2 µm, pack of 25
	11107-142-----N	0.2 µm, pack of 100
293 mm diameter	11104-293-----G	0.8 µm, pack of 25
	11104-293-----N	0.8 µm, pack of 100
	11105-293-----G	0.65 µm, pack of 25
	11106-293-----G	0.45 µm, pack of 25
	11106-293-----N	0.45 µm, pack of 100
	11107-293-----G	0.2 µm, pack of 25
	11107-293-----N	0.2 µm, pack of 100

Special brochure for all membrane filters available. Order no. SM-1503-e.

## Chemical Resistant RC-Membrane Filters, Type 184, for the Filtration of Organic Solvents



These solvent-resistant, hydrophilic membrane filters are excellently suited for their major application, particle removal from solvents.

The 50 mm diameter, 0.45  $\mu\text{m}$  pore size filter, for example, is standardly used in combination with the all-glass holder (described on page 50) to ultraclean and de-gas solvents and mobile phases for HPLC.

Regenerated cellulose membranes also feature low non-specific adsorption.

### Typical Performance for Regenerated Cellulose Membrane Filters

Adsorption	Bovine serum albumin approx. $<10 \mu\text{g}/\text{cm}^2$
Bubble point acc. DIN 58355	Min. values, wetted with water, 4.4 bar   440 kPa   63.8 psi for 0.2 $\mu\text{m}$ , 2.8 bar   280 kPa   40.6 psi for 0.45 $\mu\text{m}$
Chemical compatibility	Resistant to almost all solvents (see list above) and against aqueous solutions in the pH-range 3–12. Further details on page 124.
Extractables with water	Less than 1%
Flow rate acc. DIN 58355	Average value per $\text{cm}^2$ area for water at 1 bar   100 kPa   14.5 psi pressure, 16 ml/min for 0.2 $\mu\text{m}$ , 28 ml/min for 0.45 $\mu\text{m}$ pore size.
Material	Regenerated cellulose, reinforced with non-woven cellulose
Sterilization	By autoclaving (at 121 $^\circ\text{C}$ or 134 $^\circ\text{C}$ ), Dry heat (180 $^\circ\text{C}$ ), and gamma radiation (25 kGy) or with ethylene oxide
Thickness acc. DIN 53105	160–200 $\mu\text{m}$

### Order Numbers for Regenerated Cellulose Membrane Filters, Type 184

13 mm diameter	18406-013 N	0.45 $\mu\text{m}$ , pack of 100
	18407-013 N	0.2 $\mu\text{m}$ , pack of 100
25 mm diameter	18407-025 N	0.2 $\mu\text{m}$ , pack of 100
47 mm diameter	18406-047 N	0.45 $\mu\text{m}$ , pack of 100
	18407-047 N	0.2 $\mu\text{m}$ , pack of 100
50 mm diameter	18407-050 N	0.2 $\mu\text{m}$ , pack of 100
100 mm diameter	18406-100 G	0.45 $\mu\text{m}$ , pack of 25
142 mm diameter	18406-142 G	0.45 $\mu\text{m}$ , pack of 25
	18407-142 G	0.2 $\mu\text{m}$ , pack of 25
	18407-142 N	0.2 $\mu\text{m}$ , pack of 100
293 mm diameter	18406-293 G	0.45 $\mu\text{m}$ , pack of 25
	18407-293 G	0.2 $\mu\text{m}$ , pack of 25

Special brochure for all membrane filters available. Order no. SM-1503-e

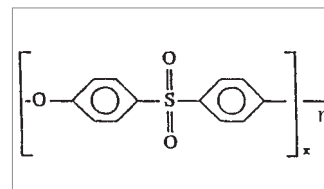
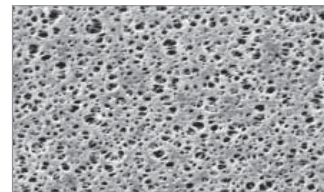
## Polyethersulfone Membrane Filters, Type 154, for the Filtration of Aqueous and Aggressive Solutions

The new polyethersulfone membrane filters feature excellent flow speeds and a high filterable volume.

Biologic and pharmaceutical solutions can be filtered in the wide pH-range of pH 2-12, because of their low protein adsorption.

Furthermore, the membranes are very well suited for samples of the environmental sector.

The 0.1 µm filters are used for the ultra-cleaning of solutions, e.g. in the case of nephelometry.



### Typical Performance for Polyethersulfone Membrane Filters

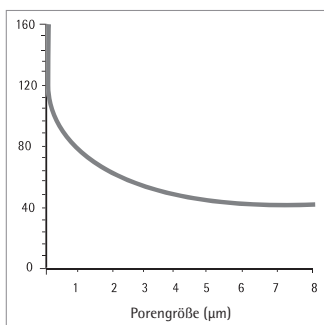
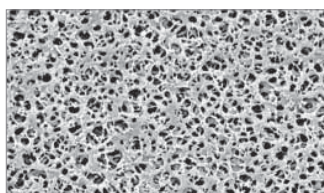
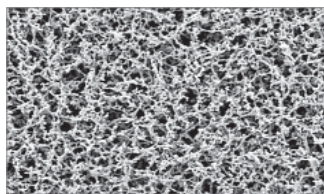
Adsorption	10 µg/cm <sup>2</sup> for IgG, 5 µg/cm <sup>2</sup> for BSA, 1.9 µg/cm <sup>2</sup> for Insulin
Bubble point acc. DIN 58355	0.1 µm with Isopropanol water (60 40) >2.1 bar 30.45 psi 0.2 µm = 3.2 bar 320 kPa 46 psi 0.45 µm = 2.3 bar 33.4 psi
Chemical compatibility	Resistant to some solutions and aggressive, aqueous solutions, pH 1-13.
Extractables with water	Less than 0.2%
Flow rate for water acc. DIN 58355	Average value per cm <sup>2</sup> area at Δp = 1 bar 100 kPa 14.5 psi: 0.1 µm - >7 ml/min. 0.2 µm - >28 ml/min. 0.45 µm - >32 ml/min.
Material	Polyethersulfone (non ionic)
Sterilization	By autoclaving at 121 °C or 134 °C, gamma radiation or with ethylenoxide.
Sterilizing filtration	Filters with 0.2 µm pore sizes have been validated with the Bacteria Challenge Test.
Thickness acc. DIN 53105	150 µm

### Order Numbers for Polyethersulfone Membrane Filters, Type 154

25 mm diameter	15458--25-----N	0.1 µm, pack of 100
	15407--25----MIN	0.2 µm, pack of 100
	15406--25-----N	0.45 µm, pack of 100
47 mm diameter	15458--47-----N	0.1 µm, pack of 100
	15407--47----MIN	0.2 µm, pack of 100
	15406--47-----N	0.45 µm, pack of 100
50 mm diameter	15458--50-----N	0.1 µm, pack of 100
	15407--50----MIN	0.2 µm, pack of 100
	15406--50-----N	0.45 µm, pack of 100

Special brochure for all membrane filters available. Order no. SM-1503-e.

## Cellulose Nitrate (Ester) Membrane Filters, Type 113, for Sample Pretreatment, Particle Testing and Chemotaxis



**Adsorption**  
( $\alpha$ -Globulin, approx. 125 µg/cm<sup>2</sup>)

Cellulose nitrate is a standard material for membrane filters and offers a wide range of pore sizes from 8 µm to 0.45 µm. The larger pore sizes (8 µm, 5 µm, 3 µm) can be used for chemotaxis and cell retention, the 0.45 µm pore size for particle collection.

The high non-specific adsorption of the cellulose nitrate membrane is very advantageous for diagnostic kits. The adsorption decreases with increasing pore size, as shown in the diagram.

### Typical Performance for Cellulose Nitrate (Ester) Membrane Filters

Adsorption	See diagram
Bubble point acc. DIN 58355	Wetted with water, minimum values: 0.3 bar 30 kPa 4.35 psi for 8 µm pore size, 11301 0.5 bar 50 kPa 7.25 psi for 5 µm pore size, 11342 0.6 bar 60 kPa 8.7 psi for 3 µm pore size, 11302 1.0 bar 100 kPa 14.5 psi for 1.2 µm pore size, 11303 1.4 bar 140 kPa 20.3 psi for 0.8 µm pore size, 11304 2.0 bar 200 kPa 29 psi for 0.65 µm pore size, 11305 2.4 bar 240 kPa 34.8 psi for 0.45 µm pore size, 11306
Chemical compatibility	Resistant to aqueous solutions in the pH-range 4–8 to hydrocarbons and to some solvents.
Extractables with water	Less than 1%
Flow rate for water acc. DIN 58355	Average values per cm <sup>2</sup> area at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ : 750 ml/min for 8 µm pore size, 11301 570 ml/min for 5 µm pore size, 11342 430 ml/min for 3 µm pore size, 11302 320 ml/min for 1.2 µm pore size, 11303 200 ml/min for 0.8 µm pore size, 11304 130 ml/min for 0.65 µm pore size, 11305 69 ml/min for 0.45 µm pore size, 11306
Material	Cellulose nitrate
Sterilization	By autoclaving at 121 °C, gamma radiation (25 kGy) or with ethylene oxide.
Thermal stability	Max. temperature 130 °C
Thickness acc. DIN 53105	130 µm

### Order Numbers for Cellulose Nitrate Membrane Filters, Type 113

13 mm diameter	11301-013 N	8 µm, pack of 100
	11342-013 N	5 µm, pack of 100
	11302-013 N	3 µm, pack of 100
	11304-013 N	0.8 µm, pack of 100
	11306-013 N	0.45 µm, pack of 100
20 mm diameter	11304-020 N	0.8 µm, pack of 100
	11306-020 N	0.45 µm, pack of 100
25 mm diameter	11301-025 N	8 µm, pack of 100
	11342-025 N	5 µm, pack of 100
	11302-025 N	3 µm, pack of 100
	11303-025 N	1.2 µm, pack of 100
	11304-025 N	0.8 µm, pack of 100
	11305-025 N	0.65 µm, pack of 100
	11306-025 N	0.45 µm, pack of 100
30 mm diameter	11306-030 N	0.45 µm, pack of 100
37 mm diameter	11301-037 N	8 µm, pack of 100
	11304-037 N	0.8 µm, pack of 100
	11306-037 N	0.45 µm, pack of 100

### Order Numbers for Cellulose Nitrate Membrane Filters, Type 113

47 mm diameter	11301-047 N	8 µm, pack of 100
	11342-047 N	5 µm, pack of 100
	11302-047 N	3 µm, pack of 100
	11303-047 N	1.2 µm, pack of 100
	11304-047 N	0.8 µm, pack of 100
	11305-047 N	0.65 µm, pack of 100
	11306-047 N	0.45 µm, pack of 100
50 mm diameter	11301-050 N	8 µm, pack of 100
	11342-050 N	5 µm, pack of 100
	11302-050 N	3 µm, pack of 100
	11303-050 N	1.2 µm, pack of 100
	11304-050 N	0.8 µm, pack of 100
	11305-050 N	0.65 µm, pack of 100
	11306-050 N	0.45 µm, pack of 100
80 mm diameter	11301-080 ALN	8 µm, pack of 100 sterile, non-individually packed
85 mm diameter	11306-085 N	0.45 µm, pack of 100
90 mm diameter	11342-090 G	5 µm, pack of 25
	11303-090 G	1.2 µm, pack of 25
	11304-090 G	0.8 µm, pack of 25
	11306-090 G	0.45 µm, pack of 25
	11306-090 N	0.45 µm, pack of 100
142 mm diameter	11301-142 G	8 µm, pack of 25
	11302-142 G	3 µm, pack of 25
	11303-142 G	1.2 µm, pack of 25
	11304-142 G	0.8 µm, pack of 25
	11304-142 N	0.8 µm, pack of 100
	11305-142 G	0.65 µm, pack of 25
	11306-142 G	0.45 µm, pack of 25
	11306-142 N	0.45 µm, pack of 100
	11342-142 G	5 µm, pack of 25
	11342-142 N	5 µm, pack of 100
293 mm diameter	11301-293 G	8 µm, pack of 25
	11303-293 G	1.2 µm, pack of 25
	11304-293 G	0.8 µm, pack of 25
	11304-293 N	0.8 µm, pack of 100
	11306-293 G	0.45 µm, pack of 25
	11306-293 N	0.45 µm, pack of 100
	11342-293 G	5 µm, pack of 25

47 mm and 50 mm filters are, in some pore sizes, sterile, individually packed, available in packs of 100.

### Order Numbers

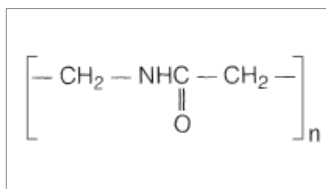
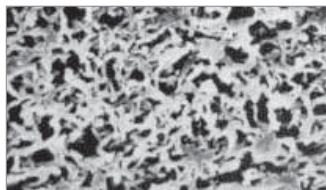
47 mm diameter	11301-047 ACN	8 µm
	11302-047 ACN	3 µm
	11303-047 ACN	1.2 µm
	11304-047 ACN	0.8 µm
	11305-047 ACN	0.65 µm
	11306-047 ACN	0.45 µm
50 mm diameter	11301-050 ACN	8 µm
	11302-050 ACN	3 µm
	11303-050 ACN	1.2 µm
	11304-050 ACN	0.8 µm
	11305-050 ACN	0.65 µm
	11306-050 ACN	0.45 µm

Order Number	Description	<> µm	length [m]	width [cm]
11327-----41BL	Nitrocellulose	0.22	3	30
11306-----41BL	Nitrocellulose	0.45	3	30





## Polyamide Membrane Filters, Type 250, for the Filtration of Alkaline Solutions and Organic Solvents



Polyamide membrane filters are hydrophilic and chemically resistant to alkaline solutions and organic solvents. They are therefore recommended for particle-removing filtration of water, aqueous solutions and solvents for analytical determination such as HPLC, as well as for the sterile filtration of these liquids. They are also highly recommended for the isolation of Legionella.

Their relatively high non-specific adsorption, which can cause loss of important substances, e.g. from tissue culture solutions, limit their application. For these kind of solutions, the low adsorption cellulose acetate membrane filters, Type 111, described on page 20, are recommended.

### Typical Performance for Polyamide Membrane Filters

Adsorption	100 µg/cm <sup>2</sup> for bovine serum albumin (0.2 µm pore size)
Bubble point acc. DIN 58355	Minimum value for 0.2 µm = 3.4 bar 340 kPa 49.3 psi, for 0.45 µm = 2.2 bar 220 kPa 33.35 psi.
Chemical compatibility	Resistant to many solvents and alkali-solutions, pH range 3–14.
Extractables with water	Less than 1%
Flow rate for water acc. DIN 58355	Average value per cm <sup>2</sup> area at Δp = 1 bar 100 kPa 14.5 psi: >12 ml/min for 0.2 µm, >26 ml/min for 0.45 µm pore size
Material	Polyamide
Sterilization	By autoclaving at 121 °C or 134 °C or with ethylene oxide.
Sterilizing filtration	Filters with 0.2 µm pore size are validated by the Bacteria Challenge Test.
Thickness acc. DIN 53105	Average value 115 µm

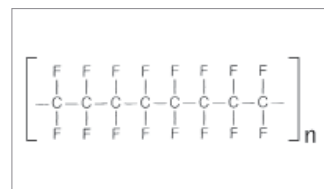
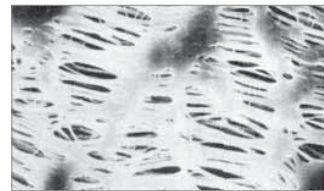
### Order Numbers for Polyamide Membrane Filters, Type 250

13 mm diameters	25006-013 N	0.45 µm, pack of 100
	25007-013 N	0.2 µm, pack of 100
25 mm diameter	25006-025 N	0.45 µm, pack of 100
	25007-025 N	0.2 µm, pack of 100
47 mm diameter	25006-047 N	0.45 µm, pack of 100
	25007-047 N	0.2 µm, pack of 100
50 mm diameter	25006-050 N	0.45 µm, pack of 100
	25007-050 N	0.2 µm, pack of 100
90 mm diameter	25006-090 G	0.45 µm, pack of 25
	25007-090 G	0.2 µm, pack of 25
142 mm diameter	25006-142 N	0.45 µm, pack of 100
	25007-142 N	0.2 µm, pack of 100
293 mm diameter	25006-293 N	0.45 µm, pack of 100
	25007-293 N	0.2 µm, pack of 100

## Hydrophobic PTFE Membrane Filters, Type 118, for the Filtration of Air, Gases or Chemicals

The main application of this membrane filter type is air|gas filtration. They are made purely of PTFE (polytetra-fluorethylene), and are therefore permanently hydrophobic. Unlike other (hydrophilic) filter types, they are not wetted by air humidity, allowing unhindered passage of air at low differential pressures as well.

PTFE membrane filters have an excellent chemical compatibility, so that they are also used for the filtration of solvents and acids, to which other filter types are not resistant. Due to their hydrophobic characteristics, they must be pre-wetted with ethanol or methanol before the filtration of aqueous media.



### Typical Performance for PTFE Membrane Filters

Adsorption	8 µg/cm <sup>2</sup> for gamma-globulin (0.2 µm pore size)
Bubble point acc. DIN 58355	Minimum value for Isopropanol 0.2 µm = 1.0 bar 100 kPa 15 psi, for 0.45 µm = 0.7 bar 70 kPa ~10 psi. Average value for 1.2 µm = 0.45 bar 45 kPa 6.52 psi, for 5 µm = 0.1 bar 10 kPa 1.45 psi
Chemical compatibility	Resistant to almost all chemicals
Extractables with water	None detectable
Flow rate for air	Average values per cm <sup>2</sup> area at Δp = 0.05 bar 5 kPa 0.725 psi: 0.2 l/min for 0.2 µm, 0.3 l/min for 0.45 µm, 1.6 l/min for 1.2 µm and 4 l/min for 5 µm pore size
Material	Polytetrafluorethylene
Sterilization	By autoclaving at 121 °C or 134 °C or with ethylene oxide.
Sterilizing filtration	Filters with 0.2 µm pore size are validated with the Bacteria Challenge Test.
Thickness acc. DIN 53105	Average values, 65 µm for 0.2 µm and 100 µm for 5 µm pore size.

Order numbers see next page.

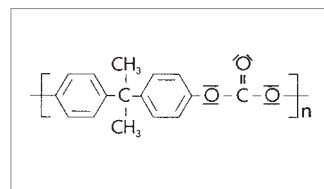
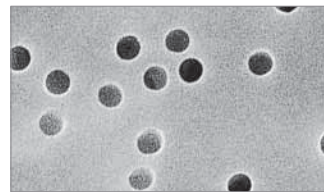
### Order Numbers for PTFE Membrane Filters, Type 118

13 mm diameter	11803-013 N	1.2 $\mu\text{m}$ , pack of 100
	11806-013 N	0.45 $\mu\text{m}$ , pack of 100
	11807-013 N	0.2 $\mu\text{m}$ , pack of 100
25 mm diameter	11842-025 N	5 $\mu\text{m}$ , pack of 100
	11803-025 N	1.2 $\mu\text{m}$ , pack of 100
	11806-025 N	0.45 $\mu\text{m}$ , pack of 100
	11807-025 N	0.2 $\mu\text{m}$ , pack of 100
47 mm diameter	66042--47-----N	5 $\mu\text{m}$ , PTFE supported, pack of 100
	11842-047 N	5 $\mu\text{m}$ , pack of 100
	11803-047 N	1.2 $\mu\text{m}$ , pack of 100
	11806-047 N	0.45 $\mu\text{m}$ , pack of 100
	11807-047 N	0.2 $\mu\text{m}$ , pack of 100
50 mm diameter	11842-050 N	5 $\mu\text{m}$ , pack of 100
	11803-050 N	1.2 $\mu\text{m}$ , pack of 100
	11806-050 N	0.45 $\mu\text{m}$ , pack of 100
	11807-050 N	0.2 $\mu\text{m}$ , pack of 100
100 mm diameter	11842-100 G	5 $\mu\text{m}$ , pack of 25
	11803-100 G	1.2 $\mu\text{m}$ , pack of 25
	11806-100 G	0.45 $\mu\text{m}$ , pack of 25
	11807-100 G	0.2 $\mu\text{m}$ , pack of 25
142 mm diameter	11842-142 G	5 $\mu\text{m}$ , pack of 25
	11803-142 G	1.2 $\mu\text{m}$ , pack of 25
	11806-142 G	0.45 $\mu\text{m}$ , pack of 25
	11807-142 G	0.2 $\mu\text{m}$ , pack of 25
293 mm diameter	11806-293 G	0.45 $\mu\text{m}$ , pack of 25
	11807-293 G	0.2 $\mu\text{m}$ , pack of 25

## Polycarbonate Track-Etch-Membrane Filters, Type 230, for the Analysis of Particles

Polycarbonate Track-Etch-Membranes are manufactured from high grade polycarbonate film using track-etch technology. They retain particles on their surfaces. Their capillary pore structure is uniform and precise, with a narrow pore size distribution. Track-etch membranes are an excellent choice for accurate fractionation of particulates because of their precise pore size. In addition, their smooth, flat surface provides high particulate visibility.

Track-etch technology offers the user distinct performance advantages when excellent surface capture and high sample visibility are required. Applications: particulate analysis, epifluorescence microscopy, fluid clarification, cytology, cell biology, bioassays, water microbiology, environmental analysis.



### Typical Performance for Polycarbonate Membrane Filters

Bubble point acc. DIN 58355	Minimum value 0.2 $\mu\text{m}$ > 4 bar/58 psi 0.4 $\mu\text{m}$ > 2.2 bar/32 psi
Chemical compatibility	See table page 124
Extractables	Low
Flow rate for water	> 10 ml/min/cm <sup>2</sup> for 0.2 $\mu\text{m}$ > 30 ml/min/cm <sup>2</sup> for 0.4 $\mu\text{m}$
Porosity	<15%
Material	Polycarbonate
Sterilization	By autoclaving at 121 °C
Thermal stability	Max. temperature 140 °C

### Order Numbers for Polycarbonate Membrane Filters, Type 230

25 mm diameter	23007-25 N	0.2 $\mu\text{m}$ , pack of 100
	23006-25 N	0.4 $\mu\text{m}$ , pack of 100
47 mm diameter	23007-47 N	0.2 $\mu\text{m}$ , pack of 100
	23006-47 N	0.4 $\mu\text{m}$ , pack of 100
50 mm diameter	23007-50N	0.2 $\mu\text{m}$ , pack of 100

## Glass Fiber Prefilters for Larger Totally Filterable Volumes in Clarification and Sterile Filtration



The major use of all three glass fiber filters is as a depth prefilter, placed directly on top of a membrane filter, whereby the prefilter diameter specified for the holder must be used. Larger diameters would intrude under the sealing ring of the holder and cause leakage.

The standard Type 13400 contains an acrylic latex binder. It has a high particle loading capacity, but for very "dirty" liquids, the thicker Type 13430 can be more effective. Type 13440 is a finer, binder-free type, and is recommended for the prefiltration of relatively clean solutions, such as tissue culture media.

Serial filtration may be necessary for difficult to filter liquids such as serum. Two or three membrane filters of different pore sizes are placed on each other, with a glass fiber prefilter on top and 13420 polyester separators between them (diameter as same as prefilter) to assist liquid passage.

### Typical Performance

Flow rates for water	At $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 320 ml/min/cm <sup>2</sup> for 13400
Materials	13400, glass fiber with acrylic latex binder.
Sterilization	By dry heat, at 180 °C or by autoclaving at 121 °C or 134 °C.
Thermal stability	220 °C for 13400
Thickness	Ca. 0.55 mm for 13400

### Order Numbers

<b>a) Type 13400, Standard Glass Fiber Filters</b>	13400-013 S	13 mm, pack of 200
	13400-042 Q	42 mm, pack of 500
	13400-044 Q	44 mm, pack of 500
	13400-047 Q	47 mm, pack of 500
	13400-050 Q	50 mm, pack of 500
	13400-100 K	100 mm, pack of 50
	13400-120 K	120 mm, pack of 50
	13400-124 K	124 mm, pack of 50
	13400-127 K	127 mm, pack of 50
	13400-130 K	130 mm, pack of 50
	13400-142 K	142 mm, pack of 50
	13400-150 K	150 mm, pack of 50
	13400-257 K	257 mm, pack of 50
	13400-260 K	260 mm, pack of 50
13400-279 K	279 mm, pack of 50	
13400-293 K	293 mm, pack of 50	
<b>b) Type 13430, Extra Thick Glass Fiber Filters</b>	13430-127 K	127 mm, pack of 50
	13430-130 K	130 mm, pack of 50
	13430-142 K	142 mm, pack of 50
	13430-257 K	257 mm, pack of 50
	13430-279 K	279 mm, pack of 50
13430-293 K	293 mm, pack of 50	
<b>c) Type 13440, Binder-free Glass Fiber Filters</b>	13440-042 Q	42 mm, pack of 500
	13440-044 Q	44 mm, pack of 500
	13440-047 Q	47 mm, pack of 500
	13440-050 Q	50 mm, pack of 500
	13440-130 K	130 mm, pack of 50

## Ultrafiltration Membrane Filters from PES 146..., CTA 145... and RC 144... for the Concentration, Purification and Removal of Proteins

### Polyethersulfone (PES)

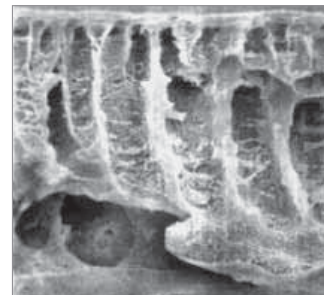
This is a general purpose membrane that provides excellent performance with most solutions when retentate recovery is of primary importance. Polyethersulfone membranes exhibit no hydrophobic or hydrophilic interactions and are usually preferred for their low fouling characteristics, exceptional flux and broad pH range.

### Cellulose Triacetate (CTA)

High hydrophilicity and very low non-specific binding characterize this membrane. Cast without any membrane support that could trap or bind passing microsolute, these membranes are to be preferred for sample cleaning and protein removal and when high recovery of the filtrate solution is of primary importance.

### Regenerated Cellulose (RC)

These membranes are also highly hydrophilic and are often preferred for their higher protein recovery when processing very dilute solutions. Resistance to autoclaving, ease of cleaning and extended chemical resistance also characterize this type of membrane.



### Typical Performance for Polyethersulfone, Type 146

Thickness	120 µm	
pH range	1–14	
Waterflux	MWCO 10,000	0.2 ml/min/cm <sup>2</sup>
Protein retention	Cytochrome C	95%

### Specifications for Cellulose Triacetate, Type 145

Thickness	120 µm	
pH range	4–8	
Waterflux	MWCO 10,000	0.11 ml/min/cm <sup>2</sup>
Protein retention	Cytochrome C	90%

### Specifications for Regenerated Cellulose, Type 144

Thickness	180 µm	
pH range	1–13	
Waterflux	MWCO 10,000	0.08 ml/min/cm <sup>2</sup>
Protein retention	Cytochrome C	99%

Order numbers see next page.

**Order Numbers for Polyethersulfone Membrane Filters, Type 146**

25 mm diameter	14629-25-----D	5,000 NMGT (MWCO), pack of 10
	14639-25-----D	10,000 NMGT (MWCO), pack of 10
47 mm diameter	14609-047 D	1.000 MWCO, pack of 10
	14629-047 D	5.000 MWCO, pack of 10
	14639-047 D	10.000 MWCO, pack of 10
	14659-047 D	30.000 MWCO, pack of 10
	14650-047 D	50.000 MWCO, pack of 10
	14668-047 D	100.000 MWCO, pack of 10
	14679-047 D	300.000 MWCO, pack of 10
63 mm diameter	14629-63-----D	5,000 NMGT (MWCO), pack of 10
	14639-63-----D	10,000 NMGT (MWCO), pack of 10
	14659-63-----D	30,000 NMGT (MWCO), pack of 10
	14668-63-----D	100,000 NMGT (MWCO), pack of 10
76 mm diameter	14629-76-----D	5,000 NMGT (MWCO), pack of 10
	14639-76-----D	10,000 NMGT (MWCO), pack of 10

**Order Numbers for Cellulose Triacetate Membrane Filters, Type 145**

43 mm diameter	14549-43-----D	20,000 NMGT (MWCO), pack of 10
47 mm diameter	14529-047 D	5.000 MWCO, pack of 10
	14539-047 D	10.000 MWCO, pack of 10
	14549-047 D	20.000 MWCO, pack of 10
	14549-047 N	20.000 MWCO, pack of 100
50 mm diameter	14539-50-----D	10,000 NMGT (MWCO), pack of 10

**Order Numbers for Regenerated Cellulose Membrane Filters, Type 144**

25 mm diameter	14429-25-----D	5,000 NMGT (MWCO), pack of 10
	14439-25-----D	10,000 NMGT (MWCO), pack of 10
47 mm diameter	14429-047 D	5.000 MWCO, pack of 10
	14439-047 D	10.000 MWCO, pack of 10
	14459-047 D	30.000 MWCO, pack of 10
63 mm diameter	14429-63-----D	5,000 NMGT (MWCO), pack of 10
	14439-63-----D	10,000 NMGT (MWCO), pack of 10
	14459-63-----D	30,000 NMGT (MWCO), pack of 10
76 mm diameter	14429-76-----D	5,000 NMGT (MWCO), pack of 10
	14439-76-----D	10,000 NMGT (MWCO), pack of 10

## Minisart® 0.2 µm Syringe Filter Holders for Rapid Small Volume Sterilization with Maximum User Convenience

Ready-to-use units, which offer high flow rates at low inlet pressures, make correspondingly rapid sterile filtration possible. Fitted on a standard syringe, they enable a less manually tiresome sterilization of up to 100 ml of liquid. A Minisart® fitted on a standard dosing syringe comprises a very convenient system for simultaneous dosage and sterilization.

The combination of a large filtration area and an optimized geometry of the filter support, which are responsible for the high flow rates, also ensures high total throughputs.

Minisart® plus units are advantageous for the sterilization of difficult to filter liquids. They include a fine glass fiber prefilter on the filter membrane, a combination which is so effective that throughputs can often be doubled. Minisarts® and their packaging are environmentally friendly, free of PVC!

Minisart® High Flow are syringe filter holders with a polyethersulfone membrane for the sterile filtration at higher flow rates and a higher filtration speed.



### Specifications for 0.2 µm Minisarts® and Minisart® plus

Adsorption	Values determined for the cellulose acetate membrane, 0.8–3 µg/cm <sup>2</sup> with RSA, 8–12 µg/cm <sup>2</sup> with gamma globulin.
Bubble point	Min. value with water 3.2 bar 320 kPa 46 psi
Color coding	Blue
Connectors	Female Luer Lock inlet, male Luer Lock outlet. Alternatively only for standard Minisarts® male luer slip outlet.
Cytotoxicity	No inhibition with MRC-5 or L-929 cells
Endotoxins	Endotoxin-output below the detection limit of the tests (0.06 EU/ml)
Filter diameter	28 mm
Filter area	6.2 cm <sup>2</sup>
Flow rate	Typical values for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ 60 ml/min
Hold-up volume	0.1 ml for standard Minisarts®, 0.23 ml for Minisart® plus
Application	Max. recommended operational pressure: 4.5 bar 450 kPa 65 psi limits housing burst pressure, 6 bar 600 kPa 87 psi and higher Max. temperature, 50 °C
Materials	Cellulose acetate membrane filters, glass fiber prefilters (only for Minisart® plus), MBS polymerisate

### Order Numbers for 0.2 µm Minisart®

Pack of 50, sterile, individually packed	16534 K with Luer Lock outlet 17597 K with male luer slip outlet
Pack of 500, non-sterile bulk packed	16534 Q with Luer Lock outlet 17597 Q with male luer slip outlet

### Order Numbers for 0.2 µm Minisart® plus

Pack of 50, sterile, individually packed	17823 K with Luer Lock outlet
Pack of 500, non-sterile bulk packed	17823 Q with Luer Lock outlet

Special brochure available. Order no. SL-0003-e

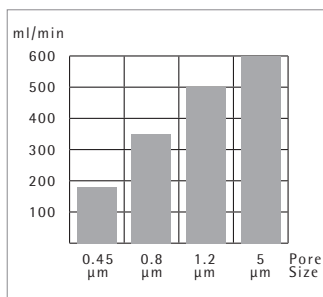


## High Flow Rate Minisart® Syringe Filters for Particle Removal, Ultracleaning and Prefiltration



Ready-to-use filter units with 0.45 µm, 0.8 µm, 1.2 µm or 5 µm pore size membrane filters. These independent filters fulfill your filtration requirements whenever volumes of up to 100 ml must be clarified or ultracleaned. They can also be used as prefilter in combination with a 0.2 µm Minisart®, increasing the total filterable volume.

