

Laboratory Filtration Products

Simplifying Progress

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Filtration and ultrafiltration are essential process steps in nearly all environmental, chemistry and bioscientific laboratory applications.

Sartorius supplies a wide range of individual filter papers, microporous membranes, filtration devices, ultrafiltration units and chromatography solutions to suit these applications. This catalog provides a condensed overview of the Sartorius Lab Filtration product range. Please contact us directly for specialty catalogs – available for in-depth technical information.

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SARTORIUS
VIVAFLOW® 50
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Ultrafiltration and Chromatography

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Introduction

Ultrafiltration is a convective process using anisotropic semi-permeable membranes to separate macromolecular species and solvents – primarily on the basis of size.

Ultrafiltration membranes are used to increase the solute concentration of a desired biological or inorganic species. Macromolecules are retained by the membrane when they are significantly larger than the nominal pore size, while salts and microsolutes are removed with the solvent. Multiple concentration steps where an ultrafiltration device is refilled with fresh buffer can also be used to progressively purify, buffer exchange or desalt samples, replacing time-intensive techniques such as dialysis. Furthermore, ultrafiltration can be used as a cost effective method for fractionating macromolecules, provided that there is at least a 10-fold difference in molecular weight. Ultrafiltration is a gentle, non-denaturing method that is more efficient and flexible than alternative processes.

Ultrafiltration Methods

Sartorius offers a comprehensive choice of operating methods for sample ultrafiltration and diafiltration.

- Centrifugal for 0.1 to 90 mL starting volumes
- Pressure for 5 to 98 mL starting volumes
- Pressure-Fugation for 5 to 15 mL starting volumes
- Crossflow | TFF for 0.1 to 5 L starting volumes
- Solvent Absorption for 1 to 20 mL starting volumes

Further information about these methods can be found on page 8.

Typical Applications for Ultrafiltration

- Concentration | desalting of proteins, enzymes, DNA, monoclonal antibodies, immunoglobulins, extracellular vesicles, viruses and nanoparticles
- Bence Jones Protein concentration from urine samples prior to capillary electrophoresis
- Forensic DNA sample concentration prior to sequencing reaction
- Peptide fractionation in FASP (filter-aided sample preparation)
- Free drug | hormone assays
- Removal of primers from PCR amplified DNA
- Removal of labeled amino acids and nucleotides
- Deproteinization of samples
- Recovery of biomolecules from cell culture supernatants | lysates
- Mammalian cell harvesting
- Cell washing, virus purification, cell debris removal and depyrogenation
- Environmental sample clarification | concentration

Membrane Performance Characteristics

Sartorius offers an extended range of membranes to cover the great majority of ultrafiltration requirements.

- Polyethersulfone (PES)
- Regenerated Cellulose (RC)
- Hydrosart® (HY)
- Cellulose Triacetate (CTA)

Further information about the properties of these membrane materials can be found on page 9.

Process Optimization

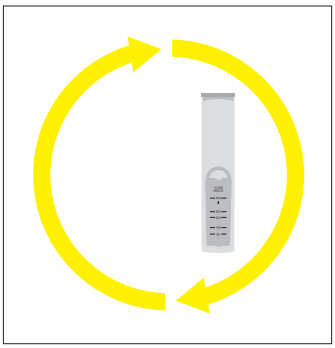
When the highest recoveries are crucial, particularly with solute quantities in the microgram range, Sartorius recommends that users consider the following:

- Select the smallest device that suits the sample volume.
- Take advantage of the extra speed of Sartorius products by refilling a smaller device repeatedly.
- Select the lowest MWCO membrane that suits the application.
- Reduce pressure or centrifugal force to approximately half of the recommended maximum.
- Avoid over-concentration. The smaller the final concentrate volume, the more difficult it is to achieve complete recovery.
- If feasible, after sample retrieval, rinse the device with one or more drops of buffer.
- Pretreat the device overnight with a passivation solution such as 5% SDS, Tween 20 or Triton X-100, then rinse thoroughly before use.


VIVASPIN® TURBO 4
10,000 MWCO

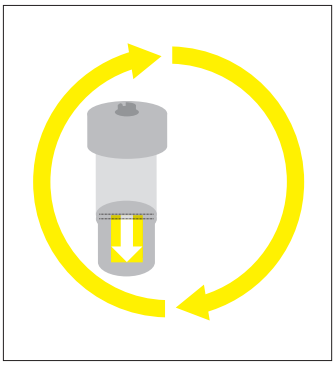
Ultrafiltration Process Methods

Sartorius offers a comprehensive range of ultrafiltration process methods for the concentration of your biological samples. Below is a guide to selecting the most suitable ultrafiltration method, depending on sample volume, equipment available, and the desired filtration speed and process control.



Centrifugal

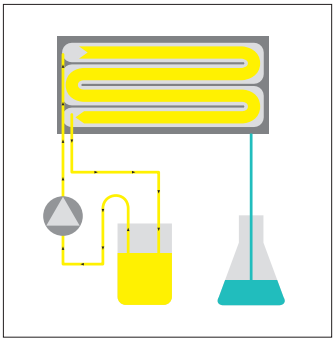
Centrifugal (0.1 to 90 mL Starting Volumes)
Driven by centrifugal force, solvent and microsolutes are cleared through the ultrafiltration membrane and into a filtrate container positioned below. This gentle process is quick to set up and offers fast filtration speeds with most solutions. Twelve centrifugal devices are offered from the Vivaspin® and Vivacon® families.



Pressure and Pressure-Fugation

Pressure (5 to 98 mL Starting Volumes)
Pressurized air or inert gas provide the filtration vector for ultrafiltration. For increased process speed, pressurized devices can be placed on an orbital shaker, where agitation impedes macromolecules from polarizing on the membrane surface. Vivaspin® 20 and 100 can be operated using gas pressure.

Pressure-Fugation (5 to 15 mL Starting Volumes)
A unique Sartorius method that combines gas pressure with centrifugation, with process times typically 30 to 50% faster than centrifugation alone. Vivaspin® 20 can be operated this way.



Crossflow | TFF

Crossflow | TFF (0.1 to 5 L Starting Volumes)
The solution to be processed is pumped under pressure across an ultrafiltration membrane and then returned to the original reservoir. The solution is progressively concentrated or purified as solvent and microsolutes pass through the membrane into a separate filtrate vessel. Vivaflow® cassettes are offered for this method.



Solvent Absorption

Solvent Absorption (1 to 20 mL Starting Volumes)
An absorbent cellulose pad mounted behind the ultrafiltration membrane draws solvents and microsolutes through the membrane. Retained macromolecules are concentrated into the bottom of the sample container. No additional equipment is required. Vivapore® is offered for this technique.

Membrane Performance Characteristics

Sartorius offers an extended range of membranes to cover the great majority of ultrafiltration requirements. The following is a guide to selecting the most appropriate membranes according to their typical performance characteristics. However, membrane behaviour and performance can be highly dependent on the specific characteristics of each sample. Therefore, it is recommended to experiment with multiple membrane materials when optimizing your ultrafiltration process.

Polyethersulfone (PES)
This is a low binding membrane that provides excellent performance with most solutions and exceptional recovery of negatively charged target molecules. Polyethersulfone membranes are usually preferred for their low fouling characteristics, exceptional flux and broad pH compatibility.

Regenerated Cellulose (RC)
The Sartorius regenerated cellulose membrane has been uniquely developed to ensure optimal performance in the lab ultrafiltration devices. This is a hydrophillic membrane suitable for general samples, with ultra-low protein adsorption and high chemical compatibility. Regenerated cellulose is especially well suited to ultrafiltration of oligonucleotides and peptides.

Hydrosart® (HY)
Demonstrating the same properties as regenerated cellulose, but with the added benefit of enhanced performance characteristics and extremely low protein binding. Hydrosart® is another membrane of choice for applications such as concentration and desalting of immunoglobulin fractions.

Cellulose Triacetate (CTA)
High hydrophilicity and very low non specific binding characterize this membrane. Cast without any support that could trap or bind passing microsolutes, these membranes are preferred for sample cleaning and protein removal, and when high recoveries from the filtrate solution is of primary importance.

Membrane Selection Guide

The molecular weight cut-off (MWCO) is the molecular weight of molecules (e.g. globular proteins) which are retained by the membrane to an extent of 90 %. Therefore, to ensure the highest recovery, select a membrane with a MWCO which is a maximum of one third to half the molecular weight of the solute to be retained.

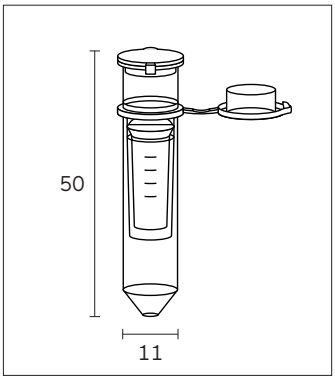
Most ultrafiltration devices are designed for concentration | diafiltration applications. Therefore, the membranes in these devices are tested for retention rather than passage of macromolecules. In particular, PES, RC and Hydrosart® membranes have support structures, which may lead to some loss of molecules that permeate the membrane.

Recommended MWCO						
Application	**< 5 kDa**	**10 kDa**	**30 kDa**	**50 kDa**	**100 kDa**	**> 300 kDa**
Bacteria					■	■
Enzymes	■	■				
Extracellular vesicles					■	■
Growth factors	■	■				
IgG and mAbs			■	■	■	
Nucleic acids	■	■	■	■	■	
Oligonucleotides	■					
Peptides	■					
Viruses			■	■	■	■
Yeast					■	■

Vivaspin® 500

For general laboratory use





100 to 500 µL Samples

Vivaspin® 500 centrifugal filter units offer a simple, one-step procedure for sample preparation. They can effectively be used in fixed-angle rotors accepting 2.2 mL centrifuge tubes.

The legacy patented vertical membrane design and thin channel filtration chamber (US 5,647,990) minimize membrane fouling and provide fast concentrations – even with particle-loaded solutions.

Specifications

Vivaspin® 500		
Concentrator capacity	Swing bucket rotor Fixed angle rotor	do not use 500 µL
Dimensions	Length × diameter Active membrane area Hold-up volume, membrane and support Dead-stop volume	50 × 11 mm 0.5 cm^2 <5 µL 5 µL
Materials of construction	Body Filtrate vessel Concentrator cap Membrane	Polycarbonate (PC) Polypropylene (PP) Polycarbonate (PC) Polyethersulfone (PES)

Typical Performance Characteristics		
	Time to concentrate up to 30x at 20 °C and solute recovery	
Rotor	Fixed angle	
Centrifugal force	12,000 *g*	
Start volume	500 µL	
	Time	**Recovery**
Aprotinin 0.25 mg/mL (6.5 kDa) 3 kDa MWCO PES	 30 min	 96%
BSA 1.0 mg/mL (66 kDa) 5 kDa MWCO PES 10 kDa MWCO PES 30 kDa MWCO PES	 15 min 5 min 5 min	 96% 96% 95%
IgG 0.25 mg/mL (160 kDa) 30 kDa MWCO PES 50 kDa MWCO PES 100 kDa MWCO PES	 10 min 10 min 10 min	 96% 96% 96%

Ordering Information

Vivaspin® 500 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS0191
3 kDa MWCO	100	VS0192
5 kDa MWCO	25	VS0111
5 kDa MWCO	100	VS0112
10 kDa MWCO	25	VS0101
10 kDa MWCO	100	VS0102
30 kDa MWCO	25	VS0121
30 kDa MWCO	100	VS0122
50 kDa MWCO	25	VS0131
50 kDa MWCO	100	VS0132
100 kDa MWCO	25	VS0141
100 kDa MWCO	100	VS0142
300 kDa MWCO	25	VS0151
300 kDa MWCO	100	VS0152
1,000 kDa MWCO	25	VS0161
1,000 kDa MWCO	100	VS0162
0.2 µm	25	VS0171
0.2 µm	100	VS0172

Visit us at www.sartorius.com/Vivaspin500 to get additional info.
Find instructions on how to use Vivaspin® 500 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration to a predefined volume
- Concentration of diluted samples with increased recovery

Vivaspin® 2

For general laboratory use

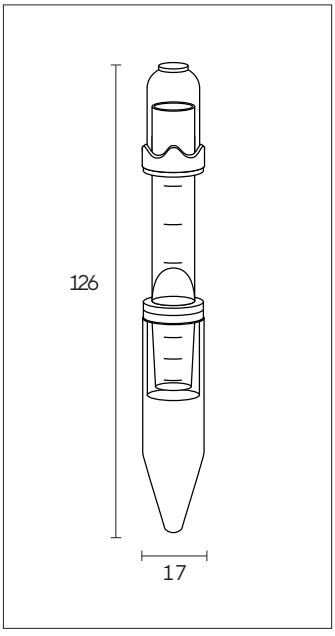


0.4 to 3 mL Samples

Vivaspin® 2 bridges the gap between the 500 µL and 4 mL centrifugal concentrators. This device combines the speed of the classic Vivaspin® products with low internal surface and membrane areas for superior recoveries from very dilute solutions.

Available with a choice of polyethersulfone, Hydrosart® or cellulose triacetate membranes, Vivaspin® 2 offers the highest flexibility for process optimization.

Also unique to Vivaspin® 2 is the choice of directly pipetting the concentrate from the dead-stop pocket built into the bottom of the concentrator, or alternatively reverse spinning into the concentrator cap. Both methods result in near total concentrate recoveries.



Specifications

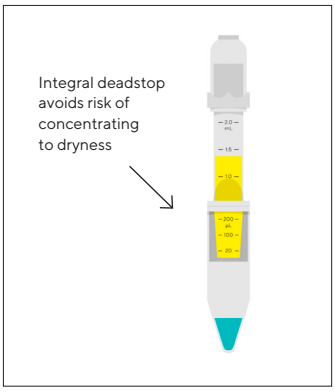
Vivaspin® 2		
Concentrator capacity	Swing bucket rotor Fixed angle rotor	3 mL 2 mL
Dimensions	Length × diameter Active membrane area Hold-up volume, membrane Dead-stop volume	126 × 17 mm 1.2 cm² < 10 µL 8 µL
Materials of construction	Body Filtrate vessel Concentrator cap Membrane	Polycarbonate (PC) Polycarbonate (PC) Polycarbonate (PC) Polyethersulfone (PES) Hydrosart® (HY) Cellulose Triacetate (CTA)

Typical Performance Characteristics		
	Time to concentrate up to 30x at 20 °C and solute recovery	
Rotor	Fixed angle	
Centrifugal force	5,000 *g*	
Start volume	2 mL	
	Time	**Recovery**
Aprotinin 0.25 mg/mL (6.5 kDa) 3 kDa MWCO PES	50 min	96%
BSA 1.0 mg/mL (66 kDa) 5 kDa MWCO PES 5 kDa MWCO HY 10 kDa MWCO PES 10 kDa MWCO CTA 10 kDa MWCO HY 20 kDa MWCO CTA 30 kDa MWCO PES 30 kDa MWCO HY	 12 min 22 min 8 min 10 min 12 min 5 min 8 min 5 min	 98% 98% 98% 96% 98% 96% 97% 97%

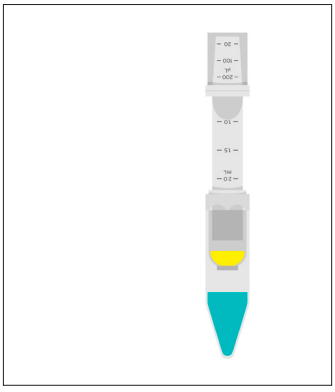
Typical Performance Characteristics		
	Time to concentrate up to 30x at 20 °C and solute recovery	
Rotor	Fixed angle	
Centrifugal force	5,000 *g*	
Start volume	2 mL	
	Time	**Recovery**
IgG 0.25 mg/mL (160 kDa)		
20 kDa MWCO CTA	6 min	97%
30 kDa MWCO PES	10 min	96%
50 kDa MWCO PES	10 min	96%
100 kDa MWCO PES	8 min	95%

Ordering Information

Vivaspin® 2 PES	**Pack size**	**Prod. No.**
3 kDa MWCO	25	VS0291
3 kDa MWCO	100	VS0292
5 kDa MWCO	25	VS0211
5 kDa MWCO	100	VS0212
10 kDa MWCO	25	VS0201
10 kDa MWCO	100	VS0202
30 kDa MWCO	25	VS0221
30 kDa MWCO	100	VS0222
50 kDa MWCO	25	VS0231
50 kDa MWCO	100	VS0232
100 kDa MWCO	25	VS0241
100 kDa MWCO	100	VS0242
300 kDa MWCO	25	VS0251
300 kDa MWCO	100	VS0252
1,000 kDa MWCO	25	VS0261
1,000 kDa MWCO	100	VS0262
0.2 µm	25	VS0271
0.2 µm	100	VS0272



PES, HY or CTA membranes



Reverse spin concentrate retrieval

Vivaspin® 2 CTA	Pack size	Prod. No.
10 kDa MWCO	25	VS02V1
10 kDa MWCO	100	VS02V2
20 kDa MWCO	25	VS02X1
20 kDa MWCO	100	VS02X2

Vivaspin® 2 HY	Pack size	Prod. No.
2 kDa MWCO	25	VS02H91
2 kDa MWCO	100	VS02H92
5 kDa MWCO	25	VS02H11
5 kDa MWCO	100	VS02H12
10 kDa MWCO	25	VS02H01
10 kDa MWCO	100	VS02H02
30 kDa MWCO	25	VS02H21
30 kDa MWCO	100	VS02H22

Ordering Tips

- Choose a membrane pore size at least 50% smaller than the size of the molecule to be retained.
- Usually choose PES membranes for fastest concentrations.
- Usually choose CTA for protein removal or ultrafiltrate recovery.
- Usually choose Hydrosart® membranes for highest recovery of immunoglobulins.

Visit us at www.sartorius.com/Vivaspin2 to get additional info.
Find instructions on how to use Vivaspin® 2 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- Sample preparation for radio immunoassay

Vivaspin® Filtrate

For general laboratory use



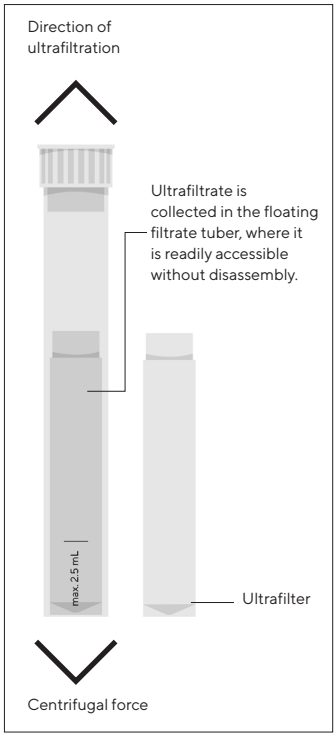
Vivaspin® Filtrate is a ready-to-use unit for low volume, centrifugal ultrafiltration to separate proteins from low molecular weight substances in biological samples.

Vivaspin® Filtrate features a unique design that enables ultrafiltration in the direction opposite to centrifugal force. This is so effective in preventing premature blockage of the filter that even whole blood samples can be deproteinized.

The ultrafiltrate is collected in the floating filtrate tube, where it is readily accessible without disassembly.

Vivaspin® Filtrate is ideal for the following applications:

- Drug binding studies
- Isolation of metabolites from serum
- Protein removal from blood samples
- Cleaning of liposomes
- Virus removal



Specifications

Vivaspin® Filtrate		
Concentrator capacity	Swing bucket rotor Fixed angle rotor	2.5 mL 2.5 mL
Dimensions	Length × diameter Active membrane area Hold-up volume of membrane Dead-stop volume	93 × 14 mm 0.79 cm² < 5 µL 100 µL
Materials of construction	Centrifuge tube Floater tube Cap Membrane	Polystyrene (PS) Styrene Acrylonitrile (SAN) Polyethylene (PE) Cellulose Triacetate (CTA) Polyethersulfone (PES)

Typical Performance Characteristics			
	Time to filter and solute passage		
	Time to filter 50% of sample	Time to filter 90% of sample	Passage
Centrifugal force	2,000 *g*		
Start volume	2.5 mL		
BSA 1.0 mg/mL (66 kDa) 5 kDa MWCO 10 kDa MWCO 20 kDa MWCO	 300 min 35 min 9 min	 N | A 80 min 20 min	 0% 2% 2%
IgG 0.25 mg/mL (160 kDa) 100 kDa	 13 min	 35 min	 3%
Blue Dextran 0.1 mg/mL (2,000 kDa) 300 kDa MWCO	 9 min	 25 min	 28%

Devices can be used in conical or flat bottom centrifuge adaptors.

Ordering Information

Vivaspin® Filtrate CTA	Pack size	Prod. No.
5 kDa MWCO	12	13229-E
10 kDa MWCO	12	13239-E
20 kDa MWCO	12	13249-E
Vivaspin® Filtrate PES		
100 kDa MWCO	12	13269-GE
300 kDa MWCO	12	13279-E

References

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Determination of acyclovir by ultrafiltration and high-performance liquid chromatography.
J. Chromatography **619**, 342-344 (1993)

F. da Fonseca-Wollheim, K.-G. Heinze, K. Lomsky and H. Schreiner:
Serum ultrafiltration for the elimination of endogenous interfering substances in creatinine determination.
J. Clin. Chem. Clin. Biochem. **26**, 523-525 (1988)

R. H. Christenson, S. D. Studenberg, S. Beck-Davis and F. A. Sedor:
Digoxin-like immunoreactivity eliminated from serum by centrifugal ultrafiltration before fluorescence polarization immunoassay of digoxin.
Clinical Chemistry **33**, 606-608 (1987)

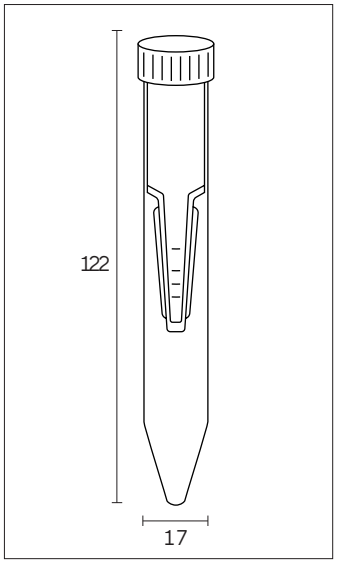
Visit us at www.sartorius.com/en/products/lab-filtration-purification/ultrafiltration-devices to get additional info.

Find instructions on how to use Vivaspin® Filtrate for the high recovery of cationized protein.

Vivaspin® Turbo 4 PES

For general laboratory use





2 to 4 mL Samples

Vivaspin® Turbo 4 PES offers the fastest sample concentration with the highest recoveries. This device can handle up to 4 mL sample volumes in swing bucket and fixed angle rotors that accept 15 mL conical bottom centrifuge tubes.

The optimized design and sleek internal profile ensure maximum process speeds all the way down to the last few microliters, resulting in more than 100-fold concentration.

UV joining technology provides a smooth joint transition between membrane and housing, allowing collection of the entire concentrated sample from the unique, pipette tip-friendly angular dead-stop pocket.

Specifications

Vivaspin® Turbo 4 PES		
Concentrator capacity	Swing bucket rotor Fixed angle rotor	4 mL 4 mL
Dimensions	Length × diameter Active membrane area Hold-up volume, membrane Dead-stop volume, swing bucket Dead-stop volume, fixed angle	122.5 × 17 mm 3.2 cm^2 < 10 µL 40 µL 30 µL
Materials of construction	Body Filtrate vessel Concentrator cap Membrane	Styrene butadiene copolymer (SBC) Polypropylene (PP) Polypropylene (PP) Polyethersulfone (PES)

Typical Performance Characteristics

	Time to concentrate up to 30x at 20 °C and solute recovery			
Rotor	Swing bucket		Fixed angle (25°)	
Centrifuge speed	4,000 *g*		7,500 *g*	
Start volume	4 mL		4 mL	
	Time	**Recovery**	**Time**	**Recovery**
Cytochrome c (12.4 kDa)				
3 kDa MWCO PES	60 min	98%	80 min	96%
5 kDa MWCO PES	40 min	95%	50 min	94%
Lysozyme (14.3 kDa)				
3 kDa MWCO PES	65 min	95%	70 min	93%
5 kDa MWCO PES	50 min	94%	60 min	92%
α-Chymotrypsin (25 kDa)				
10 kDa MWCO PES	10 min	95%	8 min	95%
BSA (66 kDa)				
10 kDa MWCO PES	10 min	98%	7 min	97%
30 kDa MWCO PES	8 min	96%	6 min	97%

Typical Performance Characteristics				
	Time to concentrate up to 30x at 20 °C and solute recovery			
	Time	Recovery	Time	Recovery
IgG (160 kDa)				
30 kDa MWCO PES	18 min	94%	13 min	92%
50 kDa MWCO PES	16 min	93%	12 min	90%
100 kDa MWCO PES*	17 min	94%	13 min	92%

* 3,000 *g* swing bucket or 5,000 *g* fixed angle

Ordering Information

Vivaspin® Turbo 4 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS04T91
3 kDa MWCO	100	VS04T92
5 kDa MWCO	25	VS04T11
5 kDa MWCO	100	VS04T12
10 kDa MWCO	25	VS04T01
10 kDa MWCO	100	VS04T02
30 kDa MWCO	25	VS04T21
30 kDa MWCO	100	VS04T22
50 kDa MWCO	25	VS04T31
50 kDa MWCO	100	VS04T32
100 kDa MWCO	25	VS04T41
100 kDa MWCO	100	VS04T42

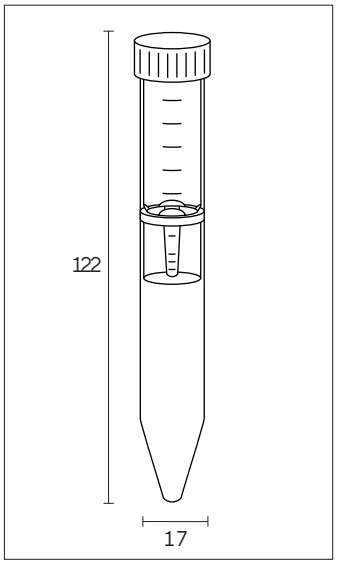
Visit us at www.sartorius.com/VivaspinTurbo4 for further information.
Here you can find instructions on how to use Vivaspin® Turbo 4 PES for:

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Separation of proteins and metabolites for disease detection

Vivaspin® 6

For general laboratory use





2 to 6 mL Samples

Vivaspin® 6 concentrators have been developed to offer increased volume flexibility and performance.

Vivaspin® 6 can process an impressive 6 mL in either swing bucket or fixed angle rotors accepting standard 15 mL conical bottom centrifuge tubes.

The Vivaspin® 6 features twin vertical membranes for unparalleled filtration speeds and more than 100-fold concentration. The remaining volume is easy to read off the printed graduations on the side of the concentrator and the modified dead-stop pocket further simplifies direct pipette recovery of the final concentrate.

Specifications

Vivaspin® 6		
Concentrator capacity	Swing bucket rotor Fixed angle rotor	6 mL 6 mL
Dimensions	Length × diameter Active membrane area Hold-up volume of membrane Dead-stop volume	122 × 17 mm 2.5 cm² < 10 µL 30 µL
Materials of construction	Body Filtrate vessel Concentrator cap Membrane	Polycarbonate (PC) Polycarbonate (PC) Polypropylene (PP) Polyethersulfone (PES)

Typical Performance Characteristics				
	Time to concentrate up to 30× at 20 °C and solute recovery			
Rotor	Swing bucket		Fixed angle [25°]	
Centrifuge speed	3,000 *g*		7,500 *g**	
Start volume	6 mL		6 mL	
	Time	Recovery	Time	Recovery
Cytochrome c 0.25 mg/mL (12.4 kDa MW) 5 kDa MWCO PES	–	–	90 min	97%
BSA 1.0 mg/mL (66 kDa MW) 5 kDa MWCO PES 10 kDa 10,000 MWCO PES 30 kDa MWCO PES	 20 min 13 min 12 min	 98% 98% 98%	 12 min 10 min 9 min	 98% 98% 97%
IgG 0.25 mg/mL (160 kDa MW) 30 kDa MWCO PES 50 kDa MWCO PES 100 kDa MWCO PES	 18 min 17 min 15 min	 96% 96% 91%	 15 min 14 min 12 min	 95% 95% 91%
Latex beads 0.004% in DMEM + 10% FCS (0.055 µm) 300 kDa MWCO PES	–	–	25 min	99%
Latex beads 0.004% in DMEM + 10% FCS (0.24 µm) 1,000 kDa MWCO PES	–	–	4 min	99%
Yeast 1.0 mg/mL (S. *Cerevisiae*) 0.2 µm PES	4 min	97%	3 min	97%

* 6,000 *g* for 100K MWCO devices

Ordering Information

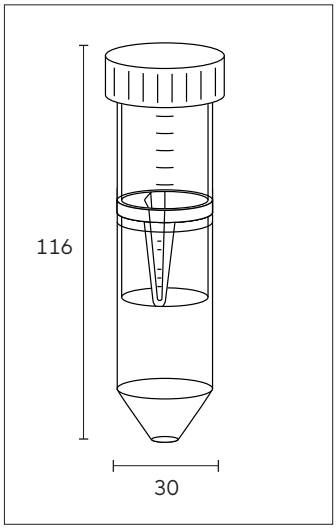
Vivaspin® 6 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS0691
3 kDa MWCO	100	VS0692
5 kDa MWCO	25	VS0611
5 kDa MWCO	100	VS0612
10 kDa MWCO	25	VS0601
10 kDa MWCO	100	VS0602
30 kDa MWCO	25	VS0621
30 kDa MWCO	100	VS0622
50 kDa MWCO	25	VS0631
50 kDa MWCO	100	VS0632
100 kDa MWCO	25	VS0641
100 kDa MWCO	100	VS0642
300 kDa MWCO	25	VS0651
300 kDa MWCO	100	VS0652
1,000 kDa MWCO	25	VS0661
1,000 kDa MWCO	100	VS0662
0.2 µm	25	VS0671
0.2 µm	100	VS0672

Visit us at www.sartorius.com/Vivaspin6 to get additional info.
Find instructions on how to use Vivaspin® 6 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery

Vivaspin® 15R





2 to 15 mL Samples

Vivaspin® 15R is designed for initial sample volumes of 2 to 15 mL and features a modified regenerated cellulose membrane; Hydrosart®. This membrane is ideal where extremely high recovery with very low adsorption is needed. Examples of these applications include desalting and concentration of Ig fractions.

