sartorius

Laboratory Filtration Products

turning science into solutions

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 protein purification devices 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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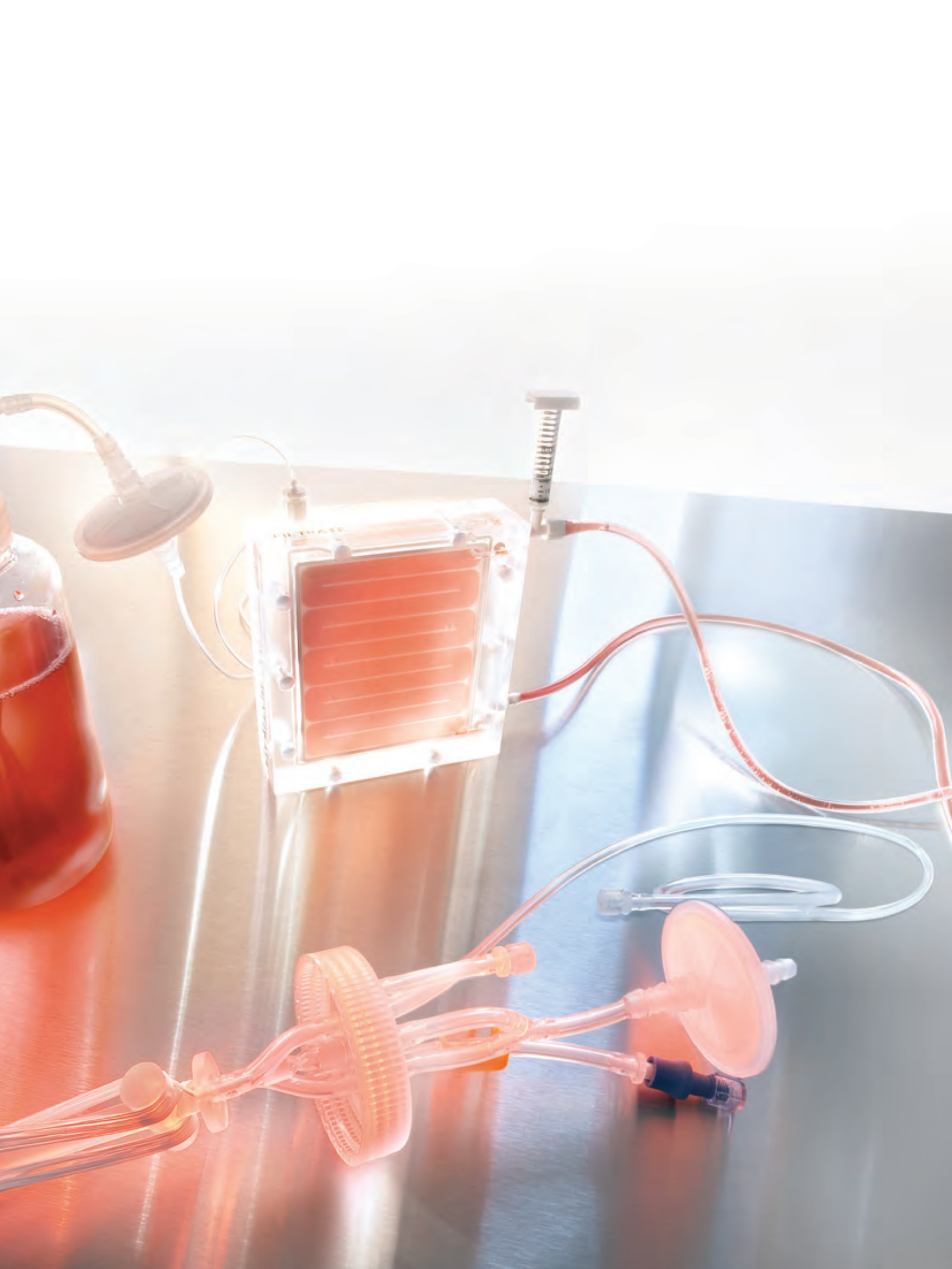


VIVAFLOW 200

Ultrafiltration

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Ultrafiltration is a convective process using anisotropic semi-permeable membranes to separate macromolecular species and solvents – primarily on the basis of size. By allowing solvents and salts to pass the ultrafiltration membrane while macromolecules are hindered to pass it, they are being concentrated. However, ultrafiltration can also be applied in solvent exchange applications. Multiple concentration and refilling steps will progressively lead to a buffer exchange, replacing lengthy techniques like dialysis. Although ultrafiltration is not a standard method for separating and fractionating macromolecules, it can be used as such if the macromolecules differ at least 10 times in size. Ultrafiltration is a gentle, non-denaturing method that is more efficient and flexible than other processes.

Ultrafiltration Methods

Sartorius offers you a comprehensive range of ultrafiltration process methods for the concentration of your biological samples. Below is a guide to selecting the most suitable one as this decision depends on your sample volume and the available equipment, as well as your desired filtration speed and process control.

– **Centrifugal Concentration (100 µl to 100 ml Starting Volume)**
Centrifugation provides the vector to clear solvent and micro-molecules through the ultrafiltration membrane and into a filtrate container positioned below. This is a gentle process that is quick to set up and offers fast filtration speeds for most solutions. Sartorius offers seven Vivaspin® devices and two Vivacell® and Centrosart® I for protein concentration, as well as Vivacon® devices for DNA and peptide concentration | fractionation.

– **Pressure Ultrafiltration (5 ml to 250 ml Starting Volume)**
Pressurized air or inert gas provide the filtration vector for pressure filtration. For the fastest filtration results, pressurized Vivacell® products can be placed on an orbital laboratory shaker. Agitation prevents macromolecules from polarizing on the membrane surface and thus reducing filtration speed. Vivaspin® 20, Vivacell® 70, Vivacell® 100 and Vivacell® 250 can be run with gas pressure. Pressure-fugation is a unique Sartorius method combining gas pressure with centrifugation. This is the fastest of all methods,

providing process times that are typically 30 to 50 percent faster than centrifugation. You can use Vivaspin® 20 and Vivacell® 70 for pressure-fugation (5 to 50 ml starting volumes).

– **Crossflow (Tangential Flow) (100 ml to 5l Starting Volumes)**
The sample is pumped across an ultrafiltration membrane and then returned to the original reservoir by building up pressure at the outlet of the device. The solution is progressively concentrated as solvent and micro-molecules pass through the membrane into a separate filtrate vessel. Reusable Vivaflow® 50R and Vivaflow® 200, as well as disposable Vivaflow® 50, are offered for your dedicated laboratory crossflow filtration.

– **Static Absorption (3 ml to 20 ml Starting Volume)**
This technique uses an absorbent cellulose pad mounted behind the ultrafiltration membrane to draw solvents and micromolecules through the membrane. The retained macromolecules thus concentrate at the bottom of the sample container. You will not need any additional equipment. These devices are ideal for clinical applications like urine concentration prior to further analysis. Both Vivapore® 5 and Vivapore® 20 offer this procedure.

Typical Applications for Ultrafiltration

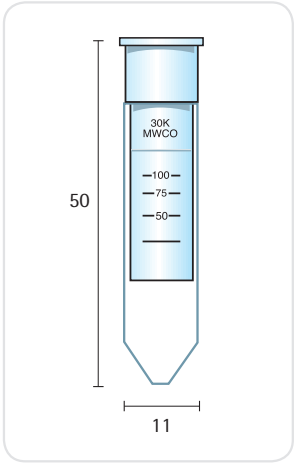
– Concentration | desalting of proteins, enzymes, DNA, monoclonal antibodies, immunoglobulins, viruses and nanoparticles
– Bence Jones Protein concentration from urine samples prior to capillary electrophoresis
– Forensic DNA sample concentration prior to sequencing reaction
– FASP (filter-based sample preparation) – peptide fractionation
– Free drug | hormone assays
– Removal of primers from PCR amplified DNA
– Removal of labeled amino acids and nucleotides
– Deproteinization of samples
– General purpose laboratory concentration and desalting of proteins, enzymes, DNA, biomolecules, viruses, antibodies and immunoglobulins

Process Optimization

When the highest recoveries are crucial, particularly with solute quantities in the microgram range, Sartorius recommends considering the following tips for optimal ultrafiltration results:

– Select the lowest MWCO membrane that suits your application. For the highest recovery, choose a membrane MWCO which is at least half of the molecular weight of the solute to be retained.
– Avoid over-concentration. The smaller the final concentrate volume, the more difficult it is to achieve complete recovery. If feasible, rinse the device with one or more drops of buffer after the first concentration cycle and then recover it again.
– Pretreat the device overnight in distilled water with a passivation solution such as 5% SDS, Tween 20 or Triton X. Rinse thoroughly before use.

Vivaspin® 500



100 µl to 500 µl Samples

Vivaspin® 500 µl 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 patented vertical membrane design and thin channel filtration chamber (US 5,647,990) minimizes membrane fouling and provides high-speed concentrations – even with particle-laden solutions.

Specifications

Vivaspin® 500

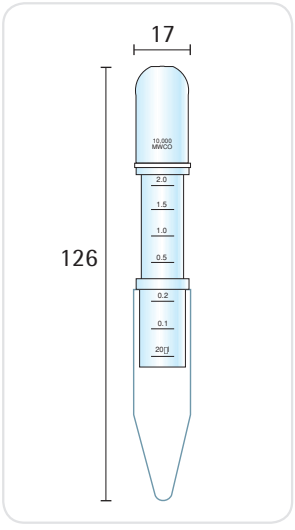
Concentrator capacity	Swing-bucket rotor	do not use
	Fixed-angle rotor	500 µl
Dimensions	Total length	50 mm
	Width	11 mm
	Active membrane area	0.5 cm^2
	Hold-up volume, membrane and support	< 5 µl
	Dead-stop volume	5 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polypropylene
	Concentrator cap	Polycarbonate
	Membrane	Polyethersulfone

Ordering Information

Vivaspin® 500 Polyethersulfone	Qty./Pkg.	Prod. No.
3,000 MWCO	25	VS0191
3,000 MWCO	100	VS0192
5,000 MWCO	25	VS0111
5,000 MWCO	100	VS0112
10,000 MWCO	25	VS0101
10,000 MWCO	100	VS0102
30,000 MWCO	25	VS0121
30,000 MWCO	100	VS0122
50,000 MWCO	25	VS0131
50,000 MWCO	100	VS0132
100,000 MWCO	25	VS0141
100,000 MWCO	100	VS0142
300,000 MWCO	25	VS0151
300,000 MWCO	100	VS0152
1,000,000 MWCO	25	VS0161
1,000,000 MWCO	100	VS0162
0.2 µm	25	VS0171
0.2 µm	100	VS0172
Starter pack (5 of each 5 k, 10 k, 30 k, 50 k, 100 k)	25	VS01S1

Vivaspin® 2

Choice of Membranes



0.4 ml to 2 ml Samples
The 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 area for superior recoveries from very dilute solutions.

Available with a choice of PES, Cellulose Triacetate and Hydrosart® membranes, Vivaspin® 2 offers the highest flexibility for process optimization.

Also unique to the 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 concentrate recovery cap, which can then be sealed for storage. Both methods result in nearly total concentrate recoveries.

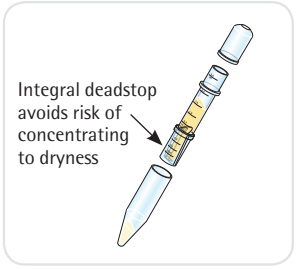
Specifications

Vivaspin® 2

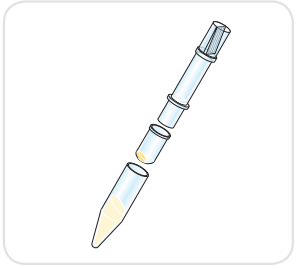
Concentrator capacity	Swing-bucket rotor	3 ml
	Fixed-angle rotor	2 ml
Dimensions	Total length	126 mm
	Width	17 mm
	Active membrane area	1.2 cm^2
	Hold-up volume of membrane	< 10 µl
	Dead-stop volume	8 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polycarbonate
	Concentrator cap	Polycarbonate
	Membrane	PES, CTA, HY

Ordering Information

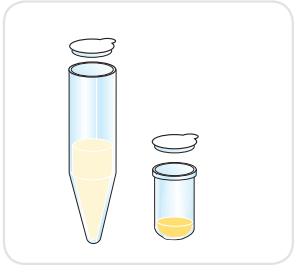
Vivaspin® 2 Polyethersulfone	Qty./Pkg.	Prod. No.
3,000 MWCO	25	VS0291
3,000 MWCO	100	VS0292
5,000 MWCO	25	VS0211
5,000 MWCO	100	VS0212
10,000 MWCO	25	VS0201
10,000 MWCO	100	VS0202
30,000 MWCO	25	VS0221
30,000 MWCO	100	VS0222
50,000 MWCO	25	VS0231
50,000 MWCO	100	VS0232
100,000 MWCO	25	VS0241
100,000 MWCO	100	VS0242
300,000 MWCO	25	VS0251
300,000 MWCO	100	VS0252
1,000,000 MWCO	25	VS0261
1,000,000 MWCO	100	VS0262
0.2 µm	25	VS0271
0.2 µm	100	VS0272
Starter pack (5 of each 5 k, 10 k, 30 k, 50 k, 100 k)	25	VS02S1



PES, CTA, or Hydrosart® membranes; Filtrate container fits standard 15 ml tube carriers



Direct pipette recovery or choice of reverse spinning concentrate into sample cap



Filtrate and concentrate can be sealed for storage

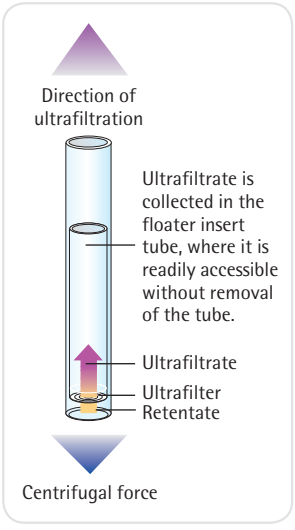
Vivaspin® 2 Cellulose Triacetate	Qty./Pkg.	Prod. No.
5,000 MWCO	25	VS02U1
5,000 MWCO	100	VS02U2
10,000 MWCO	25	VS02V1
10,000 MWCO	100	VS02V2
20,000 MWCO	25	VS02X1
20,000 MWCO	100	VS02X2

Vivaspin® 2 Hydrosart®	Qty./Pkg.	Prod. No.
2,000 MWCO	25	VS02H91
2,000 MWCO	100	VS02H92
5,000 MWCO	25	VS02H11
5,000 MWCO	100	VS02H12
10,000 MWCO	25	VS02H01
10,000 MWCO	100	VS02H02
30,000 MWCO	25	VS02H21
30,000 MWCO	100	VS02H22

Ordering Tips

- Choose a membrane pore size at least 50% smaller than the size of the molecule to be retained.
- It is usually best to select polyethersulfone membranes to achieve the fastest concentrations.
- Usually choose cellulose triacetate for protein removal or ultrafiltrate recovery.
- Usually choose Hydrosart® membranes for the highest recovery with Ig fractions.