The high flow rates of these units result from the large filter area and the very low flow resistance of the filter support, which is demonstrated by the relative constant increase in the flow rate with increasing pore size.



These flow rates contribute to user convenience by lowering the pressure required for filtration. Minisart® GF contains a glass fiber filter with a retention efficiency of 98% for 0.7 µm spherical particles. It is very useful when relatively dirty solutions are to be clarified, or when a prefilter is needed on an 0.2 µm or 0.45 µm Minisart®. Minisart® plus units also contain this glass fiber filter, but as a prefilter on a 0.45 µm or 1.2 µm membrane, for higher total throughputs.

### Order Numbers for Minisart® High Flow

0.1 µm, pack of 50, sterile, individually packed	16553 K with Luer Lock outlet
0.2 µm, pack of 50, sterile, individually packed	16532 K with Luer Lock outlet 16541 K with luer slip outlet
0.45 µm, pack of 50, sterile, individually packed	16537 K with Luer Lock outlet 16533 K with luer slip outlet

### Order Numbers for Standard 0.45 µm to 5 µm Minisarts®

Pack of 50, sterile, individually packed	17598 K	0.45 µm Minisart® with male luer slip outlet
	16555 K	0.45 µm Minisart® with Luer Lock outlet
	16592 K	0.8 µm Minisart® with Luer Lock outlet
	17593 K	1.2 µm Minisart® with Luer Lock outlet
	17594 K	5 µm Minisart® with Luer Lock outlet
Pack of 500, non-sterile bulk packed	17598 Q	0.45 µm Minisart® with male luer slip outlet
	16555 Q	0.45 µm Minisart® with Luer Lock outlet
	16592 Q	0.8 µm Minisart® with Luer Lock outlet
	17593 Q	1.2 µm Minisart® with Luer Lock outlet
	17594 Q	5 µm Minisart® with Luer Lock outlet

### Order Numbers for Minisart® plus Units

Pack of 50, sterile, individually packed	17829 K	0.45 µm with Luer Lock outlet
Pack of 500, non-sterile bulk packed	17829 Q	0.45 µm with Luer Lock outlet
	17825 Q	1.2 µm with Luer Lock outlet

### Order Numbers for Minisart® GF Units

Non-sterile bulk packed	17824 K	Luer Lock outlet, pack of 50
	17824 Q	Luer Lock outlet, pack of 50

Recommended accessories see page 46.

### Specifications for Minisarts®, Minisart® plus and Minisart® GF

Connectors	Female Luer Lock inlet, male Luer Lock outlet (the 0.45 µm unit is also available with a male luer slip outlet)
Application limits	Max. recommended operating pressure 4.5 bar 450 kPa 65 psi.
Housing burst pressure	6 bar 600 kPa 87 psi and higher
Max. temperature	50 °C
Bubble point	Min. value with water 2.0 bar 29 psi (0.45 µm), 0.8 bar 12 psi (0.8 µm), 0.7 bar 10 psi (1.2 µm), 0.4 bar 6 psi (5 µm), 0.5 bar 7 psi (Minisart® GF)
Flow rate	Typical values for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 160 ml/min (0.45 µm), 350 ml/min (0.8 µm), 400 ml/min (1.2 µm), 500 ml/min (5 µm), 450 ml/min (Minisart® GF)
Color coding	Yellow (0.45 µm), green (0.8 µm), red (1.2 µm), brown (5 µm), opaque (Minisart® GF)
Filter diameter	28 mm
Filter area	6.2 cm <sup>2</sup>
Materials	Cellulose acetate membrane (except Minisart® GF). Glass fiber filter (Minisart® GF and Minisart® plus). MBS polymerisate.
Hold-up volume	0.15 ml
Cytotoxicity	Detectably no inhibition with MRC-5 (human lung cells)



## Minisart® RC Units with Hydrophilic, Solvent-resistant RC-Membranes



Ready-to-use syringe filter units for simple, rapid and reliable ultracleaning of small-volume samples for HPLC or GC analysis.

Minisart® RC4 is recommended for sample volumes of up to about 5 ml and Minisart® RC25 for sample volumes of up to about 100 ml.

Minisart® RC units outperform competitive hydrophilic units in terms of compatibility with aqueous solutions and solvent mixtures.

They are compatible with the following substances:

Acetone	Hexane
Acetonitrile	Isobutanol
Gasoline	Isopropanol
n-Butanol	Methanol
Cellosolve (ethyl)	Methylenechloride
Chloroform	Methylethylketone
Diethyl acetamide	Pentane
Dimethyl sulfoxide	Tetrahydrofuran
Dioxane	Toluene
Acetic acid (96%)	Trichloroacetic acid (25%)
Ethanol	Trichlorethane
Ethyl acetate	Water
Ethylene glycol	Xylene
Freon TF	

### Specifications for Minisart® RC4, RC15 and RC25

Connectors	Female Luer Lock inlet. Luer slip outlet
Bubble point with water	> 2.0 bar (0.45 µm), > 3.4 bar (0.2 µm)
Flow rate for hexane at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , Minisart® RC4 Minisart® RC15 Minisart® RC25	10 ml/min (0.45 µm), 3.5 ml/min (0.2 µm) 280 ml/min (0.45 µm), 140 ml/min (0.2 µm) 430 ml/min (0.45 µm), 230 ml/min (0.2 µm)
Flow rate for methanol at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , Minisart® RC4 Minisart® RC15 Minisart® RC25	3.0 ml/min (0.45 µm), 1.5 ml/min (0.2 µm) 105 ml/min (0.45 µm), 55 ml/min (0.2 µm) 325 ml/min (0.45 µm), 160 ml/min (0.2 µm)
Flow rate for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , Minisart® RC4 Minisart® RC15 Minisart® RC25	1.5 ml/min (0.45 µm), 0.5 ml/min (0.2 µm)/3 bar 30 ml/min (0.45 µm), 10 ml/min (0.2 µm) 100 ml/min (0.45 µm), 60 ml/min (0.2 µm)
Filter diameter	4 mm (RC4), 15 mm (RC15), 25 mm (RC25)
Filter area	0.07 cm <sup>2</sup> (RC4), 1.7 cm <sup>2</sup> (RC15), 4.8 cm <sup>2</sup> (RC25)
Filling volume	0.17 ml (RC4), 0.45 ml (RC15), ca. 1.0 ml (RC25)
Housing burst pressure	6 bar   600 kPa   87 psi and higher
Materials	Polypropylene housing, reg. Cellulose membrane filter
Max. temperature	121 °C, 30 min (autoclave)
Pore size	0.45 µm or 0.2 µm
Hold-up volume	5 µl (RC4), 30 µl (RC15), ca. 100 µl (RC25)

**Order Numbers for Minisart® RC4**

17821 K	With 0.2 µm membrane, pack of 50
17821 Q	With 0.2 µm membrane, pack of 500
17822 K	With 0.45 µm membrane, pack of 50
17822 Q	With 0.45 µm membrane, pack of 500

**Order Numbers for Minisart® RC15**

17761 K	With 0.2 µm membrane, pack of 50
17761 ACK	With 0.2 µm membrane, pack of 50, sterile, individually packed
17761 Q	With 0.2 µm membrane, pack of 500
17762 K	With 0.45 µm membrane, pack of 50
17762 Q	With 0.45 µm membrane, pack of 500

**Order Numbers for Minisart® RC25**

17764 K	With 0.2 µm membrane, pack of 50
17764 ACK	With 0.2 µm membrane, pack of 50, sterile, individually packed
17764 Q	With 0.2 µm membrane, pack of 500
17765 K	With 0.45 µm membrane, pack of 50
17765 Q	With 0.45 µm membrane, pack of 500



**Minisart® NY25 (Polyamide), NY15, NYXplus**

<b>Dead Volume</b>		<b>0.030 ml</b>
Connector, outlet	male Luer Slip	
Connector, inlet	female Luer Lock	
Pore size	0.2 µm	0.45 µm
Order number (50 units)	1776B-K	1776C-K
Order number (500 units)	1776B-Q	1776C-Q
Housing material	Polypropylene	Polypropylene
Membranes material	Polyamide	Polyamide
Membranes diameter	15 mm	15 mm
Membranes area	1.7 cm <sup>2</sup>	1.7 cm <sup>2</sup>
Filling volume	0.45 ml	0.45 ml
Burst pressure	6 bar 600 kPa	6 bar 600 kPa
Max. temperature (autoclave)	121 °C, 30 min	121 °C, 30 min
Flow rate for water	> 20 ml/min	> 40 ml/min



<b>Dead Volume</b>		<b>0.144 ml</b>
Connector, outlet	Male Luer Slip	
Connector, inlet	Female Luer Lock	
Pore size	0.2 µm	0,45 µm
Order number (50 units)	1784B-K	1784C-K
Order number (500 units)	1784B-Q	1784C-K
Housing material	Polypropylene	Polypropylene
Membranes material	Polyamide + GF	Polyamid + GF
Membranes diameter	25 mm	25 mm
Membranes area	4.8 cm <sup>2</sup>	4.8 cm <sup>2</sup>
Filling volume	0.854 ml	0.854 ml
Burst pressure	6 bar 600 kPa	6 bar 600 kPa
Max. temperature (autoclave)	121 °C, 30 min	121 °C, 30 min
Flow rate for water	> 75 ml/min	> 130 ml/min



<b>Dead Volume</b>		<b>0.10 ml</b>
Connector, outlet	Male Luer Slip	
Connector, inlet	Female Luer Lock	
Pore size	0.2 µm	0.45 µm
Order number (50 units)	17845-ACK	17846-ACK
Order number (500 units)	17845-Q	17846-Q
Housing material	Polypropylene	Polypropylene
Membranes material	Polyamide	Polyamide
Membranes diameter	25 mm	25 mm
Membranes area	4.8 cm <sup>2</sup>	4.8 cm <sup>2</sup>
Filling volume	1.0 ml	1.0 ml
Burst pressure	6 bar 600 kPa	6 bar 600 kPa
Max. temperature (autoclave)	121 °C, 30 min	121 °C, 30 min
Flow rate for water	> 50 ml/min	> 80 ml/min

## Minisart® SRP Units with a Clean and Chemically Inert PTFE Membrane

Ready-to-use units for simple, rapid and reliable ultracleaning of small-volume samples for HPLC or GC analysis, which require an even more chemical resistant unit than Minisart® RC, e.g. for solvents such as acetone, dimethylformamide and DMSO, or for aggressive aqueous liquids.

Minisart® SRP4 is recommended for sample volumes of up to about 1 ml, Minisart® SRP15 for up to about 5 ml and Minisart® SRP 25 for up to 100 ml.



### Specifications for Minisart® SRP4, SRP15 and SRP25

Connectors	Female Luer Lock inlet, luer slip outlet (Minisart® SRP15 is also available with a small spike outlet)
Bubble point	With isopropanol, 0.9 bar (0.45 µm) or 1.4 bar (0.2 µm)
Flow rate for ethanol at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , Minisart® SRP4 Minisart® SRP15 Minisart® SRP25	2.0 ml/min (0.45 µm)/3 bar 45 ml/min (0.45 µm), 20 ml/min (0.2 µm) 130 ml/min (0.45 µm), 70 ml/min (0.2 µm)
Flow rate for methanol at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , Minisart® SRP4 Minisart® SRP15 Minisart® SRP25	4.5 ml/min (0.45 µm) 150 ml/min (0.45 µm), 55 ml/min (0.2 µm) 260 ml/min (0.45 µm), 160 ml/min (0.2 µm)
Flow rate for air at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , Minisart® SRP4 Minisart® SRP15 Minisart® SRP25	0.06 l/min (0.45 µm) 1.1 l/min (0.45 µm), 0.5 l/min (0.2 µm) 1.8 l/min (0.45 µm), 1.2 l/min (0.2 µm)
Filter diameter	4 mm (SRP4), 15 mm (SRP15), 25 mm (SRP25)
Filter area	0.07 cm <sup>2</sup> (SRP4), 1.7 cm <sup>2</sup> (SRP15), 4.8 cm <sup>2</sup> (SRP25)
Housing burst pressure	6 bar   600 kPa   87 psi and higher
Materials	Polypropylene (housing), Polypropylene-reinforced PTFE (membrane filter)
Max. temperature	121 °C, 30 min (autoclave)
Pore size	0.45 µm or 0.2 µm (Minisart® SRP4, only 0.45 µm)
Hold-up volume	5 µl (SRP4), 10 µl (SRP15), 100 µl (SRP25)
Water penetration point	3.0 bar (0.45 µm) or 4.0 bar (0.2 µm)



**Order Numbers for Minisart® SRP4**

17820 K	With 0.45 µm membrane, pack of 50
17820 Q	With 0.45 µm membrane, pack of 500



**Order Numbers for Minisart® SRP15 with spike outlet**

17558 K	With 0.2 µm membrane, pack of 50
17558 Q	With 0.2 µm membrane, pack of 500
17559 K	With 0.45 µm membrane, pack of 50
17559 Q	With 0.45 µm membrane, pack of 500



**Order Numbers for Minisart® SRP15 with luer outlet**

17573 K	With 0.2 µm membrane, pack of 50
17573 ACK	With 0.2 µm membrane, pack of 50, sterile, individually packed
17573 Q	With 0.2 µm membrane, pack of 500
17574 K	With 0.45 µm membrane, pack of 50
17574 Q	With 0.45 µm membrane, pack of 500



**Order Numbers for Minisart® SRP25**

17575 K	With 0.2 µm membrane, pack of 50
17575 ACK	With 0.2 µm membrane, pack of 50, sterile, individually packed
17575 Q	With 0.2 µm membrane, pack of 500
17576 K	With 0.45 µm membrane, pack of 50
17576 Q	With 0.45 µm membrane, pack of 500



## Re-usable, 13 mm Syringe Filter Holders for the Ultracleaning of Small Volumes (up to about 10 ml)

### PTFE Holder for Solvents and Chemicals

Made completely of PTFE, this holder is unaffected by chemicals and contains no trace elements which could be released into the liquid being filtered. It is therefore extremely well suited for particle removal from samples and reagents for analytical methods, such as NMR samples.

Other benefits of this application are the low hold-up volume, the easy cleaning and the drying at a temperature of 180 °C.

The construction of the holder ensures leak proof sealing without a sealing ring, and avoids twisting of the membrane filter when the top is tightened onto the base.



### Specifications for the 13 mm PTFE Syringe Filter Holder

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for PTFE
Flow rate for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ With 0.2 $\mu\text{m}$ membrane filter	Approx. 10 ml/min
With 0.45 $\mu\text{m}$ membrane filter	18 ml/min
Filtration area	0.5 cm <sup>2</sup>
Weight	13 g
Materials	PTFE top and bottom part
Max. operating pressure	5 bar   500 kPa   72.5 psi
Membrane filter diameter	13 mm
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)
Hold-up volume	Less than 0.03 ml after overcoming the bubble point (0.3 ml before)

### Order Number for the 13 mm PTFE Syringe Filter Holder

16574





### Polycarbonate Holder for Aqueous Solutions

This inexpensive filter holder is made of clear, autoclavable polycarbonate and contains a silicone gasket for leak-proof sealing. It can be used at pressures of up to 7 bar by simply manually screwing it together.

Filter supports in the top and bottom parts allow filtration in either direction.



### Specifications for the 13 mm Polycarbonate Syringe Filter Holder

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Flow rate for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , With 0.2 $\mu\text{m}$ membrane filter With 0.45 $\mu\text{m}$ membrane filter	Approx. 18 ml/min 35 ml/min
Membrane filter	35 ml/min with 0.45 $\mu\text{m}$ membrane filter
Filtration area	0.5 $\text{cm}^2$
Materials	Polycarbonate top and bottom part, silicone gasket 10 f 14.9 mm (replacement part no. 6980569 for a pack of 10)
Max. operating pressure	7 bar   700 kPa   101.57 psi
Membrane filter diameter	13 mm
Sterilization	By autoclaving at 121 °C
Hold-up volume	Less than 0.2 ml after overcoming the bubble point (0.3 ml before)

### Order Number for the 13 mm Polycarbonate Syringe Filter Holder

16514E	Pack of 12
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Recommended accessories are described on page 46.

## Re-usable 25 mm Syringe Filter Holders for the Ultracleaning and Sterilizing Filtration of Volumes of up to about 100 ml

### Stainless Steel Holder for Solvents and Chemicals

The PTFE-coated surface on the top part is an important property of the filter holder and ensures leak-proof sealing without a sealing ring. As a result, the heat-resistance is extremely good, and the chemical compatibility depends only on the inserted filter type.

The top part can easily be mounted on the bottom part using the enclosed tightening tool.

Filter supports in the top and bottom parts allow filtration in either direction.



### Specifications for the 25 mm Stainless Steel Holder

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for stainless steel and PTFE
Flow rate for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ With 0.2 $\mu\text{m}$ membrane filter With 0.45 $\mu\text{m}$ membrane filter	Approx. 45 ml/min 80 ml/min
Membrane filter	80 ml/min with 0.45 $\mu\text{m}$ membrane filter
Filtration area	3 cm <sup>2</sup>
Materials	Stainless steel (1.4305) top and bottom parts. PTFE-coated sealing area in top part. Luran 368R tightening tool (replacement part no. 6980595)
Max. operating pressure	7 bar   700 kPa   101.5 psi
Membrane filter diameter	25 mm
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)
Hold-up volume	Less than 0.1 ml after overcoming the bubble point (0.3 ml before)

### Order Number for the 25 mm Stainless Steel Holder

16214





### Polycarbonate Holder for Aqueous Solutions

This inexpensive filter holder is made of clear, autoclavable polycarbonate and offers a filtration area six times the amount of that of the 13 mm holder described on page 41. The silicone gasket enables a leak-free filtration at pressures of up to 7 bar by simply manually screwing it together.

Filter supports in the top and bottom parts allow filtration in either direction.



### Specifications for the 25 mm Polycarbonate Syringe Filter Holder

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Flow rate for water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$	
With 0.2 $\mu\text{m}$ membrane filter	70 ml/min
With 0.45 $\mu\text{m}$ membrane filter	110 ml/min
Filtration area	3 $\text{cm}^2$
Materials	Polycarbonate top and bottom parts, silicone flat gasket 20 f 25 mm (replacement part no. 1EDS-D0053 for a pack of 10)
Max. operating pressure	7 bar   700 kPa   101.5 psi
Membrane filter diameter	25 mm
Sterilization	By autoclaving at 121 °C
Hold-up volume	Less than 0.3 ml after overcoming the bubble point (0.6 ml before)

### Order Number for the 25 mm Polycarbonate Syringe Filter Holder

16517E	Pack of 12
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Recommended accessories are described on page 46. Filters see page 20.

## Ultrasart D20 for LAL Tests without Interference

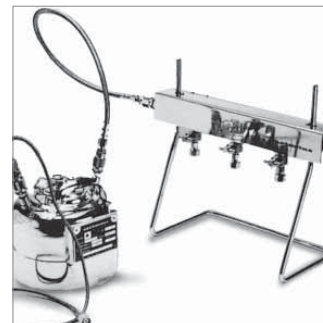
### Ultrasart D20

The Limulus Amoebocyte Lysate test is commonly used in pharmaceutical quality control. The ready-to-use ultrafiltration units Ultrasart D20 allow for removal of disturbing, low-molecular substances out of LAL-test samples within 15–30 minutes, without reducing the sensitivity of the test.

### Pressure System for Ultrasart D20

Consists of a pressure manifold for 3 Ultrasart D20 units, valves for individual control of pressure and/or flow and air venting, a 3 liter pressure tank and connecting hoses. Additional pressure manifolds can be connected by using the adapter 17152 or 17153.

Depyrogenation, after removal of the pressure gauge, at up to 200 °C.



### Specifications for Ultrasart D20

Chemical compatibility	Resistant to aqueous solutions of pH 3–9, and when contacting 1M amino acid up to 2 hours
Filtration area	5.3 cm <sup>2</sup>
Flow rate	For water at 1 bar   14.5 psi, 2 ml/min
Materials	Cellulose triacetate ultrafilter (20,000 D MWCO, 100% endotoxin retention), SAN and MBS-cyrolite housing
Max. sample volume	15 ml

### Specifications for Pressure System for Ultrasart D20

Max. operating pressure	5 bar
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### Order Numbers for Ultrasart D20

16520 C  
Ultrasart D20 ultrafiltration units, sterile and pyrogen-free, pack of 6

### Order Numbers for Pressure System for Ultrasart D20

16506	Complete Pressure system
16565	Pressure manifold
16663	Pressure tank 3 l
16698	Pressure hose for connecting tank to manifold
16664	Pressure hose for connecting tank to pressure source

## Accessories for Ready-to-use Minisarts® and Re-usable Syringe Filter Holders



### Dosing Syringe

The dosing syringe is perfectly suitable in connection with a filter holder for rapid and simple filtration. The new dosing syringe in combination with our Minisart® filter holders are ideal for wetting our nutrient pad sets with sterile water.

The volume of the dosing syringe can be infinitely adjusted from 0.5 to 5.0 ml by turning the screw on the handle. The syringe is user- and maintenance-friendly. Moreover, it is very easy to handle and so avoids fatigue signs of the hand after longer use.

The dosing syringe can be disinfected by boiling. It is not recommended to autoclave the syringes. If autoclaving is absolutely necessary, the plastic handle must first be removed.



### Order Number for Dosing Syringe 16685--2

Order Number for 3-way Valve	16639	Autoclavable (121 °C).
Replacement parts	6986070	Sealing (4 f)
	6986071	Pressure spring (2 f)
	6986072	Fixing spring (2 f)
	6986073	Perbunan valve (2 f)
Order Numbers for Disposable Syringes	16644E	5 ml volume, pack of 12
	16645E	10 ml volume, pack of 12
	16646E	20 ml volume, pack of 12
	16647E	50 ml volume, pack of 12
Order Numbers for Needles	01324	Stainless steel needle
	01325	Disposable needle

### 3-way Valve

Allows conduction of continuous filtration when connected to a syringe and fitted on the outlet side with a filter holder.

### Disposable Syringes

They can be used with the 3-way valve and the filter holders with a female luer lock inlet connection. One packet contains 12 individually packed needles and 12 disposable needles.

### Needles

Fit on the luer slip outlets of the syringe filter holders. Accommodates the piercing of silicone caps or rubber bungs and the selective induction of the filtrate into a tube or an other vessel. The stainless steel needle is autoclavable.



## Sartorius Sartolab® RF|BT Vacuum Filtration Units

Sartorius Sartolab® RF and BT units are optimized for the application in cell culture. The built-in membrane made of polyethersulfone guarantees extremely high flow rates and low protein binding, and is therefore ideal for the filtration of solutions containing proteins.

The receiver flask is delivered with tube adapter and closure lid.

The Sartolab® RF units are sterile complete units with a drainage vessel; the Sartolab® BT holders can usually be adapted to trade, vacuum resistant bottles with a screw connector 45. Attention: only use bottles which are licensed for sub-pressure methods.

Available in different sizes.

Sartorius Sartolab® 150 V filtration unit with pleated 0.2 µm PES membrane for vacuum filtration|sterile filtration of up to several liters.

By opening the drain valve protected by a 0.2 µm PTFE membrane, the created vacuum can be interrupted to replace the filled receiver flask for a new one. Filtration restarts, when the drain valve is closing. This procedure of "continuous" filtration can be repeated several times.

The 0.2 µm pleated PES membrane with an area of 150 cm<sup>2</sup> guarantees reliable sterile filtration of media, buffers and many other solutions. They can be used universally on bottles with a diameter of up to 58 mm.



### Order Numbers for Sartolab® RF Vacuum Filtration Units

180C1-----E	150 ml, with receiver, 18 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 12 units
180C7-----E	250 ml, with receiver, 24 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 12 units
180C2-----E	500 ml, with receiver, 63 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 12 units
180C3-----E	1000 ml, with receiver, 79 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 12 units
180C8-----E	1000 ml, with receiver, 79 cm <sup>2</sup> filter area, 0.1 µm PES membrane Case with 12 units

### Order Numbers for Sartolab® BT Vacuum Filtration Units

180C4-----K	150 ml, 18 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 48 units
180C5-----E	500 ml, 63 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 12 units
180C6-----E	1000 ml, 79 cm <sup>2</sup> filter area, 0.22 µm PES membrane Case with 12 units

### Order Number for Sartolab® 150 V

18080-----M	Sterile vacuum filtration unit, pack of 3
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Special brochure available. Order no. SLU1511-e and SL-2023-e

## 25 mm Glass Holder for the Filtration of Small Volumes



### 25 mm Glass Holder for Hybridisation Tests, Particle Testing and Clarification

The two devices differ only in the filter support, the glass frit or the PTFE-coated screen support. The device with glass frit ensures uniform distribution of particles and is therefore recommended, when the retained particles on the filter surface are of interest. As it is easy to clean, the device with a PTFE-coated screen support is more suitable when the filtrate is required or for radiochemical work.

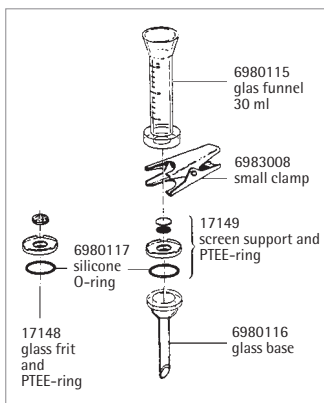
The PTFE ring, which holds the glass frit or the screen support, allows for the autoclaving of devices with a filter in position and without adherence of the filter to the support. It also protects the rim of the glass frit from breakage and from potential leakage.

It has a rim around the upper edge to simplify the positioning of the membrane filter when inserted, and a silicone ring on the underside for a reliable seal on the filtrate side. The funnel-shaped top part simplifies filling in the sample.



### Specifications

Outlet spout	12 mm †
Parts and materials	Borosilicate glass funnel and base. PTFE glass filter support (type 16306) and PTFE stainless steel, coated with Teflon (type 16315) Silicone O-ring 25 f 3 mm Aluminium clamp
Chemical compatibility	As for glass, PTFE and silicone. The silicone O-ring can be replaced by a Viton O-ring, order no. 00118
Flow rate for water at 90% vacuum	50 ml/min with 0.2 µm 150 ml/min with 0.45 µm 500 ml/min with 0.8 µm membrane filter
Funnel capacity	30 ml
Filtration area	3 cm <sup>2</sup>
Suitable membrane filter diameter	25 mm (or 24 mm)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



### Order Numbers

16306	Glass device for 25 mm membrane filter, with glass frit
16315	Glass device for 25 mm membrane filter, with PTFE-coated screen support

Recommended accessories are described on page 53.  
Replacement parts see diagram.

## 50 mm Glass Holder with Protective PTFE Ring, for Particle Testing or Clarification and Sterile Filtration

This filter holder is available in two versions differing from each other only in the type of the filter support. The filter with glass frit ensures uniform distribution of retained particles and is therefore recommended, when the residue on the filter surface is of interest. Because it is easy to clean, the device with the PTFE-coated screen support is preferable when the filtrate is required, or when liquids difficult to remove from glass frits must be examined.

The PTFE ring, which holds the glass frit and the screen support, allows for the autoclaving of the devices with a filter in position and protects the edge of the glass frit from breakage and potential leakage. It has a rim around the upper edge to simplify the positioning of the membrane filter when inserted and a silicone O-ring in the underside for a leak-proof seal on the filtrate side.



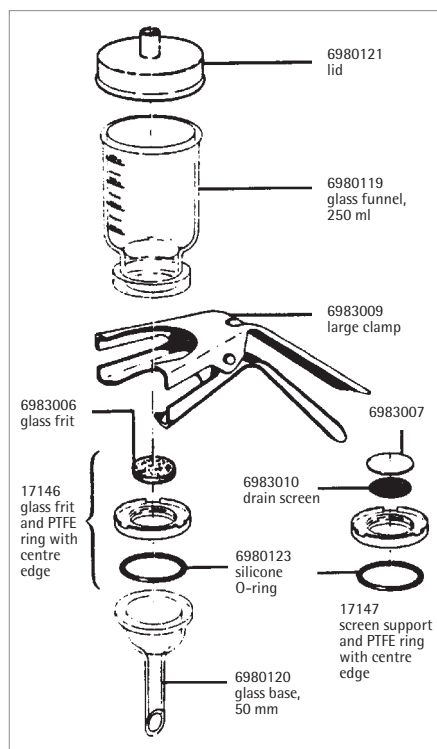
### Specifications for the 50 mm Glass Holder

Outlet spouts	15 mm outside diameter
Parts and materials	Borosilicate glass funnel and base. Anodised aluminium clamp. Silicone caoutchouc lid. PTFE glass filter support (type 16307) and PTFE stainless steel filter support, coated with Teflon (type 16316). Silicone O-ring 45 f 3 mm
Chemical compatibility	As for glass, PTFE and silicone (see page 124). If required, the silicone O-ring can be replaced by a Viton O-ring (order no. 00124).
Flow rate	For water at 90% vacuum, 200 ml/min with 0.2 µm, 600 ml/min with 0.45 µm, 2.2 l/min with 0.8 µm membrane filter.
Funnel capacity	250 ml
Filtration area	12.5 cm <sup>2</sup>
Max. operating pressure	Only for vacuum
Suitable membrane filter diameter	50 mm (or 47 mm)
Sterilization	By autoclaving (121 °C or 134 °C) or by dry heat (max. 180 °C).

### Order Numbers for the 50 mm Glass Holders

- 16307 Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with glass frit filter support
- 16316 Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with PTFE-coated screen filter support

Recommended accessories are described on page 53. Replacement parts see diagram.





## All-glass Holder for Particle Removal from Solvents for Analytical Determinations



All areas, where liquid and device can come into direct contact, are made of glass or PTFE. The device, in combination with solvent-resistant, hydrophilic RC-membranes (Type 184, see page 22), is therefore ideal for ultracleaning and degassing solvents and solvent mixtures for HPLC, GC and AA.

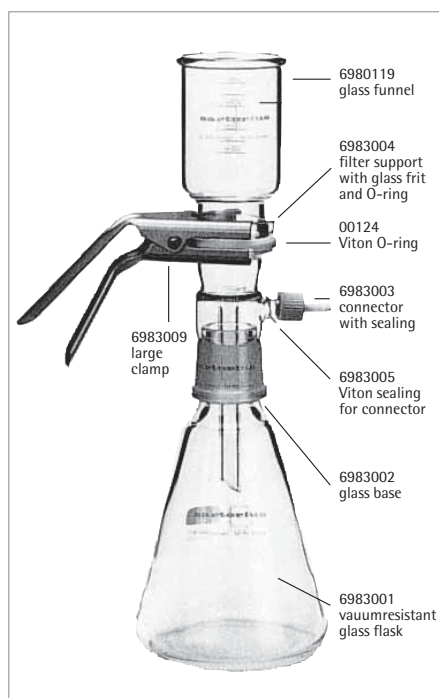
Convenience of handling is ensured by several beneficial features. A 6 mm wide non-ground rim above the ground glass neck of the suction flask prevents the filtrate from contacting grease on the ground glass surface and so avoids its contamination while being poured out of the flask.