Advantages

- Ultimate recovery with low adsorption (95 – 98%)
- Exceptionally fast concentration time (30 x in 15 min.)
- Convenient application protocol with easy handling
- Easy scale-up to 0.1 to 5 L with Vivaflow® 50R or 200 with Hydrosart® membranes
- Very low hold-up volume (< 20 µL)

Specifications

Vivaspin® 15R		
Concentrator capacity	Swing bucket rotor Fixed angle rotor	15 mL 12.5 mL
Dimensions	Length × diameter Active membrane area Hold-up volume of membrane Dead-stop volume	116 × 30 mm 3.9 cm² < 20 µL 30 µL
Materials of construction	Body Filtrate vessel Concentrator cap Membrane	Polycarbonate (PC) Polycarbonate (PC) Polypropylene (PP) Hydrosart® (HY)

Typical Performance Characteristics				
	Time to concentrate up to 30× at 20 °C and solute recovery			
Rotor	Swing bucket		Fixed angle [25°]	
Centrifuge speed	3,000 *g*		6,000 *g*	
Start volume	15 mL		12.5 mL	
	Time	Recovery	Time	Recovery
Aprotinin 0.1 mg/mL* (6.5 kDa MW) 5 kDa MWCO	47 min	95%	45 min	95%
Cytochrome c 0.25 mg/mL* (12.4 kDa MW) 5 kDa MWCO 10 kDa MWCO	45 min 25 min	96% 94%	45 min 18 min	96% 94%
α-Chymotrypsin 0.25 mg/mL* (25 kDa MW) 5 kDa MWCO 10 kDa MWCO	50 min 25 min	98% 98%	45 min 18 min	98% 98%
Ovalbumin 1.0 mg/mL* (45 kDa MW) 10 kDa MWCO 30 kDa MWCO	20 min 15 min	98% 94%	14 min 12 min	98% 94%

Typical Performance Characteristics				
	Time to concentrate up to 30× at 20 °C and solute recovery			
	Time	Recovery	Time	Recovery
BSA 1.0 mg/mL* (66 kDa MW) 30 kDa MWCO	18 min	98%	15 min	98%
IgG 0.1 mg/mL* in DMEM (160 kDa MW) 30 kDa MWCO	30 min	98%	25 min	96%

* proteins other than IgG made up in 50 mM potassium phosphate, 150 mM sodium chloride, pH 7.4

Ordering Information

Vivaspin® 15R HY	Pack size	Prod. No.
2 kDa MWCO	12	VS15RH91
2 kDa MWCO	48	VS15RH92
5 kDa MWCO	12	VS15RH11
5 kDa MWCO	48	VS15RH12
10 kDa MWCO	12	VS15RH01
10 kDa MWCO	48	VS15RH02
30 kDa MWCO	12	VS15RH21
30 kDa MWCO	48	VS15RH22

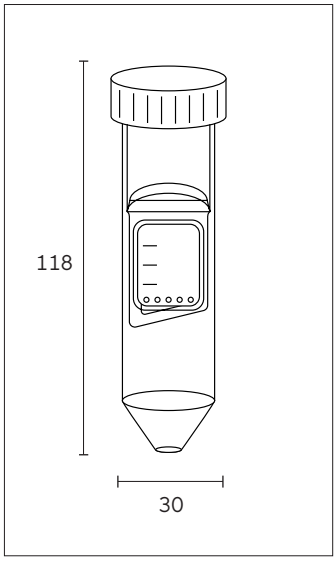
Visit us at www.sartorius.com/Vivaspin15R to get additional info.
Find instructions on how to use Vivaspin® 15R for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery

Vivaspin® Turbo 15 PES

For general laboratory use





4 to 15 mL Samples

Vivaspin® Turbo 15 enables the fastest sample concentration with the highest recoveries. This device can handle a sample volume of up to 110 or 15 mL in fixed angle or swing bucket rotors that accept 50 mL conical bottom centrifuge tubes.

The optimized design and sleek internal profile of Vivaspin® Turbo 15 ensure maximum process speeds all the way down to the last few microliters, which results in more than 100-fold concentration.

The UV joining technology ensures smooth joint transition between the membrane and the plastic housing – allowing removal of the entire sample concentrated in the unique, pipette-friendly dead-stop pocket.

Specifications

Vivaspin® Turbo 15 PES		
Concentrator capacity	Swing bucket rotor	15 mL
	Fixed angle rotor (25 °)	9 mL
Dimensions	Total length (concentrator insert)	77 mm
	Total length (in tube with cap)	118 mm
	Diameter (concentrator insert)	27 mm
	Active membrane area	7.2 cm²
	Hold-up volume of membrane	< 10 µL
	Dead-stop volume for swing-bucket rotor	100 µL
	Dead-stop volume for fixed-angle rotor	60 µL
Materials of construction	Body	Styrene butadiene copolymer (SBC)
	Filtrate vessel	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics				
	Time to concentrate up to 20× at 20 °C and solute recovery			
Rotor	Swing bucket		Fixed angle [25°]	
Centrifuge speed	4,000 *g**		4,000 *g**	
Start volume	15 mL		9 mL	
	Time	Recovery	Time	Recovery
Cytochrome c* (12.4 kDa MW) 5 kDa MWCO PES	30 min	98%	50 min	98%
Lysozyme* (14.3 kDa MW) 5 kDa MWCO PES	33 min	96%	50 min	96%
α-Chymotrypsin** (25 kDa MW) 10 kDa MWCO PES	10 min	95%	10 min	95%
BSA** (66 kDa MW) 10 kDa MWCO PES 30 kDa MWCO PES	10 min 8 min	99% 98%	10 min 10 min	99% 98%

*2,000 *g* for 100K MWCO devices

Typical Performance Characteristics				
	Time to concentrate up to 20× at 20 °C and solute recovery			
	Time	Recovery	Time	Recovery
IgG** (160 kDa MW) 30 kDa MWCO PES	23 min	95%	17 min	95%

* 0.25 mg/mL ** 1 mg/mL

Ordering Information

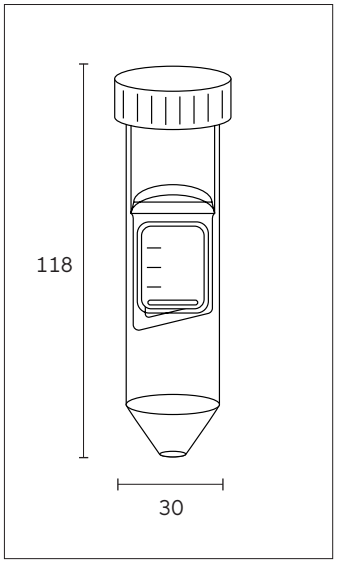
Vivaspin® Turbo 15 PES	Pack size	Prod. No.
3 kDa MWCO	12	VS15T91
3 kDa MWCO	48	VS15T92
5 kDa MWCO	12	VS15T11
5 kDa MWCO	48	VS15T12
10 kDa MWCO	12	VS15T01
10 kDa MWCO	48	VS15T02
30 kDa MWCO	12	VS15T21
30 kDa MWCO	48	VS15T22
50 kDa MWCO	12	VS15T31
50 kDa MWCO	48	VS15T32
100 kDa MWCO	12	VS15T41
100 kDa MWCO	48	VS15T42

Visit us at www.sartorius.com/VivaspinTurbo15 to get additional info.
Find instructions on how to use Vivaspin® Turbo 15 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- Concentration to a predefined volume
- Depyrogenation of ultrafiltration devices
- Concentration of mammalian cell culture supernatants

Vivaspin® Turbo 15 RC





4 to 15 mL Samples
Vivaspin® Turbo 15 RC allows fastest sample concentration with highest recoveries. This device can handle up to 11 or 15 mL sample volumes in fixed angle or swing bucket rotors accepting 50 mL centrifuge tubes.

The Vivaspin® Turbo 15 RC optimized design and sleek internal profile ensure maximum process speeds right the way down to the last few micro litres leading to more than 100-fold concentration. The hydrophillic regenerated cellulose (RC) is suitable for general samples, with ultra-low protein absorbtion and high chemical compatability. The membrane is especially well suited to oligonucleotides and peptides and has been developed uniquely for lab ultrafiltration applications.

The solvent free heat weld technology allows for a smooth transition between the membrane and plastic housing, providing complete sample recovery from the unique pipette friendly dead stop pocket. Combined with the PES counterpart the Vivaspin® Turbo range offers the best membrane, whatever the sample.

Specifications

Vivaspin® Turbo 15 PES		
Concentrator capacity	Swing bucket rotor	15 mL
	Fixed angle rotor (25 °)	9 mL
Dimensions	Total length (concentrator insert)	77 mm
	Total length (in tube with cap)	118 mm
	Diameter (concentrator insert)	27 mm
	Active membrane area	8.1 cm^2
	Hold-up volume of membrane	< 10 µL
	Dead-stop volume for swing-bucket rotor	100 µL
	Dead-stop volume for fixed-angle rotor	60 µL
Materials of construction	Body	Styrene butadiene copolymer (SBC)
	Filtrate vessel	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Regenerated Cellulose (RC)

Typical Performance Characteristics				
	Time to concentrate up to 20× at 20 °C and solute recovery			
Rotor	Swing bucket		Fixed angle [25°]	
Centrifuge speed	4,000 *g***		6,000 *g*	
Start volume	15 mL		11 mL	
	Time	Recovery	Time	Recovery
Cytochrome c* (12.4 kDa MW) 5 kDa MWCO RC	23 min	94%	37 min	92%
Lysozyme* (14.3 kDa MW) 5 kDa MWCO RC	23 min	94%	37 min	89%
α-Chymotrypsin** (25 kDa MW) 10 kDa MWCO RC	7 min	93%	9 min	92%
BSA** (66 kDa MW) 10 kDa MWCO RC** 30 kDa MWCO RC*	8 min 4 min	94% 96%	10 min 4 min	98% 93%
Gamma Globulin (160 kDa MW) 50 kDa MWCO RC** 100 kDa MWCO RC**	17 min 18 min	95% 89%	11 min 12 min	96% 89%

* 0.25 mg/mL ** 1 mg/mL *** 3,000 g for 100K MWCO devices

Ordering Information

Vivaspin® Turbo 15 RC	Pack size	Prod. No.
5 kDa MWCO	12	VS15TR11
5 kDa MWCO	48	VS15TR12
10 kDa MWCO	12	VS15TR01
10 kDa MWCO	48	VS15TR02
30 kDa MWCO	12	VS15TR21
30 kDa MWCO	48	VS15TR22
50 kDa MWCO	12	VS15TR31
50 kDa MWCO	48	VS15TR32
100 kDa MWCO	12	VS15TR41
100 kDa MWCO	48	VS15TR42

Visit us at www.sartorius.com/VivaspinTurbo15 to get additional info.
Find instructions on how to use Vivaspin® Turbo 15 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- Concentration to a predefined volume

Vivaspin® 20

For general laboratory use



5 to 20 mL Samples

Vivaspin® 20 centrifugal concentrators have been developed to offer increased volume flexibility and performance.

Vivaspin® 20 handles up to 140 or 20 mL in fixed angle or swing bucket rotors that accept 50 mL conical bottom centrifuge tubes. Featuring twin vertical membranes for unparalleled filtration speeds, the Vivaspin® 20 can achieve more than 100-fold concentrations. The remaining volume is easy to read off the printedgraduations on the side of the concentrator and the modified dead-stop pocket further simplifies direct pipette recovery of the final concentrate.



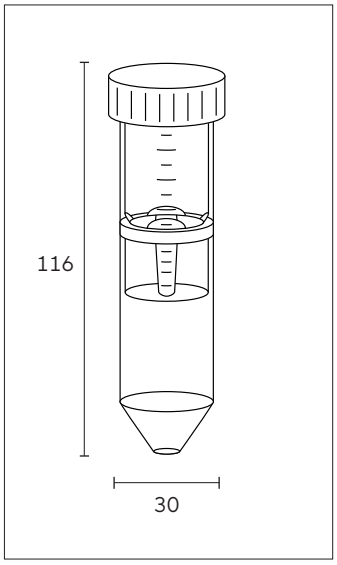
Air pressure controller, VCA002

More Process Flexibility

Vivaspin® 20 is available with unique accessories and operating methods that are designed to provide more process flexibility and further time savings.

Gas Pressure Filtration

When an appropriate centrifuge is unavailable or for single sample processing, Vivaspin® 20 can be filled with up to 15 mL and then pressurized for bench-top concentration. For even faster processing, gas pressure can be combined with centrifugal force. “Pressure-fugation” is particularly suitable for difficult or viscous samples, such as serum, or for use of a low process temperature, which reduces filtration speed, and generally when minimum process time is essential.



Specifications

Vivaspin® 20		
Concentrator capacity	Swing bucket rotor	20 mL
	Fixed angle rotor	14 mL
	With pressure head	15 mL
Dimensions	Length × diameter	116 × 30 mm, 125 × 30 mm with pressure head
	Active membrane area	6.0 cm²
	Hold-up volume of membrane	<20 µL
	Dead-stop volume	50 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polycarbonate (PC)
	Concentrator cap	Polypropylene (PP)
	Pressure head	Polyoxymethylene (POM) and Aluminium (ALU)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics				
	Time to concentrate up to 30× at 20 °C and solute recovery			
Mode	Centrifuge	Centrifuge	Bench top	Press-fuge
Rotor	Swing bucket	Fixed angle [25°]	Pressure	Swing bucket
Centrifugal speed | pressure	3,000 *g**	6,000 *g*	4 bar	3,000 *g** + 4 bar
Start volume	20 mL	14 mL	10 mL	10 mL

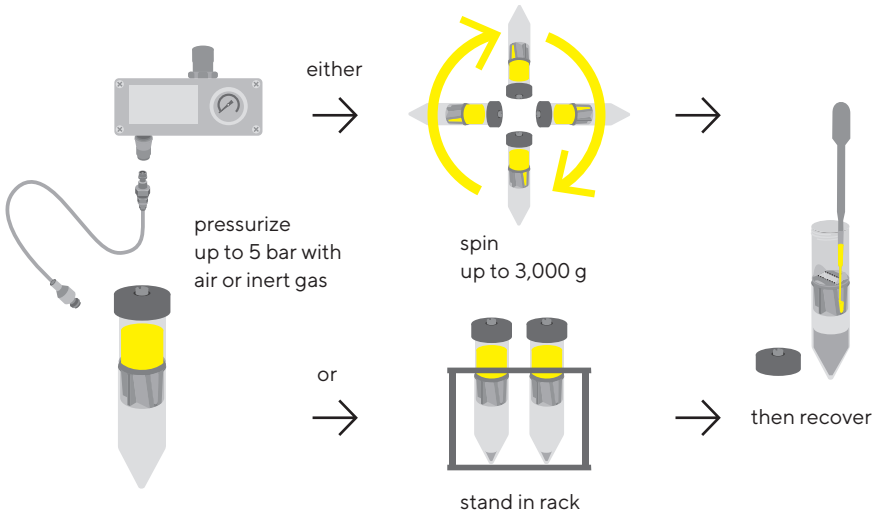
* 2,000 *g* for devices with ≥100 kDa MWCO

Typical Performance Characteristics								
	Time to concentrate up to 30× at 20 °C and solute recovery							
	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.
Cytochrome c 0.25 mg/mL (12.4 kDa MW)								
3 kDa MWCO PES	110	97%	180	96%	60	96%	–	–
BSA 1.0 mg/mL (66 kDa MW)								
5 kDa MWCO PES	23	99%	29	99%	50	98%	14	98%
10 kDa MWCO PES	16	98%	17	98%	32	97%	8	97%
30 kDa MWCO PES	13	98%	15	98%	32	97%	8	97%
IgG 0.25 mg/mL (160 kDa MW)								
30 kDa MWCO PES	27	97%	20	95%	46	94%	13	97%
50 kDa MWCO PES	27	96%	22	95%	46	93%	13	96%
100 kDa MWCO PES	25	91%	20	90%	42	88%	12	94%
Latex beads 0.004% in DMEM + 10% FCS (0.055 µm)								
300 kDa MWCO PES	20	99%	35	99%	10	99%	–	–
Latex beads 0.004% in DMEM + 10% FCS (0.24 µm)								
1,000 kDa MWCO PES	4	99%	12	99%	4	99%	–	–
Yeast 1.0 mg/mL (S. Cerevisiae)								
0.2 µm PES	15	95%	5	95%	20	95%	2	95%

Ordering Information

Vivaspin® 20 PES	Pack size	Prod. No.
3 kDa MWCO	12	VS2091
3 kDa MWCO	48	VS2092
5 kDa MWCO	12	VS2011
5 kDa MWCO	48	VS2012
10 kDa MWCO	12	VS2001
10 kDa MWCO	48	VS2002
30 kDa MWCO	12	VS2021
30 kDa MWCO	48	VS2022
50 kDa MWCO	12	VS2031
50 kDa MWCO	48	VS2032
100 kDa MWCO	12	VS2041
100 kDa MWCO	48	VS2042
300 kDa MWCO	12	VS2051
300 kDa MWCO	48	VS2052
1,000 kDa MWCO	12	VS2061
1,000 kDa MWCO	48	VS2062
0.2 µm	12	VS2071
0.2 µm	48	VS2072

Vivaspin® 20 Accessories	Pack size	Prod. No.
Air pressure controller (APC)	1	VCA002
Charge valve for pressure head	1	VCA005
Diafiltration cups	12	VSA005
Female coupling	1	VCA010
Male coupling	1	VCA011
Replacement extension line (4 mm pneumatic tubing, 3 m)	1	VCA012
Vivaspin® 20 pressure head	1	VCA200



Using the Vivaspin® 20 pressure head

Visit us at www.sartorius.com/Vivaspin20 to get additional info.
Find instructions on how to use Vivaspin® 20 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- The workflow in protein research laboratories

Vivaspin® 100





Air pressure controller, VCA002

20 to 98 mL Samples

Vivaspin® 100 bridges the gap between centrifugal concentrators and crossflow cassettes. These devices feature vertical membranes for high speed processing of even high particle loaded samples. In addition, a unique choice between centrifugal, pressure or pressure-shake operating methods provides unrivaled process flexibility.

Fitting swing bucket rotors accepting 250 mL bottles, Vivaspin® 100 offers the highest sample capacity available in a centrifugal device – up to an astonishing 90 mL.

Vivaspin® 100 units can also be used for single or extremely sensitive samples of up to 98 mL when pressurized and left on the bench. For temperature-sensitive samples, they can be placed into a refrigerator when pressurized. Pressurization is made easy by use of quick-release connectors and can be combined with orbital shaking for even faster sample concentration.

In whichever mode Vivaspin® 100 is used, the vertical membrane design inhibits membrane fouling while the integrated dead-stop impedes concentration to dryness and loss of sample.

Specifications

Vivaspin® 100		
Concentrator capacity	Swing bucket rotor With pressure head	90 mL 98 mL
Dimensions	Length × diameter Active membrane area Hold-up volume of membrane Dead-stop volume	123 × 62 mm, 197 × 63 mm with pressure head 23.5 cm² < 250 µL 350 µL
Operating requirements	Rotor type Rotor cavity Maximum speed Maximum pressure	Swing-bucket To fit 250 mL (62 mm) centrifuge bottles (maximum cavity depth 105 mm) 2,000 *g* 5 bar (75 psi)
Materials of construction	Body Filtrate vessel Concentrator cap Pressure head seal Pressure head Membrane	Polycarbonate (PC) Polycarbonate (PC) Polypropylene (PP) Thermoplastic Elastomer (TPE) Polyoxymethylene (POM) and Aluminium (ALU) Polyethersulfone (PES)

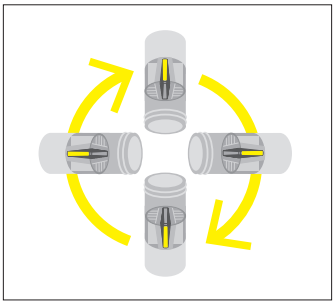
Typical Performance Characteristics				
	Time to concentrate up to 30× at 20 °C			
90 mL Start volume	Centrifuge (swing bucket, 2,000 *g*)	Pressure (4 bar)		Solute recovery
		No agitation	Orbital shake	
BSA 1.0 mg/mL (66 kDa MW)				
5 kDa MWCO PES	22 min	75 min	25 min	96%
10 kDa MWCO PES	16 min	60 min	20 min	96%
30 kDa MWCO PES	16 min	60 min	20 min	94%
IgG 0.25 mg/mL (160 kDa MW)				
50 kDa MWCO PES	20 min	70 min	30 min	94%
100 kDa MWCO PES	20 min	85 min	30 min	90%
Latex beads 0.004% in DMEM + 10% FCS (0.055 µm)				
300 kDa MWCO PES	35 min	–	120 min	99%
Latex beads 0.004% in DMEM + 10% FCS (0.24 µm)				
1,000 kDa MWCO* PES	4 min	5 min	4 min	99%

* 2 bar (29 psi) pressure

Ordering Information

Vivaspin® 100 PES	Pack size	Prod. No.
5 kDa MWCO	2	VC1011
5 kDa MWCO	10	VC1012
10 kDa MWCO	2	VC1001
10 kDa MWCO	10	VC1002
30 kDa MWCO	2	VC1021
30 kDaMWCO	10	VC1022
50 kDa MWCO	2	VC1031
50 kDa MWCO	10	VC1032
100 kDa MWCO	2	VC1041
100 kDa MWCO	10	VC1042
300 kDa MWCO	2	VC1051
300 kDa MWCO	10	VC1052
1,000 kDa MWCO	2	VC1061
1,000 kDa MWCO	10	VC1062
0.2 µm	2	VC1071
0.2 µm	10	VC1072

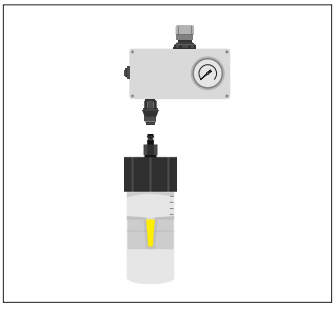
Vivaspin® 100 Accessories	Pack size	Prod. No.
Air pressure controller (APC), complete with pressure gauge, regulator, over-pressure safety valve, female connector, 1 m extension line (4 mm pressure tubing) with male and female connectors and 1 m of 6 mm inlet tubing	1	VCA002
Female coupling	1	VCA010
Male coupling	1	VCA011
4 mm pressure tubing (3 m)	1	VCA012
Replacement extension line (4 mm pneumatic tubing, 3 m)	10	VCA014
Vivaspin® 100 pressure head with seals (5x)	1	VCA800



Centrifuge

use with polypropylene concentrator cap in swing out rotor

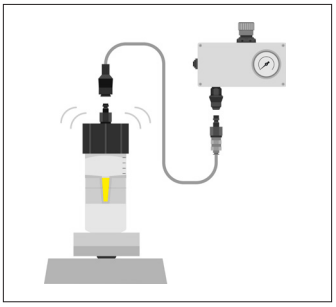
- Process convenience
- Low shear, non-foaming
- Less visual control



Pressure

use with pressure head VCA800

- Simplicity and the highest process control
- Ideal for refrigerated use
- Slower concentrations

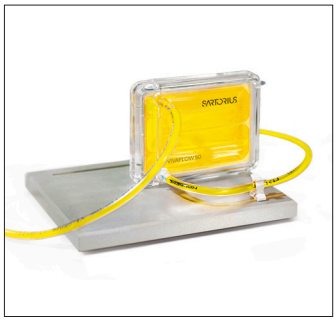


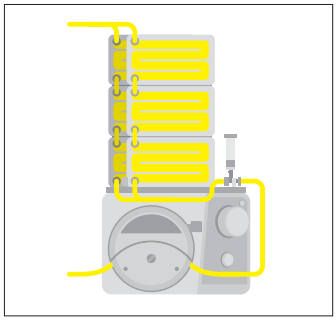
Pressure-Shake

use with pressure head VCA800

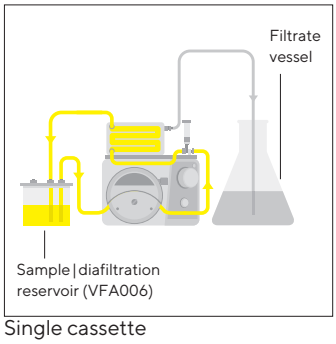
- Speed and process control
- Ideal for single samples

Vivaflow® 50





Multiple cassettes



Single cassette

0.1 to 3 L Samples

The unique, patented Vivaflow®* 50 system provides ease of use, performance, flexibility and economy that are unrivaled by any laboratory or pilot-scale filtration system on the market.

Unique Features

- The thin-channel, flip-flow recirculation path provides high crossflow velocities with minimum pump requirements
- No need for pressure holders
- Crystal clear for simple checking of the concentrate and membrane
- Unique interlocking modules with series connectors for easy scale up
- Disposable

Unique Performance

- A single 50 cm² module will typically reduce 500 mL to less than 15 mL in under 50 minutes
- Less than 10 mL minimum system recirculation for the highest concentration factors
- Less than 500 µL non-recoverable hold-up volume
- Near total recoveries achievable with a single 10 mL rinse

Unique "flip-flow" thin channel flow path results in high turbulence and linear velocity for exceptional flux, even at high concentrations.

Specifications

Vivaflow® 50		
Dimensions	Overall L | W | H	25 | 107 | 84 mm
	Channel W | H	15 | 0.3 mm
	Active membrane area	50 cm²
	Hold-up volume (module)	1.5 mL
	Minimum recirculation volume	< 10 mL
	Non-recoverable hold-up	< 0.5 mL
Operating conditions	Pump flow	200 to 400 mL/min
	Maximum pressure	3 bar (45 psi)
	Maximum temperature	60 °C
Materials of construction	Main housing	Polycarbonate (PC)
	Flow channel	Polymethylpentene (PMP)
	Membrane	Polyethersulfone (PES)
	Membrane support	Polymethylpentene(PMP)
	Seals and O-rings	Silicone (SIL)
	Flow restrictor	Polypropylene (PP)
	Fittings	Polyamide (PA)
	Tubing	Polyvinyl Chloride (PVC), medical grade

* Vivaflow® is a registered trademark in the U.S., Japan and the European Union.

Performance Characteristics				
	Time to concentrate up to 20× at 3 bar inlet pressure, 20 °C			
	Single device 250 mL start volume	Three devices 1 L start volume	Recovery Direct	10 mL rinse
BSA 1.0 mg/mL (66 kDa MW)				
5 kDa MWCO PES	34 min	49 min	96%	>99%
10 kDa MWCO PES	22 min	32 min	94%	>99%
30 kDa MWCO PES	22 min	32 min	92%	99%
50 kDa MWCO PES	20 min	29 min	92%	98%
γ Globulins 1.0 mg/mL (160 kDa MW)				
100 kDa MWCO PES	43 min	62 min	92%	98%
100 kDa MWCO RC	40 min	58 min	92%	98%
Yeast 1.0 mg/mL (*S. Cerevisiae*)				
0.2 µm PES	33 min	47 min	92%	98%

Ordering Information

Vivaflow® 50*	Pack size	Prod. No.
3 kDa MWCO PES	2	VF05P9
5 kDa MWCO PES	2	VF05P1
10 kDa MWCO PES	2	VF05P0
30 kDa MWCO PES	2	VF05P2
50 kDa MWCO PES	2	VF05P3
100 kDa MWCO PES	2	VF05P4
1,000 kDa MWCO PES	2	VF05P6
0.2 µm PES	2	VF05P7

* Vivaflow® 50 cassettes are supplied with feed, retentate and filtrate tubing, 0.6 mm flow restrictor and luer fittings.

Vivaflow® 50 Complete Set of Accessories		
Pump (230 V), Easy Load pump head (size 16), tubing, 500 mL sample	diafiltration reservoir, cassette stand, pressure indicator, T-connectors, series interconnectors	1	VFS502
Pump (115 V), Easy Load pump head (size 16), tubing, 500 mL sample	diafiltration reservoir, cassette stand, pressure indicator, T-connectors, series interconnectors	1	VFS504

Accessories	Pack size	Prod. No.
Masterflex economy drive variable speed peristaltic pump (230 V)	1	VFA004
Masterflex economy drive variable speed peristaltic pump (115 V)	1	VFA009
500 mL sample and	or diafiltration reservoir	1	VFA006
Masterflex Easy-Load pump head (size 16)	1	VFA031
Vivaflow® 50 stand	1	VFA032
Pressure indicator (1 - 3 bar)	1	VFA020

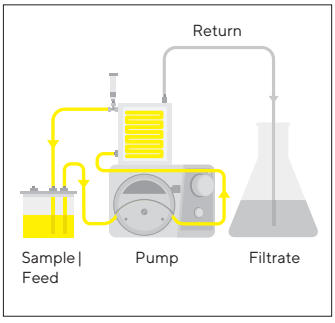
PVC Tubing and Fittings		
Size 16 PVC pump tubing and Luer fittings (3 m, 3.2 × 1.6 mm)	1	VFA004
Flow restrictor set, 2 each of 0.4, 0.6 and 0.8 mm	6	VFA009
T-connectors for running 2 stacks	2	VFA030
Series interconnectors	6	VFA031
Female luer fittings	10	VFA032
VF50 tubing kit (2 × 1 m size 16 PVC tubing with luer fittings, 2 × 50 cm size 16 PVC tubing with 0.6 mm flow restrictors, 1 x series interconnector)	1	VFA034
Flow restrictor, 0.6 mm	6	VFA035

Visit us at www.sartorius.com/Vivaflow50 to get additional info. Here you can find instructions on how to use Vivaflow® 50 for

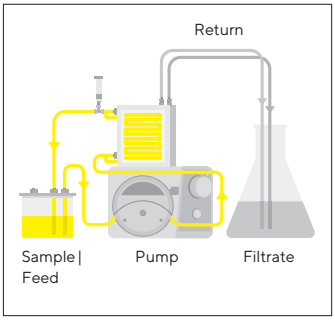
- Measurement of soluble trace metals in seawater
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses

Vivaflow® 50R





Vivaflow® 50R – Single cassette



Vivaflow® 50R – Two cassettes

0.1 to 1 L Samples
Concentrate 100 mL to under 20 mL in just a few minutes or concentrate one liter 50-fold in less than 60 minutes. Alternatively, speed up your process by using two Vivaflow® 50R units in parallel and concentrate 1 L in under 30 min.

Vivaflow® 50R is a plug-and-play laboratory crossflow cassette for concentrating up to 1 L aqueous samples. The active membrane area per device is 50 cm².

One unit comes with all the necessary accessories for running the device with a laboratory pump and a size 16 pump head. For speeding up concentration, two cassettes can be run simultaneously.

- Fast and easy protein sample concentration
- Reusable
- Concentrates volumes from 0.1 L to 1 L
- Optimal for concentration of culture supernatants and viruses
- The most compact crossflow cassette with a premium Hydrosart® membrane

Specifications

Vivaflow® 50R		
Dimensions	Overall L | W | H	24 | 100 | 100 mm
	Channel W | H	7.5 | 0.4 mm
	Active membrane area	50 cm²
	Hold-up volume (module)	1.7 mL
	Min. recirculation volume	10 mL
	Non-recoverable hold-up	< 0.5 mL
Operating conditions	Pump flow	200 to 400 mL/min
	Maximum pressure	4 bar (60 psi)
	Maximum temperature	60 °C
Materials of construction	Main housing	Acrylic
	Flow channel	Acrylic
	Membrane	Hydrosart® (HY)
	Membrane support	Polyethylene (PE)
	Seals and O-rings	Silicone (SIL)
	Pressure indicator	Polypropylene (PP), Stainless Steel (SS), Polyoxymethylene (POM), Silicone, Polyamide (PA)
	Flow restrictor	Polypropylene (PP)
	Fittings	Polyamide (PA)
	Tubing	Polyvinyl Chloride (PVC), medical grade

Performance Characteristics				
	Time to concentrate up to 20× at 3.0 bar inlet | 2.5 bar outlet pressure, 20 °C			
	Start volume 250 mL	Average flux	Recovery Direct	25 mL rinse
Lysozyme 0.25 mg/mL (14 kDa MW)				
5 kDa MWCO Hydrosart®	70 min	3.4 mL/min	96%	98%
10 kDa MWCO Hydrosart®	23 min	10.3 mL/min	94%	96%
BSA 1.0 mg/mL (66 kDa)				
10 kDa MWCO Hydrosart®	24 min	9.9 mL/min	98%	>99%
30 kDa MWCO Hydrosart®	15 min	15.8 mL/min	97%	>99%
γ Globulins 1.0 mg/mL (160 kDa MW)				
100 kDa MWCO Hydrosart®	46 min	5.2 mL/min	97%	>99%

Performance Characteristics				
	Time to concentrate up to 20× at 3.0 bar inlet | 2.5 bar outlet pressure, 20 °C			
	Start volume 250 mL	Average flux	Recovery Direct	25 mL rinse
Start volume 1 L (one Vivaflow® 50R at 3 bar) 10 kDa MWCO Hydrosart® BSA 1.0 mg/mL	95 min	10.0 mL/min	98%	>99%
Start volume 1 L (two Vivaflow® 50R in parallel at 3 bar) 10 kDa MWCO Hydrosart® BSA 1.0 mg/mL	48 min	19.8 mL/min	98%	>99%

Ordering Information

Vivaflow® 50R*	Pack size	Prod. No.
5 kDa MWCO Hydrosart®	1	VF05H1
10 kDa MWCO Hydrosart®	1	VF05H0
30 kDa MWCO Hydrosart®	1	VF05H2
100 kDa MWCO Hydrosart®	1	VF05H4

* Vivaflow® 50R and filtrate tubing, 0.6 mm flow restrictor, luer fittings and a pressure indicator.