Centrisart® I



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

Centrisart® I 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 floater insert tube, where it is readily accessible without removing the tube.

Centrisart® I is ideal for the following applications:
- Drug binding studies
- Determination of metabolites in serum
- Protein removal from blood samples
- Cleaning of liposomes
- Virus removal

Specifications

Centrisart® I

Concentrator capacity	Swing-bucket rotor	2.5 ml
	Fixed-angle rotor	2.5 ml
Dimensions	Total length	93 mm
	Width	14 mm
	Active membrane area	0.79 cm^2
	Hold-up volume of membrane	< 5 µl
	Dead-stop volume	100 µl
Materials of construction	Centrifuge tube	Polystyrene
	Floater tube	Cellulose propionate
	Cap	Polyethylene
	Membrane	CTA, PES

Ordering Information

	Qty./Pkg.	Prod. No.
5,000 MWCO CTA	12	13229-E
10,000 MWCO CTA	12	13239-E
20,000 MWCO CTA	12	13249-E
100,000 MWCO PES	12	13269-E
300,000 MWCO PES	12	13279-E
Starter pack (3 units each of 5 k, 10 k, 20 k, 100 k)	12	13209-E

References

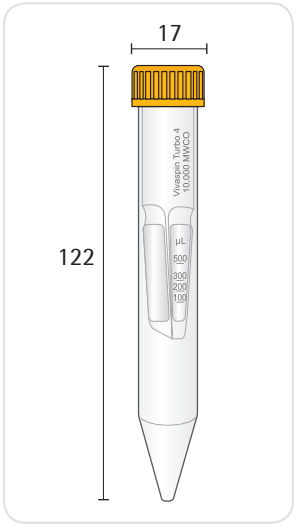
P. Nebinger and M. Koel:
Determination of acyclovir by ultrafiltration and high-performance liquid chromatography.
J. Chromatography 619, 342-344 (1993)

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)

* Centrisart is a registered trademark in the U.S. and the European Union

Vivaspin® Turbo 4



2 ml to 4 ml Samples
Vivaspin® Turbo 4 is the newest member of the ultrafiltration family and allows the fastest sample concentration with the highest recoveries.

This device can handle up to 4 ml sample volumes in swing-bucket rotors and in fixed-angle rotors that accept 15 ml centrifuge tubes.

The Vivaspin® Turbo 4 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.

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

Specifications

Vivaspin® Turbo 4

Concentrator capacity	Swing-bucket rotor	4 ml
	Fixed-angle rotor	4 ml
Dimensions	Total length	122.5 mm
	Width	17 mm
	Active membrane area	3.2 cm^2
	Hold-up volume of membrane	< 10 µl
	Dead-stop volume swing-bucket rotor	40 µl
	Dead-stop volume fixed-angle rotor (25°)	60 µl
Materials of construction	Body	Styrene butadiene copolymere
	Filtrate vessel	Polypropylene
	Concentrator cap	Polypropylene
	Membrane	Polyethersulfone

Ordering Information

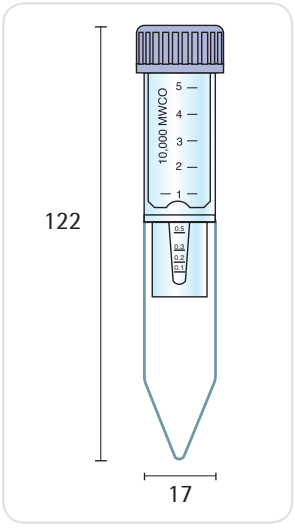
Vivaspin® Turbo 4 Polyethersulfone	Qty./Pkg.	Prod. No.
3,000 MWCO	25	VS04T91
3,000 MWCO	100	VS04T92
5,000 MWCO	25	VS04T11
5,000 MWCO	100	VS04T12
10,000 MWCO	25	VS04T01
10,000 MWCO	100	VS04T02
30,000 MWCO	25	VS04T21
30,000 MWCO	100	VS04T22
50,000 MWCO	25	VS04T31
50,000 MWCO	100	VS04T32
100,000 MWCO	25	VS04T41
100,000 MWCO	100	VS04T42

Vivaspin® 6

2 ml to 6 ml Samples
Vivaspin® 6 ml 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 test tubes.

The Vivaspin® 6 features twin vertical membranes for unparalleled filtration speeds and 100× plus concentrations. The remaining volume is easy to read off the printed scale 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	6 ml
	Fixed-angle rotor	6 ml
Dimensions	Total length	122 mm
	Width	17 mm
	Active membrane area	2.5 cm^2
	Hold-up volume of membrane	< 10 µl
	Dead-stop volume	30 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polycarbonate
	Concentrator cap	Polypropylene
	Membrane	Polyethersulfone

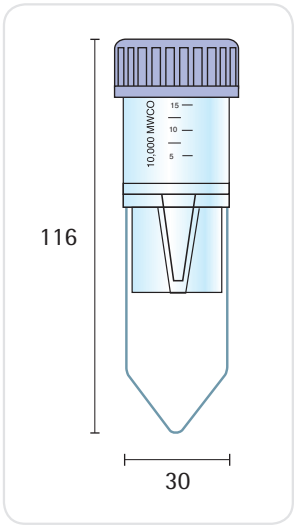
Ordering Information

Vivaspin® 6 Polyethersulfone	Qty./Pkg.	Prod. No.
3,000 MWCO	25	VS0691
3,000 MWCO	100	VS0692
5,000 MWCO	25	VS0611
5,000 MWCO	100	VS0612
10,000 MWCO	25	VS0601
10,000 MWCO	100	VS0602
30,000 MWCO	25	VS0621
30,000 MWCO	100	VS0622
50,000 MWCO	25	VS0631
50,000 MWCO	100	VS0632
100,000 MWCO	25	VS0641
100,000 MWCO	100	VS0642
300,000 MWCO	25	VS0651
300,000 MWCO	100	VS0652
1,000,000 MWCO	25	VS0661
1,000,000 MWCO	100	VS0662
0.2 µm	25	VS0671
0.2 µm	100	VS0672
Starter pack (5 of each 5 k, 10 k, 30 k, 50 k, 100 k)	25	VS06S1

Vivaspin® 15R

4 to 15 ml Samples
Vivaspin® 15R is designed for the volume segment 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 lg fractions.

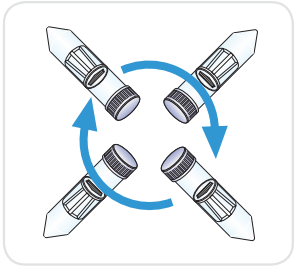
Advantages
- Ultimate recovery with low adsorption (95-98%)
- Exceptionally fast concentration time (30× in 15 min.)
- Convenient application protocol with easy handling
- Easy scale-up to Vivaflow 200 with Hydrosart® membrane for volumes up to 5 liters
- Very low hold-up volume (< 20 µl)



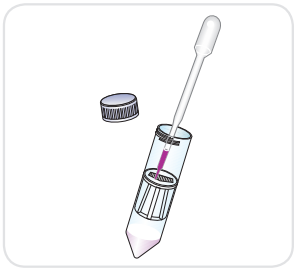
Specifications

Vivaspin® 15R

Concentrator capacity	Swing-bucket rotor	15 ml
	Fixed-angle rotor	12.5 ml
Dimensions	Total length	116 mm
	Width	30 mm
	Active membrane area	3.9 cm^2
	Hold-up volume of membrane	< 20 µl
	Dead-stop volume	30 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polypropylene
	Concentrator cap	Polycarbonate
	Membrane	Hydrosart®



Spin

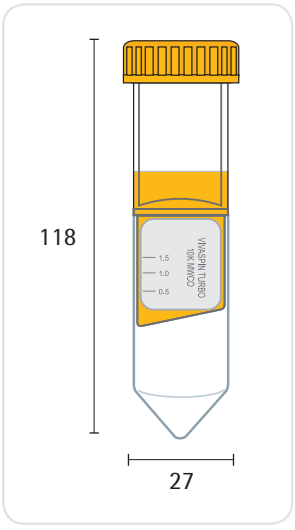


Recover

Ordering Information

Vivaspin® 15R Hydrosart®	Qty./Pkg.	Prod. No.
2,000 MWCO	12	VS15RH91
2,000 MWCO	48	VS15RH92
5,000 MWCO	12	VS15RH11
5,000 MWCO	48	VS15RH12
10,000 MWCO	12	VS15RH01
10,000 MWCO	48	VS15RH02
30,000 MWCO	12	VS15RH21
30,000 MWCO	48	VS15RH22

Vivaspin® Turbo 15



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 15 ml in swing-bucket rotors and of up to 11 ml in fixed-angle rotors that accept 50 ml centrifuge tubes.

The optimized design and sleek internal profile of the 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 plasting housing – allowing removal of the entire sample concentrated in the unique, pipette-friendly dead-stop pocket.

Specifications

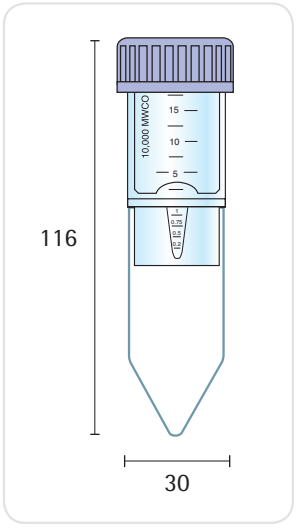
Vivaspin® Turbo 15

Materials	Body	Styrene butadiene copolymer
	Filtrate vessel	Polypropylene
	Concentrator cap	Polypropylene
	Membrane	Polyethersulfone (PES)
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 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
Concentrator capacity	Swing-bucket rotor	15 ml
	Fixed-angle rotor (25°)	11 ml
Maximum speed	4,000 × g	4,000 × g
Sterilization	ETO or 70% EtOH	
Removal of endotoxins [Depyrogenization]	Flushing with 1N NaOH	

Ordering Information

Vivaspin® Turbo 15 Polyethersulfone	Qty./Pkg.	Prod. No.
3,000 MWCO	12	VS15T91
3,000 MWCO	48	VS15T92
5,000 MWCO	12	VS15T11
5,000 MWCO	48	VS15T12
10,000 MWCO	12	VS15T01
10,000 MWCO	48	VS15T02
30,000 MWCO	12	VS15T21
30,000 MWCO	48	VS15T22
50,000 MWCO	12	VS15T31
50,000 MWCO	48	VS15T32
100,000 MWCO	12	VS15T41
100,000 MWCO	48	VS15T42

Vivaspin® 20



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

Vivaspin® 20 handles up to 20 ml in swing-bucket centrifuges and 14 ml in 25° fixed-angle rotors that accept 50 ml centrifuge tubes.

Featuring twin vertical membranes for unparalleled filtration speeds, the Vivaspin® 20 can achieve 100x plus concentrations.

The remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead-stop pocket further simplifies direct pipette recovery of the final concentrate.

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

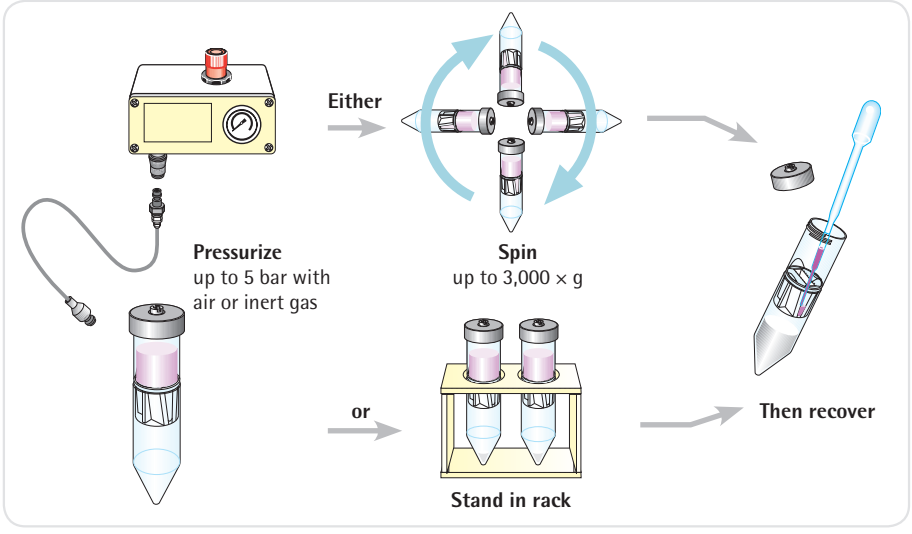
Concentrator capacity	Swing-bucket rotor	20 ml
	Fixed-angle rotor	14 ml
	With pressure head	15 ml
Dimensions	Total length	116 mm
		125 mm with pressure head
	Width	30 mm
	Active membrane area	6.0 cm^2
	Hold-up volume of membrane	< 20 µl
	Dead-stop volume	50 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polycarbonate
	Concentrator cap	Polypropylene
	Pressure head	Acetal | Aluminum
	Membrane	Polyethersulfone

Ordering Information

Vivaspin® 20 Polyethersulfone	Qty./Pkg.	Prod. No.
3,000 MWCO	12	VS2091
3,000 MWCO	48	VS2092
5,000 MWCO	12	VS2011
5,000 MWCO	48	VS2012
10,000 MWCO	12	VS2001
10,000 MWCO	48	VS2002

Vivaspin® 20 Polyethersulfone	Qty./Pkg.	Prod. No.
30,000 MWCO	12	VS2021
30,000 MWCO	48	VS2022
50,000 MWCO	12	VS2031
50,000 MWCO	48	VS2032
100,000 MWCO	12	VS2041
100,000 MWCO	48	VS2042
300,000 MWCO	12	VS2051
300,000 MWCO	48	VS2052
1,000,000 MWCO	12	VS2061
1,000,000 MWCO	48	VS2062
0.2 µm	12	VS2071
0.2 µm	48	VS2072
Starter pack (2 each of 5 kDa, 10 kDa, 30 kDa, 50 kDa, 100 kDa, 0.2 µm)	12	VS20S1

Vivaspin® 20 Accessories	Qty./Pkg.	Prod. No.
Air pressure controller (APC)	1	VCA002
Charge valve for pressure head	1	VCA005
Diafiltration cups	12	VSA005
Female connector	1	VCA010
Male connector	1	VCA011
4 mm OD pneumatic tube (3 m)	1	VCA012
Vivaspin® 20 pressure head	1	VCA200



Using the Vivaspin® 20 pressure cap

Vivaclear Centrifugal Filters

Vivaclear centrifugal filters are disposable microfiltration devices for the fast and reliable clarification|filtration of biological samples in the range 100 µl 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, 500 µl	
Pore size	0.8 µm	
Dimensions	Total length	43 mm
	Filtrate collection tube diameter	11 mm
	Active membrane area	0.34 cm^2
	Hold-up volume, membrane plus support	< 5 µl
	Maximum RCF	2,000 × g
Materials of construction	Body	Polypropylene
	Membrane	Polyethersulfone
	Filtrate collection tube	Polypropylene

Ordering Information

	Qty./Pkg.	Prod. No.
Vivaclear Mini 0.8 µm PES	100	VK01P042

Vivacell 70

10 ml to 70 ml Samples
Vivacell 70 combines the ease of use of centrifugal devices with the flexibility and control provided by pressurized ultrafiltration cells. Vivacell 70 is inexpensive, quick and easy to assemble, requires no tubing connections or stirring mechanisms and can be adapted to equipment availability or to specific user preferences.