The hose nipple connector is made of polypropylene for safe connection of the vacuum hose. The filtrate outlet spout ends well below the entrance to this hose nipple.



### Specifications for the All-glass Holder

Parts and materials	Borosilicate glass funnel, base and flask.
Filter support	PTFE ring holding a glass frit, with Viton O-ring (45 f 3 mm). Anodized aluminium clamp.
Chemical compatibility	As for glass and PTFE
Flow rate	For water at 90% vacuum, 200 ml/min with 0.2 µm, 600 ml/min with 0.45 µm, 2.2 l/min with 0.8 µm membrane filter.
Funnel capacity	250 ml
Capacity of the filtrate flask	1 liter
Filtration area	12.5 cm <sup>2</sup>
Max. operating pressure	Only for vacuum
Suitable membrane filter diameter	50 mm (or 47 mm)
Sterilization (without connector)	By autoclaving (121 °C or 134 °C) or by dry heat (max. 180 °C).



### Order Number for the All-glass Holder

16309 All-glass vacuum filtration unit for 50 mm (or 47 mm) membrane filter, with vacuum-resistant flask, capacity 1 liter

Recommended accessories are described on page 53. For replacement parts, see diagram.

## Polycarbonate Holders for the Clarification or Sterile Filtration of up to about 200 ml Volumes of Aqueous Solutions

Type 16510 is complete with a receiver flask and can be operated with sub-pressure as well as with slight over-pressure (0.5 bar is recommended for highest standing times). It is, together with a vacuum hand pump, a practical, cost-effective system for the filtration in and outside the laboratory.

For sterile filtrations, the filter holder, included in the delivery, is equipped with a glass fiber filter 13400-0013 and enables sterile venting for pressure compensation in order to avoid contamination of the sterile filtrate. The funnel fits onto the central opening of the lid and simplifies filling the liquid in the top part.

Type 16511 is like 16510, but without a receiver flask. It is used on a suction flask or a vacuum manifold, e.g. Combisart, see page 231.



### Specifications for 47 mm Polycarbonat Holders

Parts supplied	Type 16510, top part complete with lid, stopper for lid, plug and funnel, base part with hose nipple and filter holder, receiver flask with lid, all made of polycarbonate. Silicone O-rings for lid (80 f 3 mm), filter support (40 f 5 mm) and opening (14 f 2 mm). Polypropylene filter support.
Components	Type 16511, like 16510 but without receiver flask
Chemical compatibility	As for polycarbonate, polypropylene and silicone
Flow rate	For water at 90% vacuum, 200 ml/min with 0.2 µm, 700 ml/min with 0.45 µm, 2 l/min with 0.8 µm membrane filter.
Capacity	Top part and receiver flask, 250 ml
Filtration area	12.5 cm <sup>2</sup>
Max. operating pressure	Vacuum or max. 2 bar 200 kPa overpressure Suitable membrane filter diameter, 47 mm (prefilter, 37 mm).
Sterilization	By autoclaving at 121 °C. The polycarbonate material withstands numerous cycles, provided aggressive cleaning agents are completely washed off and that the steam does not contain anticorrosive, anti-scaling boiler water additives.





#### Order Numbers for 47 mm Polycarbonate Holders

16510	Polycarbonate holder for 47 mm membrane filter, with 250 ml top part and receiver flask, for vacuum or pressure filtration.
16511	Polycarbonate holder for 47 mm membrane filter, with 250 ml top part, for vacuum filtration.

Recommended accessories are described on page 53|96.



#### Replacement Parts

16514E	13 mm filter holder, pack of 12
6980110	Silicone O-ring, 40 f 5 mm
6980225	Plug, pack of 10
6980226	Funnel
6980227	Stopper for lid
6980228	Lid
6980229	Silicone O-ring, 80 f 3 mm, pack of 2
6980230	Top part, 250 ml
6980232	Filter support, pack of 2
6980233	Base part
6980234	Hose nipple
6980235	Silicone O-ring, 14 f 2 mm, pack of 3
6980236	Silicone cap, pack of 10
6981090	Receiver flask

## Accessories for Vacuum Filter Holders

### Laboratory Vacuum Pump, 90%

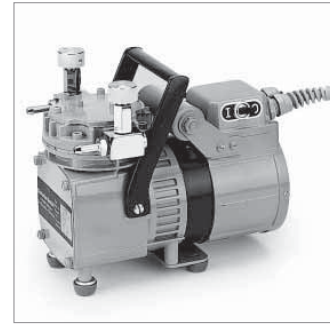
Compact, reliable and oil-free membrane pump with low noise level.

#### Specifications

Max. vacuum	90% (100 mbar, 76 torr)
Max. flow rate [l/min]	20
Wattage [W]	80
Weight [kg]	4.5
Dimensions [mm]	203 f 145 f 187
Max. ambient temperature	40 °C

#### Order Numbers

16692	220 V, 50 Hz
16695	110 V, 60 Hz
Replacement part 6986105	Set of one neoprene membrane, two valve springs and one neoprene head seal.



### Laboratory Vacuum Pump, 98%

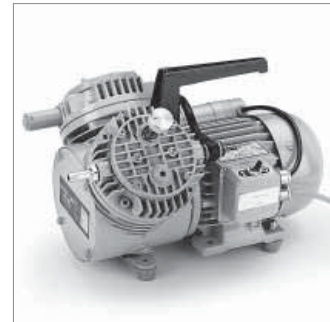
Membrane pump with high performance, reliable vacuum source, oil-free.

#### Specifications

Max. vacuum	13 mbar (10 torr)
Max. flow rate [l/min]	26
Wattage [W]	120
Current [Amp]	1.8
Weight [kg]	9.8
Dimensions [mm]	338 f 250 f 225
Max. ambient temperature	40 °C

#### Order Numbers

16612	220 V, 50 Hz
16615	110 V, 60 Hz
Replacement part 6986017	Set of two neoprene membranes, four valve springs and two neoprene head seals.





**Water Jet Pump with G<sup>3</sup>/<sub>4</sub> Female Thread**

Simple vacuum source. For connection to a water tap with G<sup>3</sup>/<sub>4</sub> male thread.

**Order Number**

16611



**Suction Flask, 2 Liter Capacity**

Vacuum-resistant flask made of Duran 50 glass with plastic safety hose nipple according to the German Industrial Standard No. 12476. Outer diameter of the hose nipple, 9 mm. Inner diameter of the opening, 60 mm. Stoppers are not enclosed.

A 1 liter capacity flask is available for countries which do not have safety restrictions on glass hose nipples.

**Order Numbers**

16672	For 2 l capacity
16672-----1	For 5 l capacity including stopper and adapter
16606	For 1 l capacity for countries which do not have safety restrictions on glass hose nipples.

**Order Numbers for Bored Stoppers for Vacuum-Resistant Flask, 2 l, 16672**

17173	For stainless steel holders 16201, 16219, 16220
17174	For 25 mm glass holders
17175	For 50 mm glass holders

**Order Numbers for Stoppers for 1 l Flask, 16606**

17004	For stainless steel holders 16201, 16219, 16220
17005	For 25 mm glass holders
17006	For 47/50 mm glass holders

**Woulff's Bottle, 500 ml**

Used between suction flask and vacuum source. Allows simple control of the vacuum with glass units without a separate tap and also prevents the filtrate from overflowing from the suction flask.

**Order Number**

16610

**Water Trap, Vacusart**

Vacusart is a ready-to-connect filtration unit, consisting of a polypropylene housing and a water-repellent, but porous PTFE membrane with a pore size of 0.45 µm. Vacusart is perfectly suitable for the protection of vacuum pumps.

**Order Number**

17804 M

Pack of 3

**Peristaltic Pump****Specification**

Maximum rotor speeds	50 rpm and 400 rpm
Operating voltages and frequencies	110–240 V 50/60 Hz
Speed control ratio	20:1
Power rating	100 VA
Operating temperature	5 °C to 40 °C
Storage temperature range	–40 °C to 70 °C
Weight [kg lb]	5.35 12
Noise	<70 dBA at 1 m
Standards	IEC 335-1, EN 60529 (IP31)
Machinery Directive	98/37/EC EN 60204-1
Low Voltage Directive	73/23/EEC EN 61010-1
EMC Directive	89/336/EEC EN 50081-1/EN 50082-1

**Order Number**

16697---00

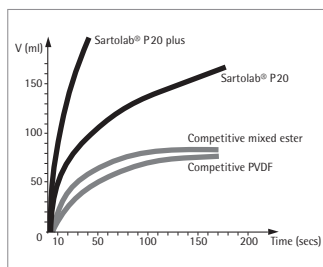
## Sartolab® P20 and Sartolab® P20 plus for Reliable Sterile Filtration of Tissue Culture Solutions



Ready-to-use units which, attached to a membrane pump or tube pump, quickly and reliably sterilize 100 ml to 5 liter of media and aqueous solutions.

The combination of a large filtration area (20 cm<sup>2</sup>) and an automatic de-aeration ensures high flow rates and optimal total throughputs. Automatic venting of any trapped air through the PTFE membrane-protected vent ports ensures that the entire filter surface is used for effective filtration.

Sartolab® P20 units have an extraordinarily favorable price-performance ratio. Often, the total filterable volume can even be doubled due to an integrated binder-free glass fiber prefilter.



Top part: results with contaminated medium (DMEM + 10% FCS), at 1 bar differential pressure.

### Specifications for Sartolab® P20 Units

Connectors	Inlet, Luer Lock inner cone or 6–12 mm stepped hose nipple. Outlet, 6–12 mm stepped hose nipple
Biosafety	Pass the USP Plastics-Class VI-Test
Bubble point	Min. value with water, 3.2 bar 320 kPa 46 psi
Flow rate	For water 250 ml/min at $\Delta p = 1 \text{ bar}$  100 kPa 14.5 psi
Filtration area	20 cm <sup>2</sup>
Filling volume	6 ml
Housing burst pressure	> 5 bar 500 kPa 72.5 psi
Materials	Membrane filter (0.2 $\mu\text{m}$ ). Cellulose acetate (SFCA) or Polyethersulfone. PTFE airfilter. Polycarbonate housing
Max. recommended inlet pressure	3 bar 300 kPa 43.5 psi
Protein adsorption	Less than 10 $\mu\text{g}$ $\gamma$ -Globulin/cm <sup>2</sup>
Hold-up volume	0.3 ml after (1.3 ml before) bubble point
Toxicity	Non-toxic as confirmed with L929 fibroblast cells of mice and with MRC-5 lung cells of human embryonic origin
Accessories	Integrity holder 18099

### Specifications for Sartolab® P20 plus Units

As for P20, except	
Filling volume	5.5 ml
Materials	Supplemented with a binder-free glass fiber prefilter
Protein adsorption	Varies due to the prefilter
Hold-up volume	0.9 ml after (1.8 ml before) bubble point

Order numbers see next page.

**Order Numbers for Sartolab® P20 Units**

18052-----D (SFCA)	With hose nipple inlet connection, pack of 10
18053-----D (SFCA)	With Luer Lock inlet connection, pack of 10
18075-----D (PES)	With Luer Lock inlet connection, pack of 10, without automatic venting

**Order Numbers for Sartolab® P20 plus Units**

18056-----D (SFCA + GF)	With hose nipple inlet connection, pack of 10
18058-----D (SFCA + GF)	With Luer Lock inlet connection, pack of 10
18068-----D (PES + GF)	With Luer Lock inlet connection, pack of 10

Recommended accessories are described on page 96.  
Special brochure available on request. Order no. SL-3009-e





## SartoScale Filter Test Disposables for Use in the Biopharmaceutical Industry



### Description

SartoScale filter test disposables are designed to perform reliable filterability trials with 47 mm flat filter discs of original filter cartridge material. The use of disposables for filtration trials avoids time consuming preparation of filter discs in stainless steel filter holders and prevents installation mistakes of the flat filter discs.

### Applications

SartoScale filter test disposables are ideally suited to perform all kind of filterability trials with the target to select the optimal membrane material for a certain application or to determine the ideal combination of prefilters and final filters with minimum product volumes.

### Original Filter Material

SartoScale filter test disposables contain the original filter active material of the respective filter cartridges in order to assure reproducible test results.

### Scale-up

After material selection or determination of a prefilter|final filter scheme with SartoScale filter test disposables a scale-up for flow rate and total throughput performance of the selected materials should be done using small scale pleated capsule devices (e. g. capsules of type 150).

### Optimized Design

SartoScale filter test disposables feature ultra low hold up and dead volumes in order to perform filterability trials with minimized product volumes.

### Reliability

SartoScale filter test disposables containing integrity testable membrane filters can be tested for integrity by a bubble-point test to assure reliable test results.

### Zero-T-Test System

We recommend to use SartoScale filter test disposables together with our Zero-T Filter Test System in order to perform filtration trials effectively. The Zero-T-System consists of hardware and software modules which allow easy handling and installation of the SartoScale filter test disposables. Automatic data acquisition is achieved by the connection of a balance to a laptop. The software analyses automatically the incoming data for scale-up calculations.

### Availability

SartoScale filter test disposables will become available for all filter materials of Sartorius AG including:

- Sartopore® 2 544...
- Sartobran® P 523...
- Sartolon® 510...
- Sartofluor® 518...
- Sartoclean® CA 562...
- Sartoclean® GF 560...
- Sartopure® PP2 559...
- Sartopure® GFPlus 555...
- Sartoguard® GF 548...
- Sartoguard® PES 547...
- Sartopore® 2 XLI 544...
- Sartopore® 2 XLG 544...
- Sartopore® 2 XLM 544...

### Specifications for SartoScale

Biosafety	All materials pass the USP Plastic Test Class VI
Extractables	Meet or exceed the requirements for WFI quality standards set by the current USP
Connectors	See order numbers
Filter area	13 cm <sup>2</sup>
Materials	Capsule housing polypropylene, all common filter materials of Sartorius
Regulatory Compliance	Non pyrogenic according to USP Bacterial Endotoxins, non fibre releasing according to 21 CFR
Max. differential pressure	5 bar 72.5 psi at 20 °C, 2 bar 29 psi at 80 °C
Sterilization	By autoclaving at 134 °C, 2 bar, 30 min. Non in-line steam sterilization

## Order Information

5445307HS--**--M	Sartopore® 2 0.2 µm, pack of 3
5445358KS--**--M	Sartopore® 2 0.1 µm, pack of 3
5445306GS--**--M	Sartopore® 2 0.45 µm, pack of 3
5445307GS--**--M	Sartopore® 2 XLG 0.2 µm, pack of 3
5445307IS--**--M	Sartopore® 2 XLI 0.2 µm, pack of 3
5445358MS--**--M	Sartopore® 2 XLM 0.1 µm, pack of 3
5235307HS--**--M	Sartobran® P 0.2 µm, pack of 3
5235358HS--**--M	Sartobran® P 0.1 µm, pack of 3
5235306DS--**--M	Sartobran® P 0.45 µm, pack of 3
5105307HS--**--M	Sartolon® 0.2 µm, pack of 3
5625307AS--**--M	Sartoclean® CA 0.2 µm, pack of 3
5625306AS--**--M	Sartoclean® CA 0.45 µm, pack of 3
5625305GS--**--M	Sartoclean® CA 0.65 µm, pack of 3
5625304ES--**--M	Sartoclean® CA 0.8 µm, pack of 3
5605305GS--**--M	Sartoclean® GF 0.65 µm, pack of 3
5605304ES--**--M	Sartoclean® GF 0.8 µm, pack of 3
5595305PS--**--M	Sartopure® PP2 0.65 µm, pack of 3
5595303PS--**--M	Sartopure® PP2 1.2 µm, pack of 3
5595302PS--**--M	Sartopure® PP2 3 µm, pack of 3
5595342PS--**--M	Sartopure® PP2 5 µm, pack of 3
5595301PS--**--M	Sartopure® PP2 8 µm, pack of 3
5595320PS--**--M	Sartopure® PP2 20 µm, pack of 3
5595350PS--**--M	Sartopure® PP2 50 µm, pack of 3
5555305PS--**--M	Sartopure® GF Plus 0.65 µm, pack of 3
5555303PS--**--M	Sartopure® GF Plus 1.2 µm, pack of 3
5485358MS--**--M	Sartoguard GF 0.1 µm nominal, pack of 3
5485307GS--**--M	Sartoguard GF 0.2 µm nominal, pack of 3
5475358GS--**--M	Sartoguard PES 0.1 µm nominal, pack of 3
5475307IS--**--M	Sartoguard PES 0.2 µm nominal, pack of 3

\*\* = Connector type

Description

F	½" Tri-Clamp
H	¼" Multiple stepped hose barb

## Sartobran® P 150 and Sartobran® P 300 Capsules; Optimum Convenience for up to 50 Liters; Cost-saving Scale-up to Larger Volumes



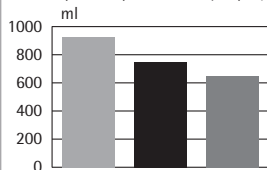
Sartobran® 300



Sartobran® 150 (Typ SS)

Comparison of filtered volumes  
( $5 \times 10^7$  Ps. diminuta/ml)  
in 2 min. at 1 bar

■ Sartobran® 300  
■ Competitive product, 0.22  $\mu$ m PVDF  
■ Competitive product, 0.2  $\mu$ m polysulfone



Newly developed, ready-to-use pressure filtration units offering maximum convenience for the sterile filtration of 0.1 to 50 liters of buffers, infusion solutions, tissue culture solutions, sera and other solutions containing proteins. No more problems with air bubbles in the liquid. A hydrophobic PTFE membrane validated for sterile air filtration allows for effective air bubble collection at the highest point upstream.

At the beginning of the filtration, the threaded closure can be opened so that air bubbles can vent away and full use of the complete filter area is guaranteed.

During this venting, the PTFE membrane prevents liquid from emerging, thus protecting the filtrate from non-sterile drops and the environment and user from possible contamination. For the subsequent integrity test, the outlet spout must be closed with the closure.

Sartobran® P 150 and Sartobran® P 300 filter capsules contain the same heterogeneous surfactant-free cellulose acetate double membrane with low adsorption as used in larger Sartobran® P capsules and Sartobran® P cartridges. They demonstrate the same superior high flow rates and large throughputs per filtration area. Furthermore, a scale-up to larger volumes is only a matter of simple multiplications, allowing you to reduce validation costs.

### Specifications for Sartobran® P 150 and Sartobran® P 300

Connectors	Sartobran® P 150: 1/4" multiple stepped hose barb inlet and outlet or 1/2" sanitary flange Sartobran® P 300: 1/4" multiple stepped hose barb inlet and outlet
Biosafety	Pass the USP Plastics-Class VI-Test
Bubble point	With water, minimum value 3.2 bar 320 kPa 46 psi
Chemical compatibility	For aqueous solutions of pH 4–8 as well as most alcohols and hydrocarbons.
Filtration area	150 cm <sup>2</sup> and 300 cm <sup>2</sup>
Materials	Cellulose acetate membrane filter (0.45 $\mu$ m or 0.2 $\mu$ m pore size). PTFE air filter (0.2 $\mu$ m). Polypropylene housing and filter support. Polycarbonate filling bell.
Max. differential pressure	4 bar 400 kPa 58 psi at 20 °C, 2 bar 200 kPa 29 psi at 80 °C
Sterilization	Supplied steam sterilized. Can be re-sterilized by autoclaving at 121 °C.
Cytotoxicity	Non-toxic as confirmed with L-929 fibroblast cells of mice and with MRC-5 lung cells of human, embryonic origin.

### Order Numbers for Sartobran® P 150 Capsules with 0.2 $\mu$ m Final Filter and 0.45 $\mu$ m Prefilter

Sterile, individually packed

5231307H4-00-B	1/4" Hose nipple inlet and outlet, pack of 5
5231307H4-SS-B	1/2" triclamp inlet and outlet, pack of 5
5231307H4-S0-B	1/2" triclamp inlet, 1/4" hose nipple outlet, pack of 5

### Order Numbers for Sartobran® P 300 Capsules with 0.2 $\mu$ m Final Filter and 0.45 $\mu$ m Prefilter

Sterile, individually packed

5231307H5-00-V	1/4" Hose nipple inlet and outlet, pack of 2
5231307H5-00-B	1/4" Hose nipple inlet and outlet, pack of 5

Recommended accessories are described on page 96.  
Special data sheet available. Order no. SPK2027-e.

## Sartoguard PES Membrane Prefiltration MidiCaps®

### Description

Sartoguard PES filter are especially designed for effective bioburden control and reliable removal of particles from a broad range of fluid streams. They provide the finest, most efficient and reliable performance for critical prefiltration applications. They can be used for protection of Mycoplasma retentive or sterilizing grade filters. They allow downsizing of filtration systems and cost saving in applications where the use of validated sterilizing grade filters is not required, but reliable bioburden and turbidity reduction is.

### Applications

Typical applications of Sartoguard PES filter include prefiltration of:

- Buffers
- Downstream Intermediates (before and after UF | DF and chromatography steps)
- Clarified cell culture harvest
- Cell Culture Media
- Aseptically filled Small Volume Parenterals (SVP)

### Economy

Sartoguard PES filter feature a unique heterogeneous double layer membrane construction in combination with an increased filtration area of 0.8 m<sup>2</sup>/10" cartridge. By providing outstanding total throughput and flow rate performance, they ensure highest process efficiency, minimized overall filtration costs and short filtration cycle times.

### Reliable Retention

Sartoguard PES filters are available with 0.1 µm and 0.2 µm nominal retention rating. The 0.1 µm rated filters typically provide a LRV of 6 per cm<sup>2</sup> filtration area for *Brevundimonas Diminuta*, while the 0.2 µm rated filters typically provide a LVR of 6 per cm<sup>2</sup> filtration area for *Serratia Marcescens*.

### Compatibility

Sartoguard PES filter elements are designed for broad chemical compatibility from pH 1 to pH 14 and low extractable levels. They are compatible with multiple in line steam sterilization cycles up to 134 °C for cartridges and multiple autoclaving cycles for MidiCaps®.

### Quality & Security

Sartoguard PES filter are individually tested for integrity during production. The integrity of the filters can be verified on-site before and after use by a diffusion or bubble-point test.

### Scalability

Sartoguard PES filter elements are available in a broad range of sizes and formats to provide linear scale-up from R&D to process scale.

### Documentation

Sartoguard PES filter are designed, developed and manufactured in accordance with an ISO 9001 certified Quality Management System. A Validation Guide is available for compliance with regulatory requirements.



## Specifications

Materials	■ Prefilter Membrane	PES, asymmetric
	■ Endfilter Membrane	PES, asymmetric
	■ Support Fleece	Polypropylene
	■ Core	Polypropylene
	■ Capsule Housing	Polypropylene
	■ End Caps	Polypropylene
	■ O-Rings	Silicone

## Pore Size Combinations

0.8  $\mu\text{m}$  + 0.1  $\mu\text{m}$  nominally  
1.2  $\mu\text{m}$  + 0.2  $\mu\text{m}$  nominally

## Available Sizes|Filtration Area

Size 4 0.021 m<sup>2</sup> | 0.22 ft<sup>2</sup>

## MidiCaps®

Size 7 0.065 m<sup>2</sup> | 0.7 ft<sup>2</sup>  
Size 8 0.13 m<sup>2</sup> | 1.4 ft<sup>2</sup>  
Size 9 0.26 m<sup>2</sup> | 2.8 ft<sup>2</sup>  
Size 0 0.52 m<sup>2</sup> | 5.6 ft<sup>2</sup>

## Available Connectors MidiCaps®

SS, SO, OO, FF, FO, HH (only size 7)

S: 1½" Tri-Clamp (Sanitary)  
O: ½" Single stepped hose barb  
F: ¾" Tri-Clamp (Sanitary)  
H: ¼" Multiple stepped hose barb  
(with filling bell at the outlet)

## Operating Parameters

Max. Allowable Differential Pressure	5 bar   72.5 psi at 20 °C (MidiCaps®) 4 bar   58 psi at 20 °C (Capsules) 2 bar   29 psi at 80 °C (MidiCaps®  capsules)
Max. Allowable Back Pressure	2 bar   29 psi at 20 °C

## Extractables

Sartoguard PES filter meet, or exceed the requirements for WFI quality standards set by the current USP.

## Regulatory Compliance

- Individually integrity tested during production
- Inside integrity testable by diffusion or bubble-point test
- Non pyrogenic according to USP Bacterial Endotoxins
- Pass USP Plastic Class VI Test
- Non fiber releasing according to 21 CFR

## Sterilization

Autoclaving: 134 °C, 2 bar, 30 min

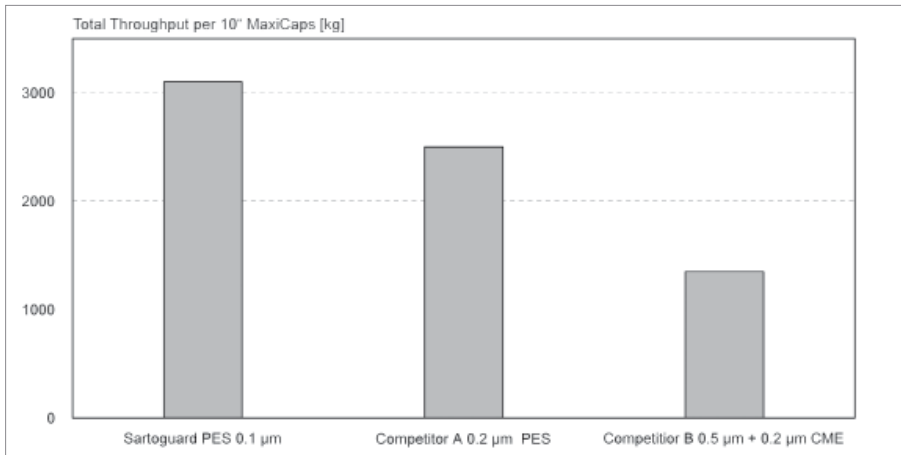
## Sterilization Cycles

Autoclaving Min. 25 (MaxiCaps & MidiCaps®)

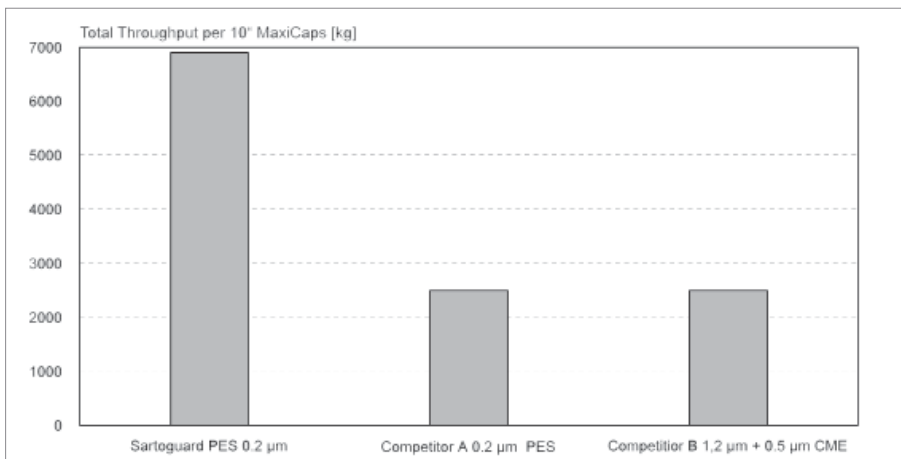
## Technical References

Validation Guide: SPK5782-e

### Soy Peptone Supplement Cell Culture Media



### Soy Peptone Supplement Cell Culture Media



### Order Codes

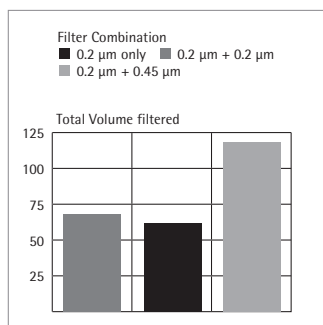
Filter	Pore Size Nominally [µm]	Test Pressure [bar psi]	Max. Diffusion [ml/min]	Min. Bubble Point [bar psi]
<b>MidiCaps® Capsule</b>				
5471358G4	0.1	1.5 22	1.1	2.8 40.5
5475358G7	0.1	1.5 22	3	2.8 40.5
5475358G8	0.1	1.5 22	6	2.8 40.5
5475358G9	0.1	1.5 22	9	2.8 40.5
5475358G0	0.1	1.5 22	18	2.8 40.5
<b>MidiCaps® Capsule</b>				
5471307F4	0.2	1.2 17.5	1.1	1.8 26
5475307F7	0.2	1.2 17.5	3	1.8 26
5475307F8	0.2	1.2 17.5	4	1.8 26
5475307F9	0.2	1.2 17.5	6	1.8 26
5475307F0	0.2	1.2 17.5	12	1.8 26

## Sartobran® P MidiCaps® for the Filtration of Protein Containing Solutions



Sartobran® P MidiCaps® are designed for maximum convenience and performance. They are complete filter units, ready-to-connect and to-use without prior cleaning. Although intended for Single-use, they can be autoclaved several times and are therefore re-usable if the application allows. The membranes are reinforced to increase their mechanical strength, thus guaranteeing greatest reliability during filtration and sterilization. Just as in the smaller Sartobran® 300 capsules, the pleating of the membranes allows large filter areas to be sealed in small, handy units.

The polypropylene housing contains two membrane filters. The first coarser membrane acts as a prefilter relieving the next finer membrane, which guarantees a reliable retention according to pore size. This fractionated retention of particles and microorganisms has a very favorable effect on the total throughput, as shown below. A solution of relatively high colloid content was filtered



### Specifications for Sartobran® P Filter Units

Biosafety	All materials pass the USP Plastics-Class VI-Tests.
Chemical compatibility	With aqueous solutions of pH 4–8 and with most alcohols and hydrocarbons (see page 124).
Filtration area	0.05 m <sup>2</sup> , 0.1 m <sup>2</sup> , 0.2 m <sup>2</sup> or 0.45 m <sup>2</sup>
Integrity test data	All Sartobran® P Capsules are integrity tested. Details on minimal bubble points and maximal diffusional values are given in the "directions for use" supplied with them.
Materials	Double layer cellulose acetate membrane, fleece-reinforced. Polypropylene housing and support.
Max. differential pressure	4 bar 58 psi at 20 °C, 2 bar 29 psi at 80 °C
Sterilization	By autoclaving at 121 °C, 30 min.
Cytotoxicity	All materials are non-toxic, as determined with L-929-cells and with MRC-5-cells.