Vivaflow® 50R Complete Set of Accessories		
Pump (230 V), Easy-Load pump head (size 16), tubing, 500 mL sample	diafiltration reservoir	1	VFS202
Pump (115 V), Easy-Load pump head (size 16), tubing, 500 mL sample	diafiltration reservoir	1	VFS204

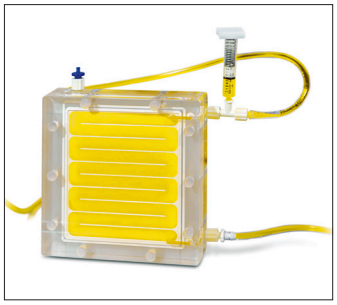
Accessories		
Masterflex economy drive variable speed peristaltic pump (230 V)	1	VFP001
Masterflex economy drive variable speed peristaltic pump (115 V)	1	VFP002
500 mL sample and	or diafiltration reservoir	1	VFA006
Masterflex Easy-Load pump head (size 16)	1	VFA012

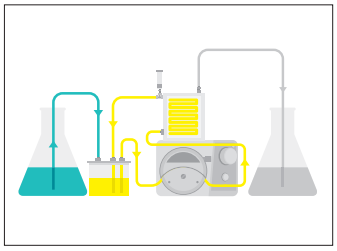
Tubing and Fittings		
Size 16 tubing and Luer fittings (3 m, 3.2 × 1.6 mm)	1	VFA004
T-connectors for running 2 cassettes	2	VFA030
Flow restrictor set, 2 each of 0.4, 0.6 and 0.8 mm	6	VFA009
Female luer fittings, size 16	10	VFA032
Flow restrictors, 0.6 mm	6	VFA035

Visit us at www.sartorius.com/Vivaflow50R to get additional info.
Here you can find instructions on how to use Vivaflow® 50R for

- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses

Vivaflow® 200





Vivaflow® 200 setup for diafiltration

0.5 to 5 L Samples
Concentrate 250 mL to under 20 mL in just a few minutes or concentrate one liter 50-fold in less than 30 minutes. Alternatively, use two Vivaflow® 200 units in parallel and concentrate 5 L in under 75 minutes.

Nearly total sample recoveries can be expected with most solutions.

Each cassette is supplied complete with tubing, pressure indicator, flow restrictor and high-pressure pump tubing. All you need is a peristaltic pump capable of handling 6.4 mm OD (size 16) tubing. Should your pump head require larger tubing, just use the interconnecter provided to attach your own peristaltic tubing to this standard product.

To operate two cassettes in parallel, the only additional accessories needed are a Y-connector and size 15 pump head.

Specifications

Vivaflow® 200		
Dimensions	Overall L | W | H	38 | 126 | 138 mm
	Channel W | H	10 | 0.4 mm
	Active membrane area	200 cm^2
	Hold-up volume (module)	5.3 mL
	Min. recirculation volume	< 20 mL
	Non-recoverable hold-up	< 2 mL
Materials of construction	Main housing	Acrylic
	Flow channel	Acrylic
	Membrane	Polyethersulfone (PES) Hydrosart® (HY)
	Membrane support	Polyethylene (PE)
	Seals and O-rings	Silicone (SIL)
	Pressure indicator	Polypropylene (PP), Stainless Steel (SS), Polyoxymethylene (POM), Silicone, Polyamide (PA)
	Flow restrictor	Polypropylene (PP)
	Fittings	Polyamide (PA)
	Tubing	Polyvinyl Chloride (PVC), medical grade
Operating conditions	Pump flow	200 to 400 mL/min
	Maximum pressure	4 bar (60 psi)
	Maximum temperature	60 °C

Performance Characteristics				
	Time to concentrate up to 20× at 3 bar inlet pressure, 20 °C			
	Start volume 1 L	Average flux	Recovery Direct	25 mL rinse
Lysozyme 0.25 mg/mL (14 kDa MW)				
2 kDa MWCO Hydrosart®	160 min	6 mL/min	97%	>99%
3 kDa MWCO PES	180 min	5 mL/min	97%	>99%
BSA 1.0 mg/mL (66 kDa MW)				
5 kDa MWCO PES	29 min	33 mL/min	98%	>99%
5 kDa MWCO Hydrosart®	70 min	14 mL/min	98%	>99%
10 kDa MWCO PES	23 min	41 mL/min	96%	>99%
10 kDa MWCO Hydrosart®	35 min	27 mL/min	98%	>99%
30 kDa MWCO PES	25 min	38 mL/min	96%	99%
30 kDa MWCO Hydrosart®	20 min	48 mL/min	96%	>99%
50 kDa MWCO PES	22 min	43 mL/min	96%	98%
γ Globulins 1.0 mg/mL (160 kDa MW)				
100 kDa MWCO PES	54 min	18 mL/min	96%	99%
Yeast 1.0 mg/mL (S. Cerevisiae)				
0.2 µm PES	11 min	86 mL/min	92%	98%
Dilute solute concentration, start volume 1 L at 3 bar, 10 kDa MWCO PES				
BSA 0.001 mg/mL	18 min	52 mL/min	90%	98%
BSA 0.01 mg/mL	20 min	47 mL/min	92%	98%
BSA 0.1 mg/mL	21 min	45 mL/min	94%	99%
Start volume 5 L (two Vivaflow® 200 in parallel at 3 bar) 10 kDa MWCO PES				
BSA 1.0 mg/mL (66 kDa MW)	67 min	70 mL/min	97%	>99%

Visit us at www.sartorius.com/Vivaflow200 to get additional info.
Find instructions on how to use Vivaflow® 200 for

- The measurement of soluble trace metals in seawater
- The workflow in protein research laboratories
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentrating hybridoma supernatants prior to to affinity chromatography

Ordering Information

Vivaflow® 200*	Pack size	Prod. No.
3 kDa MWCO PES	1	VF20P9
5 kDa MWCO PES	1	VF20P1
10 kDa MWCO PES	1	VF20P0
30 kDa MWCO PES	1	VF20P2
50 kDa MWCO PES	1	VF20P3
100 kDa MWCO PES	1	VF20P4
0.2 µm PES	1	VF20P7
2 kDa MWCO Hydrosart®	1	VF20H9
5 kDa MWCO Hydrosart®	1	VF20H1
10 kDa MWCO Hydrosart®	1	VF20H0
30 kDa MWCO Hydrosart®	1	VF20H2
100 kDa MWCO Hydrosart®	1	VF20H4

* Vivaflow® 200 cassettes are supplied with feed, retentate and filtrate tubing, 0.6 mm flow restrictor, luer fittings and a pressure indicator.

Vivaflow® 200 Complete Set of Accessories**		
Pump (230 V), Easy-Load pump head (size 16), tubing, 500 mL sample | diafiltration reservoir	1	VFS202
Pump (115 V), Easy-Load pump head (size 16), tubing, 500 mL sample | diafiltration reservoir	1	VFS204

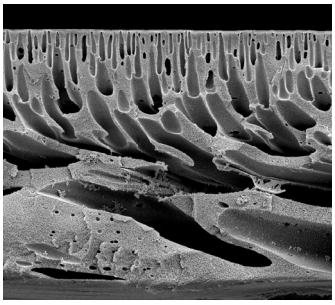
** VFS202 and VFS204 are suitable only for operation of a single Vivaflow® 200 cassette. To operate 2 cassettes in parallel, an Easy-Load size 15 pump head is required.

Accessories		
Masterflex economy drive variable speed peristaltic pump (240 V)	1	VFP001
Masterflex economy drive variable speed peristaltic pump (115 V)	1	VFP002
500 mL sample and | or diafiltration reservoir	1	VFA006
Masterflex Easy-Load pump head (size 16)	1	VFA012
Masterflex Easy-Load pump head (size 15)	1	VFA013

Tubing and Fittings		
Size 15 tubing and Luer fittings (3 m, 4.8 mm × 2.6 mm)	1	VFA003
Size 16 tubing and Luer fittings (3 m, 3.2 mm × 1.6 mm)	1	VFA004
Y-connector (size 15 to 2 × size 16 for running 2 cassettes in parallel)	1	VFA005
Flow restrictor set, 2 each of 0.4, 0.6 and 0.8 mm	6	VFA009
Female luer fittings, size 16	10	VFA032
Flow restrictors, 0.6 mm	6	VFA035
Female luer fittings, size 15	10	VFA036

Ultrafiltration Membrane Discs

PES 146, CTA 145 and Hydrosart® 144



Polyethersulfone (PES)

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

Cellulose Triacetate (CTA)

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

Hydrosart® (HY)

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

Specifications

Specifications for Polyethersulfone, Type 146		
Thickness	120 µm	
pH range	1 – 14	
Water flux	10 kDa MWCO	0.2 mL/min/cm²
Protein retention	Cytochrome C	95%

Specifications for Cellulose Triacetate, Type 145		
Thickness	120 µm	
pH range	4 – 8	
Water flux	10 kDa MWCO	0.11 mL/min/cm²
Protein retention	Cytochrome C	90%

Specifications for Hydrosart®, Type 144		
Thickness	180 µm	
pH range	1 – 13	
Water flux	10 kDa MWCO	0.08 mL/min/cm²
Protein retention	Cytochrome C	99%

Ordering Information

PES Membrane Discs, Type 146	Diameter	Pack size	Prod. No.
1 kDa MWCO	47 mm	10	14609--47------D
5 kDa MWCO	25 mm	10	14629--25------D
	47 mm	10	14629--47------D
	63 mm	10	14629--63------D
	76 mm	10	14629--76------D
10 kDa MWCO	25 mm	10	14639--25------D
	43 mm	10	14639--43------D
	47 mm	10	14639--47------D
	63 mm	10	14639--63------D
	76 mm	10	14639--76------D
30 kDa MWCO	47 mm	10	14659--47------D
	63 mm	10	14659--63------D
50 kDa MWCO	47 mm	10	14650--47------D
100 kDa MWCO	47 mm	10	14668--47------D
	63 mm	10	14668--63------D
300 kDa MWCO	47 mm	10	14679--47------D

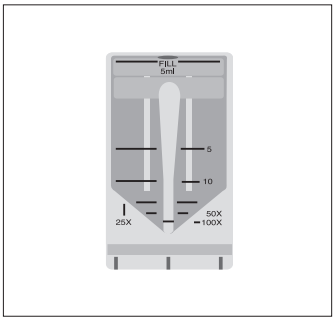
CTA Membrane Discs, Type 145	Diameter	Pack size	Prod. No.
5 kDa MWCO	47 mm	10	14529--47------D
10 kDa MWCO	47 mm	10	14539--47------D
	50 mm	10	14539--50------D
20 kDa MWCO	43 mm	10	14549--43------D
	47 mm	10	14549--47------D

HY Membrane Discs, Type 144	Diameter	Pack size	Prod. No.
5 kDa MWCO	25 mm	10	14429--25------D
	47 mm	10	14429--47------D
	63 mm	10	14429--63------D
	76 mm	10	14429--76------D
10 kDa MWCO	25 mm	10	14439--25------D
	47 mm	10	14439--47------D
	63 mm	10	14439--63------D
	76 mm	10	14439--76------D
30 kDa MWCO	47 mm	10	14459--47------D
	63 mm	10	14459--63------D

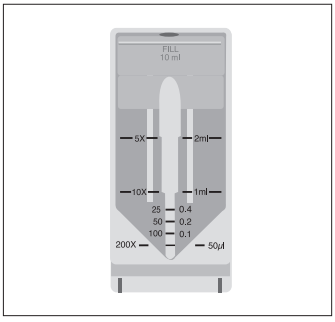
Vivapore® 5 and 10

For general laboratory use





Vivapore® 5



Vivapore® 10 | 20

3 to 20 mL Samples

With no need for additional equipment, pressure or vacuum, solvent absorption is the most economic and user-friendly concentration technique available to the clinician and research scientist.

Just fill the unit with the solution to be concentrated, wait for the desired concentration level to be achieved and then pipette the concentrated sample from the bottom of the device.

Vivapore® is ideal for general-purpose laboratory concentration and purification prior to further analysis. It is particularly suited for labile solutions that can denature with alternative shear- or pressure-inducing methods or that require processing in a cold room environment.

Vivapore® concentrators extend the solvent absorption technique to a totally new level of performance, application potential and ease of use.

Vivapore® Solvent Absorption concentrators are intended for general laboratory uses.

Specifications

	Vivapore® 5	Vivapore® 10
Membrane material	PES	PES
Membrane MWCO	7.5 kDa	7.5 kDa
Membrane surface area	20 cm²	28 cm²
Reservoir material	SAN	SAN
Volume range	1 to 5 mL	2 to 10 mL | 20 mL*
Minimum concentrate volume	50 µL	50 µL
Vivapore® overall dimensions Width (mm) Height (mm)	 42 82	 46 100

* to concentrate 20 mL please use the 10 mL expansion reservoir (VPA006)

Visit us at www.sartorius.com/en/products/lab-filtration-purification/diagnostic-sample-prep to get additional info.

Here you can find instructions on how to use Vivapore® Solvent Absorption Concentrators and Vivaspin® products for the concentration of urine samples.

Typical Performance Characteristics						
	Time to concentrate			Concentrate recovery [%]		
Product	Vivapore® 5	Vivapore® 10		Vivapore® 5	Vivapore® 10	
Start volume	5 mL	10 mL	20 mL*	5 mL	10 mL	20 mL*
Protein (MW)						
α-chymotrypsin** (25 kDa)	204 min CF 94x	424 min CF 138x	407 min CF 34x	78%	90%	74%
IgG** (150 kDa)	155 min CF 92x	319 min CF179x	371 min CF 34x	60%	65%	82%

* with Vivapore® 10 | 20 Expansion Reservoir

** Proteins were concentrated from human urine specimens (withpH of 4.5) at 20.5 C °, averaed results devices tested; n=81

Performance Characteristics						
	Time to concentrate up to 50× [min.]			Concentrate recovery [%]		
Product	VP5	VP10	VP10*	VP5	VP10	VP10*
Start volume	5 mL	10 mL	20 mL	5 mL	10 mL	20 mL
Cytochrome c (12.6 kDa MW)	65	70	160	91%	88%	90%
BSA (66 kDa MW)	45	50	105	90%	90%	92%
IgG (150 kDa MW)	50	65	140	53%	65%	74%

* with additional reservoir

Ordering Information

Vivapore® 5*	Pack size	Prod. No.
7,500 MWCO PES	30	VP-S005P0008--3

Vivapore® 10**		
7,500 MWCO PES	30	VP-S010P0008--3

Accessories		
Vivapore® Stand for 4 Devices	6	VP-AST0001-C
Vivapore® 10 Expansion Reservoir	10	VP-ARV0010-D

* Vivapore® 5 devices supplied with one disposable stand to support up to four devices
** Vivapore® 10 devices supplied with one disposable stand to support up to four devices, and one expansion reservoir


2.0
ml
1.5
1.0
100K
MWCO

DNA Concentration

Table of Contents

Vivacon® 500	48
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Vivacon® 500

For general laboratory use



Reproducible DNA and Protein Sample Desalting and Concentration

Vivacon® 500 centrifugal concentrators offer the optimal solution for DNA and protein concentration and buffer exchange applications. For optimal performance with highly dilute samples, e.g. forensic samples, Vivacon® 500 incorporates the patented regenerated cellulose membrane, Hydrosart®. High recoveries and excellent reproducibilities are combined with convenience offered by the molecular weight cutoff printed on the individual Vivacon® 500 units.

As Vivacon® 500 can be reverse spun after sample processing, this ensures complete concentrate recovery, which is especially important when working with low sample concentrations.

Vivacon® 500-PCR Grade

To use DNA amplification technologies, any traces of DNA originating from the equipment need to be eliminated.

Vivacon® 500-PCR Grade units are treated with ethylene oxide (EtO) in a validated process to denature all traces of DNA that might interfere with subsequent amplification procedures.

Reference: K. Shaw et al., Int. J. Legal Med. (2008) 122: 29 – 33

Specifications

Vivacon® 500		
Concentrator capacity	Fixed angle rotor	0.5 mL
Dimensions	Length × diameter	45 × 12.4 mm 47.5 × 12.4 mm reverse spin
	Active membrane area	12.4 mm
	Hold-up volume of membrane and support	0.32 cm²
	Dead-stop volume (40° rotor)	< 5 µL 5 µL
Materials of construction	Body Filtrate vessel Membrane	Polycarbonate (PC) Polypropylene (PP) Hydrosart® (HY) Cellulose Acetate (CA)

Conversion Table for Hydrosart® MWCO to Nucleotide Cutoff		
Membrane	**MWCO**	**Double-Stranded Nucleotide Cutoff (bp)**
Hydrosart®	2 kDa	> 10
Hydrosart®	10 kDa	> 30
Hydrosart®	30 kDa	> 50
Hydrosart®	50 kDa	> 300
Hydrosart®	100 kDa	> 600
Cellulose Acetate	125 kDa	> 650

Performance Characteristics for DNA
Start volume 0.5 mL, sample concentration 50 mg/mL.

	Molecule size (bp)	Time to concentrate up to 30× at 20 °C	Concentrate recovery	RCF
2 kDa MWCO	10	60 min.	93%	7,500 *g*
10 kDa MWCO	30	25 min.	94%	7,500 *g*
30 kDa MWCO	50	18 min.	88%	5,000 *g*
50 kDa MWCO	300	18 min.	91%	5,000 *g*
100 kDa MWCO	600	10 min.	87%	3,000 *g*
125 kDa MWCO	650	12 min.	85%	2,000 *g*
125 kDa MWCO	900	9 min.	94%	3,000 *g*

Performance Characteristics for Proteins
Start volume 0.5 mL, sample and concentration of proteins as specified in table.

	Test molecule	Time to concentrate up to 30× at 20 °C	Concentrate recovery	RCF
2 kDa MWCO	0.25 mg/mL cytochrome c	30 min.	95%	14,000 *g*
10 kDa MWCO	0.25 mg/mL cytochrome c	15 min.	92%	14,000 *g*
30 kDa MWCO	1.0 mg/mL BSA	10 min.	95%	14,000 *g*
50 kDa MWCO	1.0 mg/mL BSA	10 min.	92%	14,000 *g*
100 kDa MWCO	1.0 mg/mL bovine IgG	11 min.	90%	8,000 *g*
125 kDa MWCO	1.0 mg/mL bovine IgG	10 min.	81%	8,000 *g*

Ordering Information

Vivacon® 500	Pack size	Prod. No.
2 kDa MWCO	25	VN01H91
2 kDa MWCO	100	VN01H92
10 kDa MWCO	25	VN01H01
10 kDa MWCO	100	VN01H02
30 kDa MWCO	25	VN01H21
30 kDa MWCO	100	VN01H22
30 kDa MWCO	500	VN01H23
50 kDa MWCO	25	VN01H31
50 kDa MWCO	100	VN01H32
50 kDa MWCO	500	VN01H33

Vivacon® 500	Pack size	Prod. No.
100 kDa MWCO	25	VN01H41
100 kDa MWCO	100	VN01H42
100 kDa MWCO	500	VN01H43
125 kDa MWCO	25	VN01H81
125 kDa MWCO	100	VN01H82
125 kDa MWCO	500	VN01H83

Vivacon® 500 PCR Grade		
30 kDa MWCO	100	VN01H22ETO
30 kDa MWCO	500	VN01H23ETO
100 kDa MWCO	100	VN01H42ETO
125 kDa MWCO	100	VN01H82ETO
125 kDa MWCO	500	VN01H83ETO

Vivacon® 500 accessories		
Additional collection tubes	100	VNCT01

Visit us at www.sartorius.com/en/products/lab-filtration-purification/ultrafiltration-devices/centrifugal to get additional info.

Find instructions on how to use Vivacon® 500 for

- Primer removal after a PCR reaction
- Filter aided sample preparation (FASP) for proteomic analysis by mass spectrometry

Vivacon® 2

For general laboratory use



Reproducible DNA Sample Desalting and Concentration

Vivacon® 2 centrifugal concentrators offer the optimal solution for DNA and protein concentration and buffer exchange applications. For optimal performance with highly dilute samples, e.g. forensic samples, Vivacon® 2 incorporates the patented regenerated cellulose membrane Hydrosart®. High recoveries and excellent reproducibilities are combined with the convenience provided by the volume graduation and molecular weight cutoff printed on the individual Vivacon® 2 units.

As Vivacon® 2 can be reverse spun after sample processing, this ensures complete concentrate recovery, which is especially important when working with low sample concentrations.

Vivacon® 2-PCR Grade

Vivacon® 2-PCR Grade units are treated with ethylene oxide (EtO) in a validated process to denature all traces of DNA that might interfere with subsequent amplification procedures.

Specifications

Vivacon® 2		
Concentrator capacity	Fixed-angle rotor	2 mL
Dimensions	Length × diameter	125 × 16 mm 115 × 16 mm reverse spin
	Active membrane area	0.95 cm²
	Hold-up volume membrane and support	10 µL
	Dead-stop volume (25° rotor)	55 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polypropylene (PP)
	Backspin vial	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Hydrosart® (HY) Cellulose Acetate (CA)

Conversion Table for Hydrosart® MWCO to Nucleotide Cutoff		
Membrane	**MWCO**	**Double-Stranded Nucleotide Cutoff (bp)**
Hydrosart®	2 kDa	> 10
Hydrosart®	10 kDa	> 30
Hydrosart®	30 kDa	> 50
Hydrosart®	50 kDa	> 300
Hydrosart®	100 kDa	> 600
Cellulose Acetate	125 kDa	> 650

Performance Characteristics for DNA
Start volume 2 mL, sample concentration 50 mg/mL.

	Molecule size (bp)	Time to concentrate up to 30× at 20 °C	Concentrate recovery	RCF
2 kDa MWCO	10	120 min	92%	7,500 *g*
10 kDa MWCO	30	60 min	94%	5,000 *g*
30 kDa MWCO	50	60 min	95%	2,500 *g*
50 kDa MWCO	300	45 min	96%	2,500 *g*
100 kDa MWCO	600	30 min	93%	2,500 *g*
125 kDa MWCO	650	30 min	88%	2,500 *g*
125 kDa MWCO	900	30 min	89%	2,500 *g*

Performance Characteristics for Proteins
Start volume 2 mL, sample and concentration of proteins as specified in table.

	Test molecule	Time to concentrate up to 30× at 20 °C	Concentrate recovery	RCF
2 kDa MWCO	0.25 mg/mL cytochrome c	120 min	95%	7,500 *g*
10 kDa MWCO	0.25 mg/mL cytochrome c	90 min	96%	5,000 *g*
30 kDa MWCO	1.0 mg/mL BSA	40 min	96%	5,000 *g*
50 kDa MWCO	1.0 mg/mL BSA	30 min	94%	5,000 *g*
100 kDa MWCO	1.0 mg/mL bovine IgG	30 min	92%	5,000 *g*
125 kDa MWCO	1.0 mg/mL bovine IgG	27 min	81%	5,000 *g*

Ordering Information

Vivacon® 2	Pack size	Prod. No.
2 kDa MWCO	25	VN02H91
2 kDa MWCO	100	VN02H92
10 kDa MWCO	25	VN02H01
10 kDa MWCO	100	VN02H02
30 kDa MWCO	25	VN02H21
30 kDa MWCO	100	VN02H22
30 kDa MWCO	500	VN02H23
50 kDa MWCO	25	VN02H31
50 kDa MWCO	100	VN02H32
100 kDa MWCO	25	VN02H41
100 kDa MWCO	100	VN02H42
100 kDa MWCO	500	VN02H43
125 kDa MWCO	25	VN02H81
125 kDa MWCO	100	VN02H82
125 kDa MWCO	500	VN02H83

Vivacon® 2 PCR Grade		
30 kDa MWCO	100	VN02H22ETO
50 kDa MWCO	100	VN02H32ETO
100 kDa MWCO	100	VN02H42ETO
100 kDa MWCO	500	VN02H43ETO
125 kDa MWCO	500	VN02H83ETO



Vivaclear



Vivaclear centrifugal filters are disposable microfiltration devices for the fast and reliable clarification | filtration of biological samples in the range 100 to 500 µL. They can be used in fixed angle rotors accepting 2.2 mL centrifuge tubes.

Product Features

- High-flux polyethersulfone membrane
- 0.8 µm pore size
- Low hold-up volume (< 5 µL)
- Fast and reproducible performance

Applications

- Clarification of samples before loading in Vivapure® protein purification spin columns
- Removal of particles and precipitates
- Filtration of plasma and serum
- Filtration of cells or cell debris

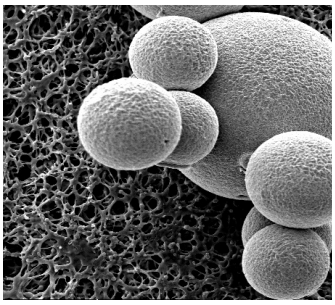
Specifications

Vivaclear Centrifugal Filters		
Rotor	40 – 45° fixed angle rotor	
Pore size	0.8 µm	
Dimensions	Length × diameter Active membrane area Hold-up volume, membrane plus support Maximum RCF	43 × 11 mm 0.34 cm^2 < 5 µL 2,000 *g*
Materials of construction	Body Membrane Filtrate collection tube	Polypropylene (PP) Polyethersulfone (PES) Polypropylene (PP)

Ordering Information

Vivaclear Mini PES	Pack size	Prod. No.
0.8 µm	100	VK01P042

Lab Chromatography



Chromatography resin beads (right) are shown on top of a membrane adsorber in this SEM. The membrane adsorber pores are more than 100x larger than bead pores.

Macromolecule purification is critical in many life science workflows. However, resin-based ion exchange or affinity chromatography methods typically require sophisticated equipment and long set-up times, exhibit low flow rates, and suffer from limited yields.

For laboratory-scale purification, Sartorius offers a range of ready-to-use units, featuring Sartobind® membrane adsorbers to overcome these challenges. The stabilized regenerated cellulose matrix displays a macroporous structure, allowing molecules to be transported to the ligands by convective flow. This results in exceptionally high flow rates, and shorter residence and cycle times.

A choice of formats from the Vivapure® and Sartobind® Lab product families provide the flexibility to purify by centrifugation, pump or FPLC system – and can even eliminate the need for specialist equipment altogether.

- Purification as simple as filtration
- Flexible handling by centrifuge, syringe or FPLC system
- Rapid, reproducible macromolecule purification and polishing
- No risk of bed cracking or channelling
- Single use or reusable membrane chromatography units
- Process-ready platform

Typical Applications

Vivapure® and Sartobind® Lab units are available with a choice of ion exchange (IEX) or affinity chromatography (AC) ligands. These are ideal for screening, scouting, optimization, and preparative purification or polishing of most macromolecules in research and development laboratories.

	Sartobind® Lab and Vivapure® IEX		Sartobind® Lab IDA	Sartobind® Lab Protein A
Interation Principle	Anion exchange	Cation exchange	Affinity	Affinity
Ligand	Quaternary ammonium (Q), diethylamine (D)	Sulfonic acid (S)	Iminodiacetic acid (IDA)	ProteinA
Typical Capture Applications	Proteins, nucleic acids, viruses, VLP	Proteins, viruses, VLP	His-tagged protein	Antibodies
Typical Flowthrough Applications	DNA, host cell proteins, viruses, endotoxins	Aggregates, host cell proteins	Host cell proteins	DNA, host cell proteins

Vivapure®



Vivapure® IEX Mini



Vivapure® IEX Maxi

Single use membrane chromatography units for screening, scouting and optimization of IEX purification conditions.

Off-the-Shelf Consistency
Avoid preparative steps and cleaning with the single use spin column format. No more column packing. Bye-bye degassing.

Purification in Parallel
Purify two, four, six or even 24 samples simultaneously to optimize or cut your already shortened process time even further. Full screen ahead.

IEX Without The CAPEX
Conserve your budget with the chromatography solution that doesn't require high-cost equipment. Your centrifuge just became your FPLC system.

Ready-to-Analyze Eluates
No need to concentrate. Membrane chromatography eliminates dilution effects to yield fractions which require no further processing before analysis.

Materials

Housing	Polycarbonate (PC)
Filtrate Tube	Polypropylene (PP)
Membrane	Stabilized regenerated cellulose
Ligand	Quaternary ammonium (Q), diethylamine (D) or sulfonic acid S)
Packaging	Cardboard (PAP) and Polyethylene (LDPE)
User Guide	Paper (PAP)

Specifications

Type	Mini	Maxi
Bed Volume	0.24 mL	2.7 mL
Sample Capacity	0.4 mL	19 mL
Minimum Elution Volume	50 µL	2 mL
Recommended RCF	2,000 *g*	500 g
Binding Capacity*	4 mg/unit	60 - 80 mg/unit
Operating pH Stability	2 – 12 for Q and S 4 – 10 for D	2 – 12 for Q and S 4 – 10 for D

*For BSA on Q | D units, or cytochrome c on S units

Ordering Information

Description	Quantity	Order No.
Vivapure® Q Mini	24	VS-IX01QH24
Vivapure® Q Maxi	8	VS-IX20QH08
Vivapure® D Mini	24	VS-IX01DH24
Vivapure® D Maxi	8	VS-IX20DH08
Vivapure® S Mini	24	VS-IX01SH24
Vivapure® S Maxi	8	VS-IX20SH08

Sartobind® Lab



Sartobind® Lab 15, 75 and 100 units

Membrane chromatography units for rapid preparative affinity or ion exchange purification, which can be re-used hundreds of times.

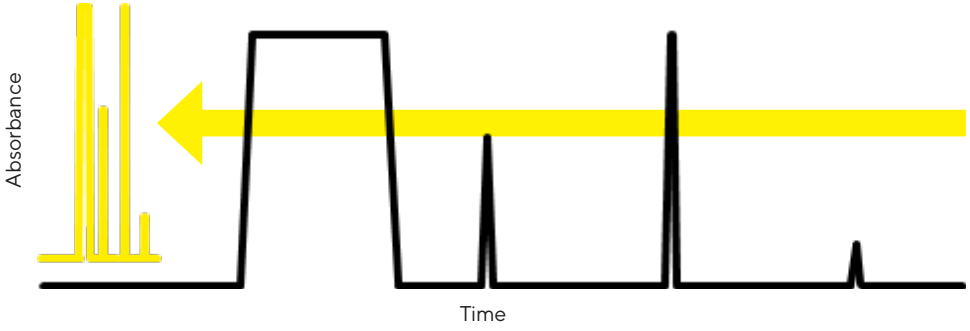
Cut to the Capture
Eliminate or combine preparative steps with plug and play chromatography units. No more column packing. Bye-bye degassing.

Purify More Than Ever Before
Experience faster flow rates and shorter cycle times while maximizing macromolecule yield. Offering unrivalled productivity for even the largest protein complexes and viruses.

Flexibility Built In
Choose your preferred handling method without worrying about flow rate limitations. Use an FPLC system or purify equipment-free for AC or IEX without the CAPEX.

Trusted Process Ready Technology
Following proof of concept in the early development phase, easily scale your process using the same platform in capsules and cassettes. That's biopharmaceutical manufacturing covered.

Purify your macromolecules up to 10X faster by switching to Sartobind® Lab units (yellow).





Luer to UNF adapters are supplied in each box of Sartobind® Lab units, for connection to an FPLC system

Materials

Housing	Polypropylene (PP)
Membrane	Stabilized regenerated cellulose
Ligand	Quaternary ammonium (Q), diethylamine (D), sulfonic acid (S), iminodi-acetic acid (IDA) or Protein A
Caps	Polycarbonate (PC)
Adapters	Polyetheretherketone (PEEK)
Packaging	Cardboard (PAP)*
User Guide	Paper (PAP)

* To ensure stability of the ligand, Sartobind® Lab Protein A is shipped under temperature-controlled conditions, which requires the use of additional packaging materials.