For convenience, simply spin in a large capacity centrifuge (rotors accepting 250 ml bottles). For the highest speeds, particularly with difficult samples, pressurize the device with air or inert gas before centrifuging.

For more process control or for single samples, combine gas pressure with a gentle orbital shake, or you can even pressurize and then leave standing on a bench top or in a refrigerator for the highest simplicity with minimum equipment requirements.

The longitudinal membrane inhibits fouling, while the built-in dead stop will hinder further concentration when the residual volume drops below 150 µl.

Specifications

Vivacell 70

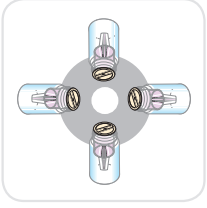
Concentrator capacity	Swing-bucket rotor	70 ml
	Fixed-angle rotor	50 ml
	With pressure head	70 ml
	With pressure-fuge head	50 ml
Dimensions	Total length	119 mm standard centrifugal 185 mm with pressure head 125 mm with pressure fuge head
	Width	62 mm
	Active membrane area	20 cm^2
	Hold-up volume of membrane	< 200 µl
	Dead-stop volume	150 µl
Operating requirements	Rotor type	Swing-bucket or fixed angle
	Minimum rotor angle	25°
	Rotor cavity	To fit 250 ml (62 mm) centrifuge bottles
	Maximum speed	1,000 g
	Maximum pressure	5 bar (75 psi)
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polycarbonate
	Concentrator cap	Santoprene
	Pressure head | pressure fuge head	Acetal
	Membrane	Polyethersulfone

Ordering Information

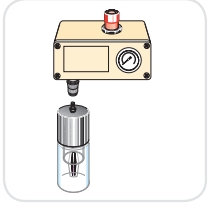
Vivacell 70 Polyethersulfone – Concentrator Bodies With Polycarbonate Filtrate Bottles	Qty./Pkg.	Prod. No.
5,000 MWCO	2	VS6011
10,000 MWCO	2	VS6001
30,000 MWCO	2	VS6021
50,000 MWCO	2	VS6031
100,000 MWCO	2	VS6041
0.2 µm	2	VS6071

Vivacell 70 Polyethersulfone – Concentrator Body Only	Qty./Pkg.	Prod. No.
5,000 MWCO	10	VS6012
10,000 MWCO	10	VS6002
30,000 MWCO	10	VS6022
50,000 MWCO	10	VS6032
100,000 MWCO	10	VS6042
0.2 µm	10	VS6072

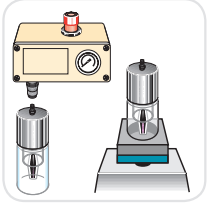
Vivacell 70 Accessories	Qty./Pkg.	Prod. No.
Air pressure controller (APC), complete with pressure gauge, regulator, over-pressure safety valve, female connector to Sartorius Stedim Biotech pressure products and 1 m extension line (4 mm pneumatic tubing) with male and female connectors and 1 m of 6 mm inlet tubing	1	VCA002
250 ml centrifuge bottle – standard caps	4	VSA003
Modified caps for use in fixed-angle rotors with 250 ml centrifuge bottles	2	VCA004
Charge valve for pressure-fuge head	1	VCA005
Replacement seals for pressure-fuge head (VCA701)	10	VCA007
Female connector	1	VCA010
Male connector	1	VCA011
4 mm pneumatic tubing (3 m)	1	VCA012
Vivacell 70 pressure head with reservoir and filtrate bottle (bench-top use)	1	VCA700
Vivacell 70 pressure-fuge head (for use in centrifuge)	2	VCA701



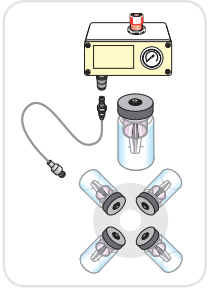
Centrifuge
- Process convenience
- Low shear, no foaming
- Less visual control



Pressure
- Simplicity and highest process control
- Ideal for refrige-rated use
- Slower concentrations

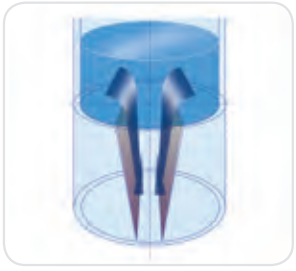


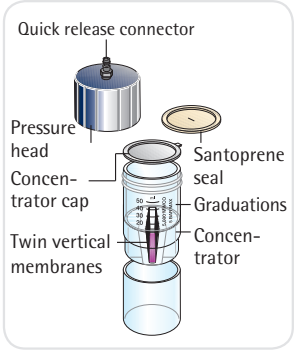
Pressure-Shake
- Speed and process control
- Ideal for single samples
- If left unattended can concentrate to dryness



Pressure-Fuge
- Fastest processing
- Ideal with low MWCO or with difficult solutions
- Less visual control

Vivacell 100





Filtrate container fits standard 250 ml rotors

20 ml to 100 ml Samples
Vivacell 100 is the latest member of the Vivacell family and bridges the volume range between the Vivacell 70 and the Vivacell 250.

The patented vertical membrane design ensures the highest performance and unmatched flexibility.

Vivacell 100 is a unique and innovative concentrator for volumes from 20 ml to 100 ml, and utilizes pressure, centrifuge or pressure-shake to rapidly concentrate even samples with very high-particle loading.

Vivacell 100 is designed for centrifugal concentration of samples up to 100 ml, which makes it the largest centrifugal unit available. At the same time, its new design allows for maximum centrifugal force of 4,000 × g to be used for even faster concentration.

Vivacell 100 Utilizes:
– Pressure
– Centrifuge
– Pressure-shake

Like the smaller Vivacell 70 unit, Vivacell 100, when used as a centrifugal device, fits only into rotors that accept 250 ml bottles.

Vivacell 100 units can also be used for single or extremely sensitive samples in the pressurized mode only and left on a bench or placed on a swing-bucket laboratory shaker for faster concentration. It can also be kept in a pressurized mode in the refrigerator. Handling is facilitated by the use of quick connectors. In whichever mode Vivacell 100 is used, the vertical membrane design inhibits membrane fouling, while the built-in dead stop impedes concentration to dryness and loss of sample.

Specifications

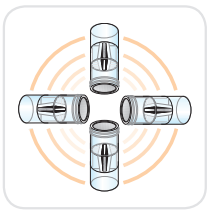
Vivacell 100

Concentrator capacity	Swing-bucket rotor	90 ml
	With pressure head	98 ml
Dimensions	Total length	123 mm centrifugal 197 mm with pressure head
	Width	62 mm
	Active membrane area	23.5 cm^2
	Hold-up volume of membrane	< 250 µl
	Dead-stop volume	350 µl
Operating requirements	Rotor type	Swing-bucket
	Rotor cavity	To fit 250 ml (62 mm) centrifuge bottles (maximum cavity depth 105 mm)
	Maximum speed	2,000 g
	Maximum pressure	5 bar (75 psi)
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polycarbonate
	Concentrator cap	Santoprene
	Pressure head	Acetal
	Membrane	Polyethersulfone

Ordering Information

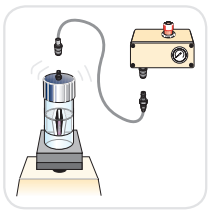
Vivacell 100 Polyethersulfone with Polypropylene Concentrator Cap	Qty./Pkg.	Prod. No.
5,000 MWCO	2	VC1011
5,000 MWCO	10	VC1012
10,000 MWCO	2	VC1001
10,000 MWCO	10	VC1002
30,000 MWCO	2	VC1021
30,000 MWCO	10	VC1022
50,000 MWCO	2	VC1031
50,000 MWCO	10	VC1032
100,000 MWCO	2	VC1041
100,000 MWCO	10	VC1042
300,000 MWCO	2	VC1051
300,000 MWCO	10	VC1052
1,000,000 MWCO	2	VC1061
1,000,000 MWCO	10	VC1062
0.2 µm	2	VC1071
0.2 µm	10	VC1072

Vivacell 100 Accessories	Qty./Pkg.	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 connector	1	VCA010
Male connector	1	VCA011
4 mm pressure tubing (3 m)	1	VCA012
Santoprene replacement seals	10	VCA014
Vivacell 100 pressure head with replacement seals (5)	1	VCA800



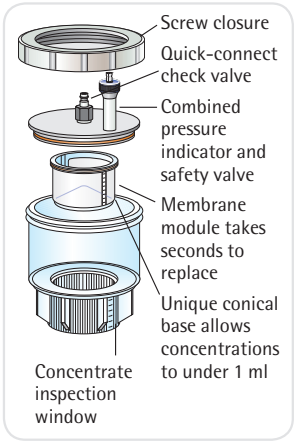
Centrifuge
- Process convenience
- Low shear, non-foaming
- Less visual control

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



Pressure-Shake
- Speed and process control
- Ideal for single samples

Vivacell 250



50 ml to 250 ml Samples
The Vivacell 250 is a totally new concept for the concentration of relatively high-volume biological samples. This product offers numerous advantages when compared to stirred cells.

- One size handles a volume range from under 50 ml to 250 ml.
- Use free standing on a bench top or in a refrigerator for maximum simplicity, or use a laboratory shaker for fastest concentrations.
- The unique, conical dead stop built into the bottom of the membrane insert allows concentrations to under 1 ml.
- The gentle vortex action controls membrane polarization, while greatly reducing the shear effects that are typical of stirring mechanisms.
- Setup or membrane replacement takes just a few seconds. Quick-connect fittings and a simple screw closure further enhance ease of use.

This unequaled membrane module takes only seconds to replace. The concentrate can be easily monitored through the graduated inspection window.

Specifications

Vivacell 250

Concentrator capacity	250 ml	
Max pressure	4 bar (60 psi)	
Dimensions	Width	116 mm
	Height (incl. pressure indicator)	235 mm
	Active membrane area	40 cm^2
	Hold-up vol. memb. & support	< 200 µl
	Dead-stop volume	600 µl
Materials of construction	Screw closure	Acetal
	Pressure head	Acetal
	Quick release connector	Acetal
	Concentrator body | sleeve	Polycarbonate
	Filtrate container	Polycarbonate

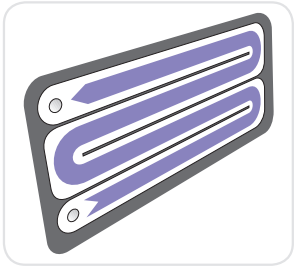
Ordering Information

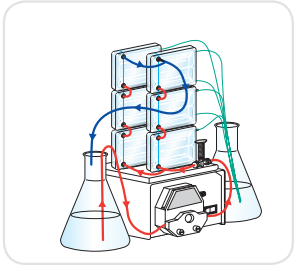
Vivacell 250	Qty./Pkg.	Prod. No.
Vivacell 250 complete with pressure head, pressure indicator | over-pressure safety valve, quick-release connection to APC, 2 sample reservoirs, filtrate container and insert tool	1	VCA250

Vivacell 250 Polyethersulfone Inserts	Qty./Pkg.	Prod. No.
5,000 MWCO	5	VC2511
10,000 MWCO	5	VC2501
30,000 MWCO	5	VC2521
50,000 MWCO	5	VC2531
100,000 MWCO	5	VC2541
0.2 µm	5	VC2571
Starter kit (1 each of 5 kDa, 10 kDa, 30 kDa, 50 kDa, 100 kDa)	5	VC25S1

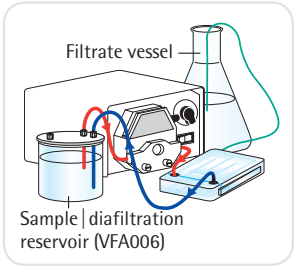
Vivacell 250 Accessories	Qty./Pkg.	Prod. No.
Air pressure controller (APC), complete with pressure gauge, regulator, over-pressure safety valve, female connector to Sartorius Stedim Biotech pressure products and 1 m extension line (4 mm pneumatic tubing) with male and female connector and 1 m of 6 mm inlet tubing	1	VCA002
Replacement pressure indicator | over-pressure safety valve	1	VCA008
Vivacell 250 maintenance kit (includes one sample reservoir and filtrate container and O-ring seals for pressure head)	1	VCA009
Female connector	1	VCA010
Male connector	1	VCA011
4 mm OD pressure tubing (3 m)	1	VCA012
Replacement pressure head and screw closure	1	VCA015

Vivaflow® 50





Multiple modules



Single module

100 ml 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 remaining hold-up volume and membrane status
- Unique interlocking modules with series connectors for easy scale up
- Disposable

Unique Performance
- A single 50 cm^2 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 concentrations
- Less than 500 µl non-recoverable hold-up volume
- Nearly 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 × H × W	107 mm × 84 mm × 25 mm
	Channel W × H	15 mm × 0.3 mm
	Active membrane area	50 cm^2
	Hold-up volume (module)	1.5 ml
	Minimum recirculation volume	< 10 ml
	Non-recoverable hold-up	< 0.5 ml
Operating conditions	Pump flow	200 ml/min to 400 ml/min
	Maximum pressure	3 bar (45 psi)
	Maximum temperature	60°C
Materials of construction	Main housing	Polycarbonate
	Flow channel	TPX (PMP)
	Membrane support	TPX (PMP)
	Seals and O-rings	Silicone
	Pressure indicator	Polypropylene, SS spring
	Flow restrictor	Polypropylene
	Fittings	Nylon
	Tubing	PVC (medical grade)

Ordering Information

Vivaflow® 50*	Qty./Pkg.	Prod. No.
3,000 MWCO PES	2	VF05P9
5,000 MWCO PES	2	VF05P1
10,000 MWCO PES	2	VF05P0
30,000 MWCO PES	2	VF05P2
50,000 MWCO PES	2	VF05P3
100,000 MWCO PES	2	VF05P4
1,000,000 MWCO PES	2	VF05P6
0.2 µm PES	2	VF05P7
100,000 MWCO RC	2	VF05C4

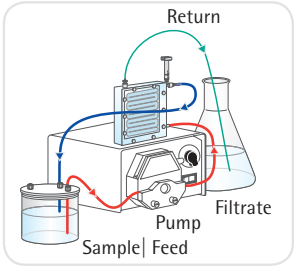
* Vivaflow® 50 modules include filtrate tube, size 16 peristaltic tubing, flow restrictors and fittings.