**Order Numbers for Sartobran® P MidiCaps®\***

**With 0.2 µm Final Filter and 0.45 µm Prefilter**

**Type OO, with 1/2" Hose Nipple Inlet and Outlet**

5235307H7-OO-A	0.05 m <sup>2</sup> filter area, pack of 4
5235307H8-OO-A	0.1 m <sup>2</sup> filter area, pack of 4
5235307H9-OO-A	0.2 m <sup>2</sup> filter area, pack of 4
5235307H0-OO-V	0.45 m <sup>2</sup> filter area, pack of 2

**Type SS, with 1 1/2" Sanitary Flange Inlet and Outlet**

5235307H7-SS-A	0.05 m <sup>2</sup> filter area, pack of 4
5235307H8-SS-A	0.1 m <sup>2</sup> filter area, pack of 4
5235307H9-SS-A	0.2 m <sup>2</sup> filter area, pack of 4
5235307H0-SS-V	0.45 m <sup>2</sup> filter area, pack of 2

**Type SO, with 1 1/2" Sanitary Flange Inlet and 1/2" Hose Nipple Outlet**

5235307H7-SO-A	0.05 m <sup>2</sup> filter area, pack of 4
5235307H8-SO-A	0.1 m <sup>2</sup> filter area, pack of 4
5235307H9-SO-A	0.2 m <sup>2</sup> filter area, pack of 4
5235307H0-SO-V	0.45 m <sup>2</sup> filter area, pack of 2

**Type HH, with 1/4" Multiple Stepped Hose Barb Inlet and Outlet**

5235307H7-HH-A	0.05 m <sup>2</sup> filter area, pack of 4
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**Type FF, with 3/4" Sanitary Flange Inlet and Outlet**

5235307H7-FF-A	0.05 m <sup>2</sup> filter area, pack of 4
5235307H8-FF-A	0.1 m <sup>2</sup> filter area, pack of 4
5235307H9-FF-A	0.2 m <sup>2</sup> filter area, pack of 4
5235307H0-FF-V	0.45 m <sup>2</sup> filter area, pack of 2

**With 0.45 µm Final Filter and 0.65 µm Prefilter**

**Type OO, with 1/2" hose nipple inlet and outlet**

5235306D7-OO-A	0.05 m <sup>2</sup> filter area, pack of 4
5235306D8-OO-A	0.1 m <sup>2</sup> filter area, pack of 4
5235306D9-OO-A	0.2 m <sup>2</sup> filter area, pack of 4
5235306D0-OO-V	0.45 m <sup>2</sup> filter area, pack of 2

**Type SS, with 1 1/2" Sanitary Flange Inlet and Outlet**

5235306D7-SS-A	0.05 m <sup>2</sup> filter area, pack of 4
5235306D8-SS-A	0.1 m <sup>2</sup> filter area, pack of 4
5235306D9-SS-A	0.2 m <sup>2</sup> filter area, pack of 4
5235306D0-SS-V	0.45 m <sup>2</sup> filter area, pack of 2

**Type SO, with 1 1/2" Sanitary Flange and 1/2" Hose Nipple Outlet**

5235306D7-SO-A	0.05 m <sup>2</sup> filter area, pack of 4
5235306D8-SO-A	0.1 m <sup>2</sup> filter area, pack of 4
5235306D9-SO-A	0.2 m <sup>2</sup> filter area, pack of 4
5235306D0-SO-V	0.45 m <sup>2</sup> filter area, pack of 2

\* Also available as mini cartridges with the same pore sizes and areas.

**Order Numbers for Packs of 5**

Pore Size	0.05 m <sup>2</sup> Filter Area	0.1 m <sup>2</sup> Filter Area	0.2 m <sup>2</sup> Filter Area
0.2 µm	5231507H7B	5231507H8B	5231507H9B

Special brochure available on request. Order no. S--0024-e



Type SS, with hose nipple inlet and outlet



Type FF, with sanitary flange inlet and outlet



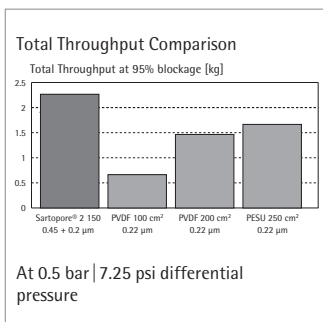
Type OO, with sanitary flange inlet and hose nipple outlet



Type HH (only size 7), with sanitary flange inlet and outlet



## Sartopore® 2 150 and Sartopore® 2 300 Best Flow Rates and Optimum Convenience for up to 50 Liters



Sartopore® 2 150 and Sartopore® 2 300 are disposable, sterile, ready-to-use membrane filter capsules for convenient sterilizing grade filtration of 0.1 to 50 liters. The polyethersulfone membrane is compatible with a pH range from pH 1 to pH 14. Therefore Sartopore® 2 150 and Sartopore® 2 300 are ideal for filtration of solutions with high|low pH.

Sartopore® 2 150 and 300 are with 3 different pore sizes available. For prefiltration filter with 0.45 µm final membranes are used, whereas Sartopore® 2 150 and 300 MidiCaps® with 0.2 µm final membranes are used for the sterile filtration. Filters with 0.1 µm final membranes are perfect suitable for combined sterile filtration and mycoplasma retention in sera and serum-containing culture media.

The asymmetric structure of the membrane and the double-layer construction with build-in prefilter allow exceptionally high standing times and flow rates. Therefore, the filter are used especially for the filtration of difficult to filter, highly viscous solutions, or when short filtration times are required.

The vent design enables easy access to the venting valve. A hydrophobic PTFE membrane positioned on the highest point upstream allows an easy venting of the filter element and prevents product loss during the venting process.

Sartopore® 2 150 and Sartopore® 2 300 contain the design like the Sartopore® 2 MidiCaps® and MaxiCaps. Thus, a scale-up to larger sizes is only a matter of simple multiplications, allowing you to reduce validation costs.

### Specifications for Sartopore® 2 150 and Sartopore® 2 300

Biosafety	All materials pass the USP Plastic Test Class VI
Chemical compatibility	To aqueous solutions in the pH-range 1–14
Connectors	See order numbers
Cytotoxicity	All materials are detectably non-toxic concerning L929-cells and MRC-5-cells
Filter area	0.015 m <sup>2</sup> and 0.03 m <sup>2</sup>
Materials	Asymmetric, double-layered polyethersulfone membrane filter, polypropylene housing parts and support framing, PTFE air filter

### Order Numbers for Sartopore® 2 150

#### With 0.2 µm Final Filter and 0.45 µm Prefilter

5441307H4-SS-B	0.015 m <sup>2</sup> , 1/2" sanitary flange inlet and outlet
5441307H4-OO-B	0.015 m <sup>2</sup> , 1/4" multiple stepped hose barb inlet and outlet
5441307H4-SO-B	0.015 m <sup>2</sup> , 1/2" sanitary flange inlet and 4" multiple stepped hose barb outlet

#### With 0.1 µm Final Filter and 0.2 µm Prefilter

5441358K4-SS-B	0.015 m <sup>2</sup> , 1/2" sanitary flange inlet and outlet
5441358K4-OO-B	0.015 m <sup>2</sup> , 1/4" multiple stepped hose barb inlet and outlet
5441358K4-SO-B	0.015 m <sup>2</sup> , 1/2" sanitary flange inlet and 4" multiple stepped hose barb outlet

### Order Numbers for Sartopore® 2 300

#### With 0.45 µm Final Filter and 0.8 µm Prefilter

5441306G5-OO-B	0.03 m <sup>2</sup> , 1/4" multiple stepped hose barb inlet and outlet
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#### With 0.2 µm Final Filter and 0.45 µm Prefilter

5441307H5-OO-B	0.03 m <sup>2</sup> , 1/4" multiple stepped hose barb inlet and outlet
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#### With 0.1 µm Final Filter and 0.2 µm Prefilter

5441358K5-OO-B	0.03 m <sup>2</sup> , 1/4" multiple stepped hose barb inlet and outlet
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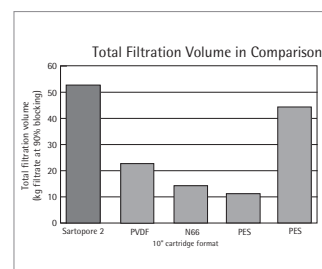
## Sartopore® 2 MidiCaps® for Best Flow Rates and Standing Times Over the Whole pH-range

The new Sartopore® 2 MidiCaps® ideally supplement the Sartobran® P filters described on page 64. Whereas Sartobran® P filters are mainly used for prefiltration and sterile filtration of protein-containing solutions in the pH-range of 4–8, the broad chemical compatibility of the polyethersulfone membranes from pH1 to pH 14 of the Sartopore® 2 filter elements also allows the filtration of aggressive liquids of high or low pH.

Sartopore® 2 MidiCaps® are available with three different pore sizes. For the prefiltration of difficult to filter solutions, Sartopore® 2 MidiCaps® with 0.45 µm final membranes are used, whereas filter elements with 0.2 µm final membranes are used for the sterile filtration of media. Sartopore® 2 MidiCaps® with 0.1 µm final membranes are perfectly suitable for combined sterile filtration and retention of mycoplasma in sera and serum-containing culture media.

The asymmetric structure of the membrane and the double-layer construction with a build-in prefilter allow exceptionally high standing times and flow rates. The filter elements are therefore used especially for the filtration of difficult to filter, highly viscous solutions or when short filtration times are required.

The graph shows the comparison of the total filtration volume of Sartopore® 2 polyethersulfone membranes, PVDF, nylon-66 membranes as well as two different PES membranes, also in the 10"-cartridge format, each measured in kg filtrate at 90% blocking.



### Specifications for Sartopore® 2 Capsules

Biosafety	All materials pass the USP Plastics Test Class VI
Chemical compatibility	To aqueous solutions in the pH-range 1–14
Connectors	See order numbers
Cytotoxicity	All materials are detectably non-toxic concerning L929-cells and MRC-5-cells.
Filter area	0.05 m <sup>2</sup> , 0.1 m <sup>2</sup> , 0.2 m <sup>2</sup> or 0.45 m <sup>2</sup>
Integrity test data	All Sartopore® 2 MidiCaps® are integrity testable. You find detailed information about minimal bubble points and maximal air diffusion values in the instructions for use, enclosed to every pack.
Materials	Asymmetric, double-layered polyethersulfone membrane filter, polypropylene housing parts and support framing drainage devices
Max. differential pressure	Δp = 4 bar at 20 °C, 2 bar at 80 °C



Type 00, with hose nipple inlet and outlet



Type SS, with sanitary flange inlet and outlet



Mini cartridges

### Order Numbers for Sartopore® 2 MidiCaps®\*

#### Sartopore® 2 MidiCaps® with 0.45 µm Final Filter

5445306G7-**-A	0.05 m <sup>2</sup> filter area
5445306G8-**-A	0.1 m <sup>2</sup> filter area
5445306G9-**-A	0.2 m <sup>2</sup> filter area
5445306G0-**-	0.45 m <sup>2</sup> filter area

#### Sartopore® 2 MidiCaps® with 0.2 µm Final Filter

5445307H7-**-A	0.05 m <sup>2</sup> filter area
5445307H8-**-A	0.1 m <sup>2</sup> filter area
5445307H9-**-A	0.2 m <sup>2</sup> filter area
5445307H0-**-	0.45 m <sup>2</sup> filter area

#### Sartopore® 2 MidiCaps® with 0.1 µm Final Filter

5445358K7-**-A	0.05 m <sup>2</sup> filter area
5445358K8-**-A	0.1 m <sup>2</sup> filter area
5445358K9-**-A	0.2 m <sup>2</sup> filter area
5445358K0-**-	0.45 m <sup>2</sup> filter area

\* Also available as mini cartridges with the same pore sizes and areas.

### Order Numbers for Packs of 5

Pore Size	0.05 m <sup>2</sup> Filter Area	0.1 m <sup>2</sup> Filter Area	0.2 m <sup>2</sup> Filter Area
0.1 µm	5441558K7B	5441558K8B	5441558K9B
0.2 µm	5441507H7B	5441507H8B	5441507H9B
0.45 µm	5441506G7B	5441506G8B	5441506G9B

\*\* Available with -SS, -S0, -00 connector (HH only size 7)

## Sartopore® 2 XLI 0.2 µm Sterilizing Grade MidiCaps® and Capsules

### Description

Sartopore® 2 XLI MidiCaps® and Capsules are self contained filter units that are especially designed for sterilizing grade filtration of pharmaceutical solutions with a homogenous particle spectrum. The unique heterogeneous double layer PES membrane combination of Sartopore® 2 XLI MidiCaps® and Capsules filters is specifically developed to provide exceptional high total throughputs and outstanding flow rates for totally chemically defined process fluids and other process fluids of biotech manufacturing processes with small particle spectrum.

### Applications

Typical applications of Sartopore® 2 XLI MidiCaps® and Capsules include sterilizing grade filtration of:

- Ophthalmic solutions
- Chemically defined cell culture media
- High viscous large volume parenterals
- Any fully chemically defined media

### Economy

The combination of the built-in 0.35 µm pre-filter in front of a 0.2 µm final filter together with the 30% enlarged effective filtration area per XLI filter element provide an outstanding total throughput and flow rate performance in the target applications. Thus ensuring highest process efficiency, minimized filtration costs and short filtration cycle times.

### Compatibility

The PES membrane of Sartopore® 2 XLI MidiCaps® and Capsules provide broad chemical compatibility from pH 1 to pH 14 and low extractable levels. They are compatible with multiple autoclaving cycles up to 134 °C.

### Scalability

Sartopore® 2 XLI filter elements are available in a broad range of sizes and formats to provide linear scale-up from R&D to process scale.

### Cost Saving

The use of the capsule design concept avoids investment in stainless steel filter housings and eliminates additional costs for cleaning of housings and cleaning validation.

### Microbiological Retention

Sartopore® 2 XLI MidiCaps® and Capsules are fully validated as sterilizing grade filters according to HIMA and ASTM F-838-05 guidelines.

### Quality Control

Each individual element is tested for integrity by B.P. and Diffusion-Test prior to being released assuring absolute reliability.

### Documentation

Sartopore® 2 XLI MidiCaps® and Capsules are designed, developed and manufactured in accordance with an ISO 9001 certified Quality Management System. A Validation Guide is available for compliance with regulatory requirements.



### Specifications

#### Materials

- |                      |                 |
|----------------------|-----------------|
| ■ Prefilter Membrane | PES, asymmetric |
| ■ Endfilter Membrane | PES, asymmetric |
| ■ Support Fleece     | Polypropylene   |
| ■ Core               | Polypropylene   |
| ■ End Caps           | Polypropylene   |
| ■ Capsule Housing    | Polypropylene   |
| ■ O-Rings            | Silicone        |
| ■ Filling Bell       | Polycarbonate   |

#### Pore Size

0.35 µm + 0.2 µm

#### Available Sizes|Filtration Area

Capsules Size 4                      0.021 m<sup>2</sup> | 0.22 ft<sup>2</sup>

#### MidiCaps®

Size 7	0.065 m <sup>2</sup>   0.7 ft <sup>2</sup>
Size 8	0.13 m <sup>2</sup>   1.4 ft <sup>2</sup>
Size 9	0.26 m <sup>2</sup>   2.8 ft <sup>2</sup>
Size 0	0.52 m <sup>2</sup>   5.6 ft <sup>2</sup>

### Available Connectors Capsules Size 4

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SS, SO, OO

### Available Connectors MidiCaps®

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SS, SO, OO; FF, FO, HH (only size 7)

- S: 1½" Tri-Clamp (Sanitary)
- O: ½" Single stepped hose barb
- F: ¾" Tri-Clamp (Sanitary)
- H: ¼" Multiple stepped hose barb (with filling bell at the outlet)
- S: ½" Tri-Clamp (only Capsule Size 4)
- O: Multiple stepped hose barb (only Capsule Size 4)

### Operating Parameters

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Max. Allowable Differential Pressure	5 bar   75 psi at 20 °C (MidiCaps®)
	4 bar   58 psi at 20 °C (Capsules)
	2 bar   29 psi at 80 °C (MidiCaps®   capsules)
Max. Allowable Back Pressure	2 bar   29 psi at 20 °C

### Extractables

Sartopore® 2 XLI 0.2 µm rated MidiCaps®, MaxiCaps® and Capsules meet or exceed the requirements for WFI quality standards set by the current USP.

### Regulatory Compliance

- Individually integrity tested during production
- Integrity test correlated to HIMA/ASTM F 838-05 Bacteria Challenge Test
- Non pyrogenic according to USP Bacterial Endotoxins
- Pass USP Plastic Class VI Test
- Non fiber releasing according to 21 CFR

### Sterilization

Autoclaving: 134 °C, 2 bar, 30 min

### Sterilization Cycles

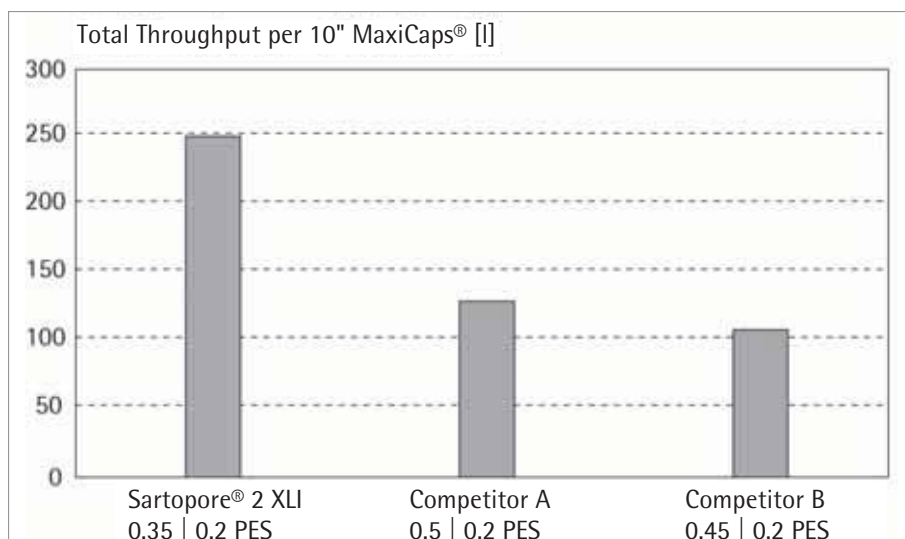
Autoclaving: 25 min (MidiCaps® and MaxiCaps®)  
No In-Line Steam Sterilization

### Technical References

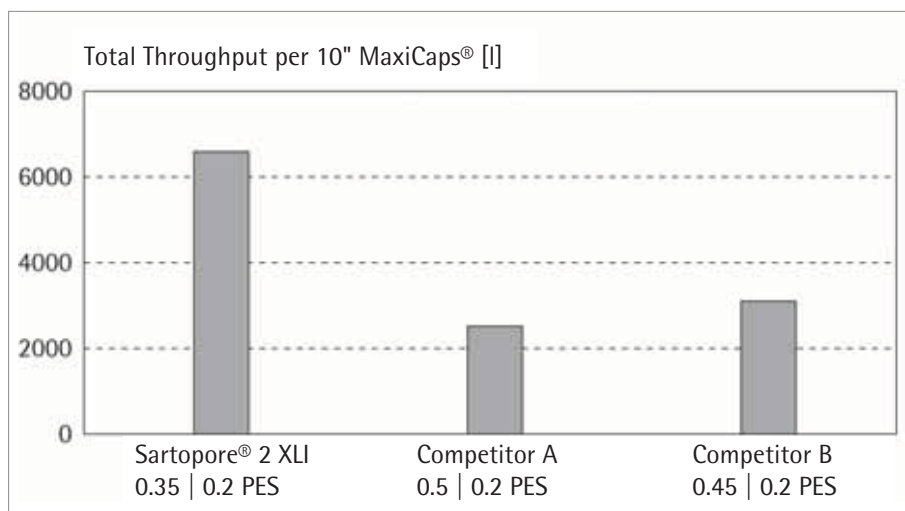
Validation Guide: SPK5768-e

Extractables Guide: SPK5776-e

Chemically Defined Cell Culture Media



Ophthalmic Solution



Order Codes

	Pore Size [µm]	Test Pressure [bar psi]	Max. Diffusion [ml/min]	Min. Bubble Point [bar psi]
<b>XLI MidiCaps®</b>				
544530717--**--A	0.35 + 0.2	2.5 36	5	3.2 46
544530718--**--A	0.35 + 0.2	2.5 36	6	3.2 46
544530719--**--A	0.35 + 0.2	2.5 36	9	3.2 46
544530710--**--V	0.35 + 0.2	2.5 36	18	3.2 46
<b>XLI Capsules Size 4</b>				
544130714--**--B	0.35 + 0.2	2.5 36	1.1	3.2 46

## Sartopore® 2 XLG 0.2 µm Sterilizing Grade MidiCaps®



### Description

Sartopore® 2 XLG MidiCaps® are self contained filter units that are especially designed for sterilizing grade filtration in special applications of cell culture processes. The unique heterogeneous double layer PES membrane combination of Sartopore® 2 XLG MidiCaps® is specifically developed to deal with the broad variety of contaminants in up- and downstream processing of biotech applications. They provide consistently high total throughput performance for biological fluid streams independent from media and process variations.

### Applications

Typical applications of Sartopore® 2 XLG MidiCaps® include sterilizing grade filtration of:

- Plant peptone or yeast supplemented cell culture media
- Serum containing cell culture media
- Other cell culture media used in biotech manufacturing
- Clarified cell culture harvest
- Downstream Intermediates (before and after UF|DF and chromatography steps)

### Economy

The combination of the built-in 0.8 µm prefilter in front of a 0.2 µm final filter together with the 30% enlarged effective filtration area per XLG filter element provide an outstanding total throughput and flow rate performance in the target applications. Thus ensuring highest process efficiency, minimized filtration costs and short filtration cycle times.

### Compatibility

The PES membrane of Sartopore® 2 XLG MidiCaps® provide broad chemical compatibility from pH 1 to pH 14 and low extractable levels. They are compatible with multiple autoclaving cycles up to 134 °C.

### Scalability

Sartopore® 2 XLG filter elements are available in a broad range of sizes and formats to provide linear scale-up from R&D to process scale.

### Cost Saving

The use of the capsule design concept avoids investment in stainless steel filter housings and eliminates additional costs for cleaning of housings and cleaning validation.

### Microbiological Retention

Sartopore® 2 XLG MidiCaps® are fully validated as sterilizing grade filters according to HIMA and ASTM F-838-05 guidelines.

### Quality Control

Each individual element is tested for integrity by B.P. and Diffusion-Test prior to being released assuring absolute reliability.

### Documentation

Sartopore® 2 XLG MidiCaps® are designed, developed and manufactured in accordance with an ISO 9001 certified Quality Management System. A Validation Guide is available for compliance with regulatory requirements.

### Specifications

Materials	<ul style="list-style-type: none"> <li>■ Prefilter Membrane PES, asymmetric</li> <li>■ Endfilter Membrane PES, asymmetric</li> <li>■ Support Fleece Polypropylene</li> <li>■ Core Polypropylene</li> <li>■ End Caps Polypropylene</li> <li>■ Capsule Housing Polypropylene</li> <li>■ O-Rings Silicone</li> <li>■ Filling Bell Polycarbonate</li> </ul>
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### Pore Size

0.35 µm + 0.2 µm

### Available Sizes|Filtration Area

#### MidiCaps®

Size 7	0.065 m <sup>2</sup>   0.7 ft <sup>2</sup>
Size 8	0.13 m <sup>2</sup>   1.4 ft <sup>2</sup>
Size 9	0.26 m <sup>2</sup>   2.8 ft <sup>2</sup>
Size 0	0.52 m <sup>2</sup>   5.6 ft <sup>2</sup>

### Available Connectors MidiCaps®

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SS, SO, OO, FF, FO, HH (only size 7)

- S: 1½" Tri-Clamp (Sanitary)
- O: ½" Single stepped hose barb
- F: ¾" Tri-Clamp (Sanitary)
- H: ¼" Multiple stepped hose barb (with filling bell at the outlet)

### Operating Parameters

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Max. Allowable Differential Pressure	5 bar   75 psi at 20 °C (MidiCaps®)
	4 bar   58 psi at 20 °C (Capsules)
	2 bar   29 psi at 80 °C
Max. Allowable Back Pressure	2 bar   29 psi at 20 °C

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### Extractables

Sartopore® 2 XLG 0.2 µm rated MidiCaps® meet or exceed the requirements for WFI quality standards set by the current USP.

### Regulatory Compliance

- Individually integrity tested
- Integrity test correlated to HIMA/ASTM F 838-05 Bacteria Challenge Test
- Non pyrogenic according to USP Bacterial Endotoxins
- Pass USP Plastic Class VI Test
- Non fiber releasing according to 21 CFR

### Sterilization

Autoclaving: 134 °C, 2 bar, 30 min

### Sterilization Cycles

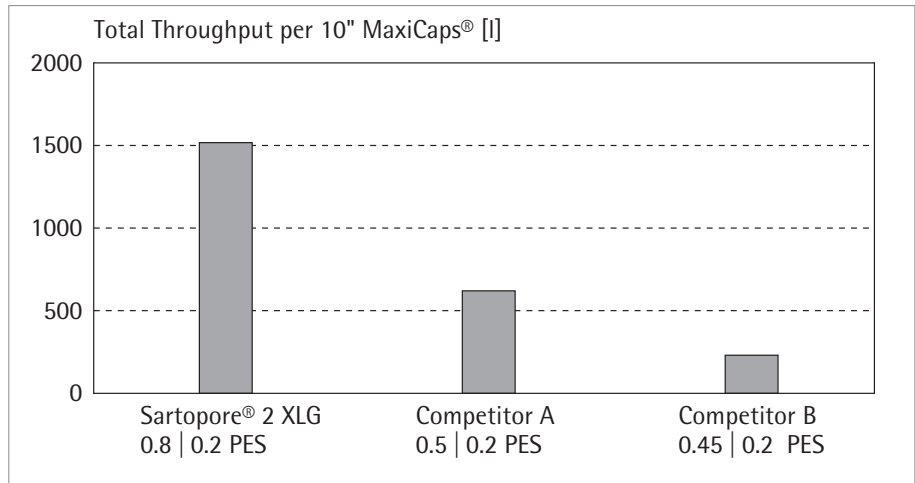
Autoclaving: Min. 25  
No In-Line Steam Sterilization

### Technical References

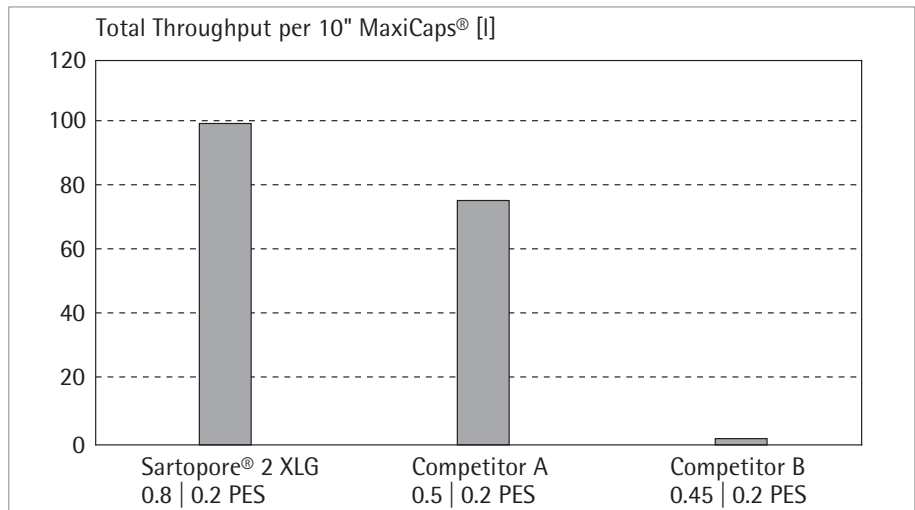
Validation Guide: SPK5772-e08121  
85034-536-30



Soy Peptone Supplemented Cell Culture Media



Monoclonal Antibody Pool



Antibody Concentration: 47.5 mg/ml

Order Numbers

	Pore Size [µm]	Pack Size (pieces)	Test Pressure [bar psi]	Max. Diffusion [ml/min]	Min. Bubble Point [bar psi]
<b>XLG MidiCaps®</b>					
5445307G7--**--A	0.8 + 0.2	4	2.5 36	5	3.2 46
5445307G8--**--A	0.8 + 0.2	4	2.5 36	6	3.2 46
5445307G9--**--A	0.8 + 0.2	4	2.5 36	9	3.2 46
5445307G0--**--V	0.8 + 0.2	2	2.5 36	18	3.2 46
<b>XLG Capsule Size 4</b>					
5441307G4--**--B	0.8 + 0.2	5	2.5 36	1.1	3.2 46

## MidiCaps® for the Particle Removing Filtration or Prefiltration of 100 Liters and More

Each of these ready-to-connect units contains a multi-step combination of filters for effective and economical particle removal. These filters are either used alone or as a prefilter in combination with a Sartobran® P or Sartofluor® MidiCaps®. There is a choice of four different types, differing only in the filters they contain. All other parts are the same and made of polypropylene.

### Sartopure® PP2 MidiCaps®

Depth-type filters containing progressively finer polypropylene fleeces for the retention of particles by fractionated depth filtration. Six retention efficiencies of 20, 8, 5, 3, 1.2 and 0.65 µm. Major applications: particle-removing filtration of deionized water, pharmaceutical solutions, reagents, chemicals, acids, solvents, air and other gases.

### Sartopure® GF Plus MidiCaps®

Sartopure® GF Plus MidiCaps® feature highly charged glass fiber layers and polypropylene fleeces for effective clarification of fluids streams based on the combination of adsorptive and mechanical retention. The 3-dimensional filter matrix assures highest total throughputs and effective clarification. Two retention efficiencies of 1.2 and 0.65 µm.

Major applications: prefiltration and clarification of biological liquids of relatively high colloid content (such as sera) and particle removal out of biological liquids like cell culture media and fermentation broths.

### Sartoclean® CA MidiCaps®

Available with 3.0 on 0.8 µm and 0.8 on 0.65 µm cellulose acetate double membrane for the retention of particles and larger microorganisms by fractionated membrane filtration, and as single layer capsules with a pore size of 0.2 and 0.45 µm.

Major application: prefiltration in combination with a subsequent Sartobran® P MidiCaps® for higher filterable volumes in the sterile filtration of serum with minimal adsorption.

### Sartoclean® GF MidiCaps®

Two types, like Sartoclean® CA MidiCaps®, but additionally with a glass fiber prefilter for the retention of particles, larger microorganisms and colloids, using a combination of depth filtration and fractionated membrane filtration.

Major applications: prefiltration of biological liquids with relatively high colloid content. Clarification of turbid solutions.



### Specifications for Sartopure® PP2 and Sartoclean® MidiCaps®

Biosafety	All materials pass the USP Plastics-Class VI-Test.
Filter area	0.05, 0.1, 0.2 or 0.45 m <sup>2</sup> , as listed under order numbers.