Specifications

Modality	**Ion Exchange (Q, D or S)**	**Metal Affinity (IDA)**	**Antibody Affinity (Protein A)**
Bed Volume	0.41, 2.1 or 2.8 mL	2.1 mL	2 mL
Recommended Flow Rate	5 – 30 MV/min	5 – 30 MV/min	2.5 – 5 MV/min
Maximum Operating Pressure	0.6 MPa	0.6 MPa	0.6 MPa
Binding Capacity	12 – 80 mg/unit BSA on Q units	7.5 mg/unit His-tagged protein	10 – 15 mg/unit Polyclonal hIgG
Operating pH Stability	2 – 14 for Q and D 3 – 14 for S	1 - 12	2 - 10
Storage After Use	20% ethanol in equilibration buffer	0.02% sodium azide in equilibration buffer	20% ethanol in PBS at 4 – 8 °C

Ordering Information

Description	**Spin Columns**	**Centrifuge Tubes**
Sartobind® Lab, Q 15	4	93IEXQ42GB-12-A
Sartobind® Lab, Q 75	2	93IEXQ42DB-12-V
Sartobind® Lab, Q 100	1	93IEXQ42BC-12
Sartobind® Lab, D 75	2	93IEXD42DB-12-V
Sartobind® Lab, S 15	4	93IEXS42GB-12-A
Sartobind® Lab, S 75	2	93IEXS42DB-12-V
Sartobind® Lab, S 100	1	93IEXS42BC-12
Sartobind® Lab, IDA 75	2	93IDA-42DB-12–V
Sartobind® Lab, Protein A 2 mL	4	93PRAP06HB-12-A
Luer female adapter to UNF 10-32 female	2	1ZA–0005
Luer male | female adapters to M6 female, 2pc/ea	4	17002–140

Vivapure® Virus Purification Kits



Recombinant virus vectors are the preferred method for a wide range of gene delivery applications. Especially adenovirus type 5 and VSV-G pseudotyped lentivirus are two frequently utilized viral vectors for in vitro and in vivo applications.

Recombinant Adenovirus Vectors
Recombinant adenovirus vectors are versatile tools in research and therapeutic applications for gene transfer and protein expression in cell lines that have low transfection efficiency with liposomes. After entering cells, the virus remains epichromosomal – i.e., does not integrate into the host chromosome, leaving the host genome unaffected. The delivery of RNAi into cells is becoming a major application for adenovirus vectors.

Lentivirus Vectors
Lentivirus vectors are frequently used in gene transfer studies, due to their ability of gene transfer and integration into dividing and non-dividing cells. The pseudotyped envelope with vesicular stomatitis virus envelope G (VSV-G) protein broadens their target cell range. Lentiviral vectors have been shown to deliver genes into cell types (e.g. neurons, lymphocytes and macrophages) which other retrovirus vectors could not be used for. The lentivirus vector is increasingly used to integrate siRNA efficiently in a wide variety of cell lines and primary cells, both in vitro and in vivo.

Rapid Virus Purification by Membrane Chromatography
The Sartobind® ion exchange membrane adsorber technology used in Adenopack and Lentiselect is unique in its capability to efficiently and rapidly capture and recover large virus particles. Compared with chromatography media, membrane adsorbers provide large 3,000 nm pores, allowing unrestricted access and recovery of virus from the charged adsorber surface. Convective flow through the syringe filter devices provides high-speed separations not possible with traditional chromatography, cesium chloride density gradients and ultracentrifugation methods.

Sartorius membrane adsorbers with porous matrices, high capacities, low differential pressures, high flow rates and low unspecific adsorption show excellent performance in small-scale virus purification. In addition, these syringe filter devices are scalable and comply with cGMP requirements for large-volume, high-performance separation, reducing final process time ten-fold.

Vivapure® Adenopack

Adenopack 20 | 100 | 500
The Adenopack adenovirus purification and concentration kits offer researchers who need to recover up to 3×10^{13} purified recombinant adenovirus particles for in vitro transfection a fast, safe and easy-to-use solution. The kits include all reagents and devices necessary for clarification, purification and concentration of adenovirus type 5 from HEK293 cell cultures – all within just two hours. These straightforward kits replace time-consuming and labor-intensive 48-hour CsCl density gradients.

Adenopack kits are offered as Adenopack 20, Adenopack 100 and Adenopack 500 for the purification and concentration of adenovirus type 5 from 20 to 500 mL cell cultures, resulting in 1×10^{11} to 3×10^{13} purified viral particles. For each sample volume, the most convenient handling method is provided for ultimate convenience.

To this end, preparations using Adenopack 20 are supplied in a spin column format for centrifuges. Adenopack 100 is a manually operated kit in a syringe filter format* and Adenopack 500 is a pump-driven kit.

Adenopack Advantages

Fast and Easy Virus Purification
- Purification completed in just 2 hours
- Convenient, over 10 × faster alternative to CsCl density gradient

Quantitative Yields
- In contrast to CsCl density gradient, the complete cell culture is used for virus purification and not only the viral pellet

Flexible Product Range
- Applicable from initial construct screening to large-scale virus production

Complete Kit
- Including filtration devices, Adenopack units for virus purification, Vivaspin® and all buffers

Low Endotoxin Levels
- High cell viability and infection rates due to endotoxin levels of < 0.025 EU/mL

* Vivapure® Adenopack 100 can be alternatively be operated with a laboratory pump or an infusion pump, for which protocols are provided on our web page at www.sartorius-stedim.com. Additionally, the tubes and adaptors needed for these operating modes can be ordered.

Specifications

Adenovirus Purification Kit Specifications			
Product	**Adenopack 20**	**Adenopack 100**	**Adenopack 500**
Sample size	20 mL cell culture	20 to 200 mL of cell culture	500 mL of cell culture
Number of purifications	6 × 20 mL	2 × 20 to 60 mL 1 × 200 mL	1 × 500 mL
Virus particles (VP) per mL	Typically up to 1×10^{11}-10^{12}	Typically up to 1×10^{13}	Typically up to 3×10^{13}
VP/IU	50 to 100	20 to 50	20 to 50
Processing time	Typically one hour	Typically two hours	
Endotoxin level	< 0.025 EU/mL	< 0.025 EU/mL	< 0.025 EU/mL

Ordering Information



Vivapure® Adenopack 20	
Vivapure® Adenopack 20	VS-AVPQ020
Vivapure® Adenopack 20 RT*	VS-AVPQ022



Vivapure® Adenopack 100	
Vivapure® Adenopack 100	VS-AVPQ101
Vivapure® Adenopack 100 RT*	VS-AVPQ102

Adenopack 100 Accessories	
Pump tubing set for Vivapure® Adenopack 100	VS-AVPA001



Vivapure® Adenopack 500	
Vivapure® Adenopack 500	VS-AVPQ501
Vivapure® Adenopack 500 RT*	VS-AVPQ502

* Adenopack RT-kits do not contain Benzonase®**
** Benzonase® is a registered trademark of Merck

Vivapure® Lentiselect

Lentiselect 40 | 500 | 1000
The Lentiselect kits for lentivirus purification and concentration offer researchers who need to recover up to 5×10^9 infective lentivirus particles per mL for in vitro transfection or animal studies a fast and easy-to-use solution.

These straightforward kits replace time-consuming ultracentrifugation protocols, which typically take approximately one day for large sample volumes. Vivapure® Lentiselect thus reduces purification time to just a few hours.

Lentiselect kits are offered as Lentiselect 40, Lentiselect 500 and Lentiselect 1000 for the purification and concentration of VSV-G pseudotyped lentivirus from 40 to 1,000 mL cell cultures, resulting in 8×10^8 to 1×10^{10} purified infective particles. The most convenient handling method is provided for each sample volume. To this end, 40 mL sample volumes are processed manually with Lentiselect 40, while Lentiselect 500 and 1000 are pump-driven kits.

Lentiselect Advantages

Fast and Easy Virus Purification
- Purification completed in less than one to six hours, depending on sample volume
- Kit is as easy to use as filtration

No Need for Expensive Instruments
- Lentivirus purification with Lentiselect is independent of equipment, such as ultracentrifuges

High Virus Purity
- Achieve pure virus based on a chromatographic method for your experiments instead of a crude and variable cell culture supernatant pellet

Optimal for Multiple Virus Construct Screening
- With Lentiselect 40, four purification runs can be conducted in parallel with one kit

Complete Kits
- Including Lentiselect units for virus purification, Vivaspin® units for concentration | buffer exchange and all buffers and syringes necessary

Low Endotoxin Levels
- High cell viability and infection rates due to endotoxin levels of < 0.025 EU/mL

Specifications

Product	Lentiselect 40	Lentiselect 500	Lentiselect 1000
Sample size	40 mL cell culture	500 mL of cell culture	1,000 mL of cell culture
Number of purifications	4 × 40 mL	1 × 500 mL	1 × 1,000 mL
Virus particles (VP) per mL	Typically up to 3×10^9	Typically up to $2-5 \times 10^9$	Typically up to $4-6 \times 10^{13}$
VP/IU	5 to 15	5 to 15	20 to 50
Processing time	Typically up to 45 min	Typically up to 3 hours	Typically up to 6 hours
Endotoxin level	< 0.025 EU/mL	< 0.025 EU/mL	< 0.025 EU/mL

Ordering Information



Vivapure® Lentiselect 40	
Vivapure® Lentiselect 40	VS-LVPQ040



Vivapure® Lentiselect 500	
Vivapure® Lentiselect 500	VS-LVPQ500



Vivapure® Lentiselect 1000	
Vivapure® Lentiselect 1000	VS-LVPQ1000



Filtration Devices

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Introduction

Syringe filters are used for many routine preparation steps in laboratories all over the world. They are convenient, ready-to-use disposables for sterile filtration of liquids and removal of particles from solutions and gases. Depending on the reagents filtered, syringe filters have to fulfill certain requirements to best serve customer's application. Sartorius offers Minisart® syringe filters and filters optimized for a wide range of relatively large volumes. The filters are reliably remove particles with no leakage. If you need to rely on the quality of your filtrate – whether it needs to be sterile prior to use or particulate-free before analysis – field-proven, high-quality Sartorius filter syringes are the No. 1 choice for reliable, convenient preparation steps.

Our Product Range

For clarification and sterilization of liquids, filtration is the optimal method. It removes microorganisms and particles reliably, without any effects on the ingredients due to adsorption or decomposition. For optimal results, Minisart® NML and High Flow Standard syringe filters with an MBS housing provide a choice of membranes with pore sizes ranging from 0.1 µm to 5 µm for high flow rates and the low adsorption characteristics. The effective filtration area of 6.2 cm^2 for the fast filtration is the largest among premium syringe filters available, and the MBS housing is color-coded for easy pore size identification. For a list of the types offered, please see page 74.

Elimination of particles from your samples prior to HPLC or other chromatographic analysis is essential in order to maintain the integrity of your chromatography column and to maximize its operating lifetime. Minisart® PP Standard syringe filters optimized for sample preparation consist of a polypropylene housing and membrane components featuring maximum chemical compatibility and minimum extractables to ensure excellent results. Due to the typical range of volumes from less than 1 mL to 100 mL, these filters are available in three different diameters with an effective filtration area of 0.07 cm^2, 1.7 cm^2 and 4.8 cm^2. For a selection guide, please see page 67.

The Sartorius medical device CE-Minisart® syringe filter with a hydrophilic (surfactant-free) cellulose acetate and hydrophobic polytetrafluoroethylene (PTFE) are the perfect choice for pharmacy admixture applications like sterile filtration and | or clarification of low volume solutions in a laboratory environment before use for patient care. The Medical Minisart® syringe filters are manufactured by Sartorius in a facility whose Quality Management System is certified for compliance with EN ISO 13485 (see page 80).

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications

Sartorius has developed a new, easy-to-use and straightforward filtration setup. The manually operated Claristep® Filtration System consisting of a station and filter units offers a novel way for clarifying your samples prior to analysis.

Claristep® Filter units are processed without syringe and are made of the purest materials. Another major benefit is that the contact time of the samples with the filters and the caps is extremely short, ensuring optimal, contamination-free results. The Claristep® Station consists of a base, a lid and an exchangeable tray for easy and accurate positioning of sample vials and Claristep® Filter units.

Claristep® syringeless filter units with RC membranes are optimized for solvents and aqueous solutions. They provide maximum chemical compatibility and exceptionally low non-specific binding of analytes.

Sartolab® filtration devices with 0.1 µm, 0.22 µm and 0.45 µm PES membranes for convenient filtration of 50 mL up to 1 L are ready to use and sterile. Sartolab® RF is a complete system that includes a receiver flask. Sartolab® BT is a bottle top filter without a receiver flask. This enables customers to use a receiver bottle of their choice and to even expand filtration capacity, depending on the particle load of the filtered liquid by filling more than one receiver flask.

Sartolab® P20 pressure filtration devices are intended for general laboratory use. They are available with a 0.2 µm and 0.45 µm PES membrane, with or without a prefilter, depending on your needs. Sartolab® P20 is designed for up to 10 L volumes and can also be used in-line. The polycarbonate housing and membrane components are ideal for filtering liquids. The versions with a prefilter are ideal for filtering environmental samples that have a high particle load prior to analyzing such samples.

Typical Applications for Filtration Devices

- Sterile filtration of liquids and gases with virtually no effect on the ingredients
- Particle removal from liquids and gases prior to downstream processes
- Venting of vials, bottles, containers, bags and bioreactors and fermenters
- Removal of precipitates and coagulates from solutions prior to use

Minisart® Standard Selection Guide

Please refer to Minisart® RC, NY, PES- or SRP for the highest chemical compatibility on page 71.
Please refer to Minisart® NML, HY or Minisart® High Flow on page 74.

Sample Composition

Aqueous		Aqueous | Solvents		
All Aqueous Solutions Buffers, Protein Analysis	All Aqueous Solutions Tissue Culture Media	Aqueous | Solvent Mixtures | Solvents	Solvent Mixtures | Solvents	Solvents | Gases | Acids | Bases
CA Cellulose Acetate	**PES** Polyethersulfone	**RC** Regenerated Cellulose	**NY** Polyamide, Nylon	**PTFE** Polytetrafluoroethylene
Hydrophilic				Hydrophobic

Pore Sizes

Sterilization		Sample Preparation | Clarification | Particle Removal					Prefiltration
Small Bacteria Mycoplasma Colloids >0.1 µm	UHPLC, etc. (Columns <3 µm Particles) Bacteria	HPLC, etc. (Columns >3 µm Particles) Particles	Particles Yeast Cells	Particles Yeast Cells	Particles Yeast Cells Platelets	Large Particles Cells	Glass Pre-Filter Glass + Membrane Highly Particle-laden Samples
0.1 µm	0.2 µm	0.45 µm	0.65 µm	0.8 µm	1.2 µm	5 µm	GF (Glass Fiber)

Sample Volume

			
1 – 200 mL	1 – 100 mL	0.5 – 15 mL	0.05 – 1 mL
28 mm for up to 200 mL	25 mm for up to 100 mL	15 mm for up to 15 mL	4 mm for up to 1 mL

Minisart® PP Standard Syringe Filter Sample Preparation for Analytics



4 mm packages are color-coded



Male Spike Outlet



Male Luer Slip Outlet



Minisart® RC 15 mm



Minisart® NY 15 mm



Minisart® SRP 15 mm



Minisart® RC 25 mm



Minisart® NY 25 mm



Minisart® SRP 25 mm

Reliable Removal of Particles from Liquids and Gases

Particle removal by filtration before analysis substantially increases the lifetime of your columns. Minisart® RC is optimized for aqueous liquids and solvents and is compatible with DMSO, other amides, ketones, esters and ethers. Minisart® NY is exceptionally pure compared with other common polyamide (=nylon) filters and competitor products. For this product raw materials are used which do not interfere with standard analytical methods.

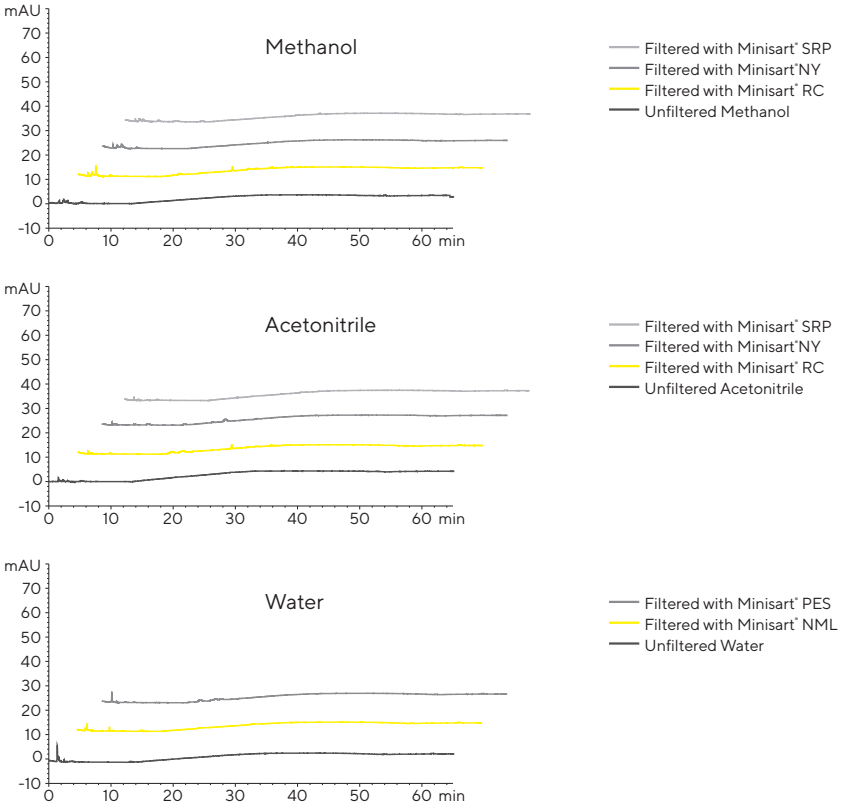
Our coating-free hydrophobic PTFE membrane used in Minisart® SRP is suitable for venting applications. The Minisart® PES- with hydrophobic polyethersulfone (PES) is suitable for venting or filtration of gases and air and can be sterilized by gamma irradiation.

Minisart® Features

- Low adsorption of analytes
- Maximum chemical compatibility
- Minimum extractables



HPLC Certification



HPLC Procedure

Column C18: 250 × 4.6 mm, Flow Rate: 1 mL/min, Wavelength: 220 nm
HPLC Injection Volume: 20 µL, Analysis Time: 65 min, Temperature: 40 °C, Mobile Phases: A) Acetonitrile | B) Water, Gradient: Hold 60% A for 10 min, 60% to 95% A in 20 min, 95% to 100% A in 35 min

Minisart® with Polypropylene Housing

Specifications

Minisart® RC | SRP | NY | PES- with 4 | 15 | 25 mm Ø Membrane Filtration Area	
Housing material	Polypropylene (PP)
Membranes	RC = Regenerated Cellulose | NY = Polyamide | SRP = Hydrophobic PTFE = Polytetrafluoroethylene | PES = Polyethersulfone | PES - = hydrophobic PES
Glass fiber prefilter	NY Plus: Ultrapure quartz, 0.7 µm particle retention
Max. operating pressure	RC | SRP | NY: 4.5 bar | 65 psi PES - : 2.0 bar | 29 psi (IN - OUT) or 0.5 bar | 7.2 psi (OUT - IN)
Housing burst pressure	≥ 7 bar | 102 psi
Max. temperature	60 °C
Sterilization	Non-sterile Minisart® RC, SRP and NY can be can sterilized by autoclaving or by using ethylene oxide (EO). Non-sterile Minisart® PES- can be sterilized by ethylene oxide or gamma irradiation

Minisart® Membrane Types	RC 0.2 µm	RC 0.2 µm	RC 0.45 µm	SRP 0.2 µm	SRP 0.45 µm
Non-sterile packs: 50 (K), 200 (S), 500 (Q), 1000 (R) | sterile packs: individually packaged, 50 (ACK)	K | S | Q | R	ACK	K | S | Q | R	K | S | Q | ACK	K | S | Q
Bubble point (≥)	With water 3.0 bar | 44 psi	With water 4.6 bar | 67 psi	With water 2.0 bar | 29 psi	With ethanol 1.1 bar | 16 psi	With ethanol 0.9 bar | 13 psi
Flow rate ((≥) mL/min), 4 mm Ø = 0.07 cm² filter area | Hold-up volume[1]: ≤ 10 µL					
▪ For water at 1 bar	0.5	–	1.5	–[3]	–[3]
▪ For methanol at 1 bar	1.5	–	3.0	2.0	4.5
▪ For air at 0.1 bar	–[2]	–	–[2]	30	60
Flow rate ((≥) mL/min), 15 mm Ø = 1.7 cm² filter area | Hold-up volume[1]: ≤ 100 µL					
▪ For water at 1 bar	20	10	40	–[3]	–[3]
▪ For methanol at 1 bar	55	25	105	55	150
▪ For air at 0.1 bar	–[2]	–[2]	–[2]	800	1,600
Flow rate ((≥) mL/min), 25 mm Ø = 4.8 cm² filter area | Hold-up volume[1]: ≤ 200 µL					
▪ For water at 1 bar	80	50	160	–[3]	–[3]
▪ For methanol at 1 bar	160	90	325	60	260
▪ For air at 0.1 bar	–[2]	–[2]	–[2]	1,800	3,000
Water penetration point[3] (≥)	–	–	–	4.0 bar | 58 psi	3.0 bar | 44 psi
Sterile filtration capability[5] acc. to the bacteria challenge test	No	Yes	No	Yes	No
Non-pyrogenic according to the USP					

Minisart® Membrane Types	NY 0.2 µm	NY 0.45 µm	NY Plus 0.2 µm	NY Plus 0.45 µm	PES 0.2 µm	PES -0.2 µm
Non-sterile packs: 50 (K), 200 (S), 500 (Q), 1000 (R) | sterile packs: individual packaged, 50 (ACK)	K | Q | R | ACK	K | Q | R | ACK	K | Q	K | Q	K | Q | ACK	K | Q
Bubble point (≥)	With water 3.0 bar | 44 psi	With water 2.0 bar | 29 psi	With water 3.0 bar | 44 psi	With water 2.0 bar | 29 psi	With water 3.2 bar | 46 psi	With ethanol 0.95 bar | 14 psi
Flow rate ((≥) mL/min), 4 mm Ø = 0.07 cm² filter area | Hold-up volume[1]: ≤ 10 µL						
▪ For water at 1 bar	–	–	–	–	1.5	–
▪ For methanol at 1 bar	–	–	–	–	–[4]	–
▪ For air at 0.1 bar	–	–	–	–	–[2]	–
Flow rate ((≥) mL/min), 15 mm Ø = 1.7 cm² filter area | Hold-up volume[1]: ≤ 100 µL						
▪ For water at 1 bar	20	40	–	–	40	–
▪ For methanol at 1 bar	40	110	–	–	–[4]	–
▪ For air at 0.1 bar	–[2]	–[2]	–	–	–[2]	–
Flow rate ((≥) mL/min), 25 mm Ø = 4.8 cm² filter area | Hold-up volume[1]: ≤ 200 µL						
▪ For water at 1 bar	50	100	50	100	100	–
▪ For methanol at 1 bar	70	200	70	200	–[4]	–[4]
▪ For air at 0.1 bar	–[2]	–[2]	–[2]	–[2]	–[2]	1,200
Water penetration point[3] (≥)	–	–	–	–	–	2.0 bar | 29 psi
Sterile filtration capability[5] acc. to the bacteria challenge text	Yes	No	Yes	No	Yes	Yes
Non-pyrogenic according to the USP						

[1] Hold-up volume after air purge
[2] Hydrophilic membranes can filter dry air or gas but become impermeable to air or gas when wetted!
[3] Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point or pre-wet them using an organic solvent (e.g. ethanol).
[4] PES is suitable for solutions only containing up to 30 % MeOH.
[5] According to the bacterial challenge test (BCT) with ≥ 1×10^7 cfu/cm² Brevundimonas diminuta. Non-sterile RC Minisart® types are optimized for sample preparation and are not suitable for sterile filtration according to the bacteria challenge test. All other non-sterile Minisart® types with 0.2 µm pore size can be sterilized by autoclaving or EO before use for sterile filtration.
[6] For sterile packs ACK.

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications

Minisart® with Polypropylene Housing

Ordering Information

Minisart® RC (Regenerated Cellulose)								
Ø in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./Pkg.	Order No.
25 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17764--------ACK
25 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17764----------K
25 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	200	17764----------S
25 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17764----------Q
25 mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17765----------K
25 mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	200	17765----------S
25 mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17765----------Q
15 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17761--------ACK
15 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17761----------K
15 mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17761----------Q
15 mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17762----------K
15 mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17762----------Q
4 mm	RC	PP	0.2 µm	Male Luer Slip	Blue Tray	No	50	17821----------K
4 mm	RC	PP	0.2 µm	Male Luer Slip	Blue Tray	No	500	17821----------Q
4 mm	RC	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	50	17822----------K
4 mm	RC	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	500	17822----------Q

Minisart® SRP (Hydrophobic PTFE)								
25 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	S7575------FXOSK
25 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17575----------K
25 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	200	17575----------S
25 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17575----------Q
25 mm	PTFE	PP	0.2 µm	Hose Barb	White, Printed	No	500	1757A----------Q
25 mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17576----------K
25 mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	200	17576----------S
25 mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17576----------Q
15 mm	PTFE	PP	0.2 µm	Male Spike	White, Printed	No	50	17558----------K
15 mm	PTFE	PP	0.2 µm	Male Spike	White, Printed	No	500	17558----------Q
15 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17573--------ACK
15 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17573----------K
15 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17573----------Q
15 mm	PTFE	PP	0.45 µm	Male Spike	White, Printed	No	50	17559----------K
15 mm	PTFE	PP	0.45 µm	Male Spike	White, Printed	No	500	17559----------Q
15 mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17574----------K
15 mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17574----------Q
4 mm	PTFE	PP	0.2 µm	Male Luer Slip	Blue Tray	No	500	17844----------Q
4 mm	PTFE	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	50	17820----------K
4 mm	PTFE	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	500	17820----------Q

Minisart® NY (Nylon) and NY25 Plus (Glass Fiber 0.7 µm² + Nylon)								
Ø in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./Pkg.	Order No.
25 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17845--------ACK
25 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17845----------Q
25 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	Yes	50	17846--------ACK
25 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17846----------Q
15 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	1776B----------K
15 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	1776B----------Q
15 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	1776C----------K
15 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	1776C----------Q
25 mm	GF+Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	1784B----------K
25 mm	GF+Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	1784B----------Q
25 mm	GF+Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	1784C----------K
25 mm	GF+Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	1784C----------Q
Minisart® PES (Polyethersulfone) Aqueous Filtration								
15 mm	PES	PP	0.22 µm	Male Luer Slip	White	Yes	50	1776D--------ACK
15 mm	PES	PP	0.22 µm	Male Luer Slip	White	No	500	1776D----------Q
Minisart® PES- (Hydrophobic PES) Venting & Gas Filtration, Gamma Stable								
25 mm	PES	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	1757H----------K
25 mm	PES	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	1757H----------Q
25 mm	PES	PP	0.2 µm	Hose Barbs[3]	White, Printed	No	50	1757G----------K
25 mm	PES	PP	0.2 µm	Hose Barbs[3]	White, Printed	No	500	1757G----------Q

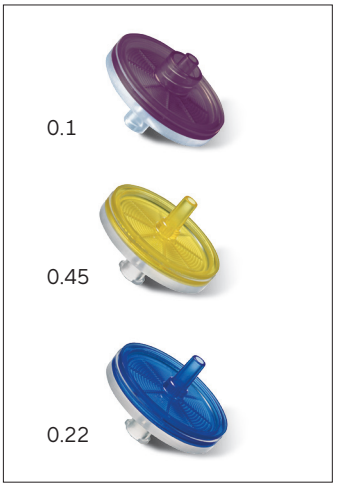
* Sterile Minisart® syringe filters are individually packaged. If not stated otherwise, Minisart® units have been sterilized by ethylene oxide.
Non-presterilized Minisart® units: RC, PTFE and nylon can be sterilized by autoclaving at 121 °C for 30 min. or by using ethylene oxide (EO).

[1] Diameter of EFA – Effective Filtration Area

[2] 0.7 µm = GF particle retention ≠ pore size!

[3] Hose barbs, inlet and outlet, stepped 4.4–6 mm diameter

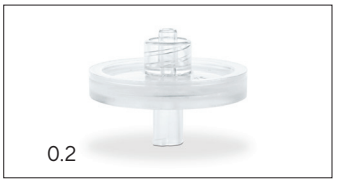
Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications.



Minisart® High Flow with PES



Minisart® NML with (SF)CA



Minisart® HY with PTFE

Minisart® NML Standard Syringe Filter Clarification and Sterilization by Filtration

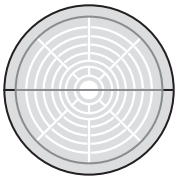
Filtration is the Optimal Method for Clarification and Sterilization of Liquids and Gases

Sterilization by filtration is the fastest method for removal of bacterial cells from liquids, while minimizing the effects on ingredients. Minisart® NML with (surfactant-free) cellulose acetate (SF)CA is the best choice for all aqueous solutions with a pH of 4 to 8. It combines fast flow rates and is available in many different pore sizes – also for the removal of larger particles. Minisart® High Flow with polyethersulfone (PES) is optimal for delivering the highest flow rates and for a broad pH compatibility range from 1 to 13. Due to the asymmetric membrane structure, the PES surface almost behaves like a prefilter.

Both Minisart® types – NML and High Flow – are available pre-sterilized by ethylene oxide (EO) or gamma irradiation. Hydrophobic PTFE filters like Minisart® HY are suitable for venting purposes and are additionally available in special formats with activated carbon.

Minisart® Features

- Largest effective filtration area (EFA) of 6.2 cm^2
- Low adsorption
- High flow rate
- High total throughput
- Low hold-up volume
- Gamma-irradiated or EO-sterilized



28 mm EFA
33 mm housing diameter
(for NML and High Flow)



Minisart® Standard Syringe Filters with MBS Housing

Specifications

Minisart® High Flow | NML | NML Plus with 28 mm accessible membrane filtration area diameter, ≤ 150 µL hold-up volume[1]
Minisart® HY | Acticosart with 26 mm accessible membrane filtration area diameter, ≤ 150 µL hold-up volume[1]
Minisart® Air with 15 mm accessible membrane filtration area diameter, ≤ 100 µL hold-up volume[1]

Housing material	Methacrylate butadiene styrene (MBS)
Membranes	High Flow: PES = Polyethersulfone NML: (SF) CA = (Surfactant-free) Cellulose Acetate NML Plus: (SF) CA = (Surfactant-free) Cellulose Acetate HY	Acticosart	Air: Hydrophobic PTFE = Polytetrafluoroethylene
Glass fiber prefilter	NML Plus: Binder-free GF, 0.7 µm particle retention
Max. operating pressure	High Flow: 6.0 bar	87 psi NML, NML Plus, HY, Air: 4.5 bar	65 psi Acticosart: 1 bar	14.5 psi
Housing burst pressure	≥ 7 bar	102 psi (not determined for Acticosart)
Max. temperature	60 °C
Sterilization	Non-sterile Minisart® High Flow, NML and NML Plus can be or sterilized by ethylene oxide (EO) or by gamma irradiation. Non-sterile Minisart® HY, Acticosart, Air* can be sterilized by ethylene oxide (EO).