Vivaflow® 50 Complete System Comprises		
Pump (240 V), Easy Load pump head (size 16), tubing, 500 ml sample | diafiltration reservoir, module stand, pressure indicator, T-connectors, series interconnectors	1	VFS502
Pump (115 V), Easy Load pump head (size 16), tubing, 500 ml sample | diafiltration reservoir, module stand, pressure indicator, T-connectors, series interconnectors	1	VFS504

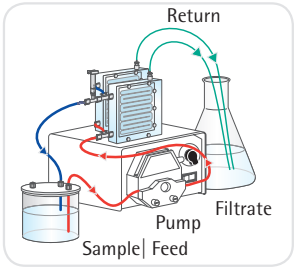
PVC Tubing and Fittings	
Size 16 PVC pump tubing (3 m, 3.2 × 1.6 mm)	VFA004
Flow restrictor set (2 × 0.4 mm, 0.6 mm, 0.8 mm)	VFA009
T-connectors for running 2 stacks (2 units)	VFA030
Series interconnectors (6 units)	VFA031
Female luer fittings (10 units)	VFA032
VF50 tubing kit (2 × 1 m size 16 PVC tubing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

Accessories	
Masterflex economy drive variable speed peristaltic pump (240 V)	VFP001
Masterflex economy drive variable speed peristaltic pump (115 V)	VFP002
500 ml sample and | or diafiltration reservoir	VFA006
Masterflex Easy Load pump head – size 16	VFA012
Vivaflow® 50 stand	VFA016
Pressure indicator (1 to 3 bar [15 psi to 45 psi])	VFA020

Vivaflow® 50R



Vivaflow® 50R – Single module



Vivaflow® 50R – Two modules

0.1 ml to 1 l Samples
Concentrate 100 ml to under 20 ml in just a few minutes or concentrate one liter 50 times in less than 60 minutes. Alternatively, speed up your process by using two Vivaflow® 50R units in parallel and concentrate 1 liters 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 cm^2. 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 × H × W	100 mm × 100 mm × 24 mm
	Channel W × H	7.5 mm × 0.4 mm
	Active membrane area	50 cm^2
	Hold-up volume (module)	1.7 ml
	Min. recirculation volume	10 ml
	Non-recoverable hold-up	< 0.5 ml
Operating conditions	Pump flow	200 ml/min to 400 ml/min
	Maximum pressure	4 bar (60 psi)
	Maximum temperature	60°C
Materials of construction	Main housing	Acrylic
	Flow channel	Acrylic
	Membrane support	Polypropylene
	Seals and O-rings	Silicone
	Pressure indicator	Polypropylene, SS spring
	Flow restrictor	Polypropylene
	Fittings	Nylon
	Tubing	PVC (medical grade)

Ordering Information

Vivaflow® 50R*	Qty./Pkg.	Prod. No.
5,000 MWCO Hydrosart®	1	VF05H1
10,000 MWCO Hydrosart®	1	VF05H0
30,000 MWCO Hydrosart®	1	VF05H2
100,000 MWCO Hydrosart®	1	VF05H4

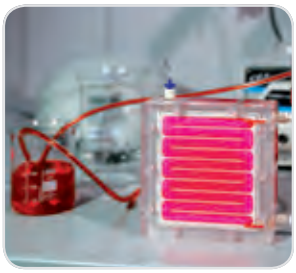
* Vivaflow® 50R modules include pressure indicator, flow restrictor and size 16 pvc peristaltic tubing and fittings.

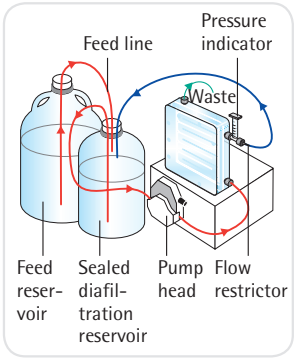
Vivaflow® 50R/200 Complete System		
Pump (240 V), Easy Load pump head (size 16), tubing, 500 ml sample | diafiltration reservoir	1	VFS202
Pump (115 V), Easy Load pump head (size 16), tubing, 500 ml sample | diafiltration reservoir	1	VFS204

Tubing and Fittings		
Size 16 pvc pump tubing and Luer fittings (3 m, 3.2 × 1.6 mm)	1	VFA004
T-connectors for running 2 units	2	VFA030
Flow restrictor set (2 × 0.4 mm, 0.6 mm, 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

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

Vivaflow® 200





Vivaflow 200 setup for diafiltration

0.5 ml to 5 l Samples
Concentrate 250 ml to under 20 ml in just a few minutes or concentrate one lirwe 50 times in less than 30 minutes. Alternatively, use two Vivaflow® 200 units in parallel and concentrate 5 liters in under 75 minutes.

Nearly total sample recoveries can be expected with most solutions.

The standard economy package comes 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.

Two modules in parallel will concentrate 5 liters in under 75 minutes

Specifications

Vivaflow 200

Dimensions	Overall L × H × W	126 mm × 138 mm × 38 mm
	Channel W × H	10 mm × 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 support	Polypropylene
	Seals and O-rings	Silicone
	Pressure indicator	Polypropylene, SS spring
	Flow restrictor	Polypropylene
	Fittings	Nylon
	Tubing	PVC (medical grade)
Operating conditions	Pump flow	200 ml/min to 400 ml/min
	Maximum pressure	4 bar (60 psi)
	Maximum temperature	60°C

Ordering Information

Vivaflow® 200*	Qty./Pkg.	Prod. No.
3,000 MWCO PES	1	VF20P9
5,000 MWCO PES	1	VF20P1
10,000 MWCO PES	1	VF20P0
30,000 MWCO PES	1	VF20P2
50,000 MWCO PES	1	VF20P3
100,000 MWCO PES	1	VF20P4
0.2 µm PES	1	VF20P7
2,000 MWCO Hydrosart®	1	VF20H9
5,000 MWCO Hydrosart®	1	VF20H1
10,000 MWCO Hydrosart®	1	VF20H0
30,000 MWCO Hydrosart®	1	VF20H2
100,000 MWCO Hydrosart®	1	VF20H4

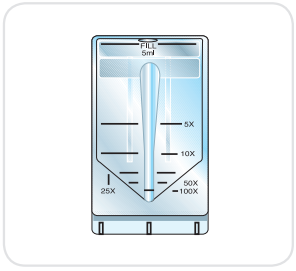
* Vivaflow® 200 modules include pressure indicator, flow restrictor and size 16 PVC peristaltic tubing and fittings.

Vivaflow® 200 Complete System Comprises		
Pump (240 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

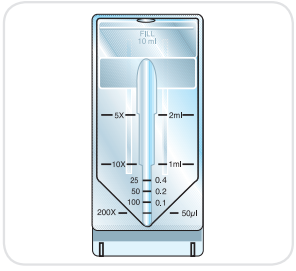
Accessories	
Masterflex economy drive variable speed peristaltic pump (240 V)	VFP001
Masterflex economy drive variable speed peristaltic pump (115 V)	VFP002
500 ml sample and	or diafiltration reservoir	VFA006
Masterflex Easy Load pump head – size 16	VFA012
Masterflex Easy Load pump head – size 15	VFA013

Tubing and Fittings	
Size 15 PVC pump tubing and Luer fittings (3 m, 4.8 mm × 2.6 mm)	VFA003
Size 16 PVC pump tubing and Luer fittings (3 m, 3.2 mm × 1.6 mm)	VFA004
Y-connetor (size 15 to 2 × size 16)	VFA005
Flow restrictor set (2 × 0.4 mm, 0.6 mm, 0.8 mm)	VFA009
Female luer fittings, size 16 (10 units)	VFA032
Flow restrictors 0.6 mm (6 units)	VFA035
Female luer fittings, size 15 (10 units)	VFA036

Vivapore® Solvent Absorption Concentrators



Vivapore® 5



Vivapore® 10 | 20

3 ml 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 reservoir.

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.

Specifications

	Vivapore® 5	**Vivapore® 10 | 20**
Membrane material	PES	PES
Membrane MWCO	7,500	7,500
Membrane surface area	20 cm^2	28 cm^2
Reservoir material	SAN	SAN
Volume range	1 ml to 5 ml	2 ml to 10 ml | 20 ml*
Minimum concentrate volume	50 µl	50 µl
Vivapore® overall dimensions		
Width (mm)	42	46
Height (mm)	82	100

Ordering Information

Vivapore® 5*	Qty./Pkg.	Prod. No.
7,500 MWCO PES	4	VP0503
7,500 MWCO PES	30	VP0501

* includes stand and recovery pipettes

Requires Stand		
7,500 MWCO PES	100	VP0502

Vivapore® 10 | 20*		
7,500 MWCO PES	4	VP2003
7,500 MWCO PES	30	VP2001

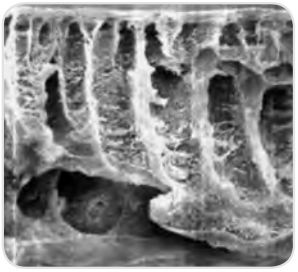
* includes stand and recovery pipettes

Requires Stand		
7,500 MWCO PES	100	VP2002

Accessories		
Disposable stands for 4 units	6	VPA002
Plastic recovery pipettes (Vivapore® 10 | 20)	100	VPA005
10 ml expansion reservoir (Vivapore® 10 | 20)	10	VPA006
Plastic recovery pipettes (Vivapore® 5)	100	VPA007

Ultrafiltration Membrane Filters

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. Polyethersulfone membranes exhibit no hydrophobic or hydrophilic interactions and are usually preferred for their low fouling characteristics, exceptional flux and broad pH range.

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

Hydrosart®
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

Typical Performance for Polyethersulfone, Type 146

Thickness	120 µm	
pH range	1–14	
Water flux	MWCO 10,000	0.2 ml/min/cm^2
Protein retention	Cytochrome C	95%

Specifications for Cellulose Triacetate, Type 145

Thickness	120 µm	
pH range	4–8	
Water flux	MWCO 10,000	0.11 ml/min/cm^2
Protein retention	Cytochrome C	90%

Specifications for Hydrosart®, Type 144

Thickness	180 µm	
pH range	1–13	
Water flux	MWCO 10,000	0.08 ml/min/cm^2
Protein retention	Cytochrome C	99%

Ordering Information

Polyethersulfone Membrane Filters, Type 146

Diameter in mm	MWCO	Qty./Pkg.	Prod. No.
47	1,000 daltons	10	14609--47------D
63	1,000 daltons	10	14609--63------D
76	1,000 daltons	10	14609--76------D
25	5,000 daltons	10	14629--25------D
47	5,000 daltons	10	14429--47------D
63	5,000 daltons	10	14629--63------D
76	5,000 daltons	10	14629--76------D
25	10,000 daltons	10	14639--25------D

Polyethersulfone Membrane Filters, Type 146

Diameter in mm	MWCO	Qty./Pkg.	Prod. No.
63	10,000 daltons	10	14639--63------D
76	10,000 daltons	10	14639--76------D
150	10,000 daltons	10	14639-150------D
25	30,000 daltons	10	14659--25------D
63	30,000 daltons	10	14659--63------D
76	30,000 daltons	10	14659--76------D
25	50,000 daltons	10	14650--25------D
47	50,000 daltons	10	14650--47------D
76	50,000 daltons	10	14650--76------D
25	300,000 daltons	10	14679--25------D
47	300,000 daltons	10	14679--47------D
76	300,000 daltons	10	14679--76------D

Cellulose Triacetate Membrane Filters, Type 145

Diameter in mm	MWCO	Qty./Pkg.	Prod. No.
25	5,000 daltons	10	14529--25------D
47	5,000 daltons	10	14529--47------D
25	10,000 daltons	10	14539--25------D
47	10,000 daltons	10	14539--47------D
50	10,000 daltons	10	14539--50------D
25	20,000 daltons	10	14549--25------D
43	20,000 daltons	10	14549--43------D
47	20,000 daltons	10	14549--47------D
47	20,000 daltons	100	14549--47------N
63	20,000 daltons	10	14549--63------D
25	30,000 daltons	10	14459--25------D
76	30,000 daltons	10	14459--76------D

Hydrosart® Membrane Filters, Type 144

Diameter in mm	MWCO	Qty./Pkg.	Prod. No.
25	5,000 daltons	10	14429--25------D
44	5,000 daltons	10	14429--44------D
63	5,000 daltons	10	14429--63------D
76	5,000 daltons	10	14429--76------D
25	10,000 daltons	10	14439--25------D
47	10,000 daltons	10	14439--47------D
63	10,000 daltons	10	14439--63------D
76	10,000 daltons	10	14439--76------D
25	30,000 daltons	100	14459--25------D
47	30,000 daltons	10	14459--47------D
63	30,000 daltons	10	14459--63------D
76	30,000 daltons	10	14459--76------D

Vivacon® 500

For DNA Sample Desalting and Concentration

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 respun 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 deactivate all traces of DNA that might interfere with subsequent amplification procedures.

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

Specifications

Vivacon® 500

Concentrator capacity	Fixed-angle rotor	0.5 ml
Dimensions	Total length (concentration)	45 mm
	Total length (backspin)	47.5 mm
	Width	12.4 mm
	Active membrane area	0.32 cm^2
	Hold-up volume of membrane and support	< 5 µl
	Dead-stop volume (40° rotor)	5 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polypropylene
	Membrane	Hydrosart®

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

Ordering Information

Vivacon® 500	Qty./Pkg.	Prod. No.
2,000 MWCO	25	VN01H91
2,000 MWCO	100	VN01H92
10,000 MWCO	25	VN01H01
10,000 MWCO	100	VN01H02
30,000 MWCO	25	VN01H21
30,000 MWCO	100	VN01H22
50,000 MWCO	25	VN01H31
50,000 MWCO	100	VN01H32
100,000 MWCO	25	VN01H41
100,000 MWCO	100	VN01H42
125,000 MWCO	25	VN01H81
125,000 MWCO	100	VN01H82
125,000 MWCO	500	VN01H83

Vivacon® 500	Qty./Pkg.	Prod. No.
Sample kit L (4 units each of 2 kDa, 10 kDa, 30 kDa)	12	VN01HL12
Sample kit H (4 units each of 30 kDa, 50 kDa, 100 kDa)	12	VN01HH12

Vivacon® 500-PCR Grade	Qty./Pkg.	Prod. No.
30,000 MWCO	25	VN01H21ETO
30,000 MWCO	100	VN01H22ETO
50,000 MWCO	25	VN01H31ETO
50,000 MWCO	100	VN01H32ETO
100,000 MWCO	25	VN01H41ETO
100,000 MWCO	100	VN01H42ETO
125,000 MWCO	25	VN01H81ETO
125,000 MWCO	100	VN01H82ETO

Accessories	Qty./Pkg.	Prod. No.
Tubes	100	VNCT01

Vivacon® 2

For DNA Sample Desalting and Concentration

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 respun 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 deactivate all traces of DNA that might interfere with subsequent amplification procedures.

Specifications

Concentrator capacity	Fixed-angle rotor	2 ml
Dimensions	Total length (concentration)	125 mm
	Total length (backspin)	115 mm
	Width	16 mm
	Active membrane area	0.95 cm^2
	Hold-up volume membrane and support	10 µl
	Dead-stop volume (25° rotor)	55 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polypropylene
	Backspin vial	Polypropylene
	Concentrator cap	Polypropylene
	Membrane	Hydrosart®

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

Ordering Information

Vivacon® 2	Qty./Pkg.	Prod. No.
2,000 MWCO	25	VN02H91
2,000 MWCO	100	VN02H92
10,000 MWCO	25	VN02H01
10,000 MWCO	100	VN02H02
30,000 MWCO	25	VN02H21
30,000 MWCO	100	VN02H22
50,000 MWCO	25	VN02H31
50,000 MWCO	100	VN02H32
100,000 MWCO	25	VN02H41
100,000 MWCO	100	VN02H42
125,000 MWCO	25	VN02H81
125,000 MWCO	100	VN02H82

Vivacon® 2-PCR Grade	Qty./Pkg.	Prod. No.
30,000 MWCO	25	VN02H21ETO
30,000 MWCO	100	VN02H22ETO
50,000 MWCO	25	VN02H31ETO
50,000 MWCO	100	VN02H32ETO
100,000 MWCO	25	VN02H41ETO
100,000 MWCO	100	VN02H42ETO
125,000 MWCO	25	VN02H81ETO
125,000 MWCO	100	VN02H82ETO

Vivaspin® Endotest

Vivaspin® Endotest is a single-use ultrafiltration device for endotoxin concentration and removal of interfering substances from liquid samples for LAL testing. The Vivaspin® Endotest is certified as endotoxin-free and is available with a cellulose triacetate membrane that has a molecular weight cutoff (MWCO) of 20,000.