Type OO, with hose nipple inlet and outlet



Type SS, with sanitary flange inlet and outlet



Type SO, with sanitary flange inlet and hose nipple outlet

## Order Numbers for Sartopure® PP2 MidiCaps® and Sartopure® GF Plus MidiCaps®

### Sartopure® PP2 Depth Filter MidiCaps®

#### Type OO, with 1/2" Single Stepped Hose Barb

5595305P7-OO-A	0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5595305P8-OO-A	0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5595305P9-OO-A	0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5595305P0-OO-V	0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5595303P7-OO-A	1.2 µm, 0.05 m <sup>2</sup> , pack of 4
5595303P8-OO-A	1.2 µm, 0.1 m <sup>2</sup> , pack of 4
5595303P9-OO-A	1.2 µm, 0.2 m <sup>2</sup> , pack of 4
5595303P0-OO-V	1.2 µm, 0.45 m <sup>2</sup> , pack of 2
5595302P7-OO-A	3 µm, 0.05 m <sup>2</sup> , pack of 4
5595302P8-OO-A	3 µm, 0.1 m <sup>2</sup> , pack of 4
5595302P9-OO-A	3 µm, 0.2 m <sup>2</sup> , pack of 4
5595302P0-OO-V	3 µm, 0.45 m <sup>2</sup> , pack of 2
5595342P7-OO-A	5 µm, 0.05 m <sup>2</sup> , pack of 4
5595342P8-OO-A	5 µm, 0.1 m <sup>2</sup> , pack of 4
5595342P9-OO-A	5 µm, 0.2 m <sup>2</sup> , pack of 4
5595342P0-OO-V	5 µm, 0.45 m <sup>2</sup> , pack of 2

#### Type SS, with 1 1/2" Sanitary Flange Inlet and Outlet

5595305P7-SS-A	0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5595305P8-SS-A	0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5595305P9-SS-A	0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5595305P0-SS-V	0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5595303P7-SS-A	1.2 µm, 0.05 m <sup>2</sup> , pack of 4
5595303P8-SS-A	1.2 µm, 0.1 m <sup>2</sup> , pack of 4
5595303P9-SS-A	1.2 µm, 0.2 m <sup>2</sup> , pack of 4
5595303P0-SS-V	1.2 µm, 0.45 m <sup>2</sup> , pack of 2

#### Type SO, with 1 1/2" Sanitary Flange Inlet and 1/2" Single Stepped Hose Barb Outlet

5595303P7-SO-A	1.2 µm, 0.05 m <sup>2</sup> , pack of 4
5595303P8-SO-A	1.2 µm, 0.1 m <sup>2</sup> , pack of 4
5595303P9-SO-A	1.2 µm, 0.2 m <sup>2</sup> , pack of 4
5595303P0-SO-V	1.2 µm, 0.45 m <sup>2</sup> , pack of 2

### Sartopure® GF Plus Depth Filter MidiCaps®

#### Type OO, with 1/2" Single Stepped Hose Barb

5555305P7-OO-A	0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5555305P8-OO-A	0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5555305P9-OO-A	0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5555305P0-OO-V	0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5555303P7-OO-A	1.2 µm, 0.05 m <sup>2</sup> , pack of 4
5555303P8-OO-A	1.2 µm, 0.1 m <sup>2</sup> , pack of 4
5555303P9-OO-A	1.2 µm, 0.2 m <sup>2</sup> , pack of 4
5555303P0-OO-V	1.2 µm, 0.45 m <sup>2</sup> , pack of 2

#### Type SS, with 1 1/2" Sanitary Flange Inlet and Outlet

5555305P7-SS-A	0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5555305P8-SS-A	0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5555305P9-SS-A	0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5555305P0-SS-V	0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5555303P7-SS-A	1.2 µm, 0.05 m <sup>2</sup> , pack of 4
5555303P8-SS-A	1.2 µm, 0.1 m <sup>2</sup> , pack of 4
5555303P9-SS-A	1.2 µm, 0.2 m <sup>2</sup> , pack of 4
5555303P0-SS-V	1.2 µm, 0.45 m <sup>2</sup> , pack of 2

**Type SO, with 1 1/2" Sanitary Flange Inlet and 1/2" Single Stepped Hose Barb Outlet**

5555305P7-SO-A	0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5555305P8-SO-A	0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5555305P9-SO-A	0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5555305P0-SO-V	0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5555303P7-SO-A	1.2 µm, 0.05 m <sup>2</sup> , pack of 4
5555303P8-SO-A	1.2 µm, 0.1 m <sup>2</sup> , pack of 4
5555303P9-SO-A	1.2 µm, 0.2 m <sup>2</sup> , pack of 4
5555303P0-SO-V	1.2 µm, 0.45 m <sup>2</sup> , pack of 2



**Type OO, with hose nipple inlet and outlet**

**Order Numbers for Sartopure® CA MidiCaps® and Sartoclean® GF MidiCaps®**

**Sartoclean® CA MidiCaps®**

**Type OO, with 1/2" Single Stepped Hose Barb**

5625307A7-OO-A	0.2 µm, 0.05 m <sup>2</sup> , pack of 4
5625307A8-OO-A	0.2 µm, 0.1 m <sup>2</sup> , pack of 4
5625307A9-OO-A	0.2 µm, 0.2 m <sup>2</sup> , pack of 4
5625307A0-OO-V	0.2 µm, 0.45 m <sup>2</sup> , pack of 2
5625306A7-OO-A	0.45 µm, 0.05 m <sup>2</sup> , pack of 4
5625306A8-OO-A	0.45 µm, 0.1 m <sup>2</sup> , pack of 4
5625306A9-OO-A	0.45 µm, 0.2 m <sup>2</sup> , pack of 4
5625306A0-OO-V	0.45 µm, 0.45 m <sup>2</sup> , pack of 2
5625305G7-OO-A	0.8 0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5625305G8-OO-A	0.8 0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5625305G9-OO-A	0.8 0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5625305G0-OO-V	0.8 0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5625304E7-OO-A	3.0 0.8 µm, 0.05 m <sup>2</sup> , pack of 4
5625304E8-OO-A	3.0 0.8 µm, 0.1 m <sup>2</sup> , pack of 4
5625304E9-OO-A	3.0 0.8 µm, 0.2 m <sup>2</sup> , pack of 4
5625304E0-OO-V	3.0 0.8 µm, 0.45 m <sup>2</sup> , pack of 2



**Type SS, with sanitary flange inlet and outlet**

**Type SS, with 1 1/2" Sanitary Flange Inlet and Outlet**

5625307A7-SS-A	0.2 µm, 0.05 m <sup>2</sup> , pack of 4
5625307A8-SS-A	0.2 µm, 0.1 m <sup>2</sup> , pack of 4
5625307A9-SS-A	0.2 µm, 0.2 m <sup>2</sup> , pack of 4
5625307A0-SS-V	0.2 µm, 0.45 m <sup>2</sup> , pack of 2
5625306A7-SS-A	0.45 µm, 0.05 m <sup>2</sup> , pack of 4
5625306A8-SS-A	0.45 µm, 0.1 m <sup>2</sup> , pack of 4
5625306A9-SS-A	0.45 µm, 0.2 m <sup>2</sup> , pack of 4
5625306A0-SS-V	0.45 µm, 0.45 m <sup>2</sup> , pack of 2
5625305G7-SS-A	0.8 0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5625305G8-SS-A	0.8 0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5625305G9-SS-A	0.8 0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5625305G0-SS-V	0.8 0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5625304E7-SS-A	3.0 0.8 µm, 0.05 m <sup>2</sup> , pack of 4
5625304E8-SS-A	3.0 0.8 µm, 0.1 m <sup>2</sup> , pack of 4
5625304E9-SS-A	3.0 0.8 µm, 0.2 m <sup>2</sup> , pack of 4
5625304E0-SS-V	3.0 0.8 µm, 0.45 m <sup>2</sup> , pack of 2



**Type SO, with sanitary flange inlet and hose nipple outlet**



Type 00, with hose nipple inlet and outlet



Type SS, with sanitary flange inlet and outlet



Type SO, with sanitary flange inlet and hose nipple outlet

Type SO, with 1½" sanitary flange inlet and ½" single stepped hose barb outlet

5625307A7-SO-A	0.2 µm, 0.05 m <sup>2</sup> , pack of 4
5625307A8-SO-A	0.2 µm, 0.1 m <sup>2</sup> , pack of 4
5625307A9-SO-A	0.2 µm, 0.2 m <sup>2</sup> , pack of 4
5625307A0-SO-V	0.2 µm, 0.45 m <sup>2</sup> , pack of 2
5625306A7-SO-A	0.45 µm, 0.05 m <sup>2</sup> , pack of 4
5625306A8-SO-A	0.45 µm, 0.1 m <sup>2</sup> , pack of 4
5625306A9-SO-A	0.45 µm, 0.2 m <sup>2</sup> , pack of 4
5625306A0-SO-V	0.45 µm, 0.45 m <sup>2</sup> , pack of 2
5625305G7-SO-A	0.8/0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5625305G8-SO-A	0.8/0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5625305G9-SO-A	0.8/0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5625305G0-SO-V	0.8/0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5625304E7-SO-A	3.0/0.8 µm, 0.05 m <sup>2</sup> , pack of 4
5625304E8-SO-A	3.0/0.8 µm, 0.1 m <sup>2</sup> , pack of 4
5625304E9-SO-A	3.0/0.8 µm, 0.2 m <sup>2</sup> , pack of 4
5625304E0-SO-V	3.0/0.8 µm, 0.45 m <sup>2</sup> , pack of 2

Sartoclean® GF MidiCaps®

Type 00, with ½" single stepped hose barb

5605305G7-00-A	0.8/0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5605305G8-00-A	0.8/0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5605305G9-00-A	0.8/0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5605305G0-00-V	0.8/0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5605304E7-00-A	3.0/0.8 µm, 0.05 m <sup>2</sup> , pack of 4
5605304E8-00-A	3.0/0.8 µm, 0.1 m <sup>2</sup> , pack of 4
5605304E9-00-A	3.0/0.8 µm, 0.2 m <sup>2</sup> , pack of 4
5605304E0-00-V	3.0/0.8 µm, 0.45 m <sup>2</sup> , pack of 2

Type SS, with 1½" sanitary flange inlet and outlet

5605305G7-SS-A	0.8/0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5605305G8-SS-A	0.8/0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5605305G9-SS-A	0.8/0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5605305G0-SS-V	0.8/0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5605304E7-SS-A	3.0/0.8 µm, 0.05 m <sup>2</sup> , pack of 4
5605304E8-SS-A	3.0/0.8 µm, 0.1 m <sup>2</sup> , pack of 4
5605304E9-SS-A	3.0/0.8 µm, 0.2 m <sup>2</sup> , pack of 4
5605304E0-SS-V	3.0/0.8 µm, 0.45 m <sup>2</sup> , pack of 2

Type SO, with 1½" sanitary flange inlet and ½" single stepped hose barb outlet

5605305G7-SO-A	0.8/0.65 µm, 0.05 m <sup>2</sup> , pack of 4
5605305G8-SO-A	0.8/0.65 µm, 0.1 m <sup>2</sup> , pack of 4
5605305G9-SO-A	0.8/0.65 µm, 0.2 m <sup>2</sup> , pack of 4
5605305G0-SO-V	0.8/0.65 µm, 0.45 m <sup>2</sup> , pack of 2
5605304E7-SO-A	3.0/0.8 µm, 0.05 m <sup>2</sup> , pack of 4
5605304E8-SO-A	3.0/0.8 µm, 0.1 m <sup>2</sup> , pack of 4
5605304E9-SO-A	3.0/0.8 µm, 0.2 m <sup>2</sup> , pack of 4
5605304E0-SO-V	3.0/0.8 µm, 0.45 m <sup>2</sup> , pack of 2

## Easy to Handle, Ready-to-connect Complete Units for the Wash Water Filtration in Hospitals

It is a well-known fact that many infections occurring in hospitals are caused by tap water used for the patients' personal hygiene (e.g. washing, showering) or to clean instruments (e.g. rinsing of endoscopes). For hospital areas where high standards of hygiene are required, sterilizing filtration of drinking and service water at the point of use is recommended.

The successful use of Sartorius Capsules in actual day-to-day use is well documented by reports of hygiene specialists. The capsules are re-usable, complete units without expensive stainless steel housings. The compact form of the units with smooth external surfaces meet hygiene requirements. They are light in weight and therefore very convenient for the user, as the snap-on connectors enable an easy and rapid installation on taps or directly in front of shower heads. The double-layered membranes are validated for sterilizing filtration, and have bacteria retention ratings that exceed standard requirements to ensure a high margin of safety.

### Specifications

Biosafety	All components pass the USP Plastics–Class VI–Test.
Bubble point	With water, min. value 3.2 bar 320 kPa 46 psi
Flow rate	For water at $\Delta p = 3 \text{ bar}   300 \text{ kPa}   43.5 \text{ psi}$ , ca. 12 l/min
Final pressure	Max. $\Delta p = 4 \text{ bar}   400 \text{ kPa}   59 \text{ psi}$ at 20 °C, 2 bar 200 kPa 29 psi at 80 °C
Filtration area	0.1 m <sup>2</sup> (size 8) 0.05 m <sup>2</sup> (size 7)
Materials	Cellulose acetate membrane filter (double-layered, 0.45 µm on 0.2 µm pore size), polypropylene support and housing.
Sterilization	By autoclaving (121 °C, 1 bar, 30 min or 134 °C, 2 bar, 15 min).



### Order Numbers for Wash Water Capsules

5 capsules in a pack, sterile, individually packed

5231307H8-PQ-B	Inlet: 6 mm quick connect coupling; outlet: integrated PP-showerhead
5231307H8-PO-B	Inlet: 6 mm quick connect coupling; outlet: hose barb
5231307H8-VQ-B	Inlet: 8 mm quick connect coupling; outlet: integrated PP-showerhead
5231307H8-VO-B	Inlet: 8 mm quick connect coupling; outlet: hose barb
5231307H8-VZ-B	Inlet: 8 mm quick connect coupling; outlet: G $\frac{1}{2}$ male thread for installation of a separate autoclavable showerhead
5231307H7-PQ-B	Inlet: 6 mm quick connect coupling; outlet: integrated PP-showerhead
5231307H7-PO-B	Inlet: 6 mm quick connect coupling; outlet: hose barb
5231307H7-VQ-B	Inlet: 8 mm quick connect coupling; outlet: integrated PP-showerhead
5231307H7-VO-B	Inlet: 8 mm quick connect coupling; outlet: hose barb
5231307H7-VZ-B	Inlet: 8 mm quick connect coupling; outlet: G $\frac{1}{2}$ male thread for installation of a separate autoclavable showerhead

### Accessories

Couplings	17712	8 mm quick-connect coupling without water stop
	17713	8 mm quick-connect coupling with water stop
Separate showerhead	17771	Autoclavable showerhead G $\frac{1}{2}$ female thread
Adapters to attach the quick-connect couplings to taps or fittings of different thread sizes	17747	G $\frac{3}{8}$ -female thread
	17748	G $\frac{1}{2}$ -female thread
	17749	M 22 f 1-female thread
	17750	G 1-female thread
	17766	M 24 f 1 male thread
Integrity testing	16296--05	Fully automated integrity test unit Sartocheck Junior
	17751	Adapter Sartocheck 8 mm quick-connect coupling

Special brochure available on request. Order no. SL-1503-e

## Mini Filter Cartridges for the Particle-removing Filtration or Prefiltration of 100 Liters and More

Each of these mini cartridges contains a series of filters with increasing fineness for effective and economical particle removal, either as an independent filter or as a prefilter in combination with a Sartobran® P or Sartofluor® mini cartridge. The four different types differ only in the filter combinations. All other parts are the same, made of polypropylene (support framing) or silicone (sealing ring).

### Sartopure® PP2 Mini Cartridges

They contain polypropylene fleeces of increasing fineness for fractionated depth filtration. Retention efficiency: 20 µm, 8 µm, 5 µm, 3 µm, 1.2 µm and 0.65 µm. Main applications: particle-removing filtration of deionized water, pharmaceutical solutions, chemicals and solvents and other gases.

### Sartoclean® CA Mini Cartridges

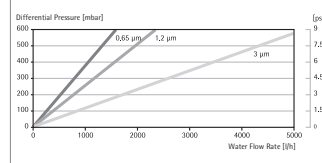
Available with 3.0 µm/0.8 µm and 0.8 µm/0.65 µm cellulose acetate double membranes, for the retention of particles and larger microorganisms by means of fractionated membrane filtration, as well as simple membrane mini cartridge with 0.2 and 0.45 µm pore sizes. Main application: prefiltration in combination with a subsequent Sartobran® P mini cartridge (e.g. for larger filterable volumes in the sterile filtration of serum) with minimal adsorption.

### Sartoclean® GF Mini Cartridges

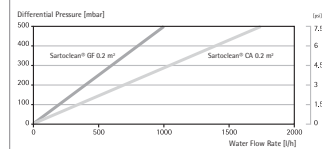
Same as Sartoclean® CA mini cartridges, but complemented by a glass fiber prefilter for the retention of particles, larger microorganisms and colloids using the combination of depth and fractionated membrane filtration. Main applications: prefiltration of biological liquids with a relatively high colloid content and clarification of turbid solutions.



**Sartopure® PP2 Mini Cartridges**  
0.2 m<sup>2</sup>, 0.65 µm, 1.2 µm, 3 µm



**Water Flow Rates**  
for 0.2 m<sup>2</sup> Sartoclean® CA and Sartoclean® GF 0.8|0.65 µm



### Specifications for Sartopure® and Sartoclean® Mini Cartridges

Connectors	Inner silicone O-ring and bayonet lock (twist lock) for safe hold on the base (also refer to descriptions on page 113 and page 115)
Flow rate*	Typical values for 0.2 m <sup>2</sup> mini cartridges for water at 0.5 bar 50 kPa 7.25 psi pressure: Sartopure® PP2 39 l/min. (1.2 µm), 24 l/min. (0.65 µm) Sartoclean® CA 41 l/min. (0.8 µm), 32 l/min. (0.65 µm) Sartoclean® GF 25 l/min. (0.8 µm), 17 l/min. (0.65 µm)
Filter area	0.05 m <sup>2</sup> , 0.1 m <sup>2</sup> , 0.2 m <sup>2</sup> or 0.3 m <sup>2</sup> , as listed under order numbers
Filter materials	Sartopure® PP 2, Polypropylene filter Sartoclean® CA, Cellulose acetate membranes Sartoclean® GF, Glass fiber prefilter, cellulose acetate membranes

Order numbers see next page.

\* See also diagram on the left



### Order Numbers for Sartopure® and Sartoclean® Mini Cartridges\*

#### Sartopure® PP2 Depth Filter Mini Cartridges

5591505P7-B	0.65 µm, 0.05 m <sup>2</sup> , pack of 5
5591505P8-B	0.65 µm, 0.1 m <sup>2</sup> , pack of 5
5591505P9-B	0.65 µm, 0.2 m <sup>2</sup> , pack of 5
5591503P9-B	1.2 µm, 0.2 m <sup>2</sup> , pack of 5
5591502P9-B	3 µm, 0.2 m <sup>2</sup> , pack of 5
5591542P9-B	5 µm, 0.2 m <sup>2</sup> , pack of 5
5591501P9-B	8 µm, 0.2 m <sup>2</sup> , pack of 5
5591520P9-B	20 µm, 0.2 m <sup>2</sup> , pack of 5

#### Sartoclean® CA Membrane Filter Mini Cartridges

5621507A9-B	0.2 µm, 0.2 m <sup>2</sup> , pack of 5
5621506A9-B	0.45 µm, 0.2 m <sup>2</sup> , pack of 5
5621505G9-B	0.8 0.65 µm, 0.2 m <sup>2</sup> , pack of 5
5621504E9-B	3.0 0.8 µm, 0.2 m <sup>2</sup> , pack of 5

#### Sartoclean® GF Membrane Filter Mini Cartridges

5601505G9-B	0.8 0.65 µm, 0.2 m <sup>2</sup> , pack of 5
5601504E9-B	3.0 0.8 µm, 0.2 m <sup>2</sup> , pack of 5

\* Special brochure available on request. Order no. S--0024-e

## Sartoclear® P Depth Filter Capsules for Bench Scale Trials

### Description

Sartoclear® P Caps are especially developed to serve small scale volumes in cell harvest and clarification applications. The product features encapsulated cellulose based depth filter media with highest dirt holding capacity. Sartoclear® P Caps are being manufactured using the advantage of the unique and closed SartoScale system.

### Applications

Sartoclear® P Caps are being used as Single-use capsules for bench scale trials, scale up trials and small scale manufacturing.

### Filter Area

Each Sartoclear® P Cap contains an effective filter area of 25 cm<sup>2</sup>.

### Product Benefits

Sartoclear® P Caps are completely disposable capsules. This technology provides highest flexibility for disposable small scale manufacturing and scale up work. Sartoclear® P Caps can be simply and directly connected to the downstream processing line or disposable bags. The integrated teflon vent valve features unique venting procedure and eliminates contamination of the laboratory environment.

### Flexibility

Sartoclear® P Caps can be used for small volume processing from 50 ml up to 1.000 ml.

### Sterilization

1 cycle of wet autoclaving 121 °C at 1 bar for 30 min  
Sartoclear® P Caps may not be in line steam sterilized!

### Extractables

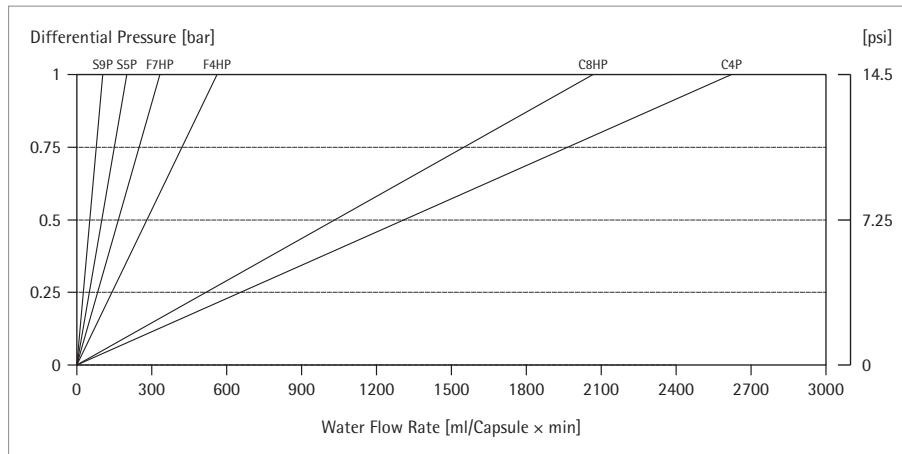
The depth filter media of Sartoclear® P meets the requirements for WFI quality standards set by the USP 26.

- Non pyrogenic according to USP Bacterial Endotoxins after a flush of 50 l/m<sup>2</sup> WFI
- LAL level < 0.125 UE/ml
- Pass USP Plastic Class VI Test

### Metal Extractables

(Please see validation guide of Sartoclear® P Depth Filter Module.)

Non fiber releasing according 21 CFR.



### Specifications

Materials	Depth Filter Media: Core: Capsule Housing:	Cellulosic depth filter media with inorganic filter aids Polypropylene Polypropylene			
<b>Grade</b>	<b>Nominal Retention [<math>\mu\text{m}</math>]</b>	<b>Thickness [mm]</b>	<b>Weight [kg/m<sup>2</sup>]</b>	<b>Ash Content [%]</b>	<b>Water Flow [l/m<sup>2</sup>/min]</b>
C4-P	8	4.1	0.93	20	1,250
C8HP	4	4.1	1.08	35	700
F4HP	1.5	4.1	1.26	45	205
F7HP	1.0	4.0	1.42	50	100
S5-P	0.3	4.0	1.55	50	70
S9-P	0.1	4.0	1.64	48	42
Filtration area				25 cm <sup>2</sup>	
Operating parameters	Max. allowable system pressure: Max. allowable pressure differential: Max. allowable back pressure:		5.5 bar 80 psi at 20 °C 2.0 bar 29 psi 0.03 bar 0.4 psi		

### Technical References

Directions for use: 85030-521-62

### Ordering Information

All Sartoclear® P Caps do have 3" Triclamp connectors at the in- and outlet.

Order No.	Grade	Description	Qty.
293C4-P13ACFF--M	C4HP	Single Layer 25 cm <sup>2</sup> Cap, Cell Harvest	3
293C8HP13ACFF--M	C8HP	Single Layer 25 cm <sup>2</sup> Cap, Cell Harvest	3
293F4HP13ACFF--M	F4HP	Single Layer 25 cm <sup>2</sup> Cap, Clarification	3
293F7HP13ACFF--M	F7HP	Single Layer 25 cm <sup>2</sup> Cap, Clarification	3
293S5-P13ACFF--M	S5P	Single Layer 25 cm <sup>2</sup> Cap, Bioburden reduction	3
293S9-P13ACFF--M	S9P	Single Layer 25 cm <sup>2</sup> Cap, Bioburden reduction	3
295PB1P13ACFF--M	PB1	Post Bioreactor 1, Multilayer 25 cm <sup>2</sup> Cap	3
295PB2P13ACFF--M	PB2	Post Bioreactor 2, Multilayer 25 cm <sup>2</sup> Cap	3
295PC1P13ACFF--M	PC1	Post Centrifuge 1, Multilayer 25 cm <sup>2</sup> Cap	3
295PC2P13ACFF--M	PC2	Post Centrifuge 2, Multilayer 25 cm <sup>2</sup> Cap	3

## Low-cost Polycarbonate Holder for the Filtration of Liter Volumes of Aqueous Solutions

This holder is made of stable, autoclavable polycarbonate. This practical holder is suitable for many simple laboratory filtrations. It can be connected to a peristaltic pump or a pressure container. The bell-shaped base protects the filtrate from repeated contamination while flowing in a receiver.

The holder is characterized by an excellent resistance to pressure and density setting by simply hand-tightening. The transparent top part allows the visual control of the correct fit of the O-ring.

The hose nipples can be replaced by luer connectors to use it as a large area syringe filter holder.

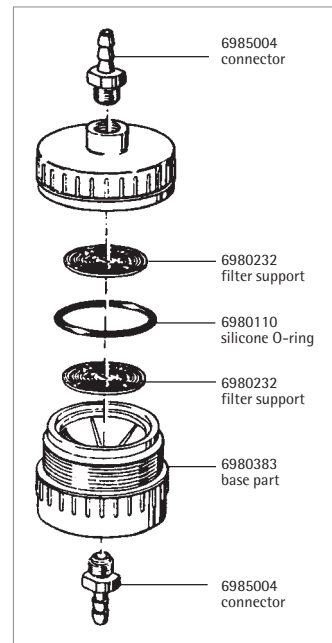
### Specifications for the 50 mm Polycarbonate Filter Holder

Chemical compatibility	As for polycarbonate, polypropylene and silicone
Flow rate	For water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 150 ml/min with 0.2 $\mu\text{m}$ , 320 ml/min with 0.45 $\mu\text{m}$ pore size
Filtration area	12.5 $\text{cm}^2$
Weight	83 g
Threads for connectors	M 12 f 1 female thread
Materials	Polycarbonate top part, base part and hose nipple. Polypropylene filter support. Silicone O-ring (40 f 5 mm).
Max. operating pressure	7 bar   700 kPa   101.5 psi
Suitable membrane filter diameter	50 mm (prefilter, 40 mm)
Sterilization	By autoclaving at 121 °C The material withstands repeated cycles, provided aggressive cleaning agents are completely washed off and that the boiler water does not contain anti-corrosive or anti-scaling additives.

### Order Number for the 50 mm Polycarbonate Filter Holder

16508B	Polycarbonate in-line pressure filter holder, for 50 mm membrane filter, pack of 5.
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Recommended accessories are described on page 96. Replacement parts are shown in the diagram.

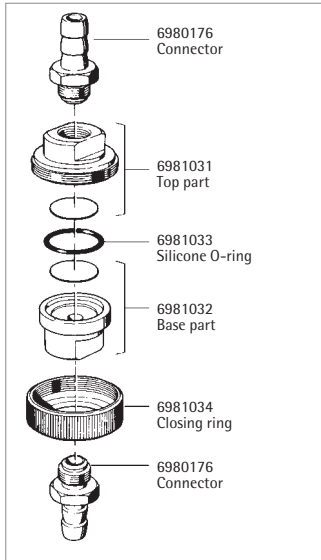


## 25 mm Stainless Steel Filter Holder for In-line Filtration



### The 25 mm Filter Holder

The G $\frac{1}{4}$  connection threads with density barrel, guaranteed leak-proof sealing of the hose nipple and the holder without sealing rings. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G $\frac{1}{4}$  female thread (Order no. 01030) or G $\frac{3}{8}$  female thread (01029) or onto pressure tanks with G $\frac{3}{8}$  male thread (00177).



### Specifications

Connectors	Hose nipples DN10
Filtration area	3 cm <sup>2</sup>
Flow rate	For air at $\bar{p} = 1$ bar   14.5 psi: 0.5 l/min with 0.2 $\mu$ m, 1.0 l/min with 0.45 $\mu$ m pore size
Weight	ca. 170 g
Materials	Stainless steel, except silicone O-ring (21 f 2 mm) and aluminium closing ring
Max. operating pressure	5 bar   500 kPa   72.5 psi
Suitable membrane filter	25 mm, type 118
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C).

### Order Number

16251

Stainless steel holder for 25 mm  $\neq$  membrane filter.

Replacement parts are shown in the diagram.



## 47 mm Stainless Steel Filter Holder for In-line Filtration

### The 47 mm Filter Holder

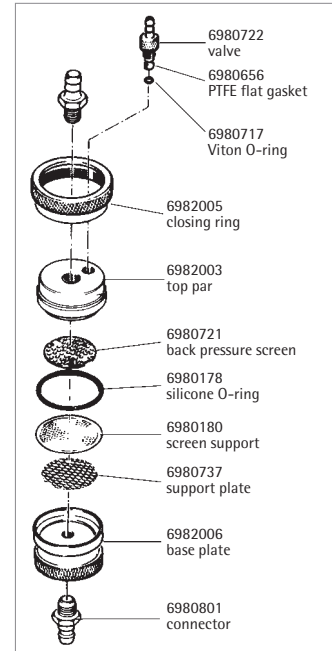
Tolerates pressure of up to 20 bar. The inlet-side valve is convenient for the intermittent run-off of waste water. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G<sup>3/8</sup> female thread (Order no. 17089) or onto pressure tanks with G<sup>3/8</sup> male thread (17069) or on taps with G<sup>3/4</sup> male thread (17068).

### Specifications

Connectors	Hose nipples DN10
Connection thread	M12 f 1
Filtration area	13 cm <sup>2</sup>
Flow rate	For air at $\bar{\Delta}p = 0.3 \text{ bar}   4.35 \text{ psi}$ : 0.5 l/min with 0.2 $\mu\text{m}$ , 1.0 l/min with 0.45 $\mu\text{m}$ pore size
Weight	ca. 490 g
Materials	Stainless steel, except silicone O-ring (42 f 3 mm), PTFE and Viton valve seals
Max. operating pressure	20 bar   2,000 kPa   290 psi
Suitable membrane filter	47 mm, type 118
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C).

### Order Number

16254	Stainless steel holder for 47 mm $\neq$ membrane filter
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Replacement parts are shown in the diagram.

## Chemical-resistant PTFE Holders for the Filtration of Aggressive Liquids



### 47 mm Holder with 200 ml Capacity

The holder hinders the release trace elements into the filtrate and is resistant to almost all chemicals. The Viton O-ring in the top part allows easy hand tightening, but can be replaced by a PTFE O-ring, Order no. 17039). The 6 mm outlet nipple is an integral part of the base, the 10 mm inlet hose nipple can be replaced by a G<sup>3</sup>/<sub>8</sub> connector 17051.

### Specifications for the 47 mm, 200 ml PTFE Filter Holder

Chemical compatibility	As for PTFE and Viton
Flow rate	For water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 170 ml/min with 0.2 $\mu\text{m}$ , 500 ml/min with 0.45 $\mu\text{m}$ , 1.4 l/min with 0.8 $\mu\text{m}$ pore size
Filtration area	12.5 cm <sup>2</sup>
Thread for inlet connector	M 14 f 1.5 male thread
Materials	Top part, barrel, base part, corrugated iron, hose nipples and filter support with 40 f 3.5 mm PTFE O-ring. Aluminium locking rings. 39 f 3.5 mm Viton O-ring (top part)
Max. operating pressure	5 bar   500 kPa   72.5 psi
Suitable membrane filter diameter	47 mm
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C)

### Order Number for the 47 mm, 200 ml PTFE Filter Holder

16579	PTFE pressure filter holder, 47 mm, with 200 ml capacity.
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### Replacement Parts

6985000	PTFE O-ring
6985002	Connector
6985001	Filter support
6985011	Viton O-ring

### 142 mm In-line PTFE Holder

This filter holder is made completely of PTFE. It is clamped between the two metal plates of the holding frame. An alternative inlet connector for the 13 mm hose nipple is the G<sup>3</sup>/<sub>8</sub> connector (Order no. 17105).