Minisart® Membrane Types	**PES 0.1 µm**	**PES 0.22 µm**	**PES 0.45 µm**	**SFCA 0.2 µm**	**SFCA 0.45 µm**	**CA 0.65 µm**	**CA 0.8 µm**	**CA 1.2 µm**	**CA 5.0 µm**
Non-sterile packages: 500 (Q, HYQ), 1000 (R), sterile packs: individually packaged: 50 (K, GUK, HYK, HNK)	K	K | GUK | Q	K | GUK | Q	K | GUK | Q	K | GUK | Q	K	K | GUK | Q	K | Q	K | Q
Bubble point (≥)	With water 5.0 bar | 73 psi	With water 3.2 bar | 46 psi	With water 2.0 bar | 29 psi	With water 3.2 bar | 46 psi	With water 2.0 bar | 29 psi	With water 1.3 bar | 19 psi	With water 0.8 bar | 12 psi	With water 0.7 bar | 10 psi	With water 0.4 bar | 6 psi
Flow Rate for[2 | 3] (≥ mL/min)									
28 mm Ø for water at 1 bar	40	140	220	60	160	250	400	500	600
15 mm Ø for air at 0.1 bar	–	–	–	–	–	–	–	–	–
26 mm Ø for air at 0.1 bar	–	–	–	–	–	–	–	–	–
Water penetration point[3] (≥)	–	–	–	–	–	–	–	–	–
Sterile filtration capability[4] acc. to the bacteria challenge test	Yes	Yes	No	Yes	No	No	No	No	No
Non-pyrogenic according to the USP	Yes[5]	Yes[5]	Yes[5]	Yes[5]	Yes[5]	Yes[5]	Yes[5]	Yes[5]	Yes[5]

Minisart® Membrane Types	GF+SFCA 0.2 µm	GF+SFCA 0.45 µm	GF+CA 1.2 µm	GF 0.7 µm	PTFE 0.2 µm	PTFE 1.0 µm	Acticosart	PTFE (Air) 0.2 µm
Non-sterile packages: 500 (Q, HYQ), 1000 (R), sterile packs: individually packaged, 50 (K, GUK, HYK, HNK)	K | Q	K | Q	Q	K | Q	K | Q	HYQ	Q	Q | HNK
Bubble point (≥)	With water 3.2 bar | 46 psi	With water 2.0 bar | 29 psi	With water 0.7 bar | 10 psi	With water 0.5 bar | 7 psi	With ethanol 1.1 bar | 20 psi	With ethanol 0.5 bar | 7 psi	With ethanol 0.9 bar | 13 psi	With ethanol 1.0 bar | 14 psi
Flow rate for [2] | [3] (≥ mL/min)								
28 mm Ø for water at 1 bar	60	160	350	450	–	–	–	–
15 mm Ø for air at 0.1 bar	–	–	–	–	–	–	–	800
26 mm Ø for air at 0.1 bar	–	–	–	–	2,000	4,000	2,300	–
Water penetration point[3] (≥)	–	–	–	–	4.0 bar | 58 psi	1.5 bar | 22 psi	N.a.	3.2 bar | 44 psi
Sterile filtration capability[4] according to the bacteria challenge test	Yes	No	No	No	Yes	No	N.a.	Yes
Non-pyrogenic according to the USP					Yes[5]			

[1] Hold-up volume after air purge
[2] Hydrophilic membranes can filter dry air or gas but become impermeable to air or gas when wetted!
[3] Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point.
[4] According to bacterial challenge test (BCT) with 1×10^7 cfu/cm² Brevundimonas diminuta. All non-sterile Minisart® types listed above can be sterilized according to the method recommended in this table.
[5] For sterile packs K | GUK
*Minisart® Air can be sterilized by Gamma irradiation according to the following parameters: Range 25 – 40 kGy (validated with 50 kGy).

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Preparation of Aqueous Liquids

Ordering Information

Minisart® High Flow (PES – Polyethersulfone)

Ø in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./Pkg.	Order No.
28 mm	PES	MBS	0.1 µm	Male Luer Lock	Dark Red	Yes	50	16553----------K
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	Yes#	50	16532--------GUK
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	Yes	50	16532----------K
28 mm	PES	MBS	0.22 µm	Male Luer Slip	Royal Blue	Yes	50	16541----------K
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	No	500	16532----------Q
28 mm	PES	MBS	0.22 µm	Male Luer Slip	Royal Blue	No	500	16541----------Q
28 mm	PES	MBS	0.45 µm	Male Luer Lock	Amber	Yes	50	16537----------K
28 mm	PES	MBS	0.45 µm	Male Luer Lock	Amber	No	500	16537----------Q
28 mm	PES	MBS	0.45 µm	Male Luer Slip	Amber	Yes#	50	16533--------GUK
28 mm	PES	MBS	0.45 µm	Male Luer Slip	Amber	Yes	50	16533----------K
28 mm	PES	MBS	0.45 µm	Male Luer Slip	Amber	No	500	16533----------Q

Minisart® NML ((SF)CA – (Surfactant-free) Cellulose Acetate)

28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	S6534------FMOSK
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes#	50	S6534------FMGUK
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	S6534------FM--Q
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	Yes	50	S7597------FXOSK
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	No	500	S7597------FX--Q
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	S6555------FMOSK
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes#	50	S6555------FMGUK
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	S6555------FM--Q
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	Yes	50	S7598------FXOSK
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	No	500	S7598------FX--Q
28 mm	CA	MBS	0.65 µm	Male Luer Slip	Pink	Yes	50	16569----------K
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	Yes	50	16592----------K
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	Yes#	50	16592--------GUK
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	No	500	16592----------Q
28 mm	CA	MBS	1.2 µm	Male Luer Lock	Red	Yes	50	17593----------K
28 mm	CA	MBS	1.2 µm	Male Luer Lock	Red	No	500	17593----------Q
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	Yes	50	S7594------FMOSK
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	No	500	17594----------Q

Ø in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./Pkg.	Order No.
Minisart® NML Plus (Glass Fiber 0.7 µm²) + (SF)CA								
28 mm	GF+SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	17823----------K
28 mm	GF+SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	17823----------Q
28 mm	GF+SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	17829----------K
28 mm	GF+SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	17829----------Q
28 mm	GF+CA	MBS	1.2 µm	Male Luer Lock	Red	No	500	17825----------Q
28 mm	GF	MBS	0.7 µm[2]	Male Luer Lock	White	No	50	17824----------K
28 mm	GF	MBS	0.7 µm[2]	Male Luer Lock	White	No	500	17824----------Q
Minisart® HY (hydrophobic PTFE)								
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	Yes	50	S6596------FMOSK
26 mm	PTFE	MBS	1 µm	Male Luer Lock	Clear	No	50	1659A--------HYQ
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	No	500	S6596------FM--Q
Minisart® High Flow (PES – Polyethersulfone)								
28 mm	PES	MBS	0.1 µm	Male Luer Lock	Dark Red	Yes	50	16553----------K
Minisart® Air (Hydrophobic PTFE)								
15 mm	PTFE	MBS	0.2 µm	Male Luer Slip	Yellow	No	500	1751A----------Q
15 mm	PTFE	MBS	0.2 µm	Male Luer Slip + Needle	Yellow	Yes#	50	16596--------HNK
Minisart® Acticosart with Dome Reservoir + Hydrophobic PTFE								
26 mm	Active carbon	MBS	0.45 µm	Male Luer Slip	Blue	No	500	17840----------Q

* Sterilized Minisart® units are individually packaged. If not stated otherwise, Minisart® are sterilized by ethylene oxide.
#-mark indicates sterilization by gamma irradiation.
Non-presterilized Minisart® units: High Flow, NML, NML Plus and HY can be sterilized by ethylene oxide; High Flow, NML and NML Plus can also be sterilized by gamma irradiation

[1] Diameter of EFA – Effective Filtration Area

[2] 0.7 µm = GF particle retention ≠ pore size!

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Chemical Compatibility

	Material								Minisart® Types									
	PES membrane	SFCA membrane	PTFE membrane	RC membrane	Nylon membrane	GF depth filter	Housing MBS	Housing PP	Minisart® HighFlow	Minisart® NML Ophthalsart	Minisart® NML Plus	Minisart® NML GF	Minisart® HY Minisart® Air	Minisart® RC	Minisart® NY	Minisart® NY Plus	Minisart® SRP	Minisart® PES
Filter Membrane	PES	(SF)CA	PTFE	RC	PA				PES	(SF)CA	(SF)CA		PTFE	RC	PA	PA	PTFE	PES
Pre-Filter						GF			-	-	GF	GF	-	-	-	GF	-	-
Housing Material							MBS	PP	MBS	MBS	MBS	MBS	MBS	PP	PP	PP	PP	PP
Sterilization																		
Ethylene oxide	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Gamma irradiation	++	++	-[1]	++	-	++	++	-	++	++	++	++	-[1]	-	-	-	-	-
Autoclaving 121 °C, 30 min	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Solvents																		
Acetone	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Acetonitrile	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
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	-	-	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-
Petroleum ether	+	++	-	++	++	++	+	++	+	+	+	+	-	++	++	++	-	+

	Material								Minisart® Types									
	PES membrane	SFCA membrane	PTFE membrane	RC membrane	Nylon membrane	GF depth filter	Housing MBS	Housing PP	Minisart® HighFlow	Minisart® NML Ophthalsart	Minisart® NML Plus	Minisart® NML GF	Minisart® HY Minisart® Air	Minisart® RC	Minisart® NY	Minisart® NY Plus	Minisart® SRP	Minisart® PES
Filter Membrane	PES	(SF)CA	PTFE	RC	PA				PES	(SF)CA	(SF)CA		PTFE	RC	PA	PA	PTFE	PES
Prefilter						GF			-	-	GF	GF	-	-	-	GF	-	-
Housing Material							MBS	PP	MBS	MBS	MBS	MBS	MBS	PP	PP	PP	PP	PP
Solvents (continued)																		
Pyridine	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Tetrahydrofuran	-	-	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Toluene	-	+	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-
Trichloroethylene	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Xylene	-	+	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-
Acids																		
Acetic acid, 25%	+	+	++	++	-	++	+	++	+	+	+	+	+	++	-	-	++	+
Acetic acid, 80%	-	-	++	+	-	++	-	+	-	-	-	-	-	+	-	-	+	-
Hydrofluoric acid, 50%	+	-	++	+	-	++	-	+	-	-	-	-	-	+	-	-	+	+
Perchloric acid, 25%	-	-	++	-	-	++	-	+	-	-	-	-	-	-	-	-	+	-
Phosphoric acid, up to 10%	+	+	++	-	-	++	+	+	+	+	+	+	+	-	-	-	+	+
Phosphoric acid, 86%	+	+	++	-	-	++	-	+	-	-	-	-	-	-	-	-	+	+
Nitric acid, 30%	+	-	++	-	-	++	+	+	+	-	-	-	+	-	-	-	+	+
Nitric acid, conc.	-	-	++	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-
Hydrochloric acid, 20%	++	-	++	-	-	++	+	+	+	-	-	-	+	-	-	-	+	+
Sulfuric acid, 25%	+	-	++	+	-	++	++	++	+	-	-	-	++	+	-	-	++	+
Sulfuric acid, 98%	-	-	++	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroacetic acid, 25%	-	-	++	++	-	++	-	+	-	-	-	-	-	+	-	-	+	-
Bases																		
Ammonia, 1N	++	+	++	+	++	++	+	++	+	+	+	+	+	+	++	++	++	++
Ammonium hydroxide, 25%	+	+	++	+	++	+	-	+	-	-	-	-	-	+	+	+	+	+
Potassium hydroxide, 32%	++	-	++	-	+	+	-	++	-	-	-	-	-	-	+	+	++	++
Sodium hydroxide, 1N	++	-	-	+	++	+	-	++	-	-	-	-	-	+	++	+	-	++
Sodium hydroxide, 32%	++	-	-	-	+	-	-	+	-	-	-	-	-	-	+	-	-	+
Aqueous solutions																		
Formaldehyde, 30%	+	++	++	+	++	++	+	+	+	+	+	+	+	+	+	+	+	+
Sodium hypochlorite, 5%	++	-	++	-	-	++	+	+	+	-	-	-	+	-	-	-	+	+
Hydrogen peroxide, 35%	++	-	++	-	-	++	+	++	+	-	-	+	+	-	-	-	++	++
pH range																		
pH 1 to 14	-	-	++	-	-	++	-	++										
pH 1 to 13	++	-	++	-	-	++	-	++										
pH 3 to 14	+	-	++	+	++	++	-	++										
pH 3 to 12	++	-	++	++	++	++	+	++										
pH 4 to 8	++	++	++	++	++	++	++	++										

The chemical compatibility guide could be confirmed either by a literature review or by laboratory tests. Please consider that compatibilities can be influenced by various factors. Therefore, we recommend that you confirm compatibility with the liquid you want to filter by performing a trial filtration run before you start your actual filtration.

Legend

++ High compatibility
\+ Limited compatibility
\- Not compatible
[1] Gamma irradiation feasible for Minisart® Air


SARTORIUS

Claristep® Filtration System



The Claristep® Station consists of a base, a lid and an exchangeable tray for easy and accurate positioning of sample vials and Claristep® Filter units.

The patent-pending design features unique grooves in the station's lid and matching guide ridges on Claristep® Filter units to enable intuitively correct alignment and convenient handling of the system.

The Power of Simplicity

Preparing samples by clarification is an essential step prior to nearly all analytical techniques, such as high pressure liquid chromatography (HPLC). This filtration step to eliminate particles is crucial for maintaining the integrity of chromatography columns and for maximizing their operating life time.

In addition, as the sensitivity of automated analytical instruments continues to improve, they increasingly require less volume to operate in order to maximize throughput. Therefore, fast clarification of small volumes that does not add leachables or extractables to the original sample is indispensable for achieving the best analytical results.

To meet these requirements, Sartorius has developed a new, easy-to-use and straightforward filtration setup. The manually operated Claristep® Filtration System consisting of a station and filter units offers a novel way for clarifying your samples prior to analysis.

- Up to 8 samples are processed simultaneously
- No syringe required
- No need for a vacuum source or a power supply
- For low sample volumes ranging from 60 µL to 600 µL
- Hold-up volume < 30 µL





The grooves automatically guide the filter unit caps into the correct positions for simultaneous and accurate cap closure.

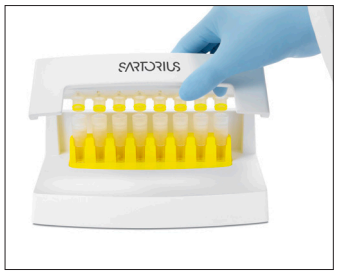


Claristep® Filter units are made of the purest materials. Another major benefit is that the contact time of the samples with the filters and the caps is extremely short, ensuring optimal, contamination-free results. Filtered liquids are collected in any 12 × 32 mm outer diameter vials of your choice based on the analytical method to be performed.

Sample Preparation for Analytics

Use the Most Ergonomic Clarification Solution

Filter 8 samples simultaneously – without needing any power supply or a vacuum | pressure source.
Simply place the filters on your vials, gently close the station and press on the station lid to filter – that's it!



1. Close the station lid. The grooves align the caps automatically, securely sealing every single Claristep® Filter unit for the most convenient processing.



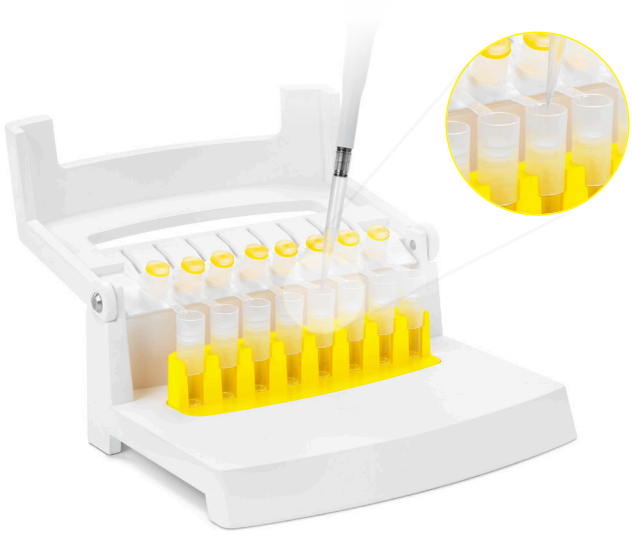
2. Apply slight uniform pressure with your hand to start sample clarification. You will feel a certain resistance while liquid is pressed through each membrane.



3. Press down on the station lid so that the left and right corners touch the base plate. Hold the lid in place for 3 seconds to ensure all sample liquid is filtered through.



Claristep® Filter units press liquid through each membrane by an air pocket that forms over each filter unit when the station lid is closed. This air pocket is released when you stop holding down the lid – you will feel it in your fingertips!



Before clarification, the samples are pipetted in the filter reservoire.

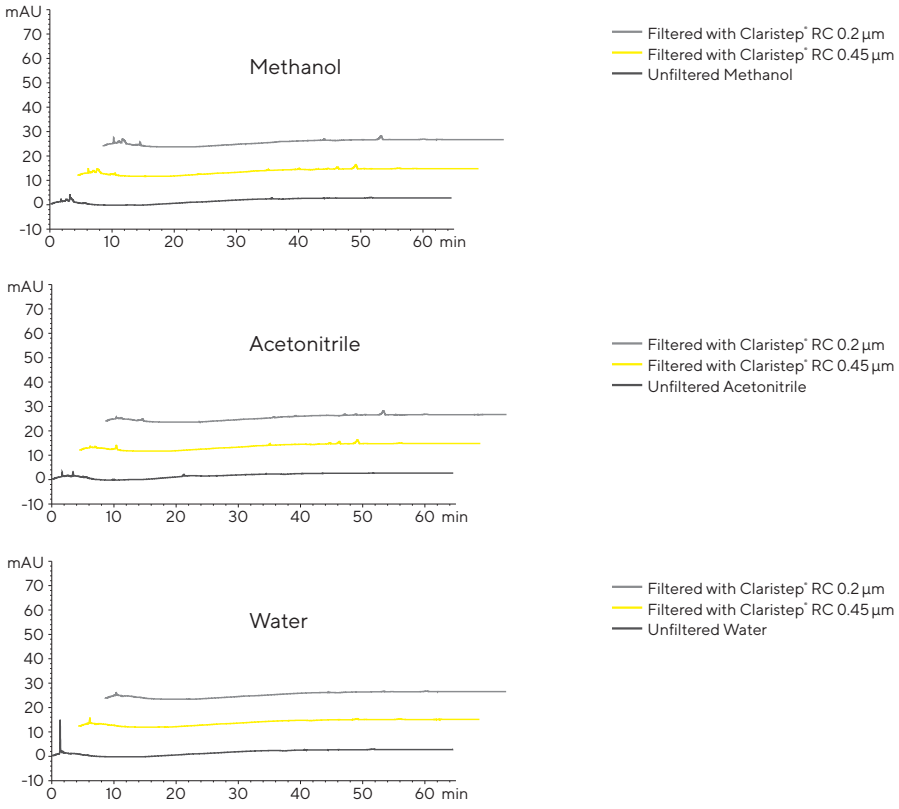


After clarification, the filtrates are collected in sample vials.

Reliable Removal of Particles

Filter Samples Without Adding Extractables and Leachables
Claristep® Filter units with RC membranes are optimized for solvents and aqueous solutions. They provide maximum chemical compatibility and exceptionally low non-specific binding of analytes.

HPLC Certification



HPLC Procedure
Column: C18: 5 µm × 250 mm × 4.0 mm, Flow Rate: 1 mL/min, Wavelength: 220 nm
Injection Volume: 20 µL, Analysis Time: 65 min, Temperature: 40 °C,
Mobile Phases: A) Acetonitrile | B) Water, Gradient: Hold 60% A for 10 min, 60% to 100% A in 20 min, 100% A for 30 min

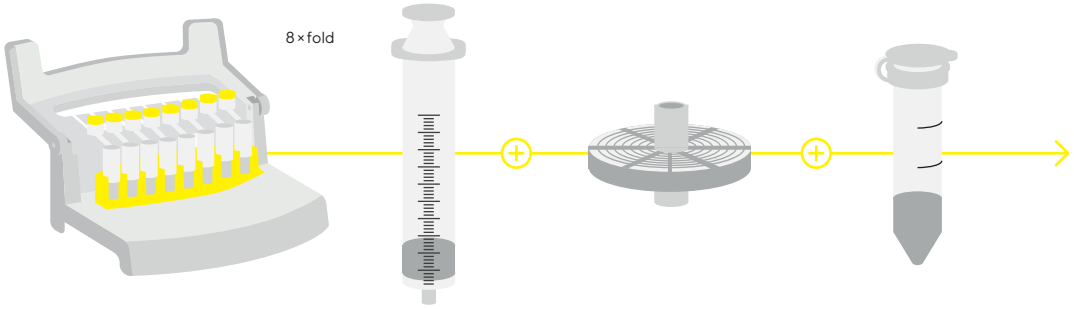
Sample Preparation Techniques

Choose the Best Solution for Your Needs
Do you process dozens of samples each day? A syringeless solution will help you reduce time, effort and waste – and minimize hand stress. If you need to analyze only a few samples a day, you will benefit from our proven combination of a syringe and syringe filter. The choice is all yours!

Claristep®
Filtration System

or

Syringe Filters
for processing one sample at a time



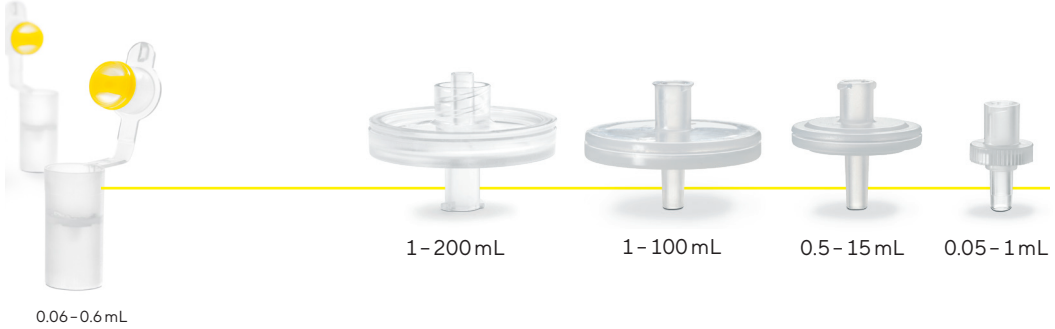
Analytical Sample Volumes Run Small

Get the Particle-free Volume You Really Need
If you need to fill only 12 × 32 mm vials, a syringeless solution will help you save time and reduce sample loss!

Syringeless Solution

or

Different Diameters
for different sample volumes



Ordering Information



Claristep® Filters are availabe in a choice of two pore sizes

Claristep® Filters						
Ø mm | EFD1	**Membrane**	**Housing**	**Pore Size**	**Sterile**	**Qty | Pk**	**Order No.**
9.7 mm	RC	PP	0.2 µm	No	96	17C07FT–96
9.7 mm	RC	PP	0.2 µm	No	480	17C07FT-480
9.7 mm	RC	PP	0.45 µm	No	96	17C06FT–96
9.7 mm	RC	PP	0.45 µm	No	480	17C06FT-480

[1] Effective Filtration Diameter
RC = Regenerated Cellulose

Claristep® System		
Name	**Qty./Pkg.**	**Prod. No.**
Claristep® Station complete	1	17C-M8
Claristep® Single Tray	1	17C-S1



The Tray can be removed and exchanged



12 × 32 mm sample vials

Additional Components Needed

The free choice of 12 × 32 mm sample vials and lids is enabeling you to chose the right vial for your particular sample and application, e.g. for light sensitive substances you can use brown glass. For small sample volumes you can use vessels with inlays. You can use glass or plastic, screw caps and | or slid lids – whatever you prefer.

Sartolab® P20 Pressure Filter Units

Compact Design for the Filtration of Large Volumes





Sartolab® P20 devices are ready-to-use pressure filter units intended for general laboratory use like the clarification and sterile filtration of media and aqueous solutions in batches from 100 mL to 10 L. Sartolab® P20 Plus with an incorporated prefilter is recommended for difficult-to-filter solutions like, for example, media that contains serum.

Membrane of Choice

Polyethersulfone (PES) is the membrane of choice for the Sartolab® P20 pressure filter units, as it combines very low protein binding properties with the highest flow rates. The Sartolab® P20 pressure filter unit is available either with 0.2 µm or 0.45 µm PES membranes, with or without a prefilter made of high purity quartz microfibers. An additional version containing quartz microfiber only is also available for clarification purposes.

Compact Design

Sartolab® P20 pressure filter units have been designed to filter batches from 100 mL to 10 L, either using a syringe or in-line with a peristaltic pump, or a pressure vessel.Sartolab® P20 pressure filter units are available in different configurations, with or without PTFE automatic venting, with or without a filling bell (including cover) on the outlet and with a combination of different inlet and outlet connectors to meet the needs of most applications.

Benefits

- Highest flow rates with a large surface of filtration (20 cm^2)
- No loss of protein with a low binding membrane
- Low dead volume due to an optimized membrane support
- Versions available with a prefilter for high particle load solutions

Specifications

Different Filter Materials	0.2 µm polyethersulfone 0.45 µm polyethersulfone High purity binder-free quartz microfibers
Housing Material	Transparent polycarbonate
Filter Diameter	61 mm
Filtration Area	20 cm²
Holdup Volume	Sartolab® P20: 1 mL Sartolab® P20 Plus: 1.2 mL Sartolab® P20 Prefilter: 1 mL
Filtration Range	Sartolab® P20: 100 mL to 5 L Sartolab® P20 Plus: 100 mL to 10 L Sartolab® P20 Prefilter: 100 mL to 10 L
Recommended Max. Inlet Pressure	4 bar
pH Range	1 – 10
Housing Burst Pressure	> 5 bar
Autoclavable	121 °C

Ordering Information

Sartolab® P20

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18075----------D	0.2 µm PES	Female Luer-Lock	Hose barb	no	no	yes	10
18075--------UPN	0.2 µm PES	Female Luer-Lock	Hose barb	no	no	no	100
18089----------D	0.2 µm PES	Hose barb	Hose barb	yes	yes	yes	10
18090----------D	0.2 µm PES	Female Luer-Lock	Male Luer-Lock	no	no	yes	10

Sartolab® P20 Plus

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18068----------D	Quartz microfibers & 0.2 µm PES	Female Luer-Lock	Hose barb	yes	yes	yes	10
18076----------N	Quartz microfibers & 0.45 µm PES	Hose barb	Hose barb	no	no	no	100
18091----------D	Quartz microfibers & 0.2 µm PES	Hose barb	Hose barb	yes	yes	yes	10
18092----------D	Quartz microfibers & 0.2 µm PES	Female Luer-Lock	Male Luer-Lock	no	no	yes	10

Sartolab® P20 Prefilter

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18072----------D	Quartz microfibers	Female Luer-Lock	Hose barb	no	no	no	10

Sartolab® RF 50

Vacuum filtration unit for volumes of up to 50 mL



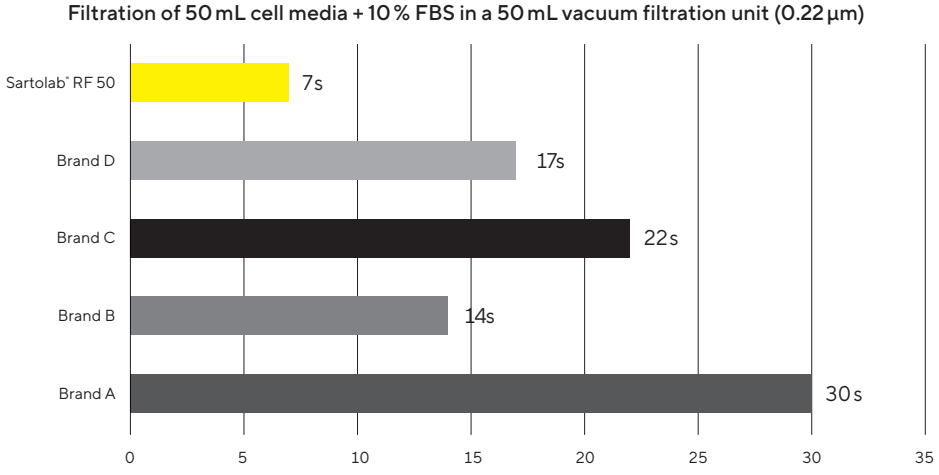
Sartolab® RF 50 vacuum filtration units are single-use units, designed for the filtration of sample volumes of up to 50 mL. They are available either with a 0.22 or a 0.45 µm polyethersulfone membrane which have been developed and manufactured by Sartorius at its own facilities. Both membranes provide fastest flow rates due to their asymmetric structure and ensure lowest protein binding as well as low extractables. The 0.22 µm version is ideal for sterile filtration of cell cultures, buffers and aqueous solutions; the 0.45 µm for clarification. Sartolab® RF 50 are available either individually packed and sterile or in bulk non-sterile.

Sartolab® RF 50 vacuum filtration unit is composed of a funnel, with dust cover, a 50 mL conical tube with graduation and writing field as well as a tubing connector for vacuum connection (sterile versions only) and a screw cap to store your filtrate in the conical tube. The design of the yellow adapter connecting the funnel to the conical tube ensures a vacuum-tight seal and enables the filtration unit to be used on the Sartolab® MultiStation for filtration of up to 6 samples in parallel with one vacuum source.

Sartolab® RF 50 can also be used alone when connecting the tubing connector delivered with each unit to your vacuum source (sterile versions only). The tubing connector and the screw cap for the conical tube are individually wrapped to maintain sterility until needed.

User Benefits

- Highest flow rates with an asymmetric membrane and a large surface area
- No loss of protein with a very low protein binding membrane
- Low dead volume thanks to an optimized membrane support
- Minimized risks of contamination with a complete ready-to-use unit (no further transfer of liquid for storage necessary)
- Designed as standalone system or for a parallel filtration of up to 6 samples with Sartolab® Multistation



Materials

Funnel with dust cover	Polystyrene (PS)
Membrane filter	0.22 µm polyethersulfone (order no. 180E01) 0.45 µm polyethersulfone (order no. 180F01)
Funnel adapter	High Density Polyethylene (HDPE)
Tubing connector for vacuum connection	High Density Polyethylene (HDPE)
Conical tube	Polypropylene
Conical tube cap	High Density Polyethylene (HDPE)

Specifications

Membrane Ø	58.5 mm
Effective filtration area	21 cm^2
Hold-up volume	1.2 mL
Filtration capacity	50 mL
Size of the 50 mL conical tube	Height: 115.5 mm, External | internal diameter: 29.5 mm | 27.48 mm
Autoclavable	No
Sterilization method	E-Beam (beta) irradiation
Storage temperature of the conical tube	4 °C to 30 °C (short-term: –80 °C to max. 100 °C)
Packaging	Single-packaged, sterile
Operating pressure	–350 to –700 mbar

Ordering Information

Description	Quantity	Order No.
Sartolab® RF 50, 0.22 µm, PES	24 units	180E01---------2
Sartolab® RF 50, 0.45 µm, PES	24 units	180F01---------2
Sartolab® RF 50, 0.22 µm, PES, non-sterile	96 units	180E01---------E8
Sartolab® RF 50, 0.45 µm, PES, non-sterile	96 units	180F01---------E8

Sartolab® RF | BT

Vacuum Filtration Units



Sartolab® RF | BT vacuum filtration units are convenient filtration units designed for research purposes and, therefore, for the filtration of small volumes from > 50 mL to 1 L. Sartolab® RF as a complete system includes a receiver flask to the filtration funnel. Sartolab® BT is a bottle top filter (filtration funnel) without a receiver flask, enabling customers to use their own receiver flasks and/or to expand the filtration capacity, depending on the particle load of the filtered liquid, by filling more than one receiver flask.

Membrane of Choice

Polyethersulfone is the membrane of choice for the Sartolab® RF | BT vacuum filtration units as it combines very low protein binding properties and highest flow rates. The 0.22 µm polyethersulfone membrane belongs to the best asymmetric membrane in the market.

The Sartolab® RF | BT vacuum filtration units are available in 3 different pore sizes to meet most of the applications:

- 0.1 µm for mycoplasma removal
- 0.22 µm for the sterile filtration of cell culture, media, buffers, and reagents
- 0.45 µm for the clarification of aqueous and viscous solutions

Ergonomic Design

Sartolab® RF | BT vacuum filtration units have been designed to maximally facilitate the user's daily work.