Due to its centrifugal design, Vivaspin® Endotest enables parallel testing to minimize hands-on time.

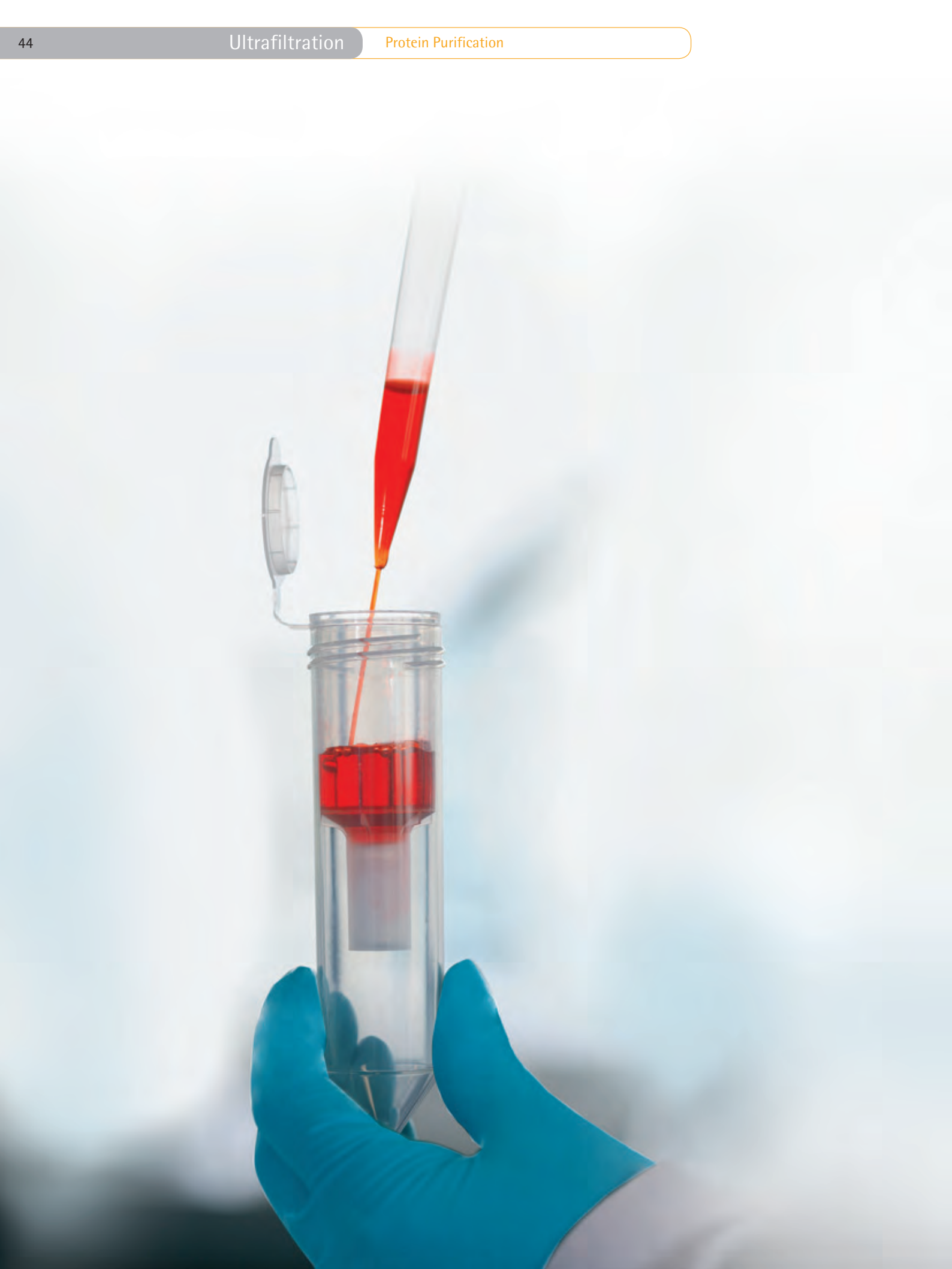
Vivaspin® Endotest can effectively be used in either swing-bucket or fixed-angle rotors that accept 50 ml conical bottom centrifuge tubes.

Specifications

Concentrator capacity	Swing-bucket rotor	15.0 ml
	Fixed-angle rotor	12.5 ml
Dimensions	Total length	116 mm
	Diameter	30 mm
	Active membrane area	3.9 cm²
	Dead-stop volume	30 µl
	Non-recoverable (hold-up) volume	≤ 10 µl
Materials of construction	Body	Polycarbonate
	Filtrate vessel	Polycarbonate
	Concentrator cap	Polypropylene
	Membrane	Cellulose triacetate

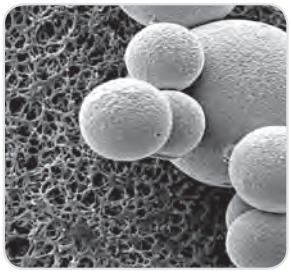
Ordering Information

Vivaspin® Endotest	Qty./Pkg.	Prod. No.
20,000	12	VS15RXET0



Vivapure®

Ion Exchange Protein Purification Products



Chromatography gel beads (right) are shown on top of a membrane adsorber in this SEM. The membrane adsorber pores are more than 50 times larger than bead pores.

Fast and Easy-to-Use Spin Columns
Vivapure® Ion Exchange (IEX) spin columns are centrifugal devices that incorporate Sartobind® membrane adsorber technology as their chromatography matrix. Vivapure® IEX spin columns make protein purification as easy as filtration. The devices are ready to use and eliminate the risk of running dry. For many protein purification applications, they replace time-consuming and tedious column chromatography.

The rapid Vivapure® IEX 1-2-3 bind-wash-elute protocol especially lends itself to screening applications, where many different samples are processed in parallel.

The Sartobind® Membrane Adsorber Matrix
Sartobind® IEX membrane adsorbers are based on stabilized regenerated cellulose and exhibit a microporous structure with a pore size of >3 µm, which is orders of magnitude larger than conventional chromatographic gel materials. This allows molecules to be transported to the ligands immobilized on the membrane adsorber by convective flow, resulting in exceptionally high flow rates.

By contrast, gel chromatography is slowed down due to diffusion limitations, as the molecules need to enter the small bead pores in order to be bound by the ligands. The porous membrane adsorber enables fast, reproducible and scalable protein purification.

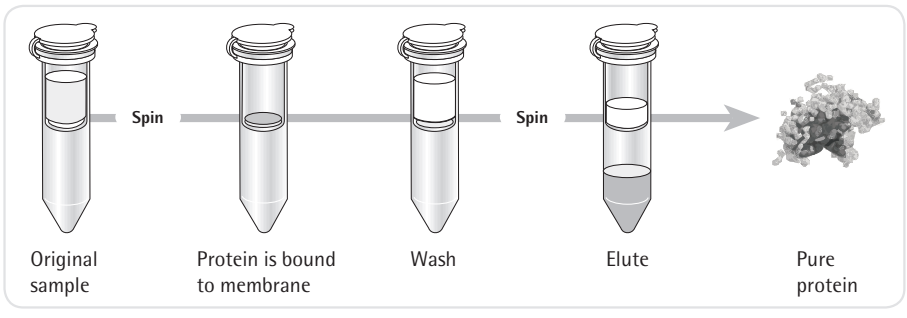
Fast and Simple-to-Use Spin Columns
- Devices are ready to use
- They make protein purification as simple as filtration

Reproducible Results
- No column packing necessary as the devices are ready to use
- Membrane adsorber spin columns cannot crack or run dry

Centrifugal Devices
- Offer the possibility of working in parallel

Low Bed Volume
- Small membrane adsorber bed volumes allow working with lower buffer amounts, resulting in concentrated elution fractions

Scalable Product Range
- Process-scale modules are available with the same Sartobind® IEX membrane adsorber matrix



Fast and easy protein purification with Vivapure® spin columns

Vivapure® Mini-400 | 500 µl
Binding capacities:
1 mg to 4 mg

Vivapure® Maxi-19 | 20 ml
Binding capacities:
15 mg to 80 mg

Specifications

Available Formats

Vivapure® IEX Products	Application
Vivapure® Mini spin columns	– Sample fractionation – Purification condition scouting – Small-scale purification
Vivapure® Maxi spin columns	– Large-scale sample fractionation – One-step protein purification | concentration – Polishing of His-tagged protein

Membrane Availability

Functional Groups	Ion Exchanger Type	
Sulfonic acid (S)	Strong acidic cation exchanger:	$R\text{-}CH_2\text{-}SO_3^-Na^+$
Quaternary ammonium (Q)	Strong basic anion exchanger:	$R\text{-}CH_2\text{-}N^+\text{-}(CH_3)_3Cl^-$
Diethylamine (D)	Weak basic anion exchanger:	$R\text{-}CH_2\text{-}NH^+\text{-}(CH_2H_5)_2$

Performance Characteristics

Vivapure® Spin Columns	Protein Binding Capacity* (mg)	Max. Volume per Centrifuge Run Using a Swing-Out Rotor (ml)	Max. Volume per Centrifuge Using a Fixed-Angle Rotor Run (ml)
Vivapure® Mini H	4	0.4	
Vivapure® Maxi H	60 to 80	19	10.5

* Actual yields depend on specific protein sample and selected pH and salt conditions.
Yields established using 1 mg/ml BSA in 25 mM Tris/HCL pH 8.0 with Vivapure® Q & D spin columns and 1 mg/ml cytochrome c in 25 mM sodium acetate buffer pH 5.5 with Vivapure® S spin columns.

Ordering Information

Description	Spin Columns	Centrifuge Tubes	Prod. No.
Vivapure® Mini Ion Exchange Spin Columns (up to 0.5 ml)			
Vivapure® Mini S&Q H starter kit	16	32	VS-IX01SQ16
Vivapure® D Mini H	24	48	VS-IX01DH24
Vivapure® Q Mini H	24	48	VS-IX01QH24
Vivapure® S Mini H	24	48	VS-IX01SH24
Vivapure® Maxi Ion Exchange Spin Columns (up to 20 ml)			
Vivapure® D Maxi H	8	16	VS-IX20DH08
Vivapure® Q Maxi H	8	16	VS-IX20QH08
Vivapure® S Maxi H	8	16	VS-IX20SH08

Vivapure® Miniprep and Maxiprep Purification Kits

For Fast Antibody and His-Tagged Protein Purification

Rapid Purification with High Yields
Vivapure® Miniprep and Maxiprep kits are spin-column-based kits for fast and effective purification of His-tagged proteins and antibodies.

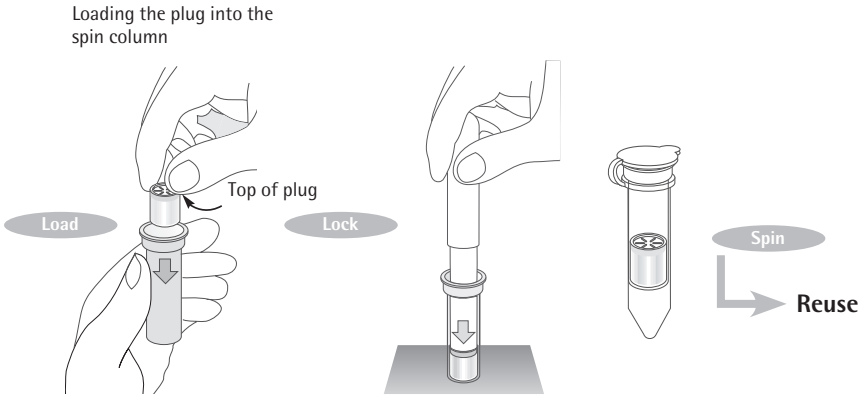
Spin columns have the advantage of speed over gravity drip columns and batch protocols.

With the patented FlowGo regulator, the sample residence time is extended to assure adequate sample binding to the resin. As a result, Vivapure® Miniprep and Maxiprep spin column kits combine the merits of spin columns and gravity drip columns. This results in rapid purification with up to 95% protein recovery and purity.

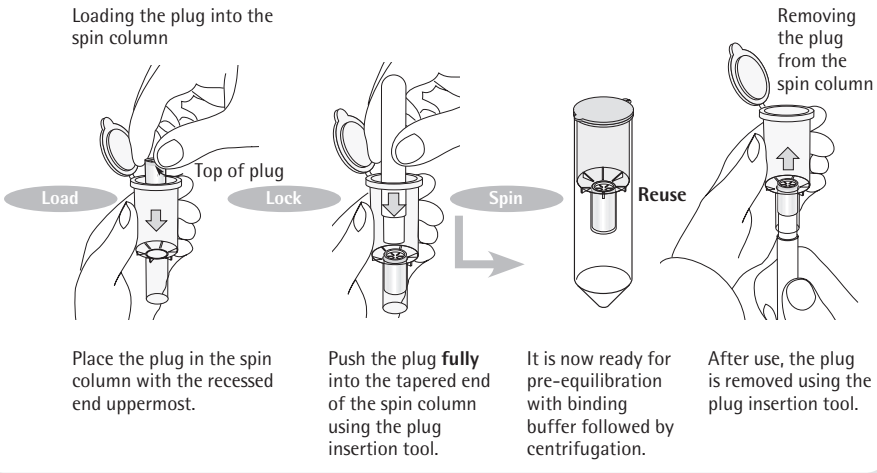
All spin columns can be conveniently used in a centrifuge. For processing large sample volumes, e.g. from diluted cell culture supernatants, Vivapure® Maxiprep spin columns can additionally be run with a peristaltic pump collar (VS-PPCSC).

Vivapure® Miniprep and Maxiprep columns come in a variety of different configurations for your convenience. They can be purchased as completely ready-to-use kits with buffers and ultrafiltration devices but just as well as stand-alone spin columns in small or large packages for frequent users.