### Specifications for the 142 mm PTFE Pressure Filter Holder

Chemical compatibility	As for PTFE
Flow rate	With 0.2 µm membrane filter at Δp = 0.5 bar 50 kPa 7.25 psi, 1 l/min for water, 1.6 l/min for ethanol
Filtration area	130 cm <sup>2</sup>
Weight	6 kg
Materials	Top part, base, back pressure screen, filter support with 131 f 4 mm O-ring, vent valve and PTFE hose nipples. Chromium plated holding frame plates. Aluminium legs
Max. operating pressure	5 bar 500 kPa 72.5 psi
Suitable membrane filter diameter	142 mm (prefilter, 130 mm)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C)

### Order Number for the 142 mm PTFE Pressure Filter Holder

16540	In-line 142 mm PTFE pressure filter holder
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### Replacement Parts

6980700	Back pressure screen
6980705	PTFE O-ring
6980706	Connector
6980701	Filter support
6980712	Screw for clamp
6980703	Base part
6980713	Aluminium legs
6980704	Vent valve
6985010	Clamp



## Stainless Steel Holder with 200 ml Capacity, for the Filtration of up to 5 Liter Volumes



A practical holder for many laboratory filtrations. It can be attached to a tripod with the help of a steel rod which can be screwed in. The hose nipple is screwed into the side of the top part, leaving room for a large filling opening. This makes pouring in the sample easier, and the sample can be refilled without removing the tube connection to the pressure source. Leak-proof sealing is achieved by hand-tightening the closing ring.

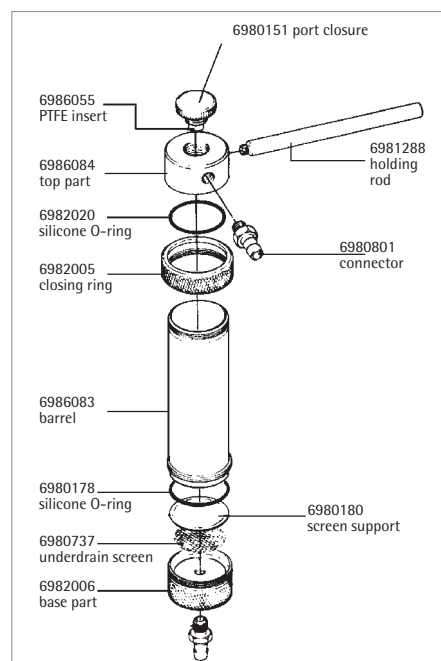
For the filtration of small volumes (up to about 200 ml of soil samples or viscous liquids, such as oils), the holder is connected directly to a pressure source.

For the filtration of up to 5 liter volumes of relatively easily filterable liquids (e.g. buffer solutions, solutions for cell counters and tissue culture solutions), it is used in combination with a pressure tank.



### Specifications for the 47 mm, 200 ml Stainless Steel Pressure Holder

Chemical compatibility	As for stainless steel, PTFE and silicone. If required, the silicone O-ring in the filter support can be replaced by a Viton O-ring 00179 or a PTFE O-ring 17038 (reduces the max. operating pressure to 4 bar 58 psi!); the silicone O-ring in the top part can be replaced by a Viton O-ring 17145.
Flow rate	For water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 200 ml/min with 0.2 $\mu\text{m}$ , 600 ml/min with 0.45 $\mu\text{m}$ , 1.3 l/min with 0.8 $\mu\text{m}$ pore size.
Filtration area	13 cm <sup>2</sup>
Weight	960 g
Threads for the connectors	M 12 f 1 female threads
Materials	Top part, barrel, base part, corrugated iron, closing ring, closure cap, back pressure screen and stainless steel hose nipples 1.4401 (AISI 316). PTFE-coated stainless steel filter support. Silicone O-rings, 41 f 2 mm (top part) and 42 f 3 mm (filter support). PTFE-sealing (cap).
Max. operating pressure	10 bar   1,000 kPa   145 psi
Suitable membrane filter diameter	47 mm (prefilter, 42 mm)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C).



### Order Number for the 47 mm, 200 ml Stainless Steel Pressure Holder

16249 Stainless steel pressure holder for 47 mm membrane filter, with 200 ml capacity.

Recommended accessories are described on page 96. Replacement parts are shown in the diagram.

## Stainless Steel Holder with 2 Liter Capacity, for Sample Preparation and Sterile Filtration of Serum

This device is perfectly suited for the removal of insoluble components from samples for the determination of the particular constituents of sludge that can be eluted with water. Due to the 2 liter capacity, the total sample volume can be filled in with a large filling port, allowing simple pouring of the liquid. The pressure filtration avoids the loss of volatile components. The filter are 130 cm<sup>2</sup>, which guarantees short filtration times.

The holder is also used for the sterile filtration of difficult-to-filter liquids, such as serum. Up to three membrane filters with progressively finer pore sizes in direction of the filtration are installed into the holder. The fractionated retention of suspended material enlarges the filterable volume. The swing-out locking clamps ensure firm sealing simply by hand-tightening.



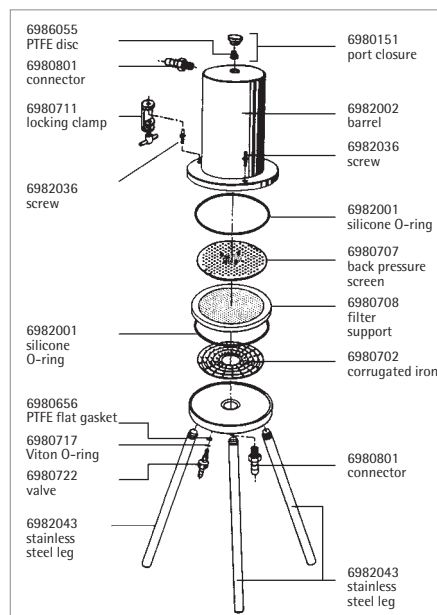
### Specifications for the 142 mm, 2000 ml Stainless Steel Pressure Holder

Chemical compatibility	As for stainless steel, PTFE, silicone and Viton. If required, the silicone O-rings can be replaced by EPDM O-rings (order no. 6982071), Viton O-rings (6982070) or PTFE O-rings (6982072, reduce the max. operating pressure to 4 bar, 58 psi), and the Viton valve O-rings by EPDM O-rings (6985184) or silicone O-rings (6985183).
Flow rate	For water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 2 l/min with 0.2 $\mu\text{m}$ , 4.5 l/min with 0.45 $\mu\text{m}$ , 11 l/min with 0.8 $\mu\text{m}$ pore size
Filtration area	130 cm <sup>2</sup>
Weight	12 kg   26.5 lbs
Threads for connectors	M 12 f 1 female threads
Materials	Top part, base, corrugated iron, locking clamps, legs, locking cap and valve body made of stainless steel 1.4401 (AISI 316). PTFE-coated stainless steel filter support and back pressure screen. Silicone O-rings (130 f 4 mm) in the top part and the filter support. Viton valve O-rings (3 f 1.5 mm). PTFE sealing (valve and cap).
Max. operating pressure	7 bar   700 kPa   101.5 psi
Suitable membrane filter diameter	142 mm (prefilter, 130 mm)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C).

### Order Number for the 142 mm, 2000 ml Stainless Steel Pressure Holder

16274 Stainless steel pressure filter holders for 142 mm membrane filter, with 2 liter capacity.

Recommended accessories are described on page 96. Replacement parts see diagram.



## 142 mm Stainless Steel Holder for the Filtration of up to about 50 Liter Volumes



This holder is very often used in laboratories for particle removal and for sterile filtration of several liters of volume. It has a stable construction and is easy to operate. The large filtration area of 130 cm<sup>2</sup> ensures high flow rate for the total filter volume. The supplied unscrewable hose nipples can be replaced by G<sup>3</sup>/<sub>8</sub> connectors, if systems with particularly practical handling is required.

The holder is designed for effective sterilization by autoclaving. The arrangement of the air venting valve in the top plate and the test valve in the base plate ensures the necessary vapour penetration. The back pressure screen has a smooth surface in order to avoid damages of the membrane filters, also when a glass fiber prefilter is used.

The swing-out locking clamps ensure a firm sealing simply by hand-tightening.



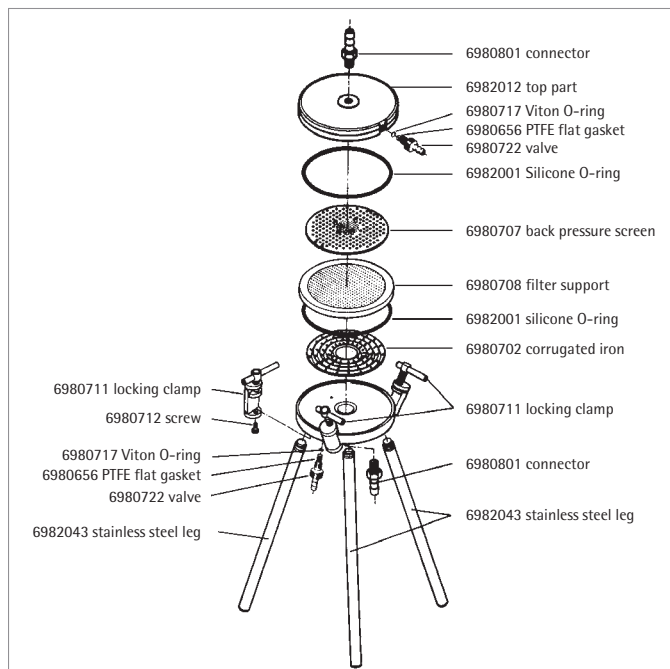
### Specifications for the 142 mm Holder with Hose Nipples

Chemical compatibility	As for stainless steel, PTFE, silicone and Viton. If required, the silicone O-rings can be replaced by EPDM O-rings (order no. 6982071), Viton O-rings (6982070) or PTFE O-rings (6982072, reduce the max. operating pressure to 4 bar  58 psi), and the Viton valve O-rings by EPDM O-rings (6985184) or silicone O-rings (6985183).
Flow rate	For water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 2 l/min with 0.2 $\mu\text{m}$ , 4,5 l/min with 0.45 $\mu\text{m}$ , 11 l/min with 0.8 $\mu\text{m}$ pore size.
Filtration area	130 cm <sup>2</sup>
Weight	6 kg
Threads for connectors	M 12 f 1 female threads
Materials	Top part, base, corrugated iron, locking clamps, stainless steel legs and valve bodies 1.4401 (AISI 316). PTFE-coated stainless steel filter support and back pressure screen. Silicone O-rings (130 f 4 mm) in the top part and filter support. Viton valve O-rings (3 f 1.5 mm). PTFE flat gasket on valves.
Max. operating pressure	7 bar 700 kPa 101.5 psi
Suitable membrane filter diameter	142 mm (prefilter, 130 mm)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C).

### Order Number for the 142 mm Holder with Hose Nipples

16275	142 mm in-line stainless steel filter holder
16660	Laboratory tripod with special socket (100 cm, ca. 33 mm $\Phi$ )

Recommended accessories are described on page 96. Replacement parts are shown in the diagram.



## GMP-complying 142 mm Stainless Steel Holder with Sanitary Flanges

The inlet and outlet connectors are sanitary flanges, which are integral parts of the top and bottom plates. They assist in making the holder easy to clean and simplify the in-line installation. A suitable clamp allows, with the legs removed, the adjustment of the outlet to any height.

The arrangement of the air venting valve in the top part and the sample removal|test

valve in the base guarantees safe sterilization of the device with a mounted filter, either by autoclaving or by in-line vapour deposition. The swing-out clamps ensure leak-proof installation simply by hand-tightening. The back pressure screen is very easy to mount and has a smooth surface in order to avoid damages to the membrane filter when being autoclaved, even when no glass fiber prefilter is used.



### Specifications for the 142 mm Sanitary Flange Holder

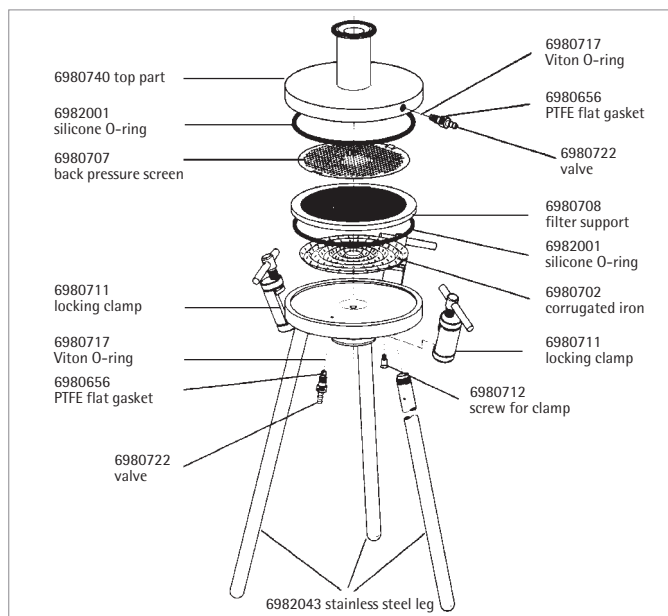
Dimensions	Max. height 404 mm, width 231 mm (in height of the clamps) or 293 mm (at the end of the legs).
Chemical compatibility	As for stainless steel, PTFE, silicone and Viton. If required, the silicone O-rings can be replaced by EPDM O-rings (order no. 6982071), Viton O-rings (6982070) or PTFE O-rings (6982072, reduce the max. operating pressure to 4 bar 58 psi, and the Viton valve O-rings by EPDM O-rings (6985184) or silicone O-rings (6985183).
Flow rate	For water at $\Delta p = 1 \text{ bar}   100 \text{ kPa}   14.5 \text{ psi}$ , 2 l/min with 0.2 $\mu\text{m}$ , 4.5 l/min with 0.45 $\mu\text{m}$ , 11 l/min with 0.8 $\mu\text{m}$ pore size.
Filtration area	130 cm <sup>2</sup>
Weight	6 kg
Materials	Top part, base, corrugated iron, locking clamps, stainless steel legs and valve body 1.4401 (AISI 316). PTFE-coated stainless steel filter support and back pressure screen. Silicone O-rings (130 f 4 mm) in the top part and filter support. Viton valve O-rings (3 f 1.5 mm). PTFE flat gasket on valves.
Max. operating pressure	At 7 bar 700 kPa
Suitable membrane filter diameter	142 mm (prefilter, 130 mm)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C).



### Order Number for the 142 mm Sanitary Flange Holder

16276 142 mm stainless steel pressure filter holder for the in-line installation, GMP-complying, with sanitary flanges

Recommended accessories are described on page 96. Replacement parts are shown in the diagram.

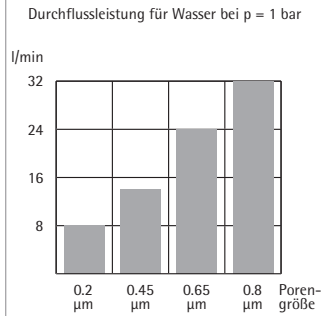


## GMP-complying 293 mm Stainless Steel Holder with Sanitary Flanges



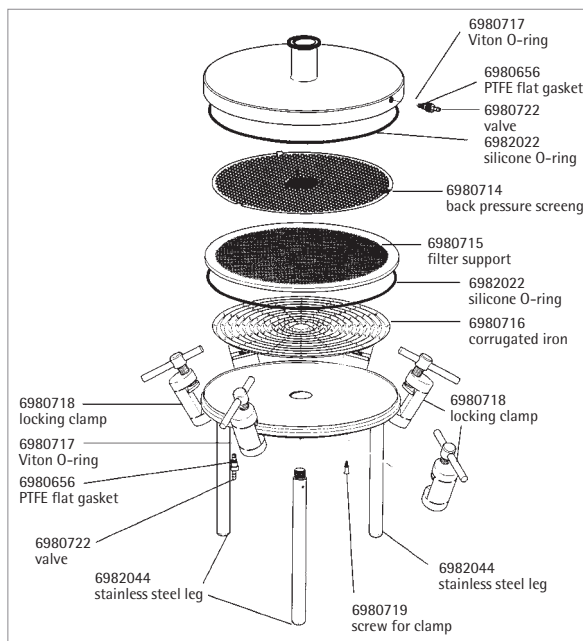
The construction of this holder is the same as that of the 142 mm holder described on page 93, except for the legs and the number of locking clamps. The three legs are made of stainless steel in order to avoid corrosion problems, as is sometimes the case with aluminium legs. They are shorter and screwed in vertically to give a very stable footing to the holder with a larger diameter. The swing-out mechanism of the locking clamps is very practical, as there are 6 clamps.

The holder offers the same advantages for the user as the 142 mm holder, however the filtration area is four times larger, correspondingly the flow rates are higher and the in-service life is longer. The filter support is designed for the maximum exploitation of the filter area and minimum flow resistance, as is confirmed by the steady increase of flow rates with increasing pore sizes (see diagram).



### Specifications for the 293 mm Sanitary Flange Holder

Dimensions	Max. height 331 mm, width 416.5 mm
Chemical compatibility	As for stainless steel, PTFE, silicone and Viton. If required, the silicone O-rings can be replaced by EPDM O-rings (order no. 6982077), Viton O-rings (6982078) or PTFE O-rings (6982079, reduce the max. operating pressure to 4 bar 58 psi), and the Viton valve O-rings by EPDM O-rings (6985184) or silicone O-rings (6985183).
Flow rate	For water at $\bar{p} = 1$ bar 100 kPa 14.5 psi, 8 l/min with 0.2 µm, 14 l/min with 0.45 µm, 32 l/min with 0.8 µm pore size.
Filtration area	560 cm <sup>2</sup>
Weight	20 kg
Materials	Top part, base, corrugated iron, locking clamps, stainless steel legs and valve body 1.4401 (AISI 316). PTFE-coated stainless steel filter support and back pressure screen. Silicone O-rings (280 f 4 mm) in the top part and filter support. Viton valve O-rings (3 f 1.5 mm). PTFE valve flat gasket
Max. operating pressure	5 bar 500 kPa
Suitable membrane filter diameter	293 mm (prefilter, 279 mm)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C)



### Order Number for the 293 mm Sanitary Flange Filter Holder

**16277** 293 mm stainless steel pressure filter holder for in-line installation, GMP-complying, with Sanitary flange inlet and outlet.

Recommended accessories are described on page 96. Replacement parts are shown in the diagram.

## Modular Assembly System for Stainless Steel Filter Housings

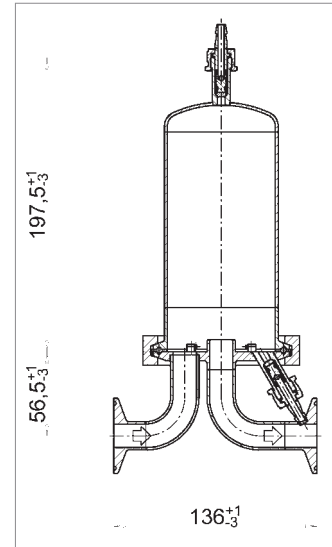
The Sartorius modular assembly system for filter housings combines the highest flexibility with short delivery periods and favorable prices. With the help of a special software, the mini-, standard-single- and multisystems can be constructed by our field service locally. There is a choice of different construction heights, different de-aerations and tubing according to German Industrial Standards DIN, the ISO and the BSOD. Furthermore, triclamp, flange or tube joint connectors are available according to the usual standards.

### Stainless Steel T-Type for 0.05 m<sup>2</sup>, 0.1 m<sup>2</sup> and 0.2 m<sup>2</sup> Mini Cartridges

Stainless steel housings for liquids, particles or sterile filtration.

The housing features an air venting valve on the inlet side. The mini cartridge is changed by opening the housing with a bayonet catch.

Suitable filter cartridges on page 81.



### Quality Standards for the Modular System

Material	AISI 316 L
Surfaces	Interior: Ra < 0,5 µm Exterior: Ra < 1.6 µm
Temperature range	-10...+150 °C
Pressure range	-1...+10 bar (1,000 kPa, -14.5 psi.. + 145.0 psi)
Adapter	Mini: 15 Standard: 25

### Specifications

Connectors	Triclamp 50.5 mm (Sanitary flange)
Width	ca. 172.5 mm
Surface roughness	Product touching areas < 0.5 µm
Materials	Stainless steel AISI 316L, silicone O-ring
Max. operating pressure	10 bar   1,000 kPa   145.0 psi
Max. temperature	150 °C

### Order Number

7M19LSB00085	Stainless steel mini cartridge housing for liquid filtration T-type
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Special brochure available on request. Order no. SPG1501-e

## Accessories for Pressure Filtration Units

The accessories required depend on the type of the pressure filtration unit.

Re-usable units with barrels to hold the liquid to be filtered can be connected to a pressure source (pressure pump or nitrogen bottle) after insertion of the membrane filter and prefilter, and if necessary, after sterilization and pouring in of the liquid.

When using ready-to-connect units, devices for the conduction installation and mini cartridge housings, the filterable liquid must be fed in on the inlet side, either out of an "open" container through a peristaltic or impeller pump, or out of a pressurized conduction system or a pressurized container. Various systems with pressurized containers are described on the next page.

### Recommended Accessories

#### 1. For Sartobran® 300 Capsules

The hose nipple inlet can be connected to a peristaltic pump or a pressurized container using commercially available tubing.

#### 2. For Sartobran® P Capsules

Connection to a pressurized container: either a capsule with G<sup>3/8</sup> male thread with inlet hose nipple using a PTFE-tube 16999, or a capsule with inlet hose nipples using commercially available tubing.

Connectors for capsules with inlet sanitary flange are described under 7.

#### 3. For Polycarbonate Holder

The inlet hose nipple can be connected to a peristaltic pump or a pressurized container using commercially available tubing. The hose nipple can be replaced by a connector with G<sup>3/8</sup> male thread (Order no. 17089) in order to connect the device to a pressurized container using the PTFE pressure hose 16999.

The hose nipple can also be replaced by a Luer Lock connector (Order no. 16881), in order to use the device as syringe filter holder. A luer slip connector (Order no. 16880) can replace the outlet hose nipple.

#### 4. For Stainless Steel Holders

The inlet hose nipple can be connected to a pressure source (pump or nitrogen bottle) with a commercially available hose. Alternatively, the hose nipple can be replaced by a connector with G<sup>3/8</sup> male thread (Order no. 17089), in order to connect the device to the pressure source with the flexible pressure hose 17091, or the PTFE pressure hose 16999.

For the filtration of easy-to-filter, large-volume liquids, the 47 mm holder can be connected to a 5 l pressurized container using a connector with G<sup>3/8</sup> male thread and a PTFE pressure hose.

#### 5. For Stainless Steel Holder

The inlet hose nipple can be connected to a peristaltic pump or a pressurized container with a commercially available hose, but it is far more practical to replace the hose nipple with a connector with G<sup>3/8</sup> male thread (Order no. 17089), in order to connect the unit to a pressurized container with the PTFE hose 16999.

However it is connected, further accessories simplify the use of the holder, when the filtrate is to be filled into bottles. A hand-operated valve (16656) on the outlet side allows the control of the filtrate flow. A clamp (17036) replaces the three legs allowing the adjustment of the height of the outlet to that of the bottles.

#### 6. For Holders, Mini Cartridge Housings and Capsules with Sanitary Flange Inlets

The sanitary flange at the inlet and outlet require one clamp (17033) and one connector.

The outlet connector is usually a 19 mm (17017) or a 25 mm (17016) hose nipple, or an adapter 17150 for the hand-operated valve (16656), with which the flow of the filtrate can be regulated.

The inlet connector depends on the system: Connector 17019 with G<sup>3/8</sup> male thread accommodates the connection with the PTFE pressure hose 16999 to a pressurized container.

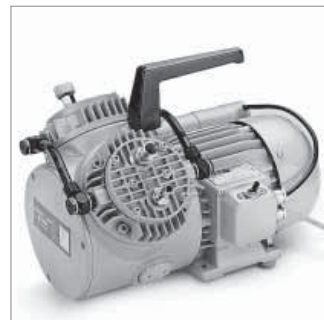
### Order Numbers

16508	Polycarbonate holder
16249	Stainless steel holder
16274	Stainless steel holder
16275	Stainless steel holder

## Filtration Systems with Pressure Tanks and Three Different Connection Possibilities

### Specifications for Membrane Pump

Input wattage	15 W
Electrical supply	220 V, 50 Hz
Diaphragm	Max. 3,000/min
Materials	Polypropylene housing, PTFE membrane, EPDM seals and valves.
Max. operating pressure	3 bar 43.5 psi, preset to 2.5 bar 36.3 psi
Rated output for water	650 ml/min without pressure, 300 ml/min with Sartolab® P20
Self-priming	Up to 3 m water column. Power consumption, 0.76 A.



### Order Numbers for Membrane Pump

18059

### Replacement Part

6988094	Tubing set, consisting of 2.5 m silicone hose (4 mm inner diameter, 1.5 mm wall thickness, 60 Shore A hardness), 5 multi functional adapters, 1 stainless steel sinker.
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### Specifications for Membrane Pump for Pressure

Weight [kg]	ca. 15
Threads for connectors	G¼ female thread
Dimensions [cm]	35 f 25 f 26
Max. performance [l/min]	55
Max. ambient temp.	40 °C
Power [W]	250
Protection	IP 44

### Order Numbers for Membrane Pump for Pressure

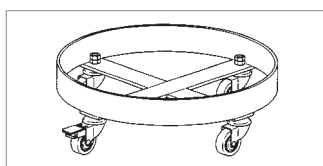
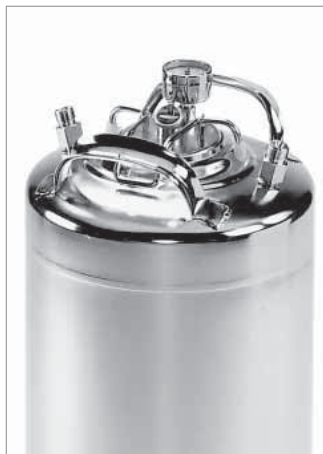
16617	(220 V, 50 Hz)
16662	(110 V, 60 Hz)

### Replacement Part

6986006	Spare parts kit, consisting of 2 membranes, 4 valve springs and 2 pump head gaskets.
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## Filtration Systems with Pressure Tanks and Three Different Connection Possibilities (continued)



### Pressure Tank

Pressure tanks serve as reserve containers for pressure filtration, and are also used for the transport, storage and distribution of liquids. Two handles simplify the handling and the transport. Special trolleys are available for the 40, 60, 80 and 100 liter pressure tanks.

The pressure tanks are made of 1.4401 (AISI 316) stainless steel and meet the requirements of PED/97/23/EC. The surfaces are electropolished. The tanks can be autoclaved at 121 °C.

The screwed on G<sup>3/8</sup> connectors allow the connection of PTFE pressure hoses 16823 or 16999. They can be replaced by hose nipples, sanitary flanges or connectors for quick-connect systems (see accessories).

As a standard, the lid is equipped with a pressure gauge, a safety valve, and a clamp for leak-proof, pressure-resistant closure.

A certificate concerning construction and pressure testing according to the German decree for pressure tanks is enclosed in every tank (the tanks are specifically designed for pressure, and are not to be used as vacuum containers).

For the specific requirements of the pharmaceutical industry, GMP-complying pressure tanks are available in various sizes upon request. Benefits of the device include the ease of cleaning, the equipment with triclamp connectors as a standard and the low surface roughness.

### Specifications

Dimensions	17530	235 f 234 mm	3.9 kg	8.6 lbs
height f diameter   weight	17531	360 f 234 mm	5.4 kg	11.9 lbs
	17532	600 f 234 mm	8.2 kg	18.2 lbs
	17533	705 f 300 mm	11.8 kg	26 lbs
	17534	643 f 400 mm	15.2 kg	33.5 lbs
	17535	802 f 400 mm	18.4 kg	40.5 lbs
	17536	962 f 400 mm	21.7 kg	47.8 lbs
	(opening, for all types, oval, length 98 mm, width 82 mm)			
Maximal operating pressure	7 bar   101.5 psi	for 17530, 17531, 17532.		
	5 bar   72.5 psi	for 17533.		
	3 bar   43.5 psi	for 17534.		
	2 bar   29 psi	for 17535, 17536		
Max. operating temperature	95 °C			

### Accessories

6985093	Spanner, 17–19 mm (to fasten connectors)
17636	Trolley for 17533
17635	Trolley for 17534, 17535 and 17536

### The Silicone O-Rings Supplied on Standard can be Replaced by the Following Viton or EPDM O-Rings

6986110	Silicone O-ring (lid)
6986132	Silicone O-ring (tubes)
6986111	EPDM O-ring (lid)
6986133	EPDM O-ring (tubes)

### Other Connectors

16863	Hose nipple, DN 10–19
17070	1"–1½" sanitary flange
17170	Quick connect nipple

**Order Numbers**

17530	5 liter capacity
17531	10 liter capacity
17532	20 liter capacity
17533	40 liter capacity
17534	60 liter capacity
17535	80 liter capacity
17536	100 liter capacity

**Replacement Parts**

For all pressure tanks	6980389	Viton O-ring (lid)
	6980395	Inlet tube
	6980396	Viton O-ring (tubes)
	6980420	Connector, G <sup>3</sup> / <sub>8</sub>
	6985131	PTFE cap (2 f)
For 17530, 17531,17532	6980390	Pressure gauge, 7 bar
	6986112	Outlet tube (17530)
	6986113	Outlet tube (17531)
	6986114	Outlet tube (17532)
	6986130	Lid with valve
For 17533	6980415	Pressure gauge, 5 bar
	6986115	Outlet tube (17533)
	6986129	Lid with valve
For 17534	6986116	Outlet tube (17534)
	6986137	Pressure gauge, 3 bar
	6986138	Lid with valve
For 17535, 17536	6986117	Outlet tube (17535)
	6986118	Outlet tube (17536)
	6986119	Pressure gauge, 2 bar
	6986131	Lid with valve

## Filtration Systems with Pressure Tanks and Three Different Connection Possibilities (continued)

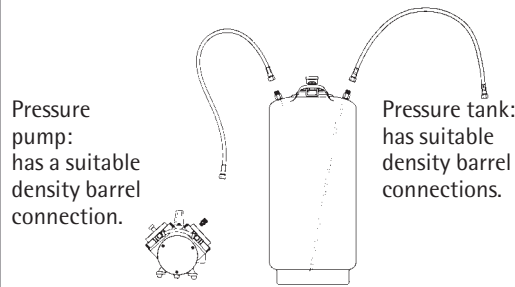
### With G<sup>3/8</sup> Connectors

The pressure tank is connected to the pressure source and the filtration unit by means of stainless steel reinforced PTFE hoses. These hoses can be autoclaved and are easy to clean. Due to the density barrel

in the connections, a slight tightening with a 19 mm wrench for a leak-proof sealing is necessary. No seals and Teflon tapes are required.

Main advantage: easy cleaning.

Pressure hoses: have suitable density barrel connections.



Sartobran® P capsules Type RO have a suitable density barrel connection. The inlet hose nipple of the holders 16249, 16275 and 16508 have to be replaced by connector 17089. Capsules, holders and holding with inlet sanitary flange require connector 17019.

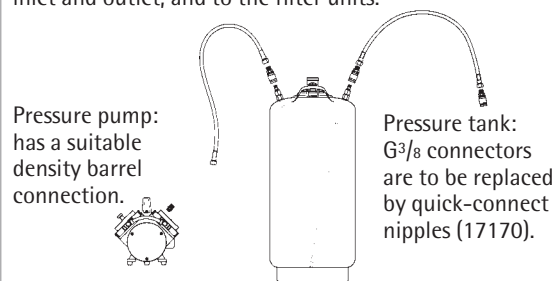
### With Quick Connectors

The pressure tank is connected to the pressure source and the filtration unit by means of stainless steel reinforced PTFE pressure hoses and quick connect couplings. Hoses and couplings can be autoclaved. The valve in the quick-connect coupling closes automatically

when the coupling is removed from the quick-connect nipple.