- Ergonomic design of the 150 mL to 1 L bottles for easy grip with one hand and designated writing field on the back for clear labeling of samples
- Engraved graduations on the funnels and the bottles ensure accuracy and highest readability
- The footprint of the bottles gives good stability for the unit during filtration
- No extra tightening of the funnel before filtration required (vacuum-tight sealed)
- The funnels and bottles are stackable to save space not only in the refrigerator but also in the bin
- The design of the yellow adapter connecting the funnel to the bottles enables the filtration unit to be used on the Sartolab® Multistation for filtration of up to 6 samples in parallel with one vacuum source
- The ergonomic soft blister packaging is not only easy to open but its design facilitates the transportation of several units with one hand

State-of-the-Art Production

- Sartolab® RF | BT vacuum filtration units are manufactured in an ISO 13485 certified plant and ISO
- Class 8 cleanroom to assure the highest level of purity
- All fluid path materials used in the production of the Sartolab® RF | BT vacuum filtration units are medical graded for highest quality, without any animal origin
- All products are sold sterilized and guaranteed endotoxin-free
- All fluid path component materials meet the requirements for United States Pharmacopeia (USP)
- Class VI Biological Test for Plastics, latest volume
- The fluid path component materials are determined to be non-cytotoxic in accordance to ISO 10993

Best Engineering

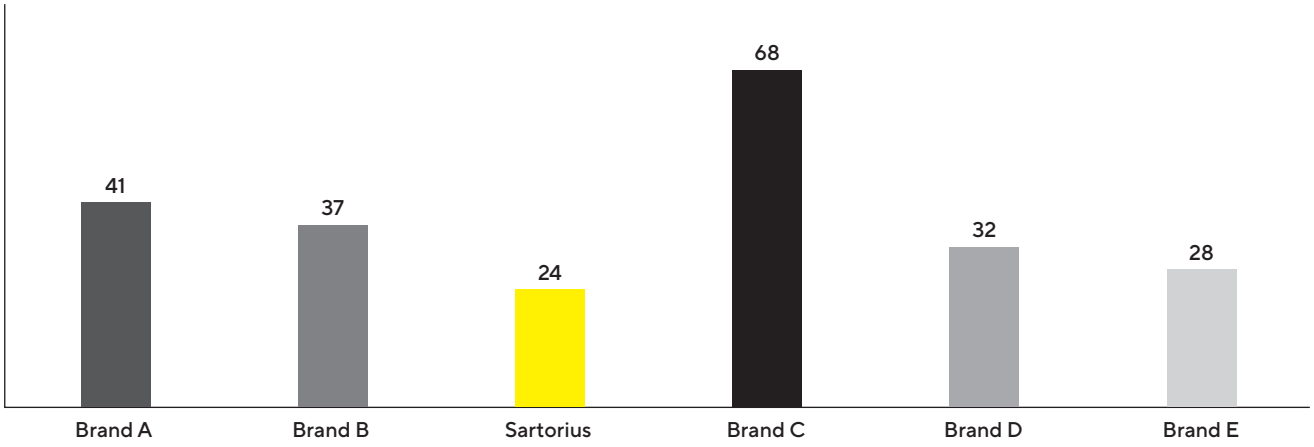
- Optimized membrane support for lowest hold-up volumes and for the reducing of foam formation and thus a denaturation of proteins
- Delivered with a vacuum tube connector for stand-alone filtration
- For the Sartolab® RF versions, the screw caps of the bottles are delivered extra packed to maintain sterility up to the end of filtration
- The 45 mm neck thread of the Sartolab® units ensures a vacuum-tight seal to bottles with this standard thread
- The risk of contamination is minimized with the complete ready-to-use unit Sartolab® RF versions

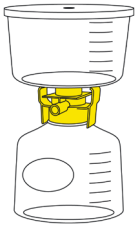
Technical Specifications

Material	
Membrane filter	0.1 µm polyethersulfone (Cat. No. 180D*) 0.22 µmpolyethersulfone (Cat. No. 180E*) 0.45 µm polyethersulfone (Cat. No. 180F*)
Funnel, lid, and bottle	Polystyrene (PS)
Tubing connector, funnel adapter, and screw cap	High Density Polyethylene (HDPE)
Packaging	PET|PE and PE|PA multilayer films

Specifications	
Membrane diameter	80 mm for 150 mL and 250 mL volumes 100 mm for 500 mL and 1,000 mL volumes
Effective filtration area	43 cm^2 for 150 mL and 250 mL volumes 69 cm^2 for 500 mL and 1,000 mL volumes
Bottle neck size	45 mm
Autoclavable	No
Sterilization method	E-Beam (beta) irradiation (SAL 10^{-6})
Transportation and storage temperatures	-20° C to + 60° C
Operational temperatures	0° C to 70° C
Packaging	Single-packaged, soft blister, sterile
Operating pressure	-350 to -750 mbar
Hold up volumes (for water)	2.7 mL for 150 mL and 250 mL versions 4.1 mL for 500 mL and 1,000 mL versions

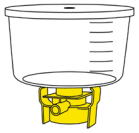
Comparison of Filtration Times [s] for 500 mL Cell Media + 10% FBS in Six 0.22 µm 500 mL Vacuum Filtration Units





The Sartolab® RF vacuum filtration unit is comprised of:

- A graduated funnel with a polyethersulfone (PES) membrane, a vacuum adapter and a lid
- A bottle, with graduation and writing field
- A tube connector for vacuum connection (for stand-alone filtration)
- A screw cap for storage of the filtrate (individually wrapped to maintain sterility)



The Sartolab® BT bottle top filter is comprised of:

- A graduated funnel with a polyethersulfone (PES) membrane, a vacuum adapter, and a lid
- A tubing connector for vacuum connection (for use as stand-alone)

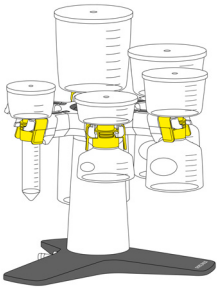
Ordering Information

Sartolab® RF

Order Number	Description	Membrane Type	Pore Size (µm)	Funnel Volume (mL)	Bottle Volume (mL)	Pkg. Unit
180E02----------E	Sartolab® RF 150	Asymmetric PES	0.22	150	150	12
180F02----------E	Sartolab® RF 150	PES	0.45	150	150	12
180D03----------E	Sartolab® RF 250	PES	0.1	250	250	12
180E03----------E	Sartolab® RF 250	Asymmetric PES	0.22	250	250	12
180F03----------E	Sartolab® RF 250	PES	0.45	250	250	12
180E04----------E	Sartolab® RF 500	Asymmetric PES	0.22	500	500	12
180F04----------E	Sartolab® RF 500	PES	0.45	500	500	12
180D05----------E	Sartolab® RF 1,000	PES	0.1	1,000	1,000	12
180E05----------E	Sartolab® RF 1,000	Asymmetric PES	0.22	1,000	1,000	12
180F05----------E	Sartolab® RF 1,000	PES	0.45	1,000	1,000	12

Sartolab® BT

Order Number	Description	Membrane Type	Pore Size (µm)	Funnel Volume (mL)	Pkg. Unit
180E12----------E	Sartolab® BT 150	Asymmetric PES	0.22	150	12
180E13----------E	Sartolab® BT 250	Asymmetric PES	0.22	250	12
180E14----------E	Sartolab® BT 500	Asymmetric PES	0.22	500	12
180E15----------E	Sartolab® BT 1,000	Asymmetric PES	0.22	1,000	12
180F15----------E	Sartolab® BT 1,000	PES	0.45	1,000	12



Accessories and Consumables

Multistation

For hands-free parallel filtration of up to six samples

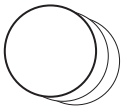
Order Number	Description	Pkg. Unit
SDLC01	Sartolab® Multistation	1



Sartolab® Bottle

Delivered sterile, for filtration and storage

Order Number	Description	Volume (mL)	Pkg.Unit
180-22---------E	Sartolab® bottle 150 mL	150	12
180-23---------E	Sartolab® bottle 250 mL	250	12
180-24---------E	Sartolab® bottle 500 mL	500	12
180-25---------E	Sartolab® bottle 1,000 mL	1,000	12



Binder-Free Glass Microfiber Prefilters

High purity prefilters to prevent the clogging of the membrane when filtering viscous or particulate-loaded solutions

Order Number	Description	Filter Diameter (mm)	Pkg. Unit
FT-3-1101-080	Binder-free glass microfiber filter discs, grade MGA, for 150 and 250 mL funnels	80	100
FT-3-1101-100	Binder-free glass microfiber filter discs, grade MGA, for 500 and 1,000 mL funnels	100	100

Sartolab® Multistation

For hands-free parallel filtration of up to 6 samples



Sartolab® Multistation is a stand specially designed to hold 1 to 6 vacuum filtration units, allowing simultaneous filtration of up to 6 samples.

The Multistation is permanently connected to your vacuum source. Easily install your vacuum filtration units in the Multistation for quick and easy filtration of samples without the need for installation of extra connectors and time-consuming stabilization.

Sartolab® Multistation works with all Sartolab® RF | BT vacuum filtration units; the funnel adapter of these units is designed to fit perfectly in the bracket of the Multistation. With one click, connect the filtration unit to the device, assuring perfect filter stability. With a second click, engage the vacuum automatically and begin filtering.

Easily manipulate your samples with the rotating, multi-directional head, and easily keep track of your samples during filtration with the numbered brackets.

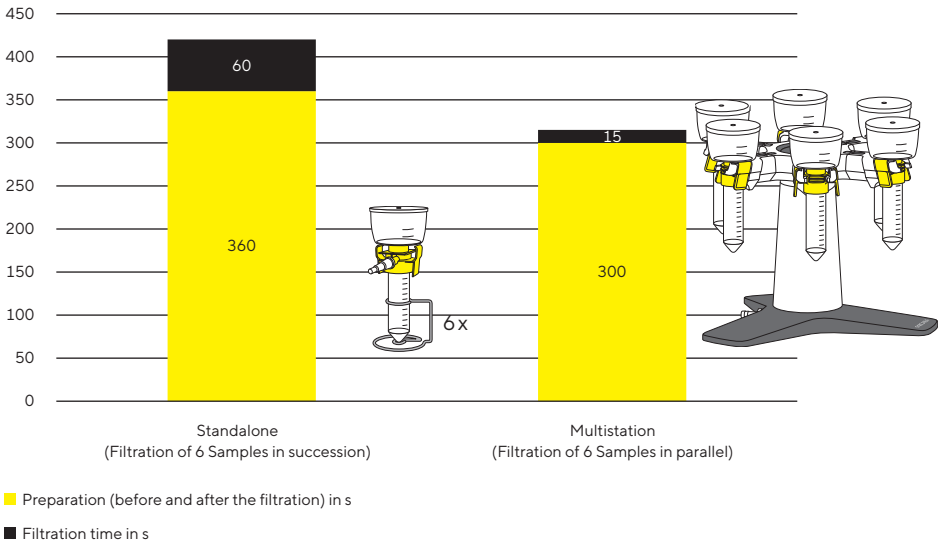
User Benefits

- Single vacuum source enables simultaneous filtration of up to 6 samples
- Time-saving (no installation time for each filter unit before use)
- Hands-free filtration



The Multistation advantage: Using the Sartolab® Multistation to filter 6 x 50 mL samples saves handling time compared to standalone filtration

Filtration of 50 mL cell media + 10% FBS in a 50 mL vacuum filtration unit (0.22 µm)



Specifications

Material (visible parts)	ABS | Aluminum | Stainless steel
Dimensions (Length × Width × Height)	307 × 348 × 281 mm
Weight	4.6 kg
Tubing connector	Designed for tubing with an inner diameter between 4 and 10 mm and with a wall thickness of minimum 3 mm

Ordering Information

Description	Quantity	Order No.
Sartolab® Multistation	1 unit	SDLC01

Sartoclear Dynamics® Lab P15

Clarification and Sterile Filtration of up to 15 mL Mammalian Cell Culture in One Step



Sartoclear Dynamics® Lab P15 is a kit for single step harvesting of 15 mL animal cell cultures with even high cell densities. With this kit, the clarification and sterile filtration of mammalian cell culture is performed in a single pressure filtration step. Inspired by the plasma industry, Sartoclear Dynamics® is based on the principles of body feed filtration.

This ready to use kit combines a 20 mL syringe pre-filled with a 0.5 g filter aid and an integrated filter* for sterile filtration. The filter aid facilitates filtration through the sterile filter while allowing complete protein recovery.

A convenient filling tube can be connected to the syringe, for the easy recovery of samples from 50 mL Falcon tubes or ambr 15 bioreactors.

As a result, this method replaces centrifugation and subsequent sterile filtration steps, leading to clarified and sterilized cell culture harvest in minutes. Your cell culture harvest will be available for following sample concentration by ultrafiltration and downstream analytics in no time.

Sartoclear® Dynamics Lab P15 Features:

- Single step mammalian cell culture harvest
- Designed for cell densities up to 20×10^6 cells and even more
- Fast and effortless filtration
- Optimized for cell culture harvest from Ambr® 15 bioreactors

* The sterile filter included in the kit contains a 0.2 µm polyethersulfone membrane and a prefilter made of 100 % high-purity quartz: The choice of these materials, along with the larger surface area of the filter, enables higher flow rates.

Quick and Easy Filtration



1. Fill the syringe with cell culture broth.



2. Shake the syringe to mix the broth with the filter aid.



3. Connect the sterile filter to the syringe and filter.

Typical Results

Cell Type	Cell Density	Viability	Mab concentration before filtration	Mab concentration after filtration	Recovery Rate
CHO DG44	16×10^6 cells/mL	78%	6.02 g/L	5.77 g/L	96%
CHO DG44	38×10^5 cells/mL	48%	0.43 g/L	0.43 g/L	100%

Specifications

DE Syringe	
Syringe material	Syringe barrel and plunger rod: polypropylene; stopper: latex-free elastomer
Syringe Cap	Polyamide
Filling tube material	Polypropylene
Filter aid	0.5 g highly pure diatomaceous earth (Celpure® C300 – pharmaceutical-grade*)

Sterile Filter	
Housing material	Polycarbonate
Prefilter material	100% high-purity quartz, binder-free
Filter material	0.2 µm polyethersulfone
Filter Ø	61 mm
Filtration area	20 cm^2
Connector inlet	Female Luer-Lock
Connector outlet	Male Luer-Lock
Hold-up volume	Approx. 2.5 mL
Housing burst pressure	> 5 bar | 72.5 psi
Packaging	Individually packed
Sterilization	EO sterilization

Ordering Information

Product Name	Number of units per box	Order No.
Sartoclear Dynamics® Lab P15	▪ 6 × 20 mL syringes, pre-filled with 0.5 g DE, including caps and filling tubes ▪ 6 × 0.2 µm PES sterile filters	SDLP--0015-----C

* Celpure® is a trademark of Advanced Minerals

Sartoclear Dynamics® Lab V

Clarification and Sterile Filtration of 50 mL up to 1 L Mammalian Cell Culture in One Step



Sartoclear Dynamics® Lab V kits enable clarification and sterile filtration to be performed in a single step. These kits simplify the cell harvesting process by fully eliminating the centrifugation step otherwise needed for clarification. As a result, they enable cell cultures to be efficiently clarified and sterilized in minutes – quickly and easily.

Sartoclear Dynamics® Lab kits have been designed and optimized for harvesting mammalian cell cultures, such as CHO, HEK, hybridomas and many others, with cell densities of up to 20×10^6 cells/mL.

Each kit provides filter aid pouches for clarification and Sartolab® RF vacuum filtration units for sterile filtration. The filter aid used in Sartoclear Dynamics® Lab products is made of highly-pure diatomaceous earth (DE) that is insoluble and inert. It is packed in ready-to-use pouches in pre-wetted condition to prevent the release of dust particles. The DE pouches are gamma-irradiated to rule out any contamination.

Sartoclear® Dynamics Lab V Features:

- Single step mammalian cell culture harvest
- Designed for cell densities up to 20×10^6 cells
- Fast and effortless filtration

Typical Results

Cell Type	Cell Density	Viability	Mab concentration before filtration	Mab concentration after filtration	Recovery Rate	Turbidity
CHO	14.46×10^6 cells/mL	85.2%	5.2 g/L	5.15 g/L	99%	18 NTU
HEK	8×10^6 cells/mL	70%	0.035 g/L	0.034 g/L	97%	8 NTU

Specifications

Clarification Pouches of Filter Aid	
Diatomaceous Earth (DE)	1 g, 5 g or 10 g highly pure diatomaceous earth, (Celpure® C300 – pharmaceutical grade)*, mixed with water in a ratio of 1 DE: 1.25 ultrapure water
Packaging | Sterilization	Dust-free, gamma irradiated pouches

Filtration Vacuum filtration units with receiver flasks (Sartolab® RF 150 – 1000)	
Funnel, dust cover, receiver bottles	Polystyrene (PS)
Filter adapter, tubing connector, cap	High Density Polyethylene (HDPE)
Filter material	0.22 µm polyethersulfone
Packaging | Sterilization	Single-packaged, sterile

Filtration Vacuum filtration units with conical tube (Sartolab® RF 50)	
Funnel, dust cover	Polystyrene (PS)
Filter adapter, tubing connector, cap	High Density Polyethylene (HDPE)
Conical tube	Polypropylene
Filter material	0.22 µm polyethersulfone (order no. 180E01) 0.45 µm polyethersulfone (order no. 180F01)
Packaging	Single-packaged, sterile

* Celpure® is a trademark of Advanced Minerals

Each Sartoclear Dynamics® Lab V kit is comprised of pouches of filter aid and Sartolab® RF vacuum filtration units that match your needs. Find the right kit in just two easy steps:

1. Determine the volume range of your sample to be filtered.
2. Then reference it to the cell density of your cell culture.

Volume	**Cell density***		
	< 5 million cells/mL	5 – 10 million cells/mL	10 – 20 million cells/mL
≤ 50	SDLV-0050-01E0-2	SDLV-0050-02E0-2	
> 50 – 150 mL	SDLV-0150-02E0-E	SDLV-0150-05E0-2	
150 – 250 mL	SDLV-0250-05E0-2	SDLV-0250-10E0-2	
250 – 500 mL	SDLV-0500-05E0-2	SDLV-0500-10E0-2	SDLV-0500-20E0-E
500 – 1,000 mL	SDLV-1000-10E0-2	SDLV-1000-20E0-E	SDLV-1000-40E0-E

* Tested with CHO cell lines with a cell viability of approx. 85%

Ordering Information

Sartoclear Dynamics® Lab V50 Kits – 0.22 µm PES

Sartoclear Dynamics Lab V, 50 mL, 1 g

Description	Qty. of Units	Order No.
Filtration of up to 50 mL with 1 g of DE per unit Contents: 1 × 180E01----------2 (24 × Sartolab® RF 50; 0.22 µm; PES) 1 × SDLKG-01.0------2 (24 × pouches of filter aid, 1 g)	24	SDLV-0050-01E0-2
Sartoclear Dynamics Lab V, 50 mL, 2 g		
Filtration of up to 50 mL with 2 g of DE per unit Contents: 1 × 180E01----------2 (24 × Sartolab® RF 50, 0.22 µm PES) 2 × SDLKG-01.0------2 (48 × pouches of filter aid, 1 g)	24	SDLV-0050-02E0-2

Sartoclear Dynamics® Lab V50 Kits – 0.45 µm PES

Sartoclear Dynamics Lab V, 50 mL, 1 g

Filtration of up to 50 mL with 1 g of DE per unit Contents: 1 × 180F01----------2 (24 × Sartolab® RF 50, 0.45 µm PES) 1 × SDLKG-01.0------2 (24 × pouches of filter aid, 1 g)	24	SDLV-0050-01F0-2
Sartoclear Dynamics Lab V, 50 mL, 2 g		
Filtration of up to 50 mL with 2 g of DE per unit Contents: 1 × 180F01----------E (24 × Sartolab® RF 50, 0.45 µm PES) 2 × SDLKG-01.0------2 (48 × pouches of filter aid, 1 g)	24	SDLV-0050-02F0-2

Sartoclear Dynamics® Lab V150 Kits

Sartoclear Dynamics® Lab V, 150 mL, 2 g

Filtration of up to 150 mL with 2 g of DE per unit Contents: 1 × 180E02---------E (12 × Sartolab® RF 150, 0.22 µm PES) 1 × SDLKG-01.0------2 (24 × pouches of filter aid, 1 g)	12	SDLV-0150-02E0-E
Sartoclear Dynamics® Lab V, 150 mL, 5 g		
Filtration of up to 150 mL with 5 g of DE per unit Contents: 2 × 180E02---------E (24 × Sartolab® RF 150, 0.22 µm PES) 1 × SDLKG-05.0------2 (24 × pouches of filter aid, 5 g)	24	SDLV-0150-05E0-2

Sartoclear Dynamics® Lab V250 Kits		
Sartoclear Dynamics® Lab V, 250 mL, 5 g		
Description	**Qty. of Units**	**Order No.**
Filtration of up to 250 mL with 5 g of DE per unit Contents: 2 × 180E03---------E (24 × Sartolab® RF 250, 0.22 µm PES) 1 × SDLKG-05.0------2 (24 × pouches of filter aid, 5 g)	24	SDLV-0250-05E0-2
Sartoclear Dynamics® Lab V, 250 mL, 10 g		
Filtration of up to 250 mL with 10 g of DE per unit Contents: 2 × 180E03---------E (24 × Sartolab® RF 250, 0.22 µm PES) 1 × SDLKG-10.0------2 (24 × pouches of filter aid, 10 g)	24	SDLV-0250-10E0-2

Sartoclear Dynamics® Lab V500 Kits		
Sartoclear Dynamics® Lab V, 500 mL, 5 g		
Filtration of up to 500 mL with 5 g DE per unit Contents: 2 × 180E04---------E (24 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-05.0------2 (24 × pouches of filter aid, 5 g)	24	SDLV-0500-05E0-2
Sartoclear Dynamics® Lab V, 500 mL, 10 g		
Filtration of up to 500 mL with 10 g DE per unit Contents: 2 × 180E04---------E (24 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-10.0-----2 (24 × pouches of filter aid, 10 g)	24	SDLV-0500-10E0-2
Sartoclear Dynamics® Lab V, 500 mL, 20 g		
Filtration of up to 500 mL with 20 g DE per unit Contents: 1 × 180E04---------E (12 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-20.0-----E (12 × pouches of filter aid, 20 g)	12	SDLV-0500-20E0-E

Sartoclear Dynamics® Lab V1000 Kits		
Sartoclear Dynamics® Lab V, 1,000 mL, 10 g		
Filtration of up to 1 L with 10 g of DE per unit Contents: 2 × 180E05---------E (24 × Sartolab® RF 1000, 0.22 µm PES) 1 × SDLKG-10.0------2 (24 × pouches of filter aid, 10 g)	24	SDLV-1000-10E0-2
Sartoclear Dynamics® Lab V, 1,000 mL, 20 g		
Filtration of up to 1 L with 20 g of DE per unit Contents: 1 × 180E05---------E (12 × Sartolab® RF 1000, 0.22 µm PES) 1 × SDLKG-20.0-----E (12 × pouches of filter aid, 20 g)	24	SDLV-1000-20E0-E
Sartoclear Dynamics® Lab V, 1,000 mL, 40 g		
Filtration of up to 1 L with 40 g of DE per unit Contents: 1 × 180E05---------E (12 × Sartolab® RF 1000, 0.22 µm PES) 2 × SDLKG-20.0-----E (24 × pouches of filter aid, 20 g)	12	SDLV-1000-40E0-E



Basic Filtration

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Introduction

Filters are indispensable for your routine work in laboratory and industrial applications. Sartorius supplies you with a broad range of filters for a myriad of filtration tasks and supports you with all your filtration challenges.

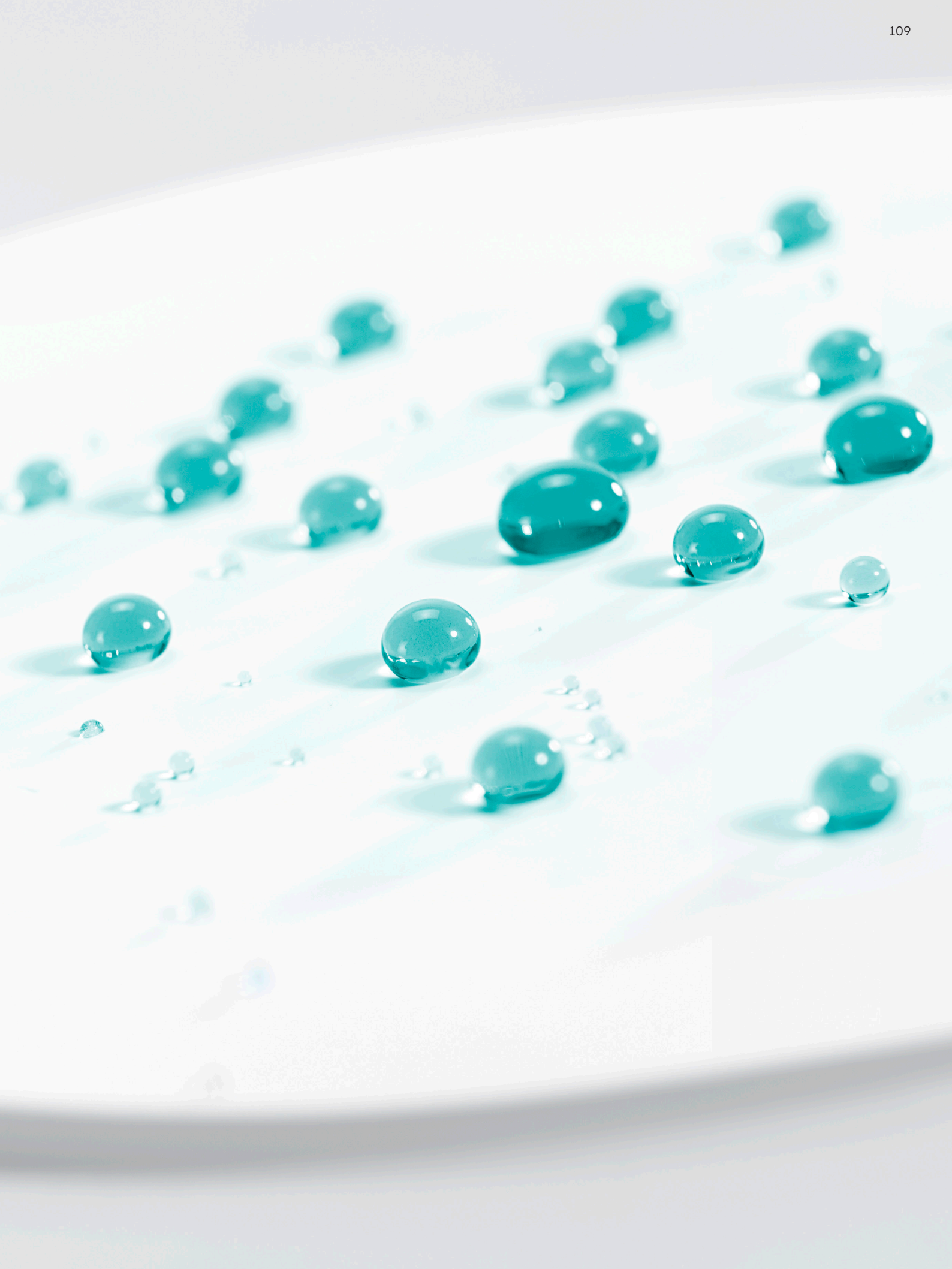
Our Product Range Covers:
- Filter papers
- Glass and quartz microfiber filters
- Membrane filters
- Blotting & chromatography papers & membranes
- Filtration equipment

Quality Assurance and Quality Control
Sartorius pays particular attention to continuous in-process quality control. Regular checks and exact analyses of the raw materials and each finished product assure constant high quality and product uniformity.

We meet the requirements set forth by the ISO 9001 quality management system and the ISO 14001 environmental management system.

How Do Filter Papers Work?
Filter papers are depth filters. Their efficiency is influenced by various parameters: the mechanical particulate retention, adsorption, pH, surface properties, thickness and strength of the filter paper as well as the shape, density and quantity of particles to be retained. The precipitates deposited on the filter form a "cake layer" which – depending on its density – increasingly affects the progress of an ongoing filtration and decisively affects the retention capability. Therefore, it is essential to select the perfect filter paper to ensure the best filtration results. This choice depends on the filtration method as well as on the amount and properties of the medium to be filtered, the size of the particulate solids to be removed and the required degree of clarification.

How Do Membrane Filters Work?
Membrane filters retain particles larger than their pore sizes. Smaller particles pass through the membrane or are captured in the membrane. Such filters are used for the filtration of smaller particles and for critical applications such as sterility testing. The choice of the right membrane type depends on the specifications of the solution to be filtered. The most important parameters for this are adsorption, chemical compatibility and the particle size to be retained.



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 α-cellulose content of > 98% and are acid-washed to make the papers ashless and achieve high purity.

Typical Values

Grade	Weight (g/m²)	Thickness (mm)	Particle retention (µm)	Filtration (s)	Precipitates	Properties
■ 388	84	0.21	12 – 15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
□ 389	84	0.19	8 – 12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
■ 392	84	0.17	5 – 8	50	Fine crystalline	Medium dense, medium fast filtering
■ 390	84	0.16	3 – 5	100	Fine crystalline	Narrow-pore, dense, slow filtering
■ 391	84	0.15	2 – 3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
■ 393	100	0.18	1 – 2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 388	Grade 389	Grade 390	Grade 391	Grade 392	Grade 393
55	FT-3-101-055	FT-3-102-055	FT-3-103-055	FT-3-104-055	FT-3-105-055	FT-3-127-055
70	FT-3-101-070	FT-3-102-070	FT-3-103-070	FT-3-104-070	FT-3-105-070	FT-3-127-070
90	FT-3-101-090	FT-3-102-090	FT-3-103-090	FT-3-104-090	FT-3-105-090	FT-3-127-090
110	FT-3-101-110	FT-3-102-110	FT-3-103-110	FT-3-104-110	FT-3-105-110	FT-3-127-110
125	FT-3-101-125	FT-3-102-125	FT-3-103-125	FT-3-104-125	FT-3-105-125	FT-3-127-125
150	FT-3-101-150	FT-3-102-150	FT-3-103-150	FT-3-104-150	FT-3-105-150	FT-3-127-150
185	FT-3-101-185	FT-3-102-185	FT-3-103-185	FT-3-104-185	FT-3-105-185	FT-3-127-185
240	FT-3-101-240	FT-3-102-240	FT-3-103-240	FT-3-104-240	FT-3-105-240	FT-3-127-240



Folded Filters, 100 pieces

Ø in mm	Grade 388	Grade 389	Grade 390	Grade 391	Grade 392
110	FT-4-101-110	FT-4-102-110	FT-4-103-110	FT-4-104-110	FT-4-105-110
125	FT-4-101-125	FT-4-102-125	FT-4-103-125	FT-4-104-125	FT-4-105-125
150	FT-4-101-150	FT-4-102-150	FT-4-103-150	FT-4-104-150	FT-4-105-150
185	FT-4-101-185	FT-4-102-185	FT-4-103-185	FT-4-104-185	FT-4-105-185
240	FT-4-101-240	FT-4-102-240		FT-4-104-240	



Sheets in 580 × 580 mm, 100 pieces

Grade 388	Grade 389	Grade 390	Grade 391	Grade 392	Grade 393
FT-2-101-580580	FT-2-102-580580	FT-2-103-580580	FT-2-104-580580	FT-2-105-580580	FT-2-127-580580

Other dimensions are available on request

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% α-cellulose content and are very pure with an ash content ≤ 0.1%.

Typical Values

Grade	Weight (g/m²)	Thickness (mm)	Particle retention (µm)	Filtration (s)	Precipitates	Properties
1288	84	0.21	12 – 15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
1289	84	0.21	8 – 12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
1292	84	0.17	5 – 8	20	Fine crystalline	Medium dense, medium fast filtering
1290	84	0.15	3 – 5	100	Fine crystalline	Narrow-pore, dense, slow filtering
1291	84	0.15	2 – 3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
293	80	0.15	1 – 2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
55	FT-3-206-055	FT-3-207-055	FT-3-208-055	FT-3-209-055	FT-3-210-055	FT-3-211-055
70	FT-3-206-070	FT-3-207-070	FT-3-208-070	FT-3-209-070	FT-3-210-070	FT-3-211-070
90	FT-3-206-090	FT-3-207-090	FT-3-208-090	FT-3-209-090	FT-3-210-090	FT-3-211-090
110	FT-3-206-110	FT-3-207-110	FT-3-208-110	FT-3-209-110	FT-3-210-110	FT-3-211-110
125	FT-3-206-125	FT-3-207-125	FT-3-208-125	FT-3-209-125	FT-3-210-125	FT-3-211-125
150	FT-3-206-150	FT-3-207-150	FT-3-208-150	FT-3-209-150	FT-3-210-150	FT-3-211-150
185	FT-3-206-185	FT-3-207-185	FT-3-208-185	FT-3-209-185	FT-3-210-185	FT-3-211-185
240	FT-3-206-240	FT-3-207-240	FT-3-208-240	FT-3-209-240	FT-3-210-240	



Folded Filters, 100 pieces

Ø in mm	Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
110	FT-4-206-110	FT-4-207-110	FT-4-208-110	FT-4-209-110	FT-4-210-110	
125	FT-4-206-125	FT-4-207-125	FT-4-208-125	FT-4-209-125	FT-4-210-125	FT-4-211-125
150	FT-4-206-150	FT-4-207-150	FT-4-208-150	FT-4-209-150	FT-4-210-150	FT-4-211-150
185	FT-4-206-185	FT-4-207-185	FT-4-208-185	FT-4-209-185	FT-4-210-185	FT-4-211-185
240	FT-4-206-240	FT-4-207-240	FT-4-208-240	FT-4-209-240	FT-4-210-240	FT-4-211-240



Sheets in 580 × 580 mm, 100 pieces

Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
FT-2-206-580580	FT-2-207-580580	FT-2-208-580580	FT-2-209-580580	FT-2-210-580580	FT-2-211-580580

Other dimensions are available on request

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.