Vivapure® Miniprep



Vivapure® Maxiprep



Specifications

Protein A and G for Antibody Purification

Protein A and G Miniprep	Centrifuge
Sample size	0.65 ml
Typical binding capacity	1 mg IgG/column
Number of reuses	3

Protein A&G Maxiprep	Centrifuge[1]
Sample size	20 ml
Typical binding capacity	20 mg IgG/column
Number of reuses	5

[1] Use the peristaltic pump accessory (VS-PPCSC) for larger volumes

Ordering Information

Product Name	Qty./Pkg.	Prod. No.
Vivapure® A Starter Pack*	2 Miniprep A units	VS-ARSTPKA2
Vivapure® Miniprep A Kit*	16 Miniprep A units	VS-ARAMINIK
Vivapure® Miniprep A Bulk Pack	48 Miniprep A units	VS-ARAMINIB
Vivapure® Miniprep A Kit*	4 Maxiprep A units	VS-ARAMAXIK
Vivapure® Maxiprep A Bulk Pack	12 Maxiprep A units	VS-ARAMAXIB
Vivapure® A Buffer Pack		VS-ARABUFPK
Vivapure® G Starter Pack*	2 Miniprep G units	VS-ARSTPKG2
Vivapure® Miniprep G Kit*	16 Miniprep G units	VS-ARGMINIK
Vivapure® Miniprep G Bulk Pack	48 Miniprep G units	VS-ARGMINIB
Vivapure® Maxiprep G Kit*	4 Maxiprep G units	VS-ARGMAXIK
Vivapure® Maxiprep G Bulk Pack	12 Maxiprep G units	VS-ARGMAXIB
Vivapure® G Buffer Pack		VS-ARGBUFPK
Sealing cap and peristaltic pump collar	1	VS-PPCSC

* including ultrafiltration concentrators and buffers

Specifications

Protein MC Miniprep Kits	Centrifuge
Sample size	0.65 ml
Typical binding capacity	1 mg His-tagged protein
Number of reuses	2

Protein MC Maxiprep Kits	Centrifuge[1]
Sample size	20 ml
Typical binding capacity	10 mg His-tagged protein
Number of reuses	2

[1] Use the peristaltic pump accessory (VS-PPCSC) for larger volumes

Ordering Information

Product Name	Qty./Pkg.	Prod. No.
Vivapure® Metal Chelate (MC) Starter Pack*	4	VS-MCST04
Vivapure® Miniprep MC Kit*	24	VS-MCMINI24
Vivapure® Miniprep MC Bulk Pack	72	VS-MCMINIB
Vivapure® Maxiprep MC Kit*	8	VS-MCMAXIK
Vivapure® Maxiprep MC Bulk Pack	24	VS-MCMAXIB
Vivapure® Metal Chelate Buffer Pack		VS-MCBUFPK

* including ultrafiltration concentrators and buffers

Vivapure® Virus Purification and Concentration 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.

Adenovirus Purification with Vivapure® AdenoPACK Kits

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 ml 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.

* 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.

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

Specifications

Adenovirus Purification Kit Specifications

Product	AdenoPACK 20	AdenoPACK 100	AdenoPACK 500
Sample size	20 ml cell culture	20 ml to 200 ml of cell culture	500 ml of cell culture
Number of purifications	6 × 20 ml	2 × 20 ml 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

* AdenoPACK 20 RT does not contain Benzonase®**

Vivapure® AdenoPACK 100

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

AdenoPACK 100 Accessories

VS-AVPA001	Pump tubing set for Vivapure® AdenoPACK 100

* AdenoPACK 100 RT does not contain Benzonase®**

Vivapure® AdenoPACK 500

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

* AdenoPACK 500 RT does not contain Benzonase®**
** Benzonase® is a registered trademark of Merck

Lentivirus Purification with the Vivapure® LentiSELECT Kit

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 ml 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	$1 \times 1{,}000$ ml
Virus particles (VP) per ml	Typically up to 3×10^9	Typically up to $2\text{-}5 \times 10^{9*}$	Typically up to $4\text{-}6 \times 10^{13}$
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

Table of Contents

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 clean and safe as they are virtually free of leachables and extractables and reliably remove particles and microorganisms with no leakage. If you need to rely on the quality of your filtrate – whether it needs to be sterile prior to injection 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

Minisart® syringe filters feature a housing made of medical-grade acrylic (MBS), which makes them the perfect choice for sterile filtration and clarification of additives, buffers, reagents, drugs and gases. Their effective filtration area of 6.2 cm^2 for liquids is the largest among premium syringe filters. The combination of the MBS housing material and surfactant-free cellulose acetate, PES or PTFE membranes add comma provides the lowest non-specific binding. As a result, Minisart® delivers excellent performance in filtering medical drugs or gases for sterilization or particle removal prior to use.

Minisart® syringe filters with a polypropylene housing are optimized for filtration prior to analysis and withstand even harsh solvents and chemicals. 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 the optimum filter capacity and the lowest hold-up volume.

Sartolab® vacuum filtration devices with 0.1 µm and 0.22 µm PES membranes for convenient filtration of 150 ml up to 1 L are ready to use and sterile. Sartolab® RF is a complete system that includes a receiver flask. Sartolab® BT Sterile is a bottle top filter without a receiver flasks. 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® 150V is a disposable vacuum filter with a pleated 0.22 µm PES membrane, which is suitable for up to 15 L of liquid.

Sartolab® pressure filtration devices with a 0.2 µm SFCA or PES membrane are available with or without a glass fiber prefilter, depending on your needs. Sartolab P20 is designed for up to 3 L volumes and can also be used in-line. The polycarbonate housing and membrane components are ideal for filtering liquid medical drugs. The glass fiber prefilter types 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 medical solutions prior to use

Minisart® Syringe Filters

Removal of Particles and Microorganisms from Liquids and Gases

Sartorius offers Minisart® syringe filters for a wide range of applications. The filters are clean and safe as they are virtually free of leachables and extractables. In addition, they reliably remove particles and microorganisms – without any leakage. Minisart® with a polypropylene housing is optimized for filtration prior to analysis and withstands even harsh solvents and chemicals. Minisart® with a housing made of medical-grade acrylic (MBS) is the perfect choice for sterile filtration and clarification of additives, buffers, reagents, drugs and gases.

A Full Range of Filters Dedicated for Various Filtration Applications

Sample Preparation
HPLC | UHPLC | Analytics
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® 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 61.

Filtration of Aqueous Liquids
Clarification | Sterile Filtration
For clarification and sterilization of liquids, filtration is the optimal method. It removes all microorganisms and particles reliably, without any effects on the ingredients due to adsorption or decomposition. For optimal results, Minisart® 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 lowest adsorption characteristics. The effective filtration area of 6.2 cm^2 for the fastest 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 65.

Medical Use and Special Sterile Venting Applications
Minisart® syringe filters are ideal for clarification of liquids laden with particles, e.g. for preparation of pharmaceuticals or infusion solutions. For sterilization and removal of particles from air and other gases, syringe filters are optimal for sterile venting of containers, bioreactors, fermenters and tubing systems in medical devices. Many Minisart® syringe filters have the CE mark of conformity (European directive) and are available with a wide choice of membranes, connectors and housing materials. For a list of the types offered, please see page 68.

Minisart® Selection Guide

Please refer to Minisart® RC, NY or SRP for the highest chemical compatibility on page 63.
Please refer to Minisart® NML or Minisart® High Flow on page 66.
Several additional Minisart® units for venting and special purposes are shown on page 70.

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
SFCA Surfactant-Free 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	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 Grit, Cells	Glass Prefilter 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 Volumes

1 ml to 200 ml	1 ml to 100 ml	0.5 ml to 15 ml	0.05 ml to 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**

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

Sample Preparation for Analytical Procedures

Reliable Removal of Particles and Microorganisms from Liquids and Gases

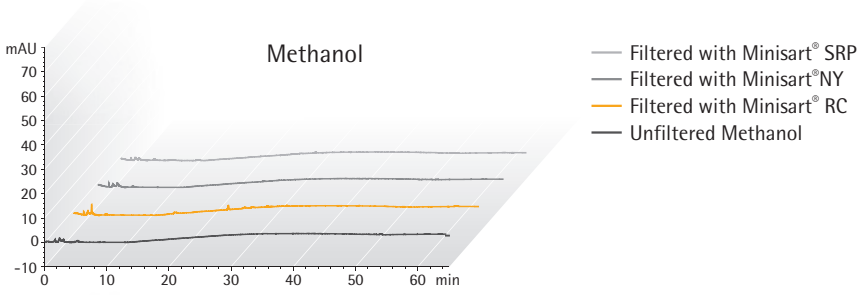
Particle removal by filtration before analysis substantially increases the lifetime of your columns. Minisart® RC is optimized for aqueous liquids and solvents and is compatible with DMSO, other amides, ketones, esters and ethers. Minisart® NY is exceptionally pure compared with other common polyamide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

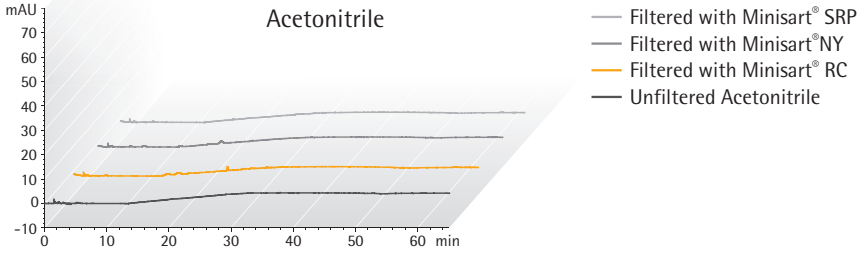
Our coating-free hydrophobic PTFE membrane used in Minisart® SRP is suitable for venting applications and leachables-free clarification of exceptionally harsh chemicals.

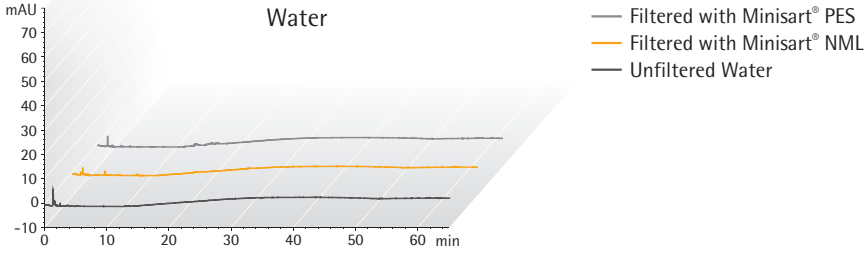
Minisart® Features

- Low adsorption of analytes
- Maximum chemical compatibility
- Minimum extractables or leachables
- Bidirectional use possible
- 100% optical integrity test

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

Sample Preparation for Chromatography

Ordering Information

Dia. in mm	EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./Pkg.	Order No.
Minisart® RC (Regenerated Cellulose)									
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	17575--------ACK
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	0.45 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

Dia. in mm	EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color	Printing	Sterile*	Qty./Pkg.	Order No.
Minisart® NY (Nylon) and NY25 Plus (Glass Fiber 0.7 µm[2] + Nylon)										
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

* 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!

For technical product specifications, please see page 72.

Minisart® High Flow with PES

Minisart® NML with SFCA

Filtration of Aqueous Liquids – Clarification | Sterilization

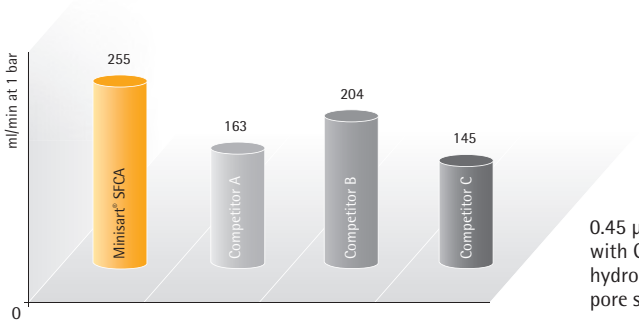
Filtration Is the Optimal Method for Clarification and Sterilization of Liquids

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 (SFCA) is the best choice for all aqueous solutions with a pH of 4 to 8. It combines fast flow rates with an exceptionally pure and leachables-free membrane 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 virtually behaves like a prefilter. Both Minisart® types – NML and High Flow – can be sterilized by ethylene oxide (EO) or gamma irradiation and are suitable for gluing and assembling on tubing. In addition, Minisart® NML has the CE mark of conformity.

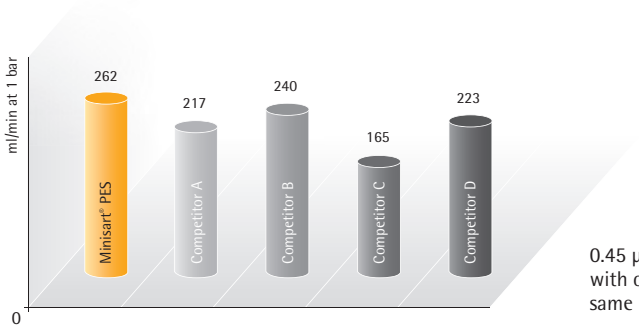
Minisart® Features

- The largest effective filtration area (EFA) of 6.2 cm^2
- The lowest adsorption
- Superior flow rate
- High total throughput
- Low hold-up volume
- Minimum extractables
- PVC-free
- Gamma-irradiated or EO-sterilized
- Bidirectional use possible
- 100% optical integrity test

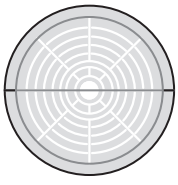
Water Flow Rates at 1 bar (ml/min); 15.4 psi; 0.45 µm Hydrophilic Membranes



0.45 µm SFCA membrane compared with CA (Cellulose Acetate) or similar hydrophilic membranes of the same pore size



0.45 µm PES membrane compared with other PES membranes of the same pore size



28 mm EFA
33 mm housing diameter

Preparation of Aqueous Liquids

Ordering Information

Dia. in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./ Pkg.	Order No.	CE Marking
Minisart® High Flow (PES – Polyethersulfone)									
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 (SFCA – Surfactant-free Cellulose Acetate)									
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	16534----------K	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes#	50	16534--------GUK	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	16534----------Q	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	Yes	50	17597----------K	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	No	500	17597----------Q	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	16555----------K	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes#	50	16555--------GUK	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	16555----------Q	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	Yes	50	17598----------K	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	No	500	17598----------Q	CE-marked
28 mm	SFCA	MBS	0.65 µm	Male Luer Slip	Pink	Yes	50	16569----------K	
28 mm	SFCA	MBS	0.8 µm	Male Luer Lock	Green	Yes	50	16592----------K	
28 mm	SFCA	MBS	0.8 µm	Male Luer Lock	Green	Yes#	50	16592--------GUK	
28 mm	SFCA	MBS	0.8 µm	Male Luer Lock	Green	No	500	16592----------Q	
28 mm	SFCA	MBS	1.2 µm	Male Luer Lock	Red	Yes	50	17593----------K	
28 mm	SFCA	MBS	1.2 µm	Male Luer Lock	Red	No	500	17593----------Q	
28 mm	SFCA	MBS	5 µm	Male Luer Lock	Brown	Yes	50	17594----------K	CE-marked
28 mm	SFCA	MBS	5 µm	Male Luer Lock	Brown	No	500	17594----------Q	

Dia. in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./ Pkg.	Order No.	CE Marking
Minisart® NML Plus (Glass Fiber 0.7 µm² + SFCA)									
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+SFCA	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	

* 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: PES, SFCA, GF+SFCA and GF can be sterilized by ethylene oxide or gamma irradiation.
[1] Diameter of EFA – Effective Filtration Area
[2] 0.7 µm = GF particle retention ≠ pore size!