Main advantage: connection and removal of the coupling is quick and simple.

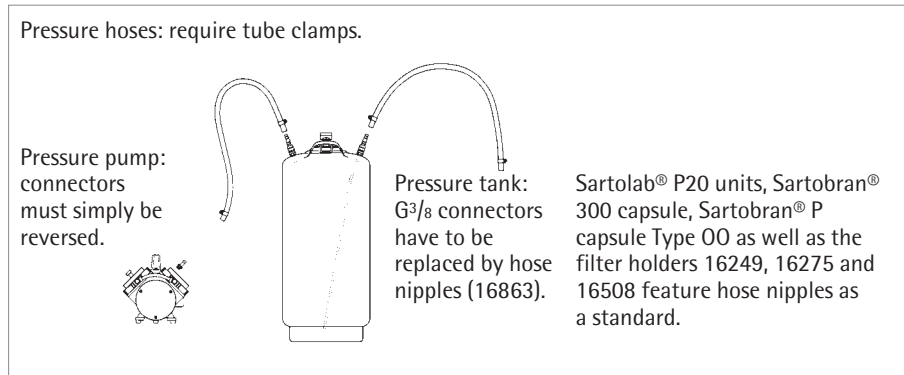
Pressure hoses: require an additional adapter (6985128) on the nuts to the pressure tank inlet and outlet, and to the filter units.



Not recommended for capsules, housings or devices with sanitary flanges. The inlet hose nipple of the holders 16249, 16275, and 16508 have to be replaced by the connector 17090.

### With Commercially Available Hoses

The pressure tank is connected to the pressure source and the filtration unit by means of commercially available pressure hoses. The hoses must be clamped to the hose nipples. Main advantage: hoses are usually available.





#### PTFE Pressure Hose

Stainless steel reinforced PTFE pressure hoses with G<sup>3/8</sup> nuts on each side. The hoses are solvent resistant and easy to clean. They can be sterilized by autoclaving (121 °C or 134 °C) or by dry heat (180 °C).

The nuts fit on the G<sup>3/8</sup> male threads, and ensure a leak-proof connection without the need for sealing rings or Teflon tapes.



The nuts also fit on a function piece with quick-connect coupling (Order no. 6985128) for quick and simple connection to holders fitted with quick connect nipples. The valve in the coupling opens when it is fitted on a quick connect nipple, and closes when removed from the nipple.

#### Flexible Pressure Hose

1 m long. G<sup>3/8</sup> nuts on each side. It is very flexible and especially practical as a pressure hose for pressure holders with capacity barrel. Can be sterilized by autoclaving or by dry heat. Not for use with liquids.



#### Plastic Pressure Hose

Flexible gas pressure hose with quick-connect coupling for direct connection to pressure holders with a capacity barrel. The hose has a quick-connect nipple and a G<sup>3/8</sup> nut for connection to the pressure source. Not for use with liquids.



#### Hand-operated Valve

This valve is fitted on the outlet side of the filter holder Type 16275, and allows a steady regulation of the filtrate or a selective dosage when filling up liter volumes.

An adapter (Order no. 17150) allows the attachment of a capsule and a mini cartridge housing with sanitary flange.

Fitted to the filter holder, the valve can be sterilized, when open, with all the usual methods. For cleaning purpose, it can be quickly disassembled without problems.

Materials: ball and housing, stainless steel (Material no. 1.4401, AISI 316).  
Seat and nipple for 13 mm hose, PTFE.

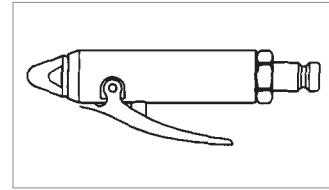
Clamp for sanitary flanges  
Two 1-1/2" sanitary flanges are pressed against the supplied gasket and are attached with the clamp.

For order numbers, see next page.



**Order Numbers for PTFE Pressure Hose**

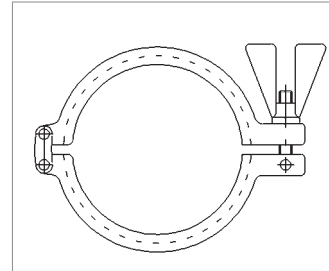
16999	1.5 m long
16823	80 cm long

**Accessories for 6985128**

6980407	Trigger valve for cleaning
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**Replacement Part for 6985128**

6985216	Seal set (Viton O-ring, flat gasket)
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**Order Number for Flexible Pressure Hose**

17091	
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**Order Number for Plastic Pressure Hose**

16931	
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**Order Number for Hand-operated Valve**

16656	
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**Replacement Parts**

6981314	Stainless steel bell
6986090	Valve body
6986091	Connector, M12 f 1
6986092	PTFE hose nipple
6988093	PTFE sealing, (pack of 2)

**Order Number for Clamp for Sanitary Flanges**

7ZSB--0009	1½" (50.5 mm)
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Replacement silicone gaskets are available under the order number 6982029 (pack of 2). Ethylene polypropylene gaskets (order no. 6982060) and PTFE reinforced buna (6982061) are also available.

## Midisart® 2000 Sterile Venting Units, Light Weight and Easy-to-connect



Re-usable complete filtration units with naturally hydrophobic PTFE membrane for reliable sterile venting of small fermenters and of containers for culture media.

Midisart® 2000 units have been designed for maximum handling ease and reliability. Tapered hose nipples ensure a simple, secure hold for tubing with an inner diameter of 6–12 mm. Due to the low weight of only 20 g, the connected tubing is not snapped off. The membrane is reinforced with polypropylene gauze for stability at pressures of up to 3 bar|43.5 psi. The 20 cm<sup>2</sup> large filter area allows high flow rates at low differential pressures.

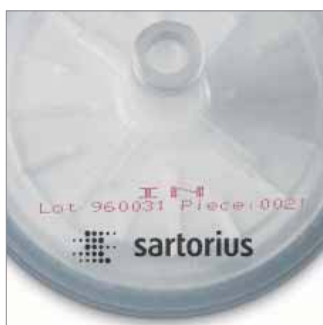
Each unit is printed with a lot number and an individual piece number on the housing for total security and traceability.

### Minisart® HY Ready to Connect Units for the Sterile Venting of Small Containers and Bottles

These 26 mm units consist of a polyester-strengthened 0.2 µm PTFE membrane in a cyrolite housing with Luer Lock connectors (female top, male bottom).

### Specifications for Midisart® 2000 Units

Connectors	Choice of conical hose nipples for tubing with 6–12 mm inner diameter (with slip-fit for luer syringes), or 1/8" male NPT.
Biosafety	All materials pass the USP Plastics Test Class VI.
Bubble point	Min. value with isopropanol for 0.2 µm unit = 1.4 bar 140 kPa 20.3 psi (1.1 bar after autoclaving) and 0.9 bar 90 kPa 13 psi for 0.45 µm unit.
Air flow rate	Typical values for 0.2 µm pore size: 1.1 l/min at 0.02 bar 0.29 psi (1.8 l/min for 0.45 µm) 2.0 l/min at 0.05 bar 0.72 psi (4.6 l/min for 0.45 µm) 5.0 l/min at 0.1 bar 1.45 psi (8.5 l/min for 0.45 µm)
Filter area	20 cm <sup>2</sup>
Filling volume	Approx. 3 ml
Housing diameter	62 mm
Materials	PTFE membrane filter aus PTFE, reinforced with polypropylene gauze, polypropylene housing.
Max. recommended operating pressure	3 bar 300 kPa 43.5 psi
Max. temperature	134 °C
Sterilization method	By autoclaving at 121 °C (at least 20 times) or 134 °C. E and G packs are presterilized with ethylene oxide. No gamma irradiation allowed.
Hold-up volume	Approx. 0.5 ml after (1 ml before) bubble point
Water penetration point	4.0 bar 58 psi (0.2 µm) and 3.0 bar 43.5 psi (0.45 µm)



### Specifications for Minisart® HY

Bubble point	Min. value with isopropanol 1.2 bar 17.4 psi
Air flow rate	Approx. 1.4 l/min at Δp = 0.1 bar 1.45 psi
Filter area	5.3 cm <sup>2</sup>
Housing burst pressure	Min. value 6.0 bar 600 kPa 87 psi
Water penetration point	Min. 4.0 bar 400 kPa 58 psi

Order numbers see next page.

**Order Numbers for Midisart® 2000 Units**

Order No.	Pore Size	Membrane	Connectors E A	Pieces/Case	Sterile
17804 E	0.45 µm	PTFE	Hose Barb Hose Barb	12	Yes
17804 G	0.45 µm	PTFE	Hose Barb Hose Barb	25	Yes
17804 NPE	0.45 µm	PTFE	1/8"   1/8" NPT	12	Yes
17804 NPG	0.45 µm	PTFE	1/8"   1/8" NPT	25	Yes
17805 E	0.2 µm	PTFE	Hose Barb Hose Barb	12	Yes
17805 G	0.2 µm	PTFE	Hose Barb Hose Barb	25	Yes
17805 NPE	0.2 µm	PTFE	1/8"   1/8" NPT	12	Yes
17805 NPG	0.2 µm	PTFE	1/8"   1/8" NPT	25	Yes
17805 UPN	0.2 µm	PTFE	Hose Barb Hose Barb	100	No
17805 UPQ	0.2 µm	PTFE	Hose Barb Hose Barb	500	No
17809 UNN	0.2 µm	PTFE	1/8"   1/8" NPT	100	No
17812 UNN	0.2 µm	PTFE	1/8"   Hose Barb	100	No
17805 TCN	0.2 µm	PTFE	TriClamp TriClamp	100	No
17877 UPN	0.2 µm	PTFE	Small Hose Barb  Small Hose Barb	100	No



Standard Hose Barb



Small Hose Barb

**Order Numbers for Minisart® HY**

16596 HYK	Sterile, individually packed, pack of 50
16596 HYQ	Non-sterile, pack of 500

Special brochure available on request. Order no. SL-1021-e



1/8" NPT Thread



TriClamp



## Midisart® BV Sterile Venting Filter on Disposable Bag and Tubing Assemblies



### Description

Midisart® BV disposable venting filter manufactured with hydrophobic, reinforced PTFE membranes, are especially designed for sterile venting on disposable bag manifolds and tubing systems.

### Applications

Midisart® BV filter elements used on disposable bags do prevent the collapsing of the bag chamber during draining by sterile venting.

Used on disposable bag manifolds Midisart® BV facilitate sterile drainage of the tubing in order to empty the tubing connection between the single bags of the bag manifold.

### Stability

The reinforcement of the hydrophobic PTFE membrane by a Polyester fleece assures the full mechanical stability of the PTFE membrane for specified applications after gamma sterilization. Midisart® BV is integrity testable.

### Documentation

Midisart® BV filter elements are designed, developed and manufactured in accordance with an ISO 9001 certified Quality Management System. A Validation Guide is available for compliance with regulatory requirements.

### Specifications

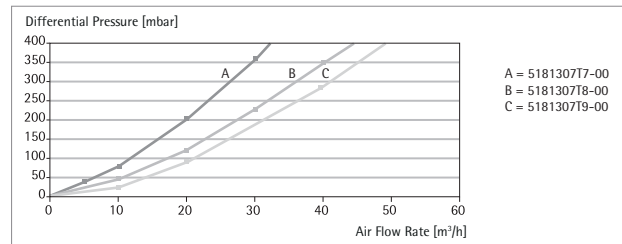
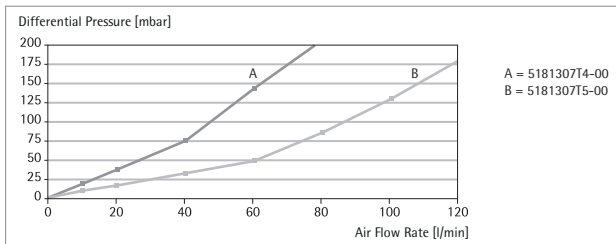
Materials	Membrane: PTFE Support fleece: Polyester Housing: Polypropylene
Pore size	0.2 µm
Article codes	17805-----BVE (12 per box) 17805-----BVN (100 per box) 17805-----BVQ (500 per box)
Connectors	Multiple stepped hosebarb (in- and outlet)
Filtration area	20 cm <sup>2</sup>  3 square inch
Housing diameter	64 mm 2.5"
Sterilization	Gamma Irradiation 50 kGy (max.)
Max. operation pressure	In direction of filtration: 1.5 bar 22 psi Opposite direction: 0.5 bar 7 psi

## Sartofluor® MidiCaps® with PTFE Membrane for Maximum Security in Sterile Venting

Sartofluor® MidiCaps® are ready-to-connect, pre-tested, complete filter units. The PTFE membrane is pleated to obtain the largest possible usable filtration area in the small polypropylene housing. The two valves on the upstream side of the housing ensure good steam passage and correspondingly accommodate sterilization of the capsules by autoclaving.

The extreme hydrophobicity of the PTFE membrane ensures maximum filtration security, even when filtering moist air. The high air flow rate of the membranes and the large filter area enable effective sterile filtration, even at low differential pressures.

The excellent chemical compatibility of the PTFE and polypropylene materials makes Sartofluor® MidiCaps® additionally useful for the filtration of those acids, bases and non-aqueous solvents for which other capsule types cannot be used.





### Specifications for Sartofluor® MidiCaps®

Connectors	Hose nipple 10 mm or 1"-1½" Sanitary flange
Biosafety	All materials pass the USP Plastics Test Class VI.
Bubble point	Min. value with 60% Isopropanol: 1.5 bar   150 kPa   21.75 psi for 0.1 µm pore size 1.0 bar   100 kPa   14.5 psi for 0.2 µm pore size 0.6 bar   60 kPa   8.7 psi for 0.45 µm pore size
Chemical compatibility	See page 124
Air flow rate	For 0.2 µm capsules see diagram on page 107
Filter area	0.015 m <sup>2</sup> , 0.03 m <sup>2</sup> , 0.05 m <sup>2</sup> , 0.1 m <sup>2</sup> or 0.2 m <sup>2</sup>
Material	PTFE membrane filter. Housing, polypropylene supporting and drainage layers
Max. differential pressure	4 bar   58 psi at 20 °C, 2 bar at 80 °C
Max. operating pressure	4 bar   58 psi at 20 °C
Sterilization	By autoclaving (121 °C or 134 °C)
Water penetration pressure	Approx. 4.5 bar   450 kPa   65.3 psi for 0.2 µm pore size

### Order Numbers for Sartofluor® MidiCaps®

Sartofluor® MidiCaps® with hose nipple inlet and outlet

5185358T7-XX-B	0.1 µm, 0.05 m <sup>2</sup> , pack of 5
5185358T8-XX-B	0.1 µm, 0.1 m <sup>2</sup> , pack of 5
5185358T9-XX-A	0.1 µm, 0.2 m <sup>2</sup> , pack of 4
5185307T7-XX-B	0.2 µm, 0.05 m <sup>2</sup> , pack of 5
5185307T8-XX-B	0.2 µm, 0.1 m <sup>2</sup> , pack of 5
5185307T9-XX-A	0.2 µm, 0.2 m <sup>2</sup> , pack of 4
5185306T9-XX-A	0.45 µm, 0.2 m <sup>2</sup> , pack of 4

XX: Connector styles

### Available Connectors

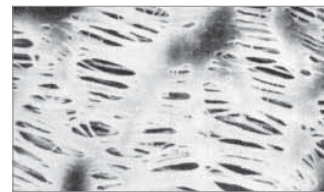
SS, SO, OO, FF, FO, HH (only for size 7)

S	1½" Tri-Clamp (Sanitary)
O	Single stepped hose barb
F	¾" Tri-Clamp (Sanitary)
H	Small, multiple stepped hose barb (with filling bell at the outlet)

## Hydrophobic PTFE Membranes, Type 118, for the Filtration of Air, Gases or Chemicals

The main application of this membrane filter type is the air/gas filtration. They are made purely of PTFE (polytetra-fluorethylene), and are therefore permanently hydrophobic. Unlike other (hydrophilic) filter types, they are not wetted by air humidity, allowing unhindered passage of air, also at low differential pressures.

PTFE membrane filters have excellent chemical compatibility, so that they are also used for the filtration of solvents and acids, to which other filter types are not resistant. Due to their hydrophobic characteristics, they must be pre-wetted with ethanol or methanol before the filtration of aqueous media.



### Specifications for PTFE Membrane Filters

Adsorption	8 µg/cm <sup>2</sup> for gamma-globulin (0.2 µm pore size).
Bubble point acc. DIN 58355	Minimum value for Isopropanol 0.2 µm = 1.0 bar 100 kPa 15 psi, for 0.45 µm = 0.7 bar 70 kPa ~10 psi. Average value for 1.2 µm = 0.45 bar 45 kPa 6.52 psi, for 5 µm = 0.1 bar 10 kPa 1.45 psi
Chemical compatibility	Resistant to almost all chemicals
Extractables with water	None detectable
Flow rate for air	Average values per cm <sup>2</sup> area at Δp = 0.05 bar 5 kPa 0.725 psi: 0.2 l/min for 0.2 µm, 0.3 l/min for 0.45 µm, 1.6 l/min for 1.2 µm and 4 l/min for 5 µm pore size
Material	Polytetrafluorethylene
Sterilization	By autoclaving at 121 °C or 134 °C or with ethylene oxide.
Sterilizing filtration	Filters with 0.2 µm pore size are validated with the Bacteria Challenge Test.
Thickness acc. DIN 53105	Average values, 65 µm for 0.2 µm and 100 µm for 5 µm pore size.

Order numbers see next page.

### Order Numbers for PTFE Membrane Filters

13 mm diameter	11803-013 N	1.2 µm, pack of 100
	11806-013 N	0.45 µm, pack of 100
	11807-013 N	0.2 µm, pack of 100
25 mm diameter	11842-025 N	5 µm, pack of 100
	11803-025 N	1.2 µm, pack of 100
	11806-025 N	0.45 µm, pack of 100
	11807-025 N	0.2 µm, pack of 100
47 mm diameter	66042--47-----N	5 µm, PTFE supported, pack of 100
	11842-047 N	5 µm, pack of 100
	11803-047 N	1.2 µm, pack of 100
	11806-047 N	0.45 µm, pack of 100
	11807-047 N	0.2 µm, pack of 100
50 mm diameter	11842-050 N	5 µm, pack of 100
	11803-050 N	1.2 µm, pack of 100
	11806-050 N	0.45 µm, pack of 100
	11807-050 N	0.2 µm, pack of 100
100 mm diameter	11842-100 G	5 µm, pack of 25
	11803-100 G	1.2 µm, pack of 25
	11806-100 G	0.45 µm, pack of 25
	11807-100 G	0.2 µm, pack of 25
142 mm diameter	11842-142 G	5 µm, pack of 25
	11803-142 G	1.2 µm, pack of 25
	11806-142 G	0.45 µm, pack of 25
	11807-142 G	0.2 µm, pack of 25
293 mm diameter	11806-293 G	0.45 µm, pack of 25
	11807-293 G	0.2 µm, pack of 25

## 25 mm Stainless Steel Filter Holder for In-line Filtration

### The 25 mm Filter Holder

The G<sup>1</sup>/<sub>4</sub> connection threads with density barrel guarantee leak-proof sealing of the hose nipple and the holder without sealing rings. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G<sup>1</sup>/<sub>4</sub> female thread (Order no. 01030) or G<sup>3</sup>/<sub>8</sub> female thread (01029), or onto pressure tanks with G<sup>3</sup>/<sub>8</sub> male thread (00177).

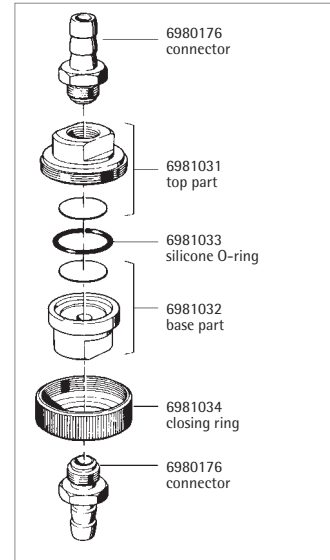
### Specifications

Connectors	Hose nipples DN10
Filtration area	3 cm <sup>2</sup>
Flow rate	For air at $\Delta p = 1 \text{ bar}   14.5 \text{ psi}$ : 0.5 l/min with 0.2 $\mu\text{m}$ , 1.0 l/min with 0.45 $\mu\text{m}$ pore size
Weight	ca. 170 g
Materials	Stainless steel, except silicone O-ring (21 f 2 mm) and aluminium closing ring
Max. operating pressure	5 bar   500 kPa   72.5 psi
Suitable membrane filter	25 mm, type 118
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C).

### Order Number

16251	Stainless steel holder for 25 mm $\nabla$ membrane filter.
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Replacement parts are shown in the diagram.

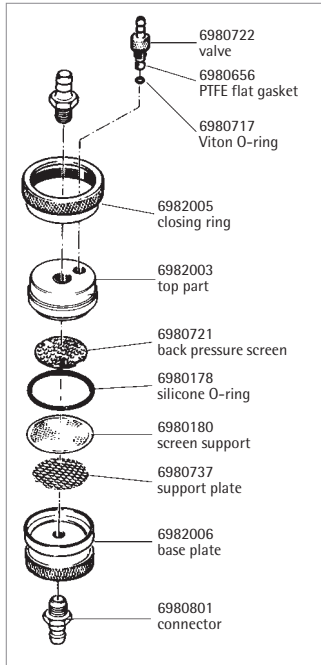


## 47 mm Stainless Steel Filter Holder for In-line Filtration



### The 47 mm Filter Holder

Tolerates pressure of up to 20 bar. The inlet side valve is convenient for the intermittent run-off of waste water. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G<sup>3/8</sup> female thread (Order no. 17089), or onto pressure tanks with G<sup>3/8</sup> male thread (17069) or on taps with G<sup>3/4</sup> male thread (17068).



### Specifications

Connectors	Hose nipples DN10
Connection thread	M12 f 1
Filtration area	13 cm <sup>2</sup>
Flow rate	For air at $\Delta p = 0.3 \text{ bar}   4.35 \text{ psi}$ : 0.5 l/min with 0.2 $\mu\text{m}$ , 1.0 l/min with 0.45 $\mu\text{m}$ pore size
Weight	ca. 490 g
Materials	Stainless steel, except silicone O-ring (42 f 3 mm), PTFE and Viton valve seals
Max. operating pressure	20 bar   2,000 kPa   290 psi
Suitable membrane filter	47 mm, type 118
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C).

### Order Number

16254	Stainless steel holder for 47 mm $\mp$ membrane filter.
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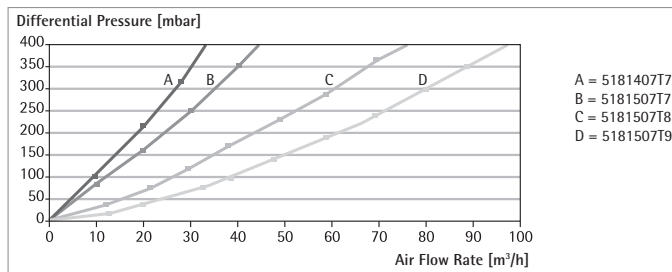
Replacement parts are shown in the diagram.

## Sartofluor® Mini Cartridges for Highest Safety in Sterile Venting and Compressed Air|Gas Filtration

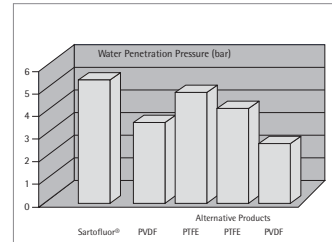
Sartofluor® mini cartridges are designed particularly for cases of sterile venting when the cGMP directives must be adhered to.

The sealing system, an inner O-ring plus bayonet twist lock, guarantees safe attachment in mini cartridge housings and a firm hold for back pressure pushes.

The inserted, specially developed PTFE membranes are extremely water-repellent, which is shown impressively by the very high water penetration pressure. The diagram shows values for various 0.2 µm filter materials. Due to the optimal hydrophobicity, steam sterilized Sartofluor® mini cartridges re-reach their maximal flow rates in shortest time.



Air flow rates at atmospheric pressure Sartofluor® mini 0.2 µm, Type 5181507T7, T8, T9, 5181407T7



### Specifications for Sartofluor® Mini Cartridges

Connector	Inner silicone O-ring (replacement part no. 6985150) and bayonet lock.
Biosafety	Pass USP Plastic Class VI Test.
Bubble point	Minimum value, wetted with 60% isopropanol, 1.5 bar 150 kPa 21.75 psi for 0.1 µm, 1.0 bar 100 kPa 14.5 psi for 0.2 µm, 0.6 bar 60 kPa 8.7 psi for 0.45 µm pore size
Chemical compatibility	As for polypropylene, PTFE and silicone (silicone O-ring can be replaced by an EPDM O-ring, order no. 6985149, or a Viton O-ring, order no. 6985151).
Flow rate	For air for 0.2 µm
Mini cartridges	See diagram
Filtration area	0.05 m <sup>2</sup> , 0.1 m <sup>2</sup> or 0.2 m <sup>2</sup>
Materials	PTFE membrane filter. Polypropylene housing protective fleece and drainage fleece. Silicone O-ring.
Max. differential pressure	5 bar 500 kPa 72.5 psi at 20 °C, 2 bar 200 kPa 29 psi at 80 °C
Sterilization	Fitted in a mini cartridge housing, autoclaving or in-line steaming (121 °C or 134 °C). In-line steaming, max. Δp = 0.5 bar 7.25 psi
Water penetration pressure	Approx. 4.5 bar 450 kPa 65.2 psi for 0.2 µm pore size.

Order numbers see next page.





### Order Numbers for Sartofluor® Mini Cartridges

With 0.1 µm filter

5181558T7 B	0.05 m <sup>2</sup> filter area, pack of 5
5181558T8 B	0.1 m <sup>2</sup> filter area, pack of 5
5181558T9 B	0.2 m <sup>2</sup> filter area, pack of 5

With 0.2 µm filter

5181507T7 B	0.05 m <sup>2</sup> filter area, pack of 5
5181507T8 B	0.1 m <sup>2</sup> filter area, pack of 5
5181507T9 B	0.2 m <sup>2</sup> filter area, pack of 5

Sartofluor® Junior

5181407T7 B	0.05 m <sup>2</sup> filter area, pack of 5
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With 0.45 µm filter

5181506T9 B	0.2 m <sup>2</sup> filter area, pack of 5
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Sartofluor® capsules see page 107.

Special brochure available on request. Order no. SPK1502-e



## Housings for Sterile Air Venting and for Air|Gas Filtration

### Housing for Sterile Venting

The cut-outs in the top part of the housing guarantee good air circulation and ensure the drying-out of the system after vapor deposition (avoidance of condensate formation). The base has a plug for the inner O-ring and a bayonet lock for a firm hold of the inserted mini cartridges.

### Housing for Pressure Gas Filtration

The bowl accommodates the condensate which can be drained via a pharma-valve. The mini cartridge holder prevents the mini cartridge from contacting condensate water and ensures the best vapor deposition conditions. Attachment of the mini cartridges like that of the T-type liquid housing, (page 95). The housing follows PED 97/23/EC.

Suitable filter cartridges on page 81.

### Specifications for Housing for Sterile Venting

Connector	DN 25 tube joint
Weight	Approx. 700 g
Height	Approx. 186 mm
Material	Stainless steel 1.4571 (= AISI 316)
Max. operating pressure	10 bar   1,000 kPa   145 psi
Max. temperature	180 °C

### Specifications for Housing for Pressure Gas Filtration

Connectors	Clamp 25 mm (sanitary flange)
Width	Approx. 164 mm
Surface roughness	Product contact areas < 0.5 µm
Materials	Stainless steel AISI 316L, silicone O-ring
Max. operating pressure	10 bar   1,000 kPa   145 psi
Max. temperature	150 °C

### Order Numbers for Housing for Sterile Venting

7M19LSB00012	Stainless steel mini cartridge housing for the sterile venting of housings and tanks, with DN 15 tube joint and bayonet-lock for the inserted mini cartridge.
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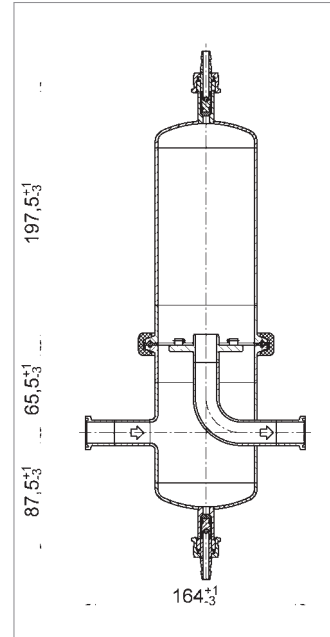
### Order Number for Housing for Pressure Gas Filtration

7M19LSB00098	Stainless steel mini cartridge housings for air pressure gas filtration.
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Special brochure available on request. Order no. SPG1501-e



Housing for sterile venting



Housing for pressure gas filtration

## Sartocon® Slice

### The Pilot-scale Crossflow System for Batches of 1 to 100 Liters



Sartocon® Slice cassettes are made of the same materials and construction and, therefore, the identical flow path length as the Sartocon® cassettes, used for larger-scale production. The scale-up and the scale-down is perfectly linear throughout the range of applications, from cell harvesting to protein purification and concentration. Validation requirements, and their high costs, are greatly reduced or entirely eliminated.

All cassettes have excellent chemical compatibility, covering a wide pH-range.

Depending on the MWCO, they are autoclavable or in-line steamable, so that they can be easily and efficiently cleaned and sterilized prior to re-use.

The Sartocon® Slice holding system can accommodate up to three or five Sartocon® Slice cassettes. It is designed for maximum performance and ease of cleaning. The system is designed with all process connectors on a stationary plate, which allows the fixed tubing of the holder and effective cleaning. Sartoflow® alpha is an optimized ultrafiltration system including a pump with optional data recording.

#### Specifications for Sartocon® Slice Cassettes

Biosafety	All materials pass the USP Plastics Test Class VI.
Chemical compatibility	pH 2–14 (Hydrosart®), pH 1–14 (polyethersulfone)
Filter area	0.1 m <sup>2</sup>
Application limits	Max. 4 bar   58 psi inlet pressure. Max. 50 °C operating temperature.

#### Order Numbers for the Sartocon® Slice Holding System

17521---001	Sartocon® Slice holding device (without accessories) for up to three Sartocon® Slice Cassettes
17521---002	Sartocon® Slice holding device (without accessories) for up to five Sartocon® Slice Cassettes
17521---101	Sartocon® Slice set with accessories for microfiltration
17521---102	Sartocon® Slice set with accessories for ultrafiltration

#### Order Numbers for the Sartocon® Slice Cassettes

3051860601W--SG	Hydrosart®, 0.45 µm pore size
3051860701W--SG	Hydrosart®, 0.2 µm pore size
30518606010--SG	Hydrosart®, 0.45 µm open channel
30518607010--SG	Hydrosart®, 0.2 µm open channel
3051545801W--SG	Polyethersulfone, 0.1 µm pore size
3051467901E--SG	Polyethersulfone, 300,000 MWCO
3051466801E--SG	Polyethersulfone, 100,000 MWCO
3051465001E--SG	Polyethersulfone, 50,000 MWCO
3051465901E--SG	Polyethersulfone, 30,000 MWCO
302146AL01K--SG	PESU max. for albumin
3051463901E--SG	Polyethersulfone, 10,000 MWCO
3051463401E--SG	Polyethersulfone, 8,000 MWCO
3051462901E--SG	Polyethersulfone, 5,000 MWCO
3051460901E--SG	Polyethersulfone, 1,000 MWCO
3051441901E--SG	Hydrosart®, 2,000 MWCO
3051442901E--SG	Hydrosart®, 5,000 MWCO
3051443901E--SG	Hydrosart®, 10,000 MWCO
3051445901E--SG	Hydrosart®, 30,000 MWCO
3051446801E--SG	Hydrosart®, 100,000 MWCO

Special data sheets available on request. Order no. SPC2039-e, SPC2032-e

## SartoJet Pump. Four-piston Diaphragm Pump for Sartoco<sup>®</sup> Slice Crossflow Filtration System

The Sartojet 4-piston diaphragm pump is a powerful positive displacement pump for all biopharmaceutical down stream processing applications in process development and small scale production.