Typical Values

Grade	Weight (g/m²)	Thickness (mm)	Particle retention (µm)	Filtration (s)	Material
292	87	0.18	5 – 8	45	Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370
292a	97	0.19	4 – 7	60	Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370
132	80	0.17	5 – 7	55	Cotton linters and refined pulp, low-phosphate and low-potassium, ash content < 0.02 % according to DIN 54370
131	80	0.16	3 – 5	100	Cotton linters and refined pulp, low-phosphate and low-potassium, ash content < 0.02 % according to DIN 54370

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 131	Grade 132	Grade 292	Grade 292a
55		FT-3-329-055	FT-3-205-055	FT-3-215-055
70		FT-3-329-070	FT-3-205-070	FT-3-215-070
90		FT-3-329-090	FT-3-205-090	FT-3-215-090
110		FT-3-329-110	FT-3-205-110	FT-3-215-110
125	FT-3-351-125	FT-3-329-125	FT-3-205-125	FT-3-215-125
150		FT-3-329-150	FT-3-205-150	FT-3-215-150
185		FT-3-329-185	FT-3-205-185	FT-3-215-185
240		FT-3-329-240	FT-3-205-240	FT-3-215-240



Folded Filters, 100 pieces

Ø in mm	Grade 131	Grade 132	Grade 292	Grade 292a
110	FT-4-351-110	FT-4-329-110	FT-4-205-110	FT-4-215-110
125	FT-4-351-125	FT-4-329-125	FT-4-205-125	FT-4-215-125
150	FT-4-351-150	FT-4-329-150	FT-4-205-150	FT-4-215-150
185	FT-4-351-185	FT-4-329-185	FT-4-205-185	FT-4-215-185
240		FT-4-329-240	FT-4-205-240	FT-4-215-240



Sheets in 580 × 580 mm, 100 pieces

Grade 292	Grade 292a
FT-2-205-580580	FT-2-215-580580

Other dimensions are available on request

Filter Papers

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. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. They are made of refined pulp and linters with an > 95% α-cellulose content, are very pure with an ash content between < 0.1 to 0.15%. Below you will find an overview of the most commonly used grades.

Typical Values

Grade	Surface	Weight (g/m^2)	Thickness (mm)	Particle Retention (µm)	Filtration (s)	Wet Burst Resistance (kPa)	Properties
3 hw	Smooth	65	0.14	8 – 12	20	40	Medium fast filtering, filter paper for routine work in the lab
4 b	Smooth	75	0.15	8 – 12	22	> 15	Medium fast filtering, filtration of coarse precipitates, wick paper for seed testing
603/N	Crêped	75	0.25	> 15	8	≥ 50	Fast filtering, filtration of sugar solutions
6	Smooth	80	0.17	10 – 13	15	30	Fast filtering, degassing beer before analysis, clarification of spirits
100/N	Smooth	85	0.18	6 – 8	30	80	Medium fast filtering, ash content < 0.1%, low potassium and sodium content, determination of the sugar content
5 H/N	Crêped	85	0.28	> 40	3	≥ 40	Very fast filtering, wide-pore, filtration of essential oils
3 S/h	Smooth	200	0.36	5 – 7	55	15	Medium fast to slow filtering, narrow-pore, re-wet test for diapers

Ordering Information



Filter Discs

Ø in mm	Grade 3 hw (100 Pieces)	Grade 4 b (100 Pieces)	Grade 603/N (100 Pieces)	Grade 6 (100 Pieces)	Grade 100/N (100 Pieces)	Grade 5 H/N (100 Pieces)	Grade 3 S/h (50 Pieces)
55	FT-3-303-055	FT-3-309-055		FT-3-312-055	FT-3-328-055		FT-3-307-055
70	FT-3-303-070	FT-3-309-070		FT-3-312-070	FT-3-328-070		
90	FT-3-303-090	FT-3-309-090	FT-3-335-090	FT-3-312-090	FT-3-328-090	FT-3-423-090	FT-3-307-090
110	FT-3-303-110	FT-3-309-110	FT-3-335-110	FT-3-312-110	FT-3-328-110		FT-3-307-110
125	FT-3-303-125	FT-3-309-125	FT-3-335-125	FT-3-312-125	FT-3-328-125	FT-3-423-125	FT-3-307-125
150	FT-3-303-150	FT-3-309-150	FT-3-335-150	FT-3-312-150	FT-3-328-150	FT-3-423-150	FT-3-307-150
185	FT-3-303-185	FT-3-309-185	FT-3-335-185	FT-3-312-185	FT-3-328-185	FT-3-423-185	FT-3-307-185
240	FT-3-303-240	FT-3-309-240	FT-3-335-240	FT-3-312-240	FT-3-328-240	FT-3-423-240	FT-3-307-240



Folded Filters, 100 pieces

Ø in mm	Grade 3 hw	Grade 4 b	Grade 603/N	Grade 6	Grade 100/N	Grade 5 H/N
125	FT-4-303-125	FT-4-309-125	FT-4-335-125	FT-4-312-125		FT-4-423-125
150	FT-4-303-150	FT-4-309-150	FT-4-335-150	FT-4-312-150	FT-4-328-150	FT-4-423-150
185	FT-4-303-185	FT-4-309-185	FT-4-335-185	FT-4-312-185		FT-4-423-185
240	FT-4-303-240	FT-4-309-240	FT-4-335-240	FT-4-312-240	FT-4-328-240	FT-4-423-240
270	FT-4-303-270	FT-4-309-270	FT-4-335-270	FT-4-312-270	FT-4-328-270	FT-4-423-270
320	FT-4-303-320	FT-4-309-320	FT-4-335-320	FT-4-312-320	FT-4-328-320	FT-4-423-320



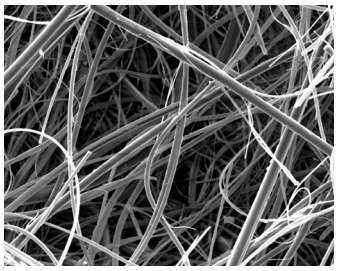
Sheets in 580 × 580 mm, 100 pieces

Grade 3 hw	Grade 4 b	Grade 603/N	Grade 6	Grade 100/N	Grade 5 H/N
FT-2-303-580580	FT-2-309-580580	FT-2-335-580580	FT-2-312-580580	FT-2-328-580580	FT-2-423-580580

Other dimensions are available on request

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, are resistant to most chemicals and withstand temperatures up to 500 °C (grade 550-HA up to 550 °C).

Typical Values

Grade	Weight (g/m²)	Thickness (mm)	Penetration 0.3 µm (%)*	Particle retention in liquids (µm)	Filtration speed (mL/min)	Fulfills the requirements in EN 872:2005 (weigh loss)
MGA	58	0.24	<0.001	1.6	435	Yes
MGB	145	0.66	<0.001	1.0	500	
MGC	56	0.24	<0.001	1.2	320	Yes
MGD	118	0.51	<0.01	2.7	885	
MGF	78	0.36	<0.001	0.7	135	
MGG	67	0.29	<0.001	1.5	570	
13440	88	0.44		0.7	120	Yes
MG 160	73	0.33	<0.001	1.2	410	
MG 550-HA	65	0.27		1.5	500	

* Measurement according to EN 143 (0.3 µm, 5.3 cm/s, paraffin oil)

Ordering Information

Filter Discs

Ø in mm	MGA (100 pieces)	MG 160 (50 pieces)	MGB (50 pieces)	MGC (100 pieces)	MGD (50 pieces)
21			FT-3-1102-021		
25	FT-3-1101-025		FT-3-1102-025	FT-3-1103-025	FT-3-1104-025
37	FT-3-1101-037	FT-3-01110-037			
47	FT-3-1101-047	FT-3-01110-047	FT-3-1102-047	FT-3-1103-047	FT-3-1104-047
50	FT-3-1101-050	FT-3-01110-050	FT-3-1102-050	FT-3-1103-050	FT-3-1104-050
55	FT-3-1101-055		FT-3-1102-055	FT-3-1103-055	
70	FT-3-1101-070	FT-3-01110-070	FT-3-1102-070	FT-3-1103-070	FT-3-1104-070
80	FT-3-1101-080				
90	FT-3-1101-090	FT-3-01110-090	FT-3-1102-090	FT-3-1103-090	FT-3-1104-090
100	FT-3-1101-100	FT-3-01110-100	FT-3-1102-100	FT-3-1103-100	FT-3-1104-100
110	FT-3-1101-110	FT-3-01110-110	FT-3-1102-110	FT-3-1103-110	FT-3-1104-110
125	FT-3-1101-125		FT-3-1102-125	FT-3-1103-125	FT-3-1104-125
150	FT-3-1101-150		FT-3-1102-150	FT-3-1103-150	FT-3-1104-150
293					FT-3-1104-293

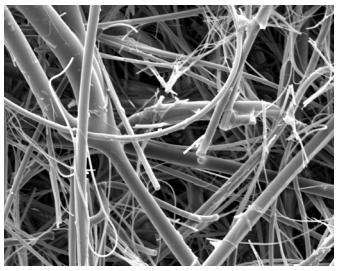
Ø in mm	MGF (100 pieces)	MGG (100 pieces)	MG 550-HA (100 pieces)	13440*
24			FT-3-01147-024	
25	FT-3-1105-025	FT-3-1106-025		
42				13440--42------Q
44				13440--44------Q
47	FT-3-1105-047	FT-3-1106-047	FT-3-01147-047	13440--47------Q
50	FT-3-1105-050	FT-3-1106-050	FT-3-01147-050	13440--50------Q
55	FT-3-1105-055	FT-3-1106-055	FT-3-01147-055	
70	FT-3-1105-070	FT-3-1106-070	FT-3-01147-070	
90	FT-3-1105-090	FT-3-1106-090	FT-3-01147-090	
100				13440-100------K
110	FT-3-1105-110	FT-3-1106-110	FT-3-01147-110	
125	FT-3-1105-125	FT-3-1106-125	FT-3-01147-125	
130				13440-130------K
150	FT-3-1105-150	FT-3-1106-150		
293	FT-3-1105-293			13440-293------K

* Q = 500 pieces | K = 50 pieces
Other dimensions are available on request



Glass Microfiber Filters

With Binder



These filters are mostly used either for monitoring air and gas or as a prefilter. They are manufactured with synthetic binding agents to ensure that the filter has a defined strength. They are mechanically and chemically stable, have a temperature resistance up to 180 °C and – depending on the binding agent used – are either hydrophobic or hydrophilic.

Typical Values

Grade	Weight (g/m^2)	Thickness (mm)	Penetration 0.3 µm (%)*	Pressure drop 5.3 cm/s (Pa)	Binding agent
MG 227/1/60	60	0.32	< 0.5	260	Hydrophobic
13430	220	1.25	0.02	360	Hydrophilic
13400	73	0.39	0.015	363	Hydrophilic
MG 400 XA	75	0.35	<0.001	425	Hydrophobic
MG 1387/1	90	0.38	≤0.003	400	Hydrophilic

* Tested and classified according to the Standard EN 143

Ordering Information

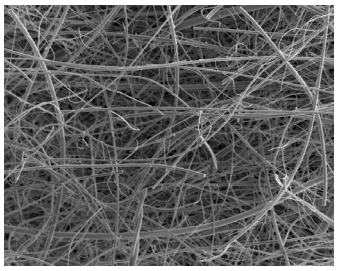


Filter Discs

Ø in mm	MG 227/1/60 (100 pieces)	13430*	13400*	MG 1387/1 (50 pieces)
13			13400--13------S	
20			13400--20------S	
25			13400--25------Q	
42			13400--42------Q	
44			13400--44------Q	
45			13400--45------Q	FT-3-01125-045
47		13430--47------S	13400--47------Q	FT-3-01125-047
50			13400--50------Q	FT-3-01125-050
55				FT-3-01125-055
80			13400--80------N	
100		13430-100------K	13400-100------K	
110				FT-3-01125-110
120			13400-120------K	
124			13400-124------K	
125				FT-3-01125-125
127		13430-127------K	13400-127------K	
130		13430-130------K	13400-130------K	FT-3-01125-130
142		13430-142------K	13400-142------K	
150	FT-3-01124-150		13400-150------K	
257		13430-257––K	13400-257------K	
260			13400-260––K	
279		13430-279------K	13400-279------K	
293		13430-293------K	13400-293------K	

** K= 50 pieces, N= 100 pieces, Q = 500 pieces, S= 200 pieces
Other dimensions are available on request

Quartz Microfiber Filters



The quartz microfiber material of the Sartorius pre-heated filters, grade Q3400, is made of high-purity quartz microfibers without any addition of glass microfibers or binding agents. In addition, the Q3400 filter grade is tempered to remove all chemically combined water and to give the filters excellent weight and dimensional stability. Sartorius filters are especially suitable for emissions monitoring at temperatures of up to 900 °C and wherever filters of the highest purity are needed.

Typical Values

Grade	Material	Weight (g/m^2)	Thickness (mm)	Penetration, 0.3 µm 15 cm/s*	Temperature Resistance
Q3400	100% Quartz microfiber silicium dioxide (SiO_2)	85	0.43	<0.002	up to 900 °C

* Tested and classified according to the Standard EN 143

Ordering Information

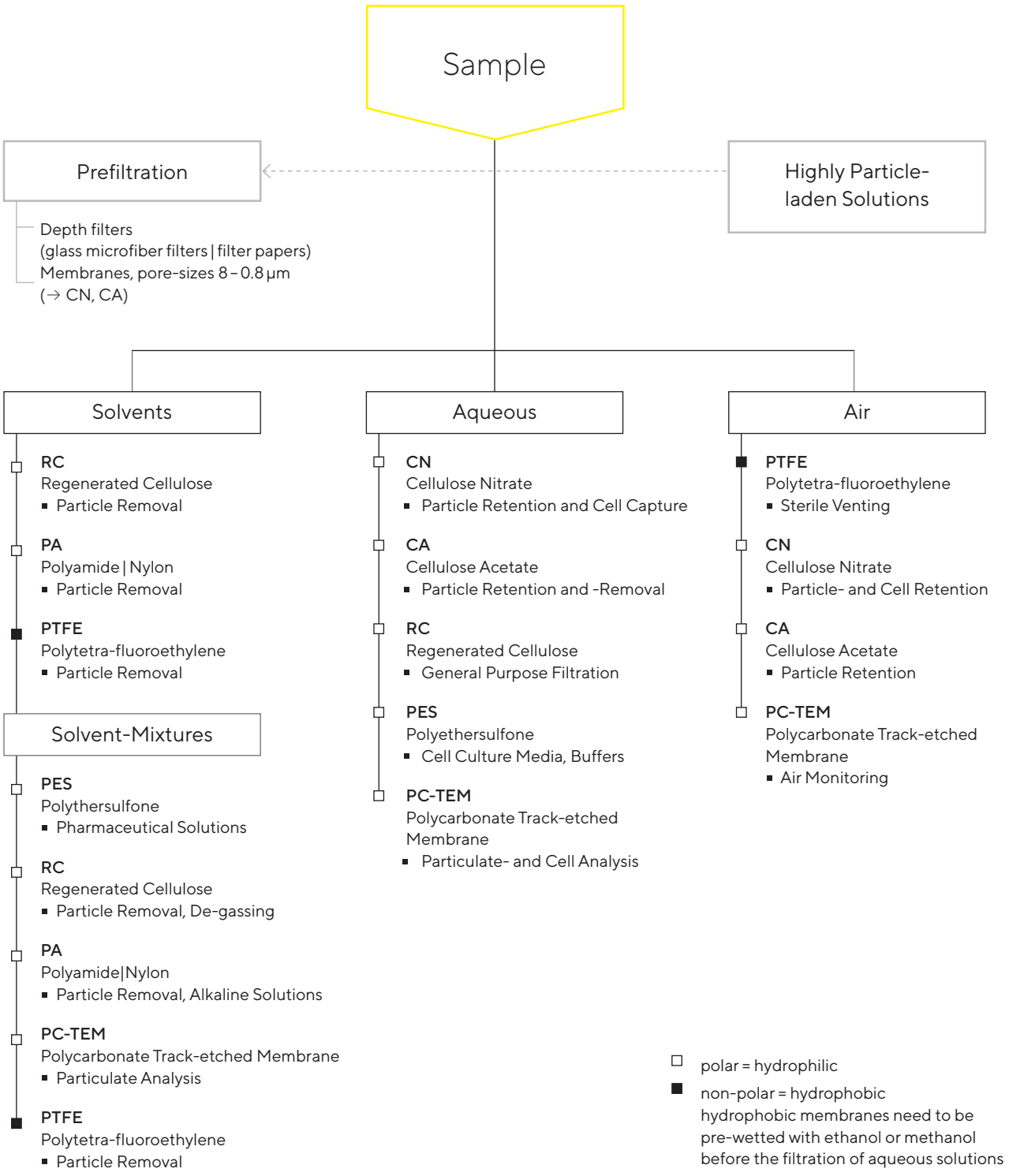


Filter Discs

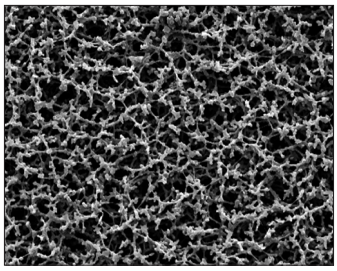
Ø in mm	Q3400
20	Q3400--20------G
25	Q3400--25------G
30	Q3400--30------G
37	Q3400--37------G
45	Q3400--45------G
47	Q3400--47------G
50	Q3400--50------G
82	Q3400--82------N
90	Q3400--90------N
142	Q3400-142------K
150	Q3400-150------K

* G = 25 pieces, K = 50 pieces, N = 100 pieces
Other dimensions as well as sheets are available on request

Membrane Filtration – Quick Selection Guide



Cellulose Nitrate (Mixed Cellulose Ester)



Cellulose nitrate membrane filters are indicated for many general laboratory applications where a membrane with a high non-specific adsorption is suitable. They are hydrophilic, have high flow rates thanks to their symmetric structure and are compatible with aqueous solutions (pH 4 to 8), hydrocarbons and several other organic solvents. The cellulose nitrate membranes are available in different pore sizes from 0.2 µm to 8 µm.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm²/bar)	Burst Pressure (bar)
11327	0.2	130	≥ 4.4	25	≥ 0.8
11306	0.45	120	≥ 2.4	68	≥ 0.2
11305	0.65	130	≥ 2	102	≥ 0.25
11304	0.8	130	≥ 1.5	5*	≥ 0.2
11303	1.2	130	≥ 1	7*	≥ 0.2
11302	3	140	≥ 0.6	16*	≥ 0.15
11342	5	140	≥ 0.5	25*	≥ 0.15
11301	8	140	≥ 0.3	37*	≥ 0.15

*Flow rate for air [L/(m²s)])

Ordering Information

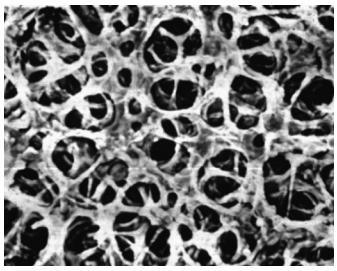
Filter Discs

Ø in mm	11301 (8 µm)*	11302 (3 µm)*	11303 (1.2 µm)*	11304 (0.8 µm)*
13	11301--13------N	11302--13------N	11303--13------N	11304--13------N
20				11304--20------N
25	11301--25------N	11302--25------N	11303--25------N	11304--25------N
37	11301--37------N			11304--37------N
47	11301--47------N	11302--47------N	11303--47------N	11304--47------N
50	11301--50------N	11302--50------N	11303--50------N	11304--50------N
70	11301--70------G			
90		11302--90------G	11303--90------G	11304--90------G
100	11301-100------N	11302-100------G	11303-100------G	11304-100------G
142	11301-142------G	11302-142------G		
142			11303-142------G	11304-142------G
150	11301-150------G	11302-150------G	11303-142------N	11304-142------N
293	11301-293------G	11302-293------G	11303-293------G	11304-293------G

Ø in mm	11305 (0.65 µm)*	11306 (0.45 µm)*	11327 (0.2 µm)*	11342 (5 µm)*
13	11305--13------N	11306--13------N	11327--13------N	11342--13------N
20		11306--20------N		
25	11305--25------N	11306--25------N	11327--25------N	11342--25------N
37		11306--37------N		
47	11305--47------N	11306--47------N	11327--47------N	11342--47------N
50	11305--50------N	11306--50------N		11342--50------N
85		11306--85------N		
90		11306--90------N		11342--90------G
100	11305-100------N	11306-100------N		11342-100------G
110		11306-110------N		
142	11305-142------G	11306-142------G	11327-142------N	11342-142------G
142				11342-142------N
293	11305-293------G	11306-293------G		

* G = 25 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Cellulose Acetate



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. They are hydrophilic, have high flow rates thanks to their symmetric structure and are compatible with aqueous solutions (pH 4 – 8), oils, alcohols and other organic solvents. The 0.2 µm membrane is the filter of choice for sterile filtration of aqueous solutions, such as nutrient media, buffers and sera. The cellulose acetate membranes are available in different pore sizes from 0.2 to 5 µm.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm²/bar)	Burst Pressure (bar)
11107	0.2	120	≥ 2.9**	24	≥ 0.8
11106	0.45	120	≥ 2.0	65	≥ 0.4
11105	0.65	120	≥ 1.3	116	≥ 0.7
11104	0.8	120	≥ 0.8	6*	≥ 0.3
12303	1.2	140	≥ 0.6	10*	≥ 0.4
12342	5	140	≥ 0.3	23	≥ 0.25

*Flow rate for air [L/(m²s)]
** with Sartocheck®

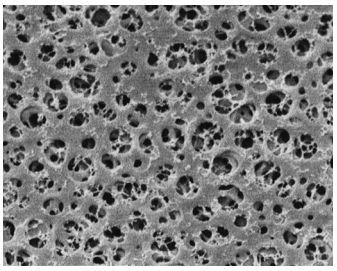
Ordering Information

Filter Discs

Ø in mm	11104 (0.8 µm)*	11105 (0.65 µm)*	11106 (0.45 µm)*	11107 (0.2 µm)*	12303 (1.2 µm)*	12342 (5 µm)*
13	11104--13------N		11106--13------N	11107--13------N		
25	11104--25------N	11105--25------N	11106--25------N	11107--25------N	12303--25------N	12342--25------N
30			11106--30------N	11107--30------N		
37	11104--37------N		11106--37------N			
45						
47	11104--47------N	11105--47------N	11106--47------N	11107--47------N	12303--47------N	12342--47------N
50	11104--50------N	11105--50------N	11106--50------N	11107--50------N	12303--50------N	
70						
85			11106--85------N			
90	11104--90------N	11105--90------G	11106--90------G	11107--90------G		
100			11106-100------N	11107-100------N	12303-100------G	
110			11106-110------N			
142	11104-142------G	11106-142------G		11107-142------G		12303-142------G
142	1104-142------N	11106-142------N		11107-142------N		12303-142------N
293			11106-293------N		11107-293------G	
293			11106-293------G		11107-293------N	

* G = 25 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Regenerated Cellulose



The very low adsorption membranes are hydrophilic, solvent-resistant (pH 3 – 12) and therefore suited for the particle removal from solvents. The membrane is reinforced with nonwoven cellulose. They are available in two pore sizes: 0.45 µm and 0.2 µm.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm²/bar)
18407	0.2	150	≥ 4.5	16
18406	0.45	150	≥ 2.9	32

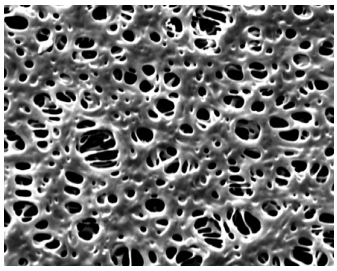
Ordering Information

Filter Discs

Ø in mm	18406 (0.45 µm)*	18407 (0.2 µm)*
13	18406--13------N	18407--13------N
25	18406--25------N	18407--25------N
47	18406--47------N	18407--47------N
50	18406--50------N	18407--50------N
90	18406--90------G	
100	18406-100------G	18407-100------G
142	18406-142------G	18407-142------G
142		18407-142------N
293	18406-293------G	18407-293------G

* G = 25 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Polyethersulfone



Polyethersulfone (PES) membrane filters are hydrophilic, have high flow rates, a low non-specific protein adsorption and are chemically resistant over a pH range of 1 – 14. They are therefore recommended for the filtration of aqueous solutions as well for protein filtration. Furthermore, the low level of extractables makes them suitable for environmental analysis.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL | min | cm² | bar)	Burst Pressure (bar)
15458	0.1	150	≥ 2.5*	9	0.5
15407MI	0.2	150	≥ 3.2	30	0.4
15406	0.45	150	≥ 2.6	56	0.4
15404	0.8	150	≥ 1.1	125	≥ 0.2

*with isopropyl alcohol | water 60 vol% | 40 vol%

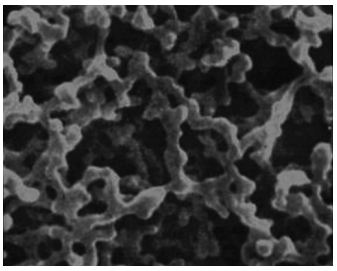
Ordering Information

Filter Discs

Ø in mm	15406 (0.45 µm)*	15407MI (0.2 µm)*	15458 (0.1 µm)*	15404 (0.8 µm)
25	15406--25------N	15407--25----MIN	15458--25------N	
47	15406--47------N	15407--47----MIN	15458--47------N	
50	15406--50------N	15407--50----MIN	15458--50------N	
90		15407--90----MIK		
142	15406-142------G	15407-142----MIG		
293		15407-293----MIG	15458-293------G	15458-293------G

* G = 25 pieces, K = 50 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Polyamide



Polyamide membrane filters are hydrophilic and chemically resistant to alkaline solutions and organic solvents. They are therefore recommended for the particle removal from aqueous solutions and solvents for analytical determination such as HPLC, for the sterile filtration of these liquids as well as for applications where a membrane with a relatively high non-specific adsorption is suitable.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm²/bar)	Burst Pressure (bar)
25007	0.2	110	3.3	24	≥ 0.25
25006	0.45	110	≥ 2.3	46	≥ 0.23

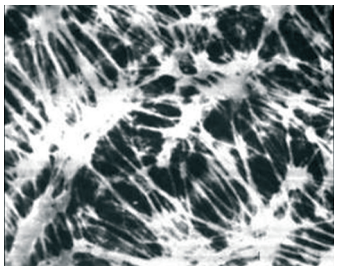
Ordering Information

Filter Discs

Ø in mm	**25006 (0.45 µm)***	**25007 (0.2 µm)***
13	25006--13------N	25007--13------N
25	25006--25------N	25007--25------N
47	25006--47------N	25007--47------N
50	25006--50------N	25007--50------N
90	25006--90------G	25007--90------G
142	25006-142------N	25007-142------N
293		25007-293------G
293	25006-293------N	25007-293------N

* G = 25 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Hydrophobic PTFE



The main application of these membrane filters is the filtration of air, gases or chemicals. They are made of PTFE (polytetra-fluorethylene) only 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 (pH 1 to 14), 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.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point with Isopropylalcohol [bar], visual	Isopropanol Flow Rate (mL/min/cm²/bar)
11807	0.2	60	≥ 1.2	9
11806	0.45	80	≥ 0.9	20
11803	1.2	100		86
11842	5	100		250

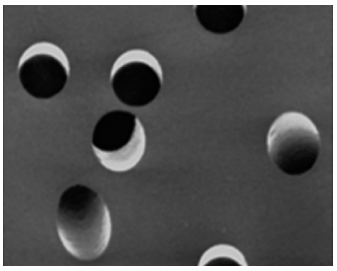
Ordering Information

Filter Discs

Ø in mm	11803 (1.2 µm)*	11806 (0.45 µm)*	11807 (0.2 µm)*	11842 (5 µm)*
13	11803--13------N	11806--13------N	11807--13------N	
25	11803--25------N	11806--25------N	11807--25------N	11842--25------N
37	11803--37------N	11806--37------N		
42				11842--42------N
47	11803--47------N	11806--47------N	11807--47------N	11842--47------N
50	11803--50------N	11806--50------N	11807--50------N	11842--50------N
90	11803--90------G	11806--90------G	11807--90------G	
100	11803-100------G	11806-100------G	11807-100------G	11842-100------G
142	11803-142------G	11806-142------G	11807-142------G	11842-142------G
293	11803-293------G	11806-293------G	11807-293------G	11842-293------G

* G = 25 pieces, K = 50 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Polycarbonate Track-Etched



Those white and hydrophilic polycarbonate track-etched filters are manufactured from high grade polycarbonate film using track-etch technology. Their capillary pore structure is uniform and precise, with a narrow pore size distribution to retain particles on their surface. Track-etched filters are an excellent choice for accurate fractionation of particulates because of their precise pore size. Track-etch technology offers the user distinct performance advantages when excellent surface capture and high sample visibility are required. Their main applications are particulate analysis, epifluorescence microscopy, fluid clarification, cytology, cell biology, bioassays, water microbiology and environmental analysis.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm²/0.7 bar)	Burst Pressure (bar)
23058	0.1	25	≥ 7.0	≥ 0.5	≥ 0.7
23007	0.2	25	≥ 3.5	≥ 10	≥ 0.7
23006	0.4	25	≥ 2.0	≥ 30	≥ 0.7
23004	0.8	25	≥ 0.6	≥ 40	≥ 0.7
23A42	5	11	N/A	50*	N/A
23015	15	37	N/A	100*	N/A

*Flow rate for air [L/(m²s 0.7 bar)]

Ordering Information

Filter Discs, 100 Pieces

Ø in mm	23004 (0.8 µm)	23006 (0.4 µm)	23007 (0.2 µm)	23058 (0.1 µm)
25	23004--25------N	23006--25------N	23007--25------N	23058--25------N
47		23006--47------N	23007--47------N	23058--47------N
50			23007--50------N	

Ø in mm	23A42 (5µm)	23015 (15µm)
47	23A42--47------N	23015--47------N

Other dimensions and packaging units are available on request

Blotting | Chromatography Papers



These papers are made of cotton linters only with α-cellulose content of > 98%. These highly pure papers are not only ideal for blotting and chromatography, but also for a wide range of absorption applications like those common in the life sciences and diagnostics. Below you will find an overview of the most commonly used grades.

Typical Perfomance Characteristics

Grade	Weight (g/m^2)	Thickness (mm)	Capillary Rise (mm/30 min)	Capillary Rise (mm/10 min)	Properties
FN 4	125	0.24	95		Chromatography paper, ash content < 0.04%
FN 7	150	0.32	145		Chromatography paper, ash content < 0.04%
FN 30	320	0.90	240		Chromatography paper, ash content < 0.04%, paper for antibiotic test strips
FN 100	195	0.35	115	70	The most commonly used chromatography and blotting paper
BF 3	330	0.76	30	130	Blotting paper to increase and maintain the transport of liquids

Ordering Information

Sheets in 580 × 600 mm

Grade FN 4 (100 Sheets)	Grade FN 7 (50 Sheets)	Grade FN 30 (25 Sheets)	Grade FN 100 (50 Sheets)	Grade BF 3 (50 Sheets)
FT-2-504-580600N	FT-2-507-580600K	FT-2-526-580600G	FT-2-527-580600K	FT-2-520-580600K

Other dimensions and packaging units are available on request

Nitrocellulose Membrane for Blotting

Sartorius nitrocellulose membranes are available in two pore sizes, 0.22 µm and 0.45 µm. Both versions combine the advantages of high protein binding capacity with low background and high membrane stability, which ensures easy handling. Due to its large surface area, the 0.22 µm membrane version is recommended for small proteins. Sartorius blotting membranes are ideal for western blotting, DNA blotting as well as dot or slot blots. They have been optimized for all protein blotting systems, such as electrotransfer, semi-dry or simple capillary blotting.