For technical product specifications, please see page 74.

Minisart® available in many configurations

Special Applications – Medical Uses and Sterile Venting

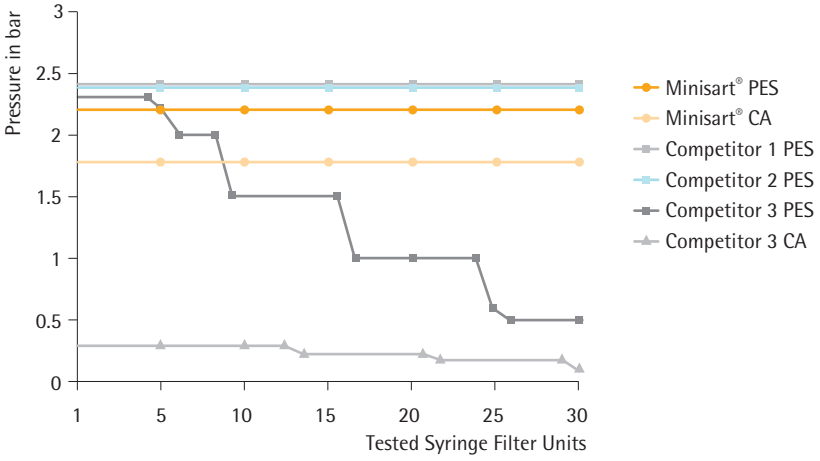
Choose from a Broad Range of Pore Sizes, Materials and Formats

Bacterial cell removal or particulate removal from liquids, including medical drugs, can easily be performed with Minisart® syringe filters. Minisart® has a minimal effect on the ingredients of a filtered solution. Minisart® NML and Ophthalsart with surfactant-free cellulose acetate (SFCA) and Minisart® HY and SRP with hydrophobic PTFE have the CE mark of conformity and are frequently used for sterile filtration of aqueous and oily ear or eye solutions and other drugs. Minisart® NML with a 5 µm pore size removes particulates or coagulates in dissolved medical drugs prior to injection, offering the highest total throughput under sterile conditions – without any early clogging. Hydrophobic PTFE filters are suitable for venting purposes and are additionally available in special formats with activated carbon.

Minisart® Features

- 100% optical integrity test
- Low adsorption
- Minimum extractables
- Particulate-free
- PVC-free
- Gamma-irradiated or EO-sterilized
- Many CE-marked types
- Bidirectional use possible
- Many configurations available

Pressure-Hold Test



Method: Pressure-hold tests were performed by connecting pre-wetted syringe filter units to a 10-fold pressure device with a pressure gauge. The pressure applied equaled 4/5 of the bubble point. Units failed the test if they released air bubbles before reaching 4/5 of the minimum bubble point. These units were remeasured to determine at which pressure air bubbles appear.

Result: Testing the pressure-hold capability of syringe filters revealed that many competitor 3's filters are dysfunctional and not intact. Filtration performed with such filters will result in unsterile filtrates or filtrates without an appropriately reduced level of particles.


BIOCOMPATIBILITY
CERTIFICATE

Biocompatibility
Certificate Minisart® HY


BIOCOMPATIBILITY
CERTIFICATE

Biocompatibility
Certificate Minisart® NML


SGS
SARTORIUS STEDIM BIOTECH GmbH
Directive 93/42/EEC
Richtlinie 93/42/EEC

Declaration of Conformity
Minisart®

Minisart® Syringe Filters – Special

Ordering Information

Dia. in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./ Pkg.	Order No.	CE Marking
Minisart® NML (SFCA – Cellulose Acetate) Aqueous Filtration									
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	16534----------K	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes#	50	16534--------GUK	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	16534----------Q	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	Yes	50	17597----------K	CE-marked
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	No	500	17597----------Q	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	16555----------K	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes#	50	16555--------GUK	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	16555----------Q	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	Yes	50	17598----------K	CE-marked
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	No	500	17598----------Q	CE-marked
28 mm	SFCA	MBS	5 µm	Male Luer Lock	Brown	Yes	50	17594----------K	CE-marked
Minisart® Ophthalsart (SFCA – Cellulose Acetate) Aqueous Filtration									
28 mm	Ophthalsart	MBS	0.2 µm	Male Luer Slip	Pink	Yes	50	17528----------K	CE-marked
Minisart® High Flow (PES – Polyethersulfone) Aqueous Filtration									
28 mm	PES	MBS	0.1 µm	Male Luer Lock	Dark Red	Yes	50	16553----------K	
Minisart® PES (Polyethersulfone) Aqueous Filtration									
15 mm	PES	PP	0.22 µm	Male Luer Slip	White	Yes	50	1776D--------ACK	
Minisart® Air (Hydrophobic PTFE) Venting									
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® HY (hydrophobic PTFE), CE-Marked, for Venting and Gas Filtration									
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	Yes	50	16596--------HYK	CE-marked
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	No	500	16596--------HYQ	CE-marked
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock[a]	Clear	No	500	16599--------HYQ	CE-marked
26 mm	PTFE	MBS	0.2 µm	Hose Barbs[b]	Clear	No	500	40078----------Q	CE-marked
26 mm	PTFE	MBS	1 µm	Male Luer Lock	Clear	No	500	1659A--------HYQ	
26 mm	PTFE	MBS	1 µm	Hose Barbs[b]	Clear	No	500	1659B--------HYQ	
Minisart® Acticosart with Dome Reservoir and Hydrophobic PTFE for Venting and Ultracleaning of Gases									
26 mm	Active Carbon	MBS	0.45 µm	Male Luer Slip[a]	Blue	No	500	17840----------Q	

Dia. in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./ Pkg.	Order No.	CE Marking
Minisart® SRP (Hydrophobic PTFE) CE-marked Venting & Gas Filtration									
25 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17575--------ACK	CE-marked
25 mm	PTFE	PP	0.2 µm	Hose Barb	White	No	500	1757A----------Q	

* Sterilized Minisart® units are individually packaged. If not stated otherwise, Minisarts are sterilized by ethylene oxide.
#-mark indicates sterilization by gamma irradiation
Non-presterilized Minisart® units: SFCA can be sterilized by ethylene oxide or gamma irradiation. PTFE can be sterilized by ethylene oxide.
[a] Connector inlet: Male Luer slip (all other Minisart® types have female luer lock inlets)
[b] Hose barbs, inlet and outlet, 5 mm diameter
[1] Diameter of EFA – Effective Filtration Area

For technical product specifications, please see pages 72 and 74.

Do you need other quantities per package?
Are you looking for special versions or do you have requirements?
Do you need other inlet and | or outlet connectors?

Please contact us to learn more about additional Minisart® configurations that are available.

Minisart® with Polypropylene Housing

Specifications

Minisart® RC | SRP | NY | PES with 4 | 15 | 25 mm Diameter Membrane Filtration Area	
Housing material	Polypropylene (PP)
Membranes	RC = Regenerated Cellulose | NY = Polyamide | SRP = Hydrophobic PTFE = Polytetrafluoroethylene | PES = Polyethersulfone
Glass fiber prefilter	NY Plus: Ultrapure quartz, 0.7 µm particle retention
Application limits	Max. recommended operating pressure 4.5 bar | 65 psi
Housing burst pressure	> 7 bar | 102 psi
Max. temperature	121 °C, 30 min (autoclavable)
Sterilization	Non-sterile Minisart® can be autoclaved or sterilized by ethylene oxide (EO)

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: individual 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 1.4 bar | 20 psi	With ethanol 0.9 bar | 13 psi
Flow rate, 4 mm dia. = 0.07 cm^2 filter area | Hold-up volume[1]: 5 µl to 10 µl (▶ ml/min)					
– 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, 15 mm dia. = 1.7 cm^2 filter area | Hold-up volume[1]: 30 µl to 100 µl (▶ ml/min)					
– 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	1600
Flow rate, 25 mm dia. = 4.8 cm^2 filter area | Hold-up volume[1]: 100 µl to 200 µl (▶ ml/min)					
– For water at 1 bar	80	50	160	–[3]	–[3]
– For methanol at 1 bar	160	90	325	160	260
– For air at 0.1 bar	–[2]	–[2]	–[2]	1800	3000
Water penetration point	–	–	–	> 4.0 bar | 58 psi[3]	> 3.0 bar | 44 psi[3]
Sterile filtration capability acc. to the bacteria challenge text	No[5]	Yes	No	Yes	No
Pyrogen-free according to the USP				Yes	
Cytotoxity (17575-ACK)	No inhibition with MRC-5 (human lung cells) and L929				

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
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
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
Flow rate, 4 mm dia. = 0.07 cm^2 filter area | Hold-up volume[1]: 5 µl to 10 µl (▶ ml/min)					
– For water at 1 bar	–	–	–	–	1.5
– For methanol at 1 bar	–	–	–	–	–[4]
– For air at 0.1 bar	–	–	–	–	–[2]
Flow rate, 15 mm dia. = 1.7 cm^2 filter area | Hold-up volume[1]: 30 µl to 100 µl (▶ ml/min)					
– 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, 25 mm dia. = 4.8 cm^2 filter area | Hold-up volume[1]: 100 µl to 200 µl (▶ ml/min)					
– For water at 1 bar	50	100	50	100	100
– For methanol at 1 bar	70	200	70	200	–[4]
– For air at 0.1 bar	–[2]	–[2]	–[2]	–[2]	–[2]
Water penetration point	–	–	–	–	–
Sterile filtration capability acc. to the bacteria challenge test	Yes	No	Yes	No	Yes
Pyrogen-free according to the USP					
Cytotoxity (17575-ACK)	No inhibition with MRC-5 (human lung cells) and L929				

[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 10^7 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 mm pore size can be sterilized by autoclaving or EO before use for sterile filtration.

Minisart® with MBS Housing

Specifications

Minisart® High Flow | NML | NML Plus with 28 mm accessible membrane filtration area diameter, 100 µl to 150 µl hold-up volume[1]
Minisart® HY | Acticosart with 26 mm accessible membrane filtration area diameter, 100 µl to 150 µl hold-up volume[1]
Minisart® Air with 15 mm accessible membrane filtration area diameter, 100 µm 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 pre-filter	NML Plus: Binder-free GF, 0.7 µm particle retention
Application limits	High Flow: Max. recommended operating pressure 6.0 bar | 87 psi NML, NML Plus, HY, Air: Max. recommended operating pressure 4.5 bar | 65 psi Acticosart: Max. recommended operating pressure 1 bar | 14.5 psi
Housing burst pressure	> 7 bar | 102 psi (not determined for Acticosart)
Max. temperature	60°C, not autoclavable
Sterilization	Non-sterile Minisart® High Flow, NML and NML Plus can be or sterilized by ethylene oxide (EO) or by gamma sterilization Non-sterile Minisart® HY, Acticosart, Air* can be sterilized by ethylene oxide (EO)

Minisart® Membrane Types	**PES 0.1 µm**	**PES 0.2 µm**	**PES 0.45 µm**	**CA 0.2 µm**	**CA 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 dia. for water at 1 bar	40	140	220	60	180	250	400	500	600
15 mm dia. for air at 0.1 bar	–	–	–	–	–	–	–	–	–
26 mm dia. for air at 0.1 bar	–	–	–	–	–	–	–	–	–
Water penetration point	–	–	–	–	–	–	–	–	–
Sterile filtration capability[4] acc. to the bacteria challenge test	Yes	Yes	No	Yes	No	No	No	No	No
Pyrogen-free according to the USP				Yes	Yes				Yes
Cytotoxity	No inhibition with MRC-5 (human lung cells) and L929								

Minisart® Membrane Type	GF + CA 0.2 µm	GF + CA 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	HYK | HYQ | 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 1.4 bar | 20 psi	With ethanol 0.5 bar | 7 psi	With ethanol 0.9 bar | 13 psi	With ethanol 0.9 bar | 13 psi
Flow rate for[2|3] (► ml/min)								
28 mm dia. for water at 1 bar	60	160	350	450	–	–	–	–
15 mm dia. for air at 0.1 bar	–	–	–	–	–	–	–	2000
26 mm dia. for air at 0.1 bar	–	–	–	–	2000	4000	2300	–
Water penetration point	–	–	–	–	> 4.0 bar | 58 psi[3]	> 1.5 bar | 22 psi[3]	N.a.	> 3.0 bar | 44 psi[3]
Sterile filtration capability[4] according to the bacteria challenge test	Yes	No	No	No	Yes	No	N.a.	Yes
Pyrogen-free according to the USP					Yes			
Cytotoxity	No inhibition with MRC-5 (human lung cells) and L929							

[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 10^7 Brevundimonas diminuta. All non-sterile Minisart® types listed above can be sterilized according to the method recommended in this table.
* Minisart® Air can be sterilized by gamma rays according to the following parameters: Range 25 – 40 kGy (validated with 50 kGy).

Sartolab® P20 and Sartolab® P20 Plus

Sterile Filtration of Sample Volumes of Up to 5 Liters

Using Sartolab® P 20 or Sartolab® P 20 Plus in Available Systems

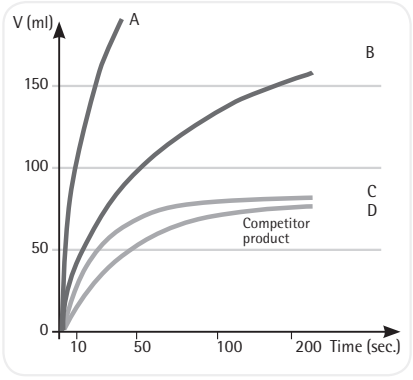
Systems with Luer Lock Connectors
Sartolab® units with a luer lock inlet fit directly onto the corresponding connectors of tubing from peristaltic pumps. This configuration can also be used with luer lock syringes.

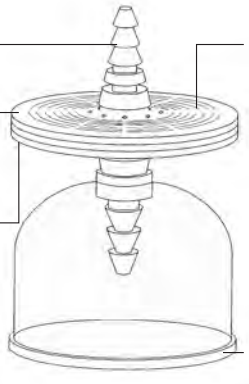
Systems with Tubing
If the liquid to be filtered will be pumped through open tubing from a pressure tank or a peristaltic pump, then a Sartolab® unit with a hose nipple inlet is required. The stepwise increase in diameter of the nipple, from 6 mm to 12 mm, makes it suitable for a wide range of tubing.

Application
The Sartolab® P 20 is a ready-to-use pressure filtration unit for sterile filtration of media and aqueous solutions in batches ranging from 100 ml to 5 l. For media that contain sera and difficult-to-filter solutions, a Sartolab® P 20 Plus unit with an incorporated prefilter is also available.

Security
The effectiveness of every batch of 0.2 µm cellulose acetate membranes for sterile filtration is confirmed by bacteria challenge tests (HIMA) using Brevundimonas diminuta. Only biosafe material is used in the filtration units; they have been proven non-toxic by passing the USP plastics test for toxicity. Tests with MRC-5 human lung cells on cellulose acetate membranes and glass fiber prefilters showed no cytotoxic effects. Finished units are also tested for their sterile filtration capability and for housing and membrane integrity.

Fast Filtration
The combination of a large filtration area (20 cm^2) and the optimal design of the filter support guarantees high flow rates with high total throughputs. Automatic venting of any trapped air through the PTFE membrane-protected vent ports ensures that the entire filter surface is used for effective filtration.