### Applications

- Transfer of biopharmaceutical solutions and suspensions
- Feedpump for crossflow and cartridge filtration applications
- Dosing and mixing pump for chromatography systems
- Feedpump for centrifuges, separators and homogenizers

### The Pump Design is Especially Suited for:

- Protein solutions
- Polymer solutions
- Cell and cell debris suspensions
- Mammalian and insect cell suspensions
- Vaccines
- Monoclonal antibodies

The unique pump technology ensures high reliability and very low energy uptake even at high flow rates with shear sensitive cell suspensions. Therefore, in cell harvest crossflow applications no cooling of the suspension is necessary. The pump is self priming and can be combined with several different accessories.

The pump is easy to operate. Pump and control pad are mounted in an easy-to-clean stainless steel cabinet.

### Specifications

#### Product Wetted Components

Pump head	AISI 316L stainless steel
Surface finish	Ra < 0.8 µm
Diaphragm	Santoprene <sup>®</sup>
Valves & O-Ring	EPDM & BUNA
Valve chamber & pistons	Polypropylene
Ports	Tri-Clamp 3/4" O.D.

**3.1B material certificates, surface finish protocol, pump performance chart and FDA conformity documents are supplied with the pump.**

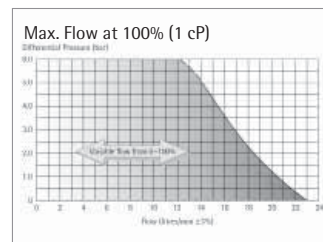
A special designed Sartoco<sup>®</sup> Slice crossflow set fits directly to the feed adapter of the pump. All pressurized parts of the system are hard piped and connected via sanitary Tri Clamp adapters. This system supplies up to five Sartoco<sup>®</sup> Slice Cassettes with 0.1 m<sup>2</sup> filter area each.

An optional pressure switch with local digital pressure read out shuts the pump down when a predefined pressure is triggered. This accessory protects the user and the process by shutting down the pump automatically when the maximum operation pressure of a cartridge or a crossflow system is obtained. The pressure switch is easily programmed by the user.

Additional control is achieved by using an inductive level sensor. This small sensor is placed outside of a glass or plastic vessel and is not in contact with the product. It switches the pump off when a predefined level of liquid in the vessel is detected.

### Features

- Easy to clean, no shaft seals
- Can run dry, self priming
- Low noise, constant flow
- Compact
- Adjustable flow up to 1,380 l/h
- Pressure up to 6.0 bar|90 psi, 5.0 bar|75 psi in permanent use
- Temperature up to 60 °C, CIP up to 90 °C (short time), SIP up to 135 °C



## Specifications

### Drive

Motor	24 V DC
Variable speed	0–3,000 rpm
Torque	0.59 Nm at 3,000 rpm
Motor power	185 Watt, 8.7 Amp.

### Electrical Details

Power supply	115–240 V, AC, 50 Hz or 60 Hz
Controls voltage	24 V, DC
Controls (ON OFF)	Touch Pad 0–100%
Connector 1	Electronic pressure switch
Connector 2	Inductive level switch
Dimensions L f W f H [mm]	415 f 300 f 385

### Ordering Informations and Accessories

17521---110	SartoJet 4-piston diaphragm pump
17521---111	Pressure switch with local digital display for SartoJet
17521---112	Level Switch for SartoJet
17521---113	Drain Valve
17521---105	Sartocon® Slice Microfiltration Set for SartoJet
17521---106	Sartocon® Slice Ultrafiltration Set for SartoJet

## Sartocon® Slice 200. The Low Hold-up Volume Crossflow Cassette Filter for Low Volume Applications

### Sartocon® Slice 200

Sartocon® Slice 200 Crossflow filters are designed for low volume applications.

#### Target use

- Product discovery
- Pre-clinical trials
- Small-scale clinical trials
- Membrane screening

The cassettes are available with Polyethersulfone and Hydrosart® membrane types in both MF and UF formats.

### The Polyethersulfone Membrane

The robust polyethersulfone membrane (PESU) is a polymer –which is stable within a broad pH (1–14) and temperature range – that is well established and widely accepted in the biotechnological and pharmaceutical industries. Membrane regeneration and depyrogenation is accomplished by using (1N) NaOH at elevated temperatures as required. Cassettes are stored in 0.1N NaOH.

### The Hydrosart® Membrane

Hydrosart® is a stabilized cellulose-based membrane that has been optimized for use in the biotechnological and pharmaceutical industries. The Hydrosart® membrane is a stable polymer (created by a Sartorius patented process) which is compatible with a wide range of chemical agents and stable within a broad pH range. It is also an extremely hydrophilic and neutral membrane, making it non-protein binding and virtually non-fouling. It exhibits extremely high and consistent flux rates. Membrane regeneration, and depyrogenation is accomplished by using (1N) NaOH at elevated temperatures as required. Cassettes are stored in 0.1N NaOH.

### Ordering Information

Available Slice 200 types and order numbers

### Product Profile

Hydrosart® cassettes exhibit no adsorption of proteins, viruses, etc. Membrane retention is unaffected by repeated use. The Hydrosart® ultrafiltration cassette can be re-used without any loss of integrity or performance. "Out-of-the-box" performance is maintained with multiple uses. These features make the PESU and Hydrosart® membrane ideally suited to the biotechnological industry



Feature	Benefits
Low hold-up volume	Minimized working volume.
Low protein-binding	High product yield; Easily cleaned.
Wide pH and a wide variety of temperature range	Chemicals can be used for the removal of foulants.
High flow rates	Economical filtration runs.
Silicone sealing compound	No glues etc. Self Sealing.
Identical flow geometry and hydraulic dimensions as larger scale-up devices.	Straight line, scale-up.

Cut Off Pore Size	Hydrosart® 200 cm² Filter Area	Polyethersulfone 200 cm² Filter
<b>Area</b>		
1 kD		3081460902E--SG
2 kD	3081441902E--SG	
5 kD	3081442902E--SG	3081462902E--SG
8 kD		3081463402E--SG
10 kD	3081443902E--SG	3081463902E--SG
30 kD	3081445902E--SG	3081465902E--SG
50 kD		3081465002E--SG
100 kD	3081446802E--SG	3081466802E--SG
300 kD		3081467902E--SG
0.1 µm		3081545802W--SG
0.2 µm	3081860702W--SG	
0.45 µm	3081860602W--SG	

## Sartocon® Slice 200 Stainless Steel Holder. Low Hold-up Volume Crossflow Holder for Sartocon® Slice 200 Cassettes



### Sartocon® Slice 200 Holder

The Sartocon® Slice 200 stainless steel holder is optimized for the use of up to two Slice 200 Crossflow cassettes (max. 0.04 m<sup>2</sup>). It is designed for low volume applications from 100 ml to 5 l.

#### Target use

- Product discovery
- Pre-clinical trials
- Small pilot lots

The Slice 200 holder uses female stainless steel Luer Lock connectors. This ensures a safe and reliable connection to additional equipment. The stainless steel Luer Lock thread even allows the use of polypropylene adapters without the risk of damaging. The feed and retentate ports and the two filtrate ports are located on one side. In combination with the small footprint design, this provides a compact system with low minimum working volume. The adjustable feet guarantee a firm stand of the holder on the bench.

The bores of the ports are widened up to the cassette side to avoid air locks and to ensure proper cleaning of the Slice 200 system.

### Technical Data

Holder Hold-up volume Feed Retentate ports	< 2 ml
Holder Hold-up volume permeate ports	< 2 ml
Maximum number of cassettes	2 Slice 200 cassettes (200 cm <sup>2</sup> each)
Dimensions L f W f H [mm]	160 f 120 f 275
Weight [kg]	5.8

### Ordering Informations and Accessories

17525--01	Slice 200 stainless steel holder
17521---023	Torque wrench
17521---022	Hexagon nut
17525---001	Pressure gauge, 0-6 bar, oil damped
17525---002	Luer lock adapter kit



## Sartoflow® Slice 200 Benchtop Crossflow System

### Design Description

The Family of Sartorius benchtop crossflow systems feature the latest advances in crossflow technology from Sartorius. The Sartoflow® Slice 200 benchtop system is designed around our Sartoco® Slice 200 (filter area: 200 cm<sup>2</sup>) cassette and is perfectly suited for R&D, process development, pre-clinical and small pilot lots.

The Sartoflow® Slice 200 benchtop features:

- Sartoco® Slice 200 cassette holder which fits up to two Sartoco® Slice 200 filter cassettes
- 500 ml feed reservoir with sealed cap
- 900 rpm magnetic stirrer
- Peristaltic pump
- Three pressure transmitters
- Display of process parameters (pressures, TMP, flow rates, volume)
- 3 modes of operation (manual|TMP control|constant flow)
- 5 built-in independent alarms
- Win Wedge PC interface software with custom Excel macros for data logging process analysis complete with graphs.

### Ordering Information

17525SYS-BT1	Sartoflow® Slice 200 benchtop system (120 V)
17525SYS-BT2	Sartoflow® Slice 200 benchtop system (220 V)
17525SP-01	3 Pack of pressure transmitters
17525SP-02	Spare parts kit (replacement leur valves and fittings)





## Filter Papers (Including Thimbles, Glass and Quartz Microfiber Filters)



### Introduction

Nowadays, high-grade filter papers are indispensable for routine work in laboratory applications. Sartorius Stedim Biotech supplies you with a broad range of filter papers for myriad filtration tasks and supports you in solving all your filtration challenges.



### Ash-free Filter Papers for Quantitative and Gravimetric Analyses

These filter papers are used for quantitative and gravimetric analyses as well as for pressure or vacuum filtration. They are made out of 100% cotton linters with an alpha-cellulose content of > 98% and are washed out with acid to make the papers ashless and achieve high purity.



### Wet-strengthened Filter Papers for Qualitative Analyses

These qualitative filter papers are essentially used for analytical purposes and routine analyses, whenever no gravimetric analyses are required. They are wet-strengthened and can be used for pressure and vacuum filtration. They are made of refined pulp and linters with an > 95% alpha-cellulose content with an ash content < 0.1%.

### High-purity Filter Papers for Qualitative Analyses

These paper grades are used for analytical purposes that require a low ash content. Grades 292 and 292a are especially suitable for soil analyses because they are low in nitrogen. For phosphate or sodium determination, we recommend grades 131 and 132.

### Smooth Filter Paper for Qualitative-technical Analyses

These filter papers are used for routine analyses like clarification, determination of substances, but also as discs with a center hole for technical applications.

### Crêped Filter Papers for Qualitative-technical Analyses

Crêped filter papers are mostly used for the rapid filtration of relatively coarse precipitates; because of their crêped structure they provide a larger filtration area than smooth filter paper.

### Boards

#### for the Filtration and Absorption of Liquids

Among other applications, these boards are used for the filtration of cooking and transformer oils, galvanic baths and as base paper for further impregnation with certain reagents, cytocards or fragrance test cards.

### Seed Testing Papers

These papers satisfy the requirements for the determination of germination capability according to ISTA (International Seed Test Association) and are ideal for ensuring an optimal moisture content for the most diverse types of seeds and germination forms. Their pH ranges between 6.0 and 7.5, they are wet-strengthened and their special structure prevents fine seed roots from growing through the paper.

### Filter Papers for the Sugar Industry

In the sugar industry, filter papers are used in laboratories to assay sugar beet or cane sugar. These papers are wet-strengthened and either smooth or crêped; they are made of cellulose or a mixture of cellulose and diatomaceous earth. Grade 100/N is not only supplied as discs or folded filters, but also on rolls for VENEMA systems.

### Surface Protection Paper

LabSorb and LabSorb Ultra are highly absorptive grades of paper coated on one side with polyethylene. Used with the cellulose side up, the paper absorbs liquids, which are stopped by the polyethylene layer and thus prevented from soaking through. Used with the polyethylene side up, the papers are highly useful for recovery of valuable or toxic liquids.

### Phase Separating Paper

Grade 480 is impregnated with a stabilized silicon, thus rendering it hydrophobic: It retains water, but allows solvents to flow through. The flow stops automatically when the entire solvent has passed through. In many applications, this phase separator paper eliminates the need to use separating funnels.

### Diatomaceous Earth Filter Paper

Grade 470 papers are made of cellulose and diatomaceous earth and offer a much better separating capability than pure cellulose papers at the same rate of filtration. This grade quickly retains the finest particles at high flow rates.

### Sample Carrier Paper

Grade TFN is made from pure cotton linters without any additives. This sample carrier material is intended for absorbing and transporting human bodily fluids and/or as a carrier for in-vitro diagnostic tests. For example, it is used to perform screening tests for hereditary diseases and metabolic disorders such as phenylketonuria (Guthrie test). Grade TFN papers comply with the requirements of EC Directive 98/79/EC, Annex I and III (other IVD) and is recommended for applications in accordance with the CLSI-LA4-A5:2007 standard.

### Nonwovens

These nonwoven grades are made of rayon or polyester and are available in different weights. They are usually sold on rolls – as nonwoven rayon (viscose), but can also be supplied on request as discs or sheets.

### Weighing Paper

Grade 605 weighing paper is made of transparent smooth parchment that is ideal for the weighing of viscous, semi-crystalline or solid substances.

### Lens Cleaning Paper

Grade 2113 lens cleaning paper is a thin, non-linting silk tissue paper used for cleaning very sensitive surfaces, such as optical glasses or lenses without scratching them.

### Extraction Thimbles

Sartorius Stedim Biotech thimbles are supplied in three different thimble designs to cover the majority of application areas. These cellulose or glass microfiber thimbles are primarily used in Soxhlet extraction units to extract defined substances from solids for further analyses. Quartz microfiber thimbles are preferred for emission control due to their high temperature resistance. They are supplied in a large variety of diameters and lengths.

### Blotting Papers

These blotting papers are made from the purest raw materials with the maximum degree of absorptiveness and cellulose content.

### Chromatography Papers

Chromatography papers are made of 100% cotton linters. These highly pure papers are not only ideal for chromatography, but also for a wide range of absorption applications like those common in the life sciences and diagnostics.

### Glass Microfiber Filters Without Binder

Binder-free glass microfiber filters are recommended for analytical and gravimetric analyses and also as prefilters. These filters combine fast flow rates with high load capacity and the retention of very fine particles; they are biologically inert and resistant to most chemicals.

### Glass Microfiber Filters With Binder

These filters are mostly used for monitoring air and gas. They are manufactured with synthetic binding agents to ensure that the filter has a defined strength. They are mechanically and chemically stable and – depending on the binding agent used – are either hydrophobic or hydrophilic.

### Quartz Microfiber Filters

These quartz microfiber filters are free of glass fibers and binding agents. They are especially suited for emission monitoring at temperatures of up to 900 °C and wherever filters of the highest purity are needed. They are available in two grades:

- Grade T 293, quartz microfiber filters unconditioned
- Grade MK 360, quartz microfiber filters conditioned (heat pre-treated); certificate on trace elements available for every batch.



# Chemical Compatibility

## 1. Filter Materials and Mini Cartridges

	Cellulose Acetate	Cellulose Nitrate	Reg. Cellulose	PTFE	Polyamide	Glass Fiber	Polycarbonate	Polyethersulfone	Sartobran® P Cartridge	Sartofluor® Cartridge
Solvents	111	113	184	118	250	134	230	154		
Acetone	–	–	•	•	–	•	○	–	–	E
Acetonitrile	?	?	•	•	–	?	?	•	?	?
Gasoline	•	•	•	•	•	•	•	•	V	–
Benzene	•	•	•	•	•	•	?	•	–	–
Benzyl alcohol	○	○	•	•	•	•	?	–	○	•
n-Butyl acetate	○	–	•	•	•	•	•	•	E	?
n-Butanol	•	•	•	•	•	•	•	•	•	•
Cellosolve	•	–	•	•	?	•	–	•	–	–
Chloroform	–	•	•	•	•	•	–	–	–	–
Cyclohexane	○	○	•	•	?	•	•	–	○	V
Cyclohexanone	–	–	•	•	•	•	?	?	–	–
Diethylacetamide	–	–	•	•	•	•	?	?	–	?
Diethyl ether	•	–	•	•	•	•	•	?	–	–
Dimethyl formamide	–	–	○	•	○	•	–	?	–	•
Dimethylsulfoxide	–	–	•	•	•	•	–	–	–	•
Dioxane	–	–	•	•	•	•	–	•	–	•
Ethanol, 98%	•	○	•	•	•	•	•	•	•	•
Ethyl acetate	–	–	•	•	•	•	?	–	–	–
Ethylene glycol	•	○	•	•	?	•	•	•	•	•
Formamide	?	?	?	•	?	•	–	?	–	•
Glycerin	•	•	•	•	•	•	•	•	•	•
n-Heptane	•	•	•	•	?	•	?	?	•	V
n-Hexane	•	•	•	•	•	•	•	?	V	–
Isobutanol	○	○	•	•	•	•	•	?	–	•
Isopropanol	•	○	•	•	•	•	•	•	•	•
Isopropyl acetate	○	–	•	•	?	•	?	•	–	•
Methanol, 98%	•	–	•	•	?	•	•	•	•	•
Methyl acetate	–	–	•	•	•	•	?	–	–	•
Methylene chloride	–	○	•	•	•	•	–	–	–	–
Methyl ethyl ketone	–	–	•	•	•	•	?	–	–	•
Methyl isobutyl ketone	•	–	•	•	•	•	?	?	–	–
Monochlorobenzene	•	•	•	•	•	•	–	?	V	V
Nitrobenzene	•	○	•	•	•	•	–	?	–	–
n-Pentane	•	•	•	•	•	•	•	?	V	V
Perchloroethylene	•	•	•	•	•	•	•	?	V	V
Pyridine	–	–	•	•	•	•	–	–	–	–
Carbon tetrachloride	○	•	•	•	•	•	?	•	–	?
Tetrahydrofuran	–	–	•	•	•	•	–	–	–	–
Toluene	•	•	•	•	•	•	?	•	–	–

Key to symbols see next page.

	Cellulose Acetate	Cellulose Nitrate	Reg. Cellulose	PTFE	Polyamide	Glass Fiber	Polycarbonate	Polyether-sulfone	Sartobran® P Cartridge	Sartofluor® Cartridge
<b>Solvents</b>	<b>111</b>	<b>113</b>	<b>184</b>	<b>118</b>	<b>250</b>	<b>134</b>	<b>230</b>	<b>154</b>		
Trichloroethane	○	●	●	●	?	●	?	?	–	?
Trichloroethylene	●	●	●	●	●	●	–	●	–	?
Xylene	●	●	●	●	●	●	●	●	–	–
<b>Acids</b>										
Acetic acid, 25%	●	●	●	●	○	?	○	●	●	?
Acetic acid, 96%	–	–	●	●	–	?	?	●	–	●
Hydrofluoric acid, 25%	●	○	○	●	–	?	●	?	–	–
Hydrofluoric acid, 50%	●	○	–	●	–	?	●	?	–	–
Perchloric acid, 25%	–	○	○	●	–	?	?	?	–	●
Phosphoric acid, 25%	●	○	○	●	–	?	?	?	●	●
Phosphoric acid, 85%	○	○	○	●	–	?	–	?	–	V/E
Nitric acid, 25%	–	○	–	●	–	?	●	●	–	V
Nitric acid, 65%	–	–	–	●	–	?	●	●	–	–
Hydrochloric acid, 25%	–	○	–	●	–	?	●	●	–	V/E
Hydrochloric acid, 37%	–	–	–	●	–	?	●	●	–	V/E
Sulfuric acid, 25%	–	○	○	●	–	●	?	●	–	●
Sulfuric acid, 98%	–	–	–	●	–	?	–	?	–	–
Trichloroacetic acid, 25%	–	○	●	●	–	?	?	?	–	●
<b>Bases</b>										
Ammonium, 1N	●	●	○	●	●	●	–	●	E	●
Ammonium hydroxide, 25%	–	○	–	○	●	○	–	●	–	●
Potassium hydroxide, 32%	–	–	○	●	○	○	–	●	–	●
Sodium hydroxide, 32%	–	–	○	●	○	○	–	●	–	●
Sodium, 1N	○	–	○	●	●	●	–	●	–	●
<b>Aqueous Solutions</b>										
Formalin, 30%	○	●	○	●	○	●	●	●	–	●
Sodium hypochlorite, 5%	●	○	●	●	○	●	?	?	–	●
Hydrogen peroxide, 35%	●	●	○	●	○	?	?	?	●	●

#### Key to Symbols

- = compatible
- = limited compatibility
- = not compatible
- ? = not tested
- E = compatible after replacing silicone O-ring with an EPDM O-ring
- V = compatible after replacing the silicone O-ring with a Viton O-ring

Contact time: 24 hours at 20 °C

Chemical compatibilities can be influenced by various factors. Therefore, we recommend that you confirm compatibility with the liquid you wish to filter by performing a trial filtration run before you begin with actual filtration.

## 2. Filter Holder, Cartridge Housing and O-Ring Materials

Solvents	Glass	Poly-carbonate	Poly-propylene	PTFE	Stainless Steel	EPDM O-Ring	PTFE O-Ring	Silicone O-Ring	Viton O-Ring
Acetone	•	○	•	•	•	•	•	-	-
Acetonitrile	•	?	•	•	•	○	•	-	•
Gasoline	•	○	•	•	•	-	•	-	•
Benzene	•	-	-	•	•	-	•	-	•
Benzyl alcohol	•	-	•	•	•	○	•	•	•
n-Butyl acetate	•	-	○	•	•	•	•	-	-
n-Butanol	•	•	•	•	•	•	•	•	•
Cellosolve	•	-	-	•	•	○	•	-	-
Chloroform	•	-	-	•	•	-	•	-	•
Cyclohexane	•	○	•	•	•	-	•	-	•
Cyclohexanone	•	-	•	•	•	-	•	-	-
Diethylacetamide	•	-	?	•	•	?	•	•	-
Diethyl ether	•	-	○	•	•	-	•	-	-
Dimethyl formamide	•	-	•	•	•	•	•	○	-
Dimethylsulfoxide	•	?	?	•	•	?	•	○	-
Dioxane	•	-	○	•	•	•	•	-	-
Ethanol, 98%	•	•	•	•	•	•	•	•	•
Ethyl acetate	•	-	•	•	•	•	•	-	-
Ethylene glycol	•	•	•	•	•	•	•	•	•
Formamide	•	-	•	•	•	•	•	-	○
Glycerin	•	○	•	•	•	•	•	•	•
n-Heptane	•	•	•	•	•	-	•	•	•
n-Hexane	•	•	•	•	•	-	•	-	•
Isobutanol	•	•	•	•	•	•	•	•	•
Isopropanol	•	○	•	•	•	•	•	•	•
Isopropyl acetate	•	•	•	•	•	•	•	-	-
Methanol, 98%	•	-	•	•	•	•	•	•	•
Methyl acetate	•	?	•	•	•	•	•	-	-
Methylene chloride	•	-	-	•	•	-	•	-	○
Methyl ethyl ketone	•	-	•	•	•	•	•	-	-
Methyl isobutyl ketone	•	-	?	•	•	-	•	-	-
Monochlorobenzene	•	-	•	•	•	-	•	-	•
Nitrobenzene	•	-	○	•	•	-	•	-	-
n-Pentane	•	•	•	•	•	-	•	-	•
Perchloroethylene	•	-	○	•	•	-	•	-	•
Pyridine	•	-	○	•	•	-	•	-	-
Carbon tetrachloride	•	-	○	•	•	-	•	-	•
Tetrahydrofuran	•	-	○	•	•	-	•	-	-
Toluene	•	-	•	•	•	-	•	-	○

Key to symbols see next page.

Solvents	Glass	Poly-carbonate	Poly-propylene	PTFE	Stainless Steel	EPDM O-Ring	PTFE O-Ring	Silicone O-Ring	Viton O-Ring
Trichloroethane	•	–	?	•	•	–	•	–	•
Trichloroethylene	•	–	–	•	•	–	•	–	•
Xylene	•	–	○	•	•	–	•	–	○
<b>Acids</b>									
Acetic acid, 25%	•	•	•	•	•	•	•	•	–
Acetic acid, 96%	•	–	•	•	•	•	•	?	–
Hydrofluoric acid, 25%	–	–	•	•	–	○	•	–	○
Hydrofluoric acid, 50%	–	–	•	•	–	○	•	–	○
Perchloric acid, 25%	•	○	•	•	–	•	•	–	•
Phosphoric acid, 25%	•	○	•	•	○	•	•	–	•
Phosphoric acid, 85%	•	○	•	•	○	•	•	–	•
Nitric acid, 25%	•	–	•	•	–	○	•	–	•
Nitric acid, 65%	•	–	–	•	–	–	•	–	•
Hydrochloric acid, 25%	•	○	•	•	–	○	•	–	•
Hydrochloric acid, 37%	•	–	•	•	–	•	•	–	•
Sulfuric acid, 25%	•	•	•	•	○	•	•	–	•
Sulfuric acid, 98%	•	–	–	•	–	–	•	–	•
Trichloroacetic acid, 25%	•	○	•	•	–	•	•	–	–
<b>Bases</b>									
Ammonium, 1N	•	–	•	•	•	•	•	–	–
Ammonium hydroxide, 25%	•	–	•	•	•	•	•	•	–
Potassium hydroxide, 32%	•	–	•	•	•	•	•	○	○
Sodium hydroxide, 32%	•	–	•	•	•	•	•	○	•
Sodium, 1N	•	–	•	•	•	•	•	•	•
<b>Aqueous Solutions</b>									
Formalin, 30%	•	•	•	•	•	•	•	○	•
Sodium hypochlorite, 5%	•	•	•	•	•	•	•	•	•
Hydrogen peroxide, 35%	•	•	•	•	•	•	•	•	•

#### Key to Symbols

- = compatible
- = not compatible
- = limited compatibility
- ? = not tested

Contact time: 24 hours at 20 °C

Chemical compatibilities can be influenced by various factors. Therefore, we recommend that you confirm compatibility with the liquid you wish to filter by performing a trial filtration run before you begin with actual filtration.

### 3. Ready-to-connect Filtration Units

Solvents	Midisart® 2000	Minisart®	Minisart® HY	Minisart® RC	Minisart® SRP	Sartobran® 300	Sartobran® P Capsule	Sartofluor® Capsule	Sartolab® P20
Acetone	•	–	–	•	–	–	–	•	–
Acetonitrile	•	–	?	•	•	?	?	?	?
Gasoline	•	•	•	•	•	•	•	•	○
Benzene	•	–	–	?	•	–	–	○	–
Benzyl alcohol	•	?	?	?	•	○	○	•	–
n-Butyl acetate	•	–	–	?	•	•	•	•	–
n-Butanol	•	○	○	•	•	•	•	•	•
Cellosolve	○	–	–	•	○	–	–	○	–
Chloroform	•	–	–	•	•	–	–	•	–
Cyclohexane	•	–	–	?	•	○	○	•	○
Cyclohexanone	•	–	–	?	•	–	–	•	–
Diethylacetamide	•	–	–	•	•	–	–	•	–
Diethyl ether	•	?	?	?	•	○	○	•	–
Dimethyl formamide	•	–	–	?	•	–	–	•	–
Dimethylsulfoxide	•	–	–	•	•	–	–	•	–
Dioxane	•	–	–	•	•	–	–	○	–
Ethanol, 98%	•	–	–	•	•	•	•	•	•
Ethyl acetate	•	○	○	•	•	–	–	○	–
Ethylene glycol	•	?	?	•	•	•	•	•	•
Formamide	•	?	?	?	•	?	?	•	–
Glycerin	•	•	•	?	•	•	•	•	○
n-Heptane	•	•	•	?	•	•	•	•	•
n-Hexane	•	•	•	•	•	•	•	•	•
Isobutanol	•	○	○	•	•	○	○	•	○
Isopropanol	•	○	○	–	•	•	•	•	○
Isopropyl acetate	•	○	○	?	•	○	○	•	○
Methanol, 98%	•	–	–	•	•	•	•	•	–
Methyl acetate	•	–	–	?	•	–	–	•	–
Methylene chloride	•	–	–	•	•	–	–	○	–
Methyl ethyl ketone	•	–	–	•	•	–	–	•	–
Methyl isobutyl ketone	•	?	?	?	•	?	?	•	–
Monochlorobenzene	•	?	?	?	•	•	•	•	–
Nitrobenzene	•	?	?	?	•	○	○	•	–
n-Pentane	•	•	•	•	•	•	•	•	•
Perchloroethylene	•	○	○	?	•	○	○	•	–
Pyridine	•	–	–	?	•	–	–	•	–
Carbon tetrachloride	•	○	○	?	•	○	○	•	–
Tetrahydrofuran	•	–	–	•	•	–	–	○	–
Toluene	•	–	–	•	•	•	•	•	–

Key to symbols see next page.

Solvents	Midisart® 2000	Minisart®	Minisart® HY	Minisart® RC	Minisart® SRP	Sartobran® 300	Sartobran® P Capsule	Sartofluor® Capsule	Sartolab® P20
Trichloroethane	•	○	○	•	•	?	?	•	-
Trichloroethylene	○	?	?	?	○	-	-	-	-
Xylene	•	-	-	•	•	○	○	•	-
<b>Acids</b>									
Acetic acid, 25%	•	○	○	?	?	•	•	•	•
Acetic acid, 96%	•	-	-	?	•	-	-	•	-
Hydrofluoric acid, 25%	•	○	○	?	•	•	•	•	-
Hydrofluoric acid, 50%	•	○	○	?	•	-	-	•	-
Perchloric acid, 25%	•	?	?	?	•	-	-	•	-
Phosphoric acid, 25%	•	•	•	?	•	•	•	•	•
Phosphoric acid, 85%	-	?	?	?	-	○	○	-	○
Nitric acid, 25%	•	-	-	?	•	-	-	•	-
Nitric acid, 65%	•	-	-	?	•	-	-	○	-
Hydrochloric acid, 25%	•	-	-	?	•	-	-	•	-
Hydrochloric acid, 37%	•	-	-	?	•	-	-	•	-
Sulfuric acid, 25%	•	-	-	?	•	-	-	•	-
Sulfuric acid, 98%	•	-	-	?	•	-	-	•	-
Trichloroacetic acid, 25%	•	-	-	•	•	-	-	•	-
<b>Bases</b>									
Ammonium, 1N	•	•	•	?	•	•	•	•	-
Ammonium hydroxide, 25%	•	○	○	?	•	○	○	•	-
Potassium hydroxide, 32%	•	-	-	?	•	-	-	•	-
Sodium hydroxide, 32%	•	-	-	?	•	-	-	•	-
Sodium, 1N	•	○	○	?	•	○	○	•	-
<b>Aqueous Solutions</b>									
Formalin, 30%	•	-	-	?	•	○	○	•	○
Sodium hypochlorite, 5%	•	•	•	?	•	-	-	•	•
Hydrogen peroxide, 35%	•	•	•	?	•	•	•	•	•

#### Key to Symbols

- = compatible
- = limited compatibility
- = not compatible
- ? = not tested

Contact time: 24 hours at 20 °C

Chemical compatibilities can be influenced by various factors. Therefore, we recommend that you confirm compatibility with the liquid you wish to filter by performing a trial filtration run before you begin with actual filtration.