Typical Values

	0.22 µm	**0.45 µm**
Material	Cellulose nitrate	Cellulose nitrate
Thickness	130 µm	130 µm
Water flow rate	27 mL/(min. cm^2 bar)	70 mL/(min. cm^2 bar)
Bubble point	4.4 bar	2.4 bar
Wettability in water	≤ 1 s	≤ 1 s
Extractable content in water	≤ 1 %	≤ 1 %
Burst pressure	0.8 bar	0.2 bar
Binding capacity for IgG	200 µg/cm^2	200 µg/cm^2

Ordering Information

	Roll Size	**Order No.**
NC 0.22 µm	30 cm × 3 m	11327------41BL
NC 0.45 µm	30 cm × 3 m	11306------41BL

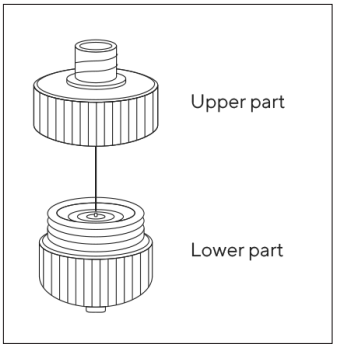
All indicated data to be understood as typical average values



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.

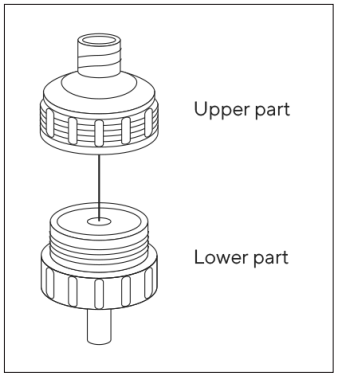
Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for PTFE
Filtration area	0.5 cm^2
Materials	PTFE top and bottom parts
Max. operating pressure	5 bar | 500 kPa | 72.5 psi
Membrane filter Ø	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)

Ordering Information

Description	Order No.
13 mm PTFE Syringe Filter Holder	16574





Polycarbonate Holder for Aqueous Solutions
This inexpensive filter holder is made of clear, autoclavable polycarbonate.
The silicone gasket enables a leak-free filtration at pressures of up to 7 bar by simply screwing it together manually. Filter supports in the top and bottom parts allow filtration in either direction.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Filtration area	0.5 cm^2
Materials	Polycarbonate top and bottom part,silicone gasket
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Membrane filter Ø	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)

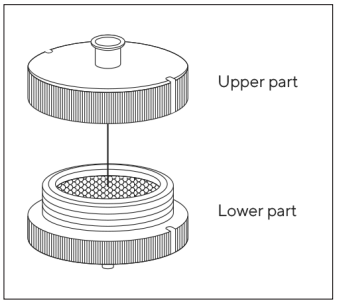
Ordering Information

Description	Order No.
13 mm Polycarbonate Syringe Filter Holder	16514----------E

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

Made of stainless steel, this holder is heat-resistant, 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.

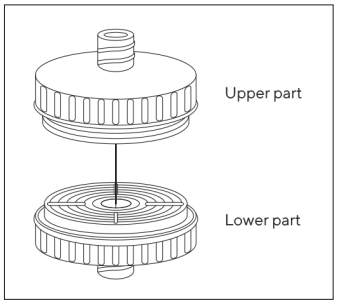
Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for stainless steel
Filtration area	3 cm^2
Materials	Stainless steel (1.4305) top and bottom parts
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Membrane filter Ø	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)

Ordering Information

Description	Order No.
25 mm Stainless Steel Holder	16214
Tightening tool, Polyman 24/5	6980595





Polycarbonate Holder for Aqueous Solutions
This inexpensive filter holder is made of clear, autoclavable polycarbonate. The silicone gasket enables a leak-free filtration at pressures of up to 7 bar by simply screwing it together manually. Filter supports in the top and bottom parts allow filtration in either direction.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Filtration area	3 cm^2
Materials	Polycarbonate top and bottom parts, silicone gasket
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Membrane filter Ø	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)

Ordering Information

Description	Order No.
25 mm Polycarbonate Syringe Filter Holder, pack of 12	16517–––-E
Silicone gasket, 20.5 × 26.5 × 0.5 mm, pack of 10	6980570

25 mm Glass Vacuum Filter Holder

For Hybridization Tests, Particle Testing and Clarification



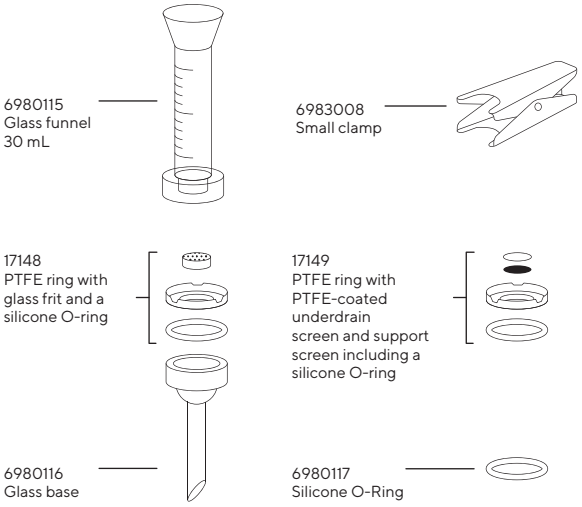


This filter holder is available in two versions differing from each other only in the type of the filter support. The filter with glass frit ensures uniform distribution of retained particles and is therefore recommended when the residue on the filter surface is of interest. Because it is easy to clean, 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. The funnel-shaped top part simplifies filling in the sample.

Specifications

Outlet spout	12 mm Ø
Parts and materials	Borosilicate glass funnel and base PTFE | glass filter support (type 16306) or PTFE | stainless steel filter support, coated with PTFE (type 16315) Silicone O-ring 25 × 3 mm Anodized Aluminium clamp
Chemical compatibility	As for glass, PTFE and silicone. The silicone O-ring can be replaced by a fluoroelastomer O-ring (order no. 00118)
Funnel capacity	30 mL
Filtration area	3 cm²
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	25 mm (or 24 mm)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Note: PTFE rings in sets 17148 and 17149 have different dimensions and are not interchangeable.

Ordering Information

Description	Order No.
Glass vacuum filtration holder for 25 mm (or 24 mm) membrane filter, with glass frit filter support	16306
Glass vacuum filtration holder for 25 mm (or 24 mm) membrane filter, with PTFE-coated screen filter support	16315

Replacement parts are shown in the diagram.

50 mm Glass Vacuum Filter Holder

For Particle Testing or Clarification and Sterile Filtration



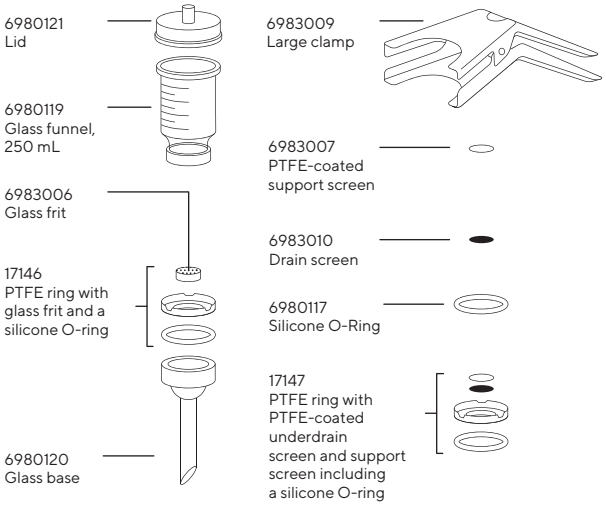


This filter holder is available in two versions differing from each other only in the type of the filter support. The device with glass frit ensures uniform distribution of retained particles and is therefore recommended, when the residue on the filter surface is of interest. Because it is easy to clean, 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 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

Outlet spout	15 mm Ø
Parts and materials	Borosilicate glass funnel and base Silicone caoutchouc lid PTFE	glass filter support (type 16307) or PTFE	stainless steel filter support, coated with PTFE (type 16316) Silicone O-ring 45 × 3 mm Anodized Aluminium clamp
Chemical compatibility	As for glass, PTFE and silicone. The silicone O-ring can be replaced by a fluoroelastomer O-ring (order no. 00124).
Funnel capacity	250 mL
Filtration area	12.5 cm²
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	50 mm (or 47 mm)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Note: PTFE rings in sets 17146 and 17147 have different dimensions and are not interchangeable.

Ordering Information

Description	Order No.
Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with glass frit filter support	16307
Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with PTFE-coated screen filter support	16316

Replacement parts are shown in the diagram.

All-Glass Vacuum Filter Holder

For Analytical Determinations, Particle Removal from Solvents



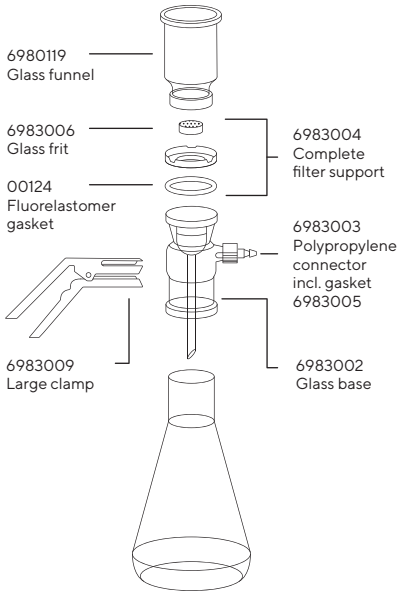


All areas, where liquid and device can come into direct contact, are made of glass or PTFE. The device, in combination with solvent-resistant, hydrophilic RC-membranes, is therefore ideal for ultracleaning and degassing solvents and solvent mixtures for HPLC, GC and AA.

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

Outlet spout	15 mm Ø
Parts and materials	Borosilicate glass funnel, base and flask, sintered glass frit in a PTFE ring and fluoroelastomer O-ring (45 × 3 mm) underneath, anodized aluminium clamp
Chemical compatibility	As for glass and PTFE
Funnel capacity	250 mL
Bottle capacity	1 L
Filtration area	12.5 cm^2
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	50 mm (or 47 mm), 40 or 42 mm prefilter
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



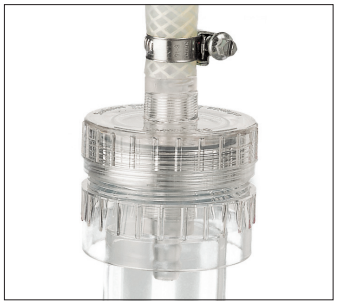
Ordering Information

Description	Order No.
All-glass vacuum filter holder for 50 mm (or 47 mm) membrane filter, with vacuum-resistant flask, capacity 1 liter	16309

Replacement parts are shown in the diagram.

Polycarbonate In-Line Filter Holder

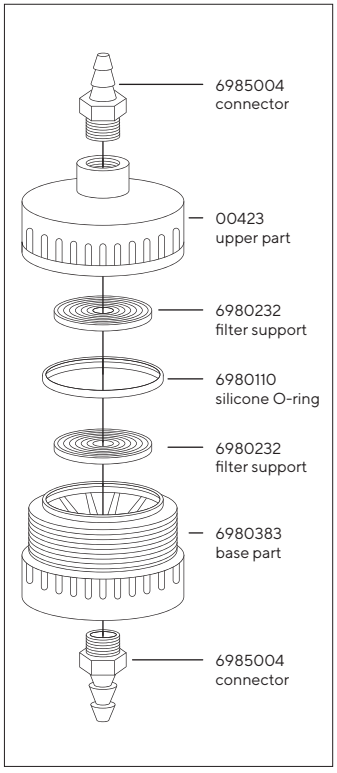
For the Filtration of Liter Volumes of Aqueous Solutions



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 simple 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

Chemical compatibility	As for polycarbonate, polypropylene and silicone
Filtration area	12.5 cm²
Weight	83 g
Connectors	M 12x1 male thread to hose barb DN10
Materials	Polycarbonate top part, base part and hose nipple, polypropylene filter support, silicone O-ring (40 × 5 mm)
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Suitable membrane filter Ø	50 mm (40 or 42 mm prefilter)
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.

Ordering Information

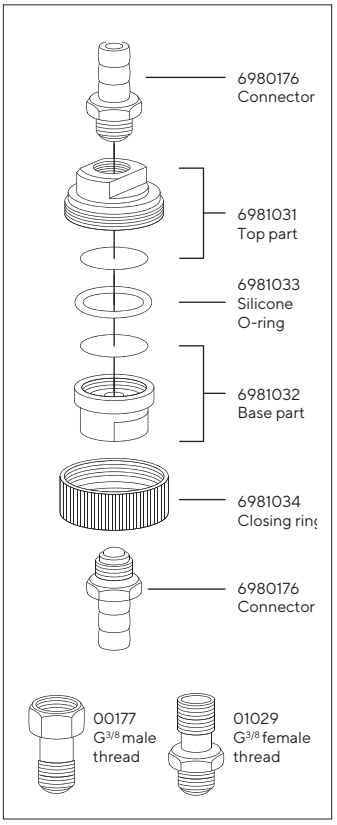
Description	Order No.
Polycarbonate in-line filter holder for 50 mm membrane filter, pack of 5.	16508----------B

Replacement parts are shown in the diagram.

25 mm Stainless Steel Filter Holder

For In-Line Filtration





The G¼ 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 G⅜ female thread (order no. 01029) or onto pressure tanks with G⅜ male thread (order no. 00177).

Specifications

Connectors	M 12x1 male thread to hose barb DN10
Filtration area	3 cm²
Weight	ca. 170 g
Materials	Stainless steel, except silicone O-ring (21 × 2 mm) and aluminium closing ring
Max. operating pressure	5 bar | 500 kPa | 72.5 psi
Suitable membrane filter	25 mm (20 mm prefilter for the filtration of liquids only)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

Description	Order No.
Stainless steel pressure filter holder for 25 mm Ø membrane filter.	16251

Replacement parts are shown in the diagram.

47 mm Stainless Steel Filter Holder

For In-Line Filtration



The filter holder is suitable for a 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 G⅜ female thread (order no. 17089) or onto pressure tanks with G⅜ male thread (order no. 17069) or on taps with G¾ male thread (order no. 17068).

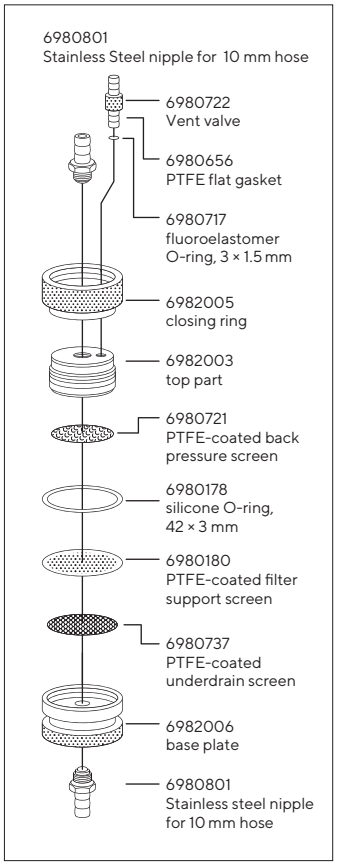


Diagram for 16254

Specifications

Connectors	M 12x1 male thread to hose barb DN10
Filtration area	13 cm²
Weight	ca. 490 g
Materials	Stainless steel, except silicone O-ring (42 × 3 mm), PTFE and fluoroelastomer valve seals
Max. operating pressure	20 bar | 2,000 kPa | 290 psi
Suitable membrane filter	47 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

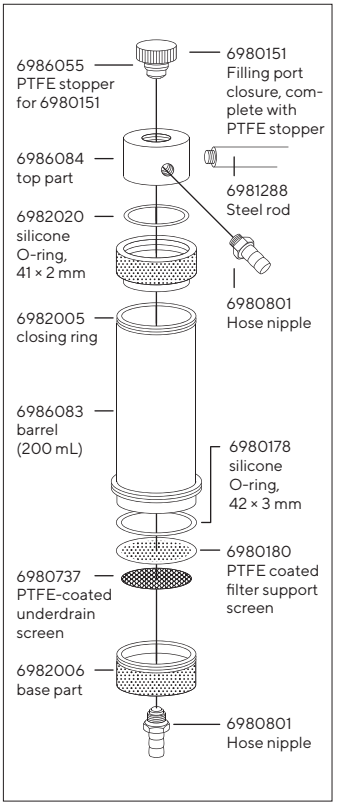
Description	Order No.
Stainless steel filter holder for 47 mm membrane filter (with adapter M12 × 1 male thread to hose barb DN10, Mat. 316, ref. 6980801) – Replacement parts are shown in the diagram	16254
Stainless steel filter holder for 47 mm membrane filter (with adapter M12 × 1 male thread to hose barb DN 4 to 5, Mat. 316, ref. 6981132)	16278
Stainless steel back pressure screen	6980721-----1
Stainless steel filter support screen	6980180-----1
Stainless steel underdrain screen	00181
Stainless steel connector M12 × 1 male thread to hose barb DN 4 – 5	6981132
Adapter Quick connect nipple length 60 mm male part to male thread M12 × 1, Mat 316	17090-----1

Stainless Steel Pressure Filter Holder

For the Filtration of Up to 5 L Volumes







A practical filter 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 L 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

Chemical compatibility	As for stainless steel, PTFE and silicone. If required, the silicone O-ring in the filter support can be replaced by a fluoroelastomer O-ring 00179 or a PTFE O-ring 17038 (by reducing the max. operating pressure to 4 bar | 58 psi); the silicone O-ring in the top part can be replaced by a fluoroelastomer O-ring 17145.
Filtration area	13 cm²
Weight	960 g
Connectors	M 12x1 male thread to hose barb DN10
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 × 2 mm (top part) and 42 × 3 mm (filter support), PTFE-sealing (cap).
Max. operating pressure	10 bar | 1,000 kPa | 145 psi
Suitable membrane filter Ø	47 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C)

Ordering Information

Description	Order No.
Stainless steel pressure filter holder	16249
Stainless steel pressure filter holder with double jacket	16249-----3

Replacement Parts

Description	Order No.
Fluoroelastomer O-ring, 42 × 3 mm	00179
PTFE O-ring, 42 × 3 mm	17038
Fluoroelastomer O-ring for upper part, 41 × 2 mm	17145

Other replacement parts are shown in the diagram or on page 138.

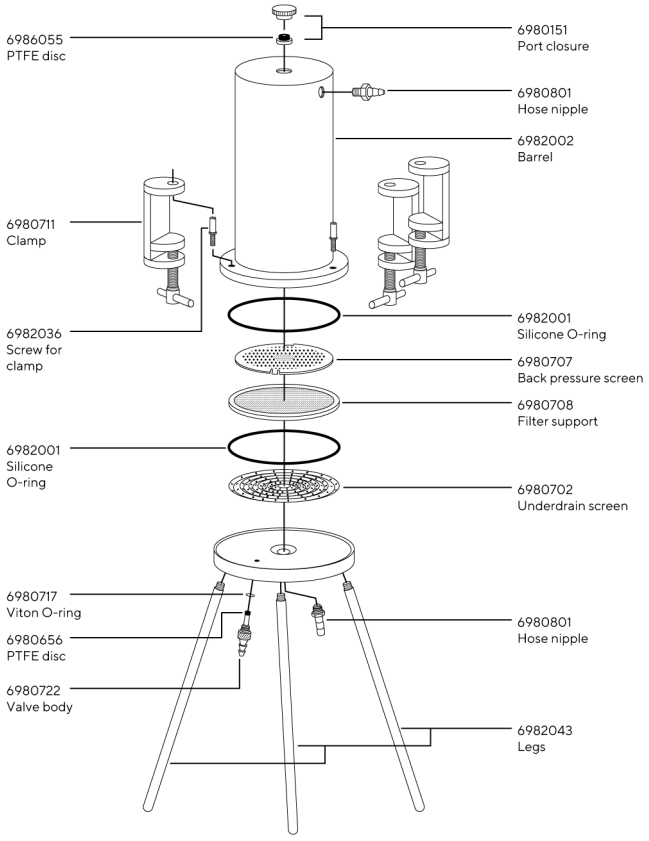
NEW! Large Stainless Steel Pressure Filter Holder



This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 142 mm. It has a stable construction and is easy to operate. In addition, this filter holder has an integrated funnel with a capacity of 2 liters, eliminating the need for an additional pressure vessel. The large filtration area of 130 cm^2 ensures a high flow rate for the total filter volume.

Specifications

Stainless steel pressure filter holder (142 mm, 2000 mL)	
Connectors	M 12x1 male thread to hose barb DN10
Filtration area	130 cm^2
Capacity	2000 mL
Weight	12 kg
Materials	Stainless steel 1.4401, except silicone O-ring (280 mm × 4 mm)
Max. operating pressure	7 bar
Suitable membrane filter Ø	142 mm (130 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



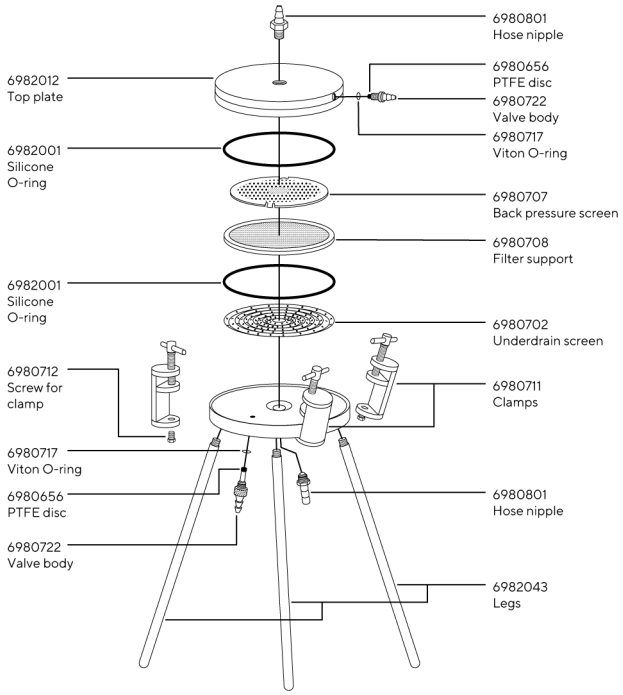
NEW! Large Stainless Steel In-Line Filter Holder



This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 142 mm.This in-line filter is installed directly in the fluid flow path, making it easy to integrate into your filtration system. The supplied unscrewable hose nipples can be replaced by G3/8 connectors, if systems with particularly practical handling are required.

Specifications

Stainless steel in-line filter holder (142 mm)	
Connectors	M 12x1 male thread to hose barb DN10
Filtration area	130 cm^2
Weight	6 kg
Materials	Stainless steel 1.4401, except silicone O-ring (280 mm × 4 mm)
Max. operating pressure	7 bar
Suitable membrane filter Ø	142 mm (130 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Ordering Information

Description	Order No.
Stainless steel pressure filter holder, 142 mm, 2000 mL	16274
Stainless steel in-line filter holder, 142 mm	16275
O-Ring EPDM 130.00 × 4.00 mm	6982071
O-Ring Fluoroelastomer 130.00 × 4.00 mm	6982070
Back pressure screen uncoated, Mat 316	6982017
Support screen uncoated, Mat 316	6982018

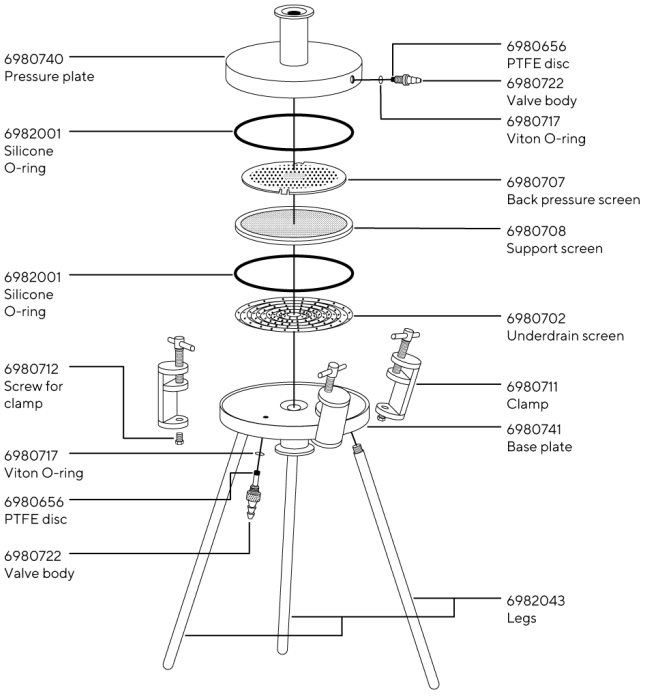
NEW! Large Stainless Steel In-Line Filter Holder



This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 142 mm. It is supplied with a Tri Clamp (TC) connection, which is widely used in industries with stringent hygiene requirements because it is easy to clean and maintain. This in-line filter is installed directly in the fluid flow path, making it easy to integrate into your filtration system.

Specifications

Stainless steel pressure filter holder (142 mm)	
Connectors	TC 50.5
Filtration area	130 cm²
Weight	6 kg
Materials	Stainless steel 1.4401, except silicone O-ring (130 mm × 4 mm)
Max. operating pressure	7 bar
Suitable membrane filter Ø	142 mm (130 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



NEW! Large Stainless Steel In-Line Filter Holder



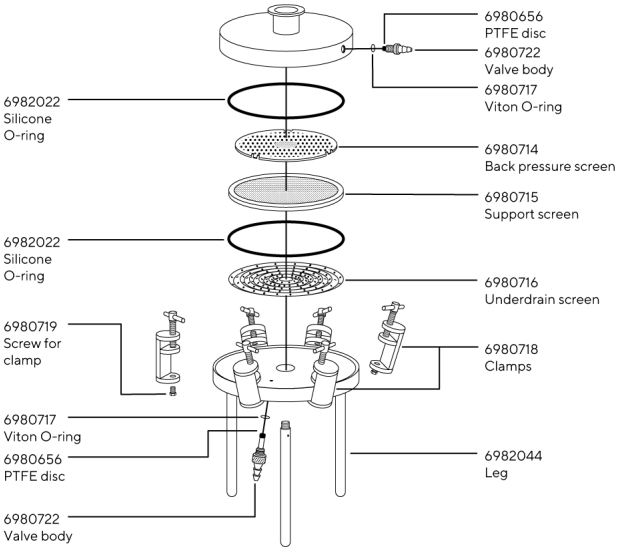
This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 293 mm. It is supplied with a Tri Clamp (TC) connection, which is widely used in industries with stringent hygiene requirements because it is easy to clean and maintain. This in-line filter is installed directly in the fluid flow path, making it easy to integrate into your filtration system.

Specifications

Stainless steel in-line filter holder (293 mm)	
Connectors	TC 50.5
Filtration area	560 cm²
Weight	12 kg
Materials	Stainless steel 1.4401, except silicone O-ring (280 mm × 4 mm)
Max. operating pressure	5 bar
Suitable membrane filter Ø	293 mm (279 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

Description	**Order No.**
Stainless steel in-line filter holder, 142 mm	16276
Stainless steel in-line filter holder, 293 mm	16277
O-Ring EPDM 130.00 × 4.00 mm	6982071
O-Ring Fluoroelastomer 130.00 × 4.00 mm	6982070
Back pressure screen uncoated, Mat 316	6982017
Support screen uncoated, Mat 316	6982018
O-Ring EPDM 280.00 × 4.00 mm	6982077
O-Ring Fluoroelastomer 280.00 × 4.00 mm	6982078
Back pressure screen uncoated, Mat 316	6982027
Support screen uncoated, Mat 316	6980653



Microsart® Manifolds

1-, 3- and 6-Branch



Depending on the number of daily tests you can choose between different sizes of manifolds, from single branch to multi-branch. The different Manifold sizes are connectable with each other by quick connection to enable the manifold to adapt to your daily workload.

Standardized quick connectors at both sides of the manifolds enable fast connections of either tubing, another manifold or end caps. Depending on your application and criticality of product to be tested, choose between different funnel and filtration units, either glass filter holder, polycarbonate filter holder, stainless or plastic funnel.

The higher quality of the stainless steel material and the consequence in using one material type ensures a long working life of the manifold in your lab

Intuitive handling of the valves is given by clear start | stop feedback when turning the valves and indications on the manifold

Ordering Information

Microsart® Manifolds, without Base Support and Frit	Order No.
Microsart® 1-branch manifold with base support for 47 mm and 50 mm filter	168M1-BS250
Microsart® 3-branch manifold with base support for 47 mm and 50 mm filter	168M3-BS250
Microsart® 6-branch manifold with base support for 47 mm and 50 mm filter	168M6-BS250

Microsart® Sets, Stainless Steel Capacity	Order No.
1-branch 1 × 100 mL	168M1-SS100
1-branch 1 × 500 mL	168M1-SS500
3-branch 3 × 100 mL	168M3-SS100
3-branch 3 × 500 mL	168M3-SS500
6-branch 6 × 100 mL	168M6-SS100
6-branch 6 × 500 mL	168M6-SS500

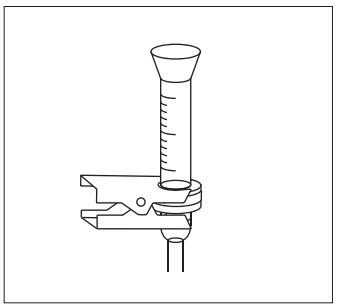
In each set stainless steel funnels with lids are preassembled.

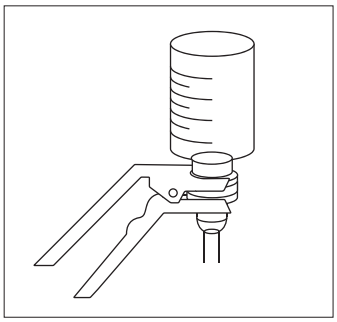
Accessories and Replacement Parts

Description	Pack Size	Order No.
Plug, conical, to close the venting hole beside the 3-way valve	10	6980225
Silicone O-ring for manifold female threads	3	6980235
Rubber tubing, 1 m	1	16623
Stainless steel frit for 50 mm membrane filters	1	6980102
Stainless steel frit for 47 mm membrane filters	1	6980103
Silicone flat gasket underneath the frit	2	6980124
PTFE flat gasket underneath the frit	2	6980104
Silicone O-ring for 16840 male thread	3	6980274

Glass Filter Holders; 30, 250 mL

For Particle Counting



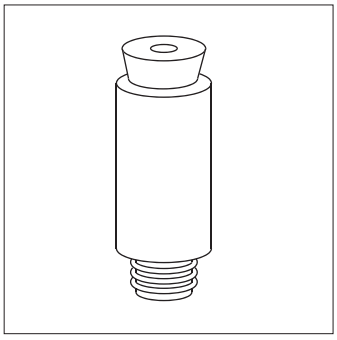


Glass Filter Holders

Two compact vacuum filter holders for easy particulate analysis. Both the top and bottom part of the filter holders are easily and securely fastened together using the metal clamp. The centering rim on the filter support ensures correct positioning of the membrane filter. The glass frit filter support guarantees uniform distribution of retained particles on the filter surface.

Ordering Information

Description		Order No.
Glass filter holder	30 mL	16306
Filter Ø	25 mm (or 24 mm) Prefilter, 20 mm	
Filtration area	3 cm^2	
Capacity	30 mL	
Outlet	12 mm outer Ø	
Glass filter holder	250 mL	16307
Filter Ø	47 mm (or 50 mm) Prefilter, 40 mm	
Filtration area	12.5 cm^2	
Capacity	250 mL	
Outlet	15 mm outer Ø	



Adapter, 16836 | Adapter, 16837

For use of a glass filter holder, 16306 or 16307, on a Microsart® stainless steel manifold.

Ordering Information

Description	Order No.
Adapter with 11 mm opening in stopper; for using filter holder 16306 on a Microsart® manifold	16836
Replacement stopper for 16836	00280
Adapter with 14 mm opening in stopper; for using filter holder 16307 on a Microsart® manifold	16837
Replacement stopper for 16837	00281
Adapter for glass filter holder adapter 16836 and 16837 on a Microsart® manifold	168ZA-D0001



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