Specifications

Technical Specifications for Sartolab® P20 and Sartolab® P20 Plus Units with SFCA Membrane

Properties	Description	
	Sartolab® P20 18052 18053	**Sartolab® P20 Plus 18056 18058**
Filter material	SFCA, type 12587, 0.2 µm pore size and PTFE	SFCA, type 12587 0.2 µm pore size plus GF, 100% free of binding agents and PTFE
Housing material	Polycarbonate	Polycarbonate
Color code	Transparent	Transparent
Filter diameter	64 mm	64 mm
Connector inlet	Female luer lock or stepped hose nipple with 6 mm to 12 mm outer diameter	Female luer lock or stepped hose nipple with 6 mm to 12 mm outer diameter
Connector outlet	Hose nipple	Hose nipple
Filling bell	Yes	Yes
Filtration area	20 cm^2	20 cm^2
Hold-up volume before bubble point	1 ml	Approx 1.5 ml
Housing burst pressure	> 5 bar | 72.5 psi	> 5 bar | 72.5 psi
Bubble point	≥ 3.2 bar | 46.4 psi	≥ 3.2 bar | 46.4 psi
Max. recommended inlet pressure	3 bar | 43.5 psi	3 bar | 43.5 psi
Flow rate for water	≥ 250 ml/min at Δp = 1 bar | 14.5 psi	≥ 250 ml/min at Δp = 1 bar | 14.5 psi
Filtration range	100 ml to max. 5 l	100 ml to max. 10 l
pH-range	4–8	4–8
Non-specific protein adsorption	No loss of protein detectable (filtration of γ globulin, method acc. to Bradford)	< 80 µg/cm^2 (filtration of γ globulin, method acc. to Bradford)
Sterilization	EO sterilization	EO sterilization
Biosafety	Class VI Plastics Test	Class VI Plastics Test
Operating instructions	Directions for use included in each box	Directions for use included in each box

Technical Specifications for Sartolab® P20 and Sartolab® P20 Plus Units with PES Membrane

	Sartolab® P20 Plus 18068	**Sartolab® P20 18075**
Filter material	PES, type 15407 MI 0.2 µm pore size plus GF, 100% free of binding agents and PTFE	PES, type 15407 MI 0.2 µm pore size
Housing material	Polycarbonate	Polycarbonate
Color code	Transparent	Transparent
Filter diameter	64 mm	64 mm
Connector inlet	Female luer lock or stepped hose nipple with 6 mm to 12 mm outer diameter	Female luer lock or stepped hose nipple with 6 mm to 12 mm outer diameter
Connector outlet	Hose nipple	Hose nipple
Filling bell	Yes	No
Filtration area	20 cm^2	20 cm^2
Hold-up volume before bubble point	Approx 1.5 ml	1 ml
Housing burst pressure	> 5 bar | 72.5 psi	> 5 bar | 72.5 psi

Properties	Description	
	Sartolab® P20 Plus 18068	**Sartolab® P20 18075**
Bubble point	≥ 3.2 bar | 46.4 psi	≥ 3.2 bar | 46.4 psi
Max. recommended inlet pressure	3 bar | 43.5 psi	3 bar | 43.5 psi
Flow rate for water	400 ml/min at Δp = 1 bar | 14.5 psi	400 ml/min at Δp = 1 bar | 14.5 psi
Filtration range	100 ml–max. 10 l	100 ml–max. 5 l
pH range	1 to 8	1 to 8
Non-specific protein adsorption	< 80 µg/cm² (filtration of γ globulin, method acc. to Bradford)	No loss of protein detectable (filtration of γ globulin, method acc. to Bradford)
Sterilization	EO sterilization	EO sterilization
Biosafety	Class VI Plastics Test	Class VI Plastics Test
Operating instructions	Directions for use included in each box	Directions for use included in each box

Ordering Information

Type	Membrane	Housing	Pore Size	Inlet	Outlet	Sterile	Qty./Pkg.	Order No.
Sartolab® P20								
	SFCA	PC	0.2 µm	Hose Nipple	Hose Nipple	Yes	10	18052----------D
	SFCA	PC	0.2 µm	Luer Lock	Hose Nipple	Yes	10	18053----------D
	PES	PC	0.2 µm	Luer Lock	Hose Nipple	Yes	10	18075----------D
Sartolab® P20 Plus								
	SFCA + GF	PC	0.2 µm	Hose Nipple	Hose Nipple	Yes	10	18056----------D
	SFCA + GF	PC	0.2 µm	Luer Lock	Hose Nipple	Yes	10	18058----------D
	PES + GF	PC	0.2 µm	Luer Lock	Hose Nipple	Yes	10	18068----------D

SFCA – Cellulose Acetate, PES – Polyethersulfone, GF – Glass Fiber Prefilter, PC – Polycarbonate

Sartolab® 150v

Disposable PES Vacuum Filtration Unit for Volumes of Up to 15 Liters

Description
Sartolab®150v is a disposable, sterile, ready-to-use membrane filter capsule for highest convenience. Sartolab®150v capsules are made of a unique hydrophilic polyethersulfone (PES) membrane providing outstanding total throughput, flow rate performance, low extractables and broadest chemical compatibility.

Applications
Typical applications include sterilizing-grade filtration of:
– Biological fluids
– Purified water
– Media
– Buffers

Compatibility
The PES membrane is compatible with a pH range from 1 to 14, making Sartolab®150v ideal for filtration of solutions with either high or low pH values.

Microbiological Retention
Sartolab®150v capsules rated to 0.2 µm arefully validated as sterilizing-grade filters according to HIMA and ASTM F-838-05 guidelines.

Quality Control
Each individual element is integrity tested by the bubble point and diffusion test methods before final assembly. Sartolab®150v capsules are designed, developed and manufactured in accordance with a ISO 9001:2000 certified quality management system.

Performance
The unique pleated filter construction, combined with the highly asymmetric pore structure of the PES membrane, provides excellent flow rates and superior total throughput performance, especially in comparison to conventional disc filter systems.

Specifications

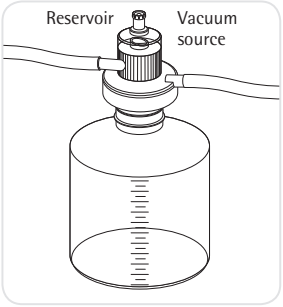
Materials and Data

Filter	Polyethersulfone (PES)
Support fleece	Polypropylene fleece
Housing	Polypropylene
Vent	PTFE
Pore size	0.2 µm
Filtration area	150 cm^2
Flow rate	1.5 L/min
Total throughput	15 L

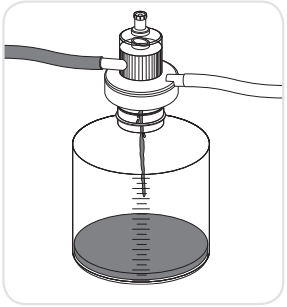
Ordering Information

Qty./Pkg.	Order No.
3	18080-M

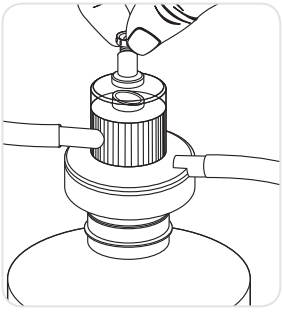
Easy to Use



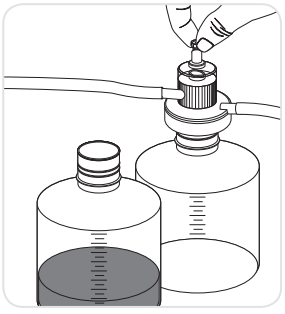
Place Sartolab® 150v on the bottle neck. Vacuum is automatically created when used with a water jet pump or a different vacuum source.



Create vacuum to start filtration.



To fill multiple receiving bottles, break the vacuum by opening the valve on top of the Sartolab® 150v housing.



To continue filtration with the next receiving bottle, close the valve.

Sartolab® RF | BT

Disposable Filter Systems and Bottle-Top Filters

Sartolab® single-use sterile filter systems and bottle-top filters are designed for the vacuum filtration of tissue culture media and components, biological fluids, and other aqueous solutions.

The Sartolab® single-use 150 mL, 250 mL, 500 mL and 1,000 mL bottles are designed as storage containers for sterile media, buffers, or other aqueous solutions.

These products are for laboratory use only and not for human parenteral applications.

Materials
The filter funnels, dust covers and receiver bottles are manufactured from virgin, heavy metal-free polystyrene. The tubing adapters, filter adapters, and the plug seal caps are made of heavy metal-free polyethylene. Sartolab® filter systems are available with polyethersulfone membranes. All units are sterilized by gamma irradiation.

Performance
The filter units contain membranes integrally sealed to a support grid designed to maximize flow and reduce foaming and protein denaturation.

The membrane is compatible with most aqueous solutions and tested for use in cell culture applications.

Filter Systems
The filter adapter utilizes a gasket design to ensure a vacuum-tight seal on the receiver | storage bottle. Each filter unit also contains a convenient tubing adapter that will fit most vacuum hoses.

The bottles are single-use containers. They cannot withstand autoclaving or use at temperatures greater than 70°C. The suitability of the bottles for storage of solutions below 0°C depends both on the solution and the storage conditions. Many aqueous solutions, including culture media, have been successfully frozen and stored at temperatures down to –20°C. However, a trial run under actual conditions is strongly recommended to test the suitability of the bottles for frozen storage.

Specifications

Pore Size	Membrane Material	Characteristics
0.22 µm	Polyethersulfone	Very low protein binding and low extractables, fast flow rate
0.1 µm	Polyethersulfone	Very low protein binding and low extractables, fast flow rate

Bottle-Top Filters
The filter adapter is available with a 45 mm thread finish, and is designed to ensure a vacuum-tight seal on customer-supplied bottles with the appropriate thread finish. Each filter unit also contains a tubing adapter that will fit most vacuum hoses.

Chemical Compatibility
The mechanical strength, color, appearance, and dimensional stability of filter systems, bottle-top filters and plastic bottles are affected to varying degrees by the chemicals with which they come in contact. Specific operating conditions, especially temperature, will also affect their chemical resistance. A table is provided to serve as a general guideline for the chemical resistance of Sartolab® single-use sterile filters and bottles.

Chemical Resistance of Sartolab® Filters

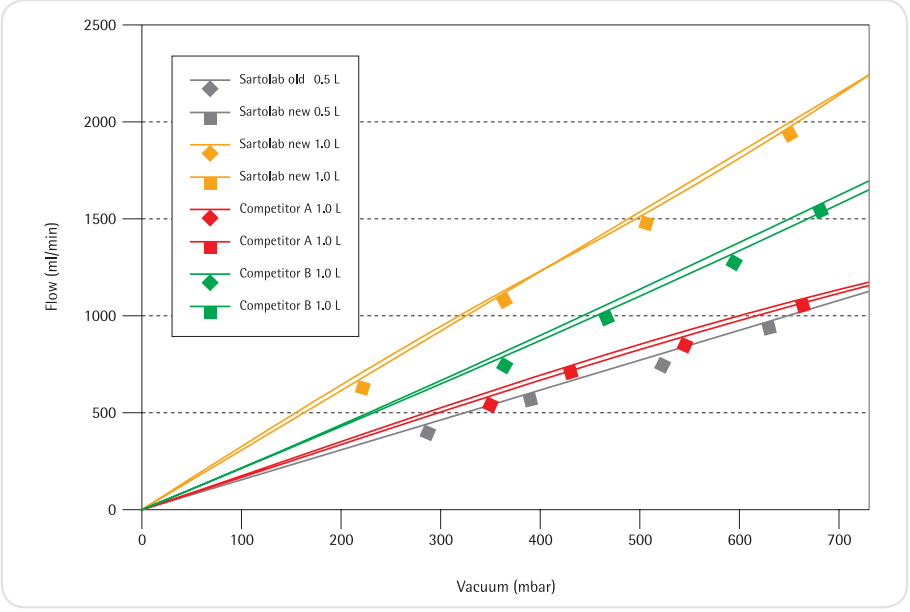
Chemical Class	Membrane (PES)	Housing (PS)
Weak Acids	3	1
Strong Acids	3	2
Alcohols	1	2
Aldehydes	3	3
Aliphatic Amines	1	3
Aromatic Amines	3	3
Bases	3	1
Esters	3	3
Hydrocarbons	3	3
Ketones	3	3

Key: 1. recommended
2. may be suitable for some applications; a trial run is recommended
3. not recommended. PS, polystyrene; PES, polyethersulfone.

Ordering Information

Volume	Membrane	Filter Area	Qty./Pkg.	Order No.
Sartolab® RF Filtration System Including Collection Bottle				
150 ml	0.22 µm PES	18 cm^2	12	180C1----------E
250 ml	0.22 µm PES	24 cm^2	12	180C7----------E
500 ml	0.22 µm PES	39 cm^2	12	180C2----------E
1,000 ml	0.22 µm PES	62 cm^2	12	180C3----------E
1,000 ml	0.1 µm PES	62 cm^2	12	180C8----------E
Sartolab® BT Bottle-Top Filters Without Integrated Collection Bottle				
150 ml	0.22 µm PES	18 cm^2	48	180C4----------K
500 ml	0.22 µm PES	39 cm^2	12	180C5----------E
1,000 ml	0.22 µm PES	62 cm^2	12	180C6----------E

Water Throughput



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	SFCA	PTFE	RC	PA				PES	SFCA	SFCA		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	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Gasoline	+	++	++	++	++	++	+	++	+	+	+	+	+	++	++	++	++	+
Benzene	+	+	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Benzyl alcohol	+	+	++	++	++	++	-	+	-	-	-	-	-	++	++	++	++	+
n-Butyl acetate	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
n-Butanol	++	++	++	++	++	++	+	++	+	+	+	+	+	++	++	++	++	++
Cellosolve	+	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Chloroform	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Cyclohexane	-	-	++	++	++	++	+	+	-	-	-	+	+	+	+	+	+	-
Cyclohexanone	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Diethylacetamide	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Diethyl ether	-	+	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Dimethyl formamide	-	-	++	+	+	++	-	++	-	-	-	-	-	+	+	+	++	-
Dimethylsulfoxide	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Dioxane	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Ethanol, 98%	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Ethyl acetate	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Ethylene glycol	++	+	++	++	++	++	++	++	++	+	+	++	++	++	++	++	++	++
Formamide	++	-	++	+	++	++	++	++	++	-	-	++	++	+	++	++	++	++
Glycerin	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
n-Heptane	+	+	++	++	++	++	++	+	+	+	+	+	++	+	+	+	+	+
n-Hexane	+	+	++	++	++	++	++	+	+	+	+	+	++	+	+	+	+	+
Isobutanol	++	+	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Isopropanol	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Isopropyl acetate	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Methanol, 98%	+	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Methyl acetate	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Methylene chloride	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Methyl ethyl ketone	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Methyl isobutyl ketone	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Monochlorobenzene	+	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	+
Nitrobenzene	-	-	++	++	+	++	-	+	-	-	-	-	-	+	+	+	+	-
n-Pentane	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+
Perchloroethylene	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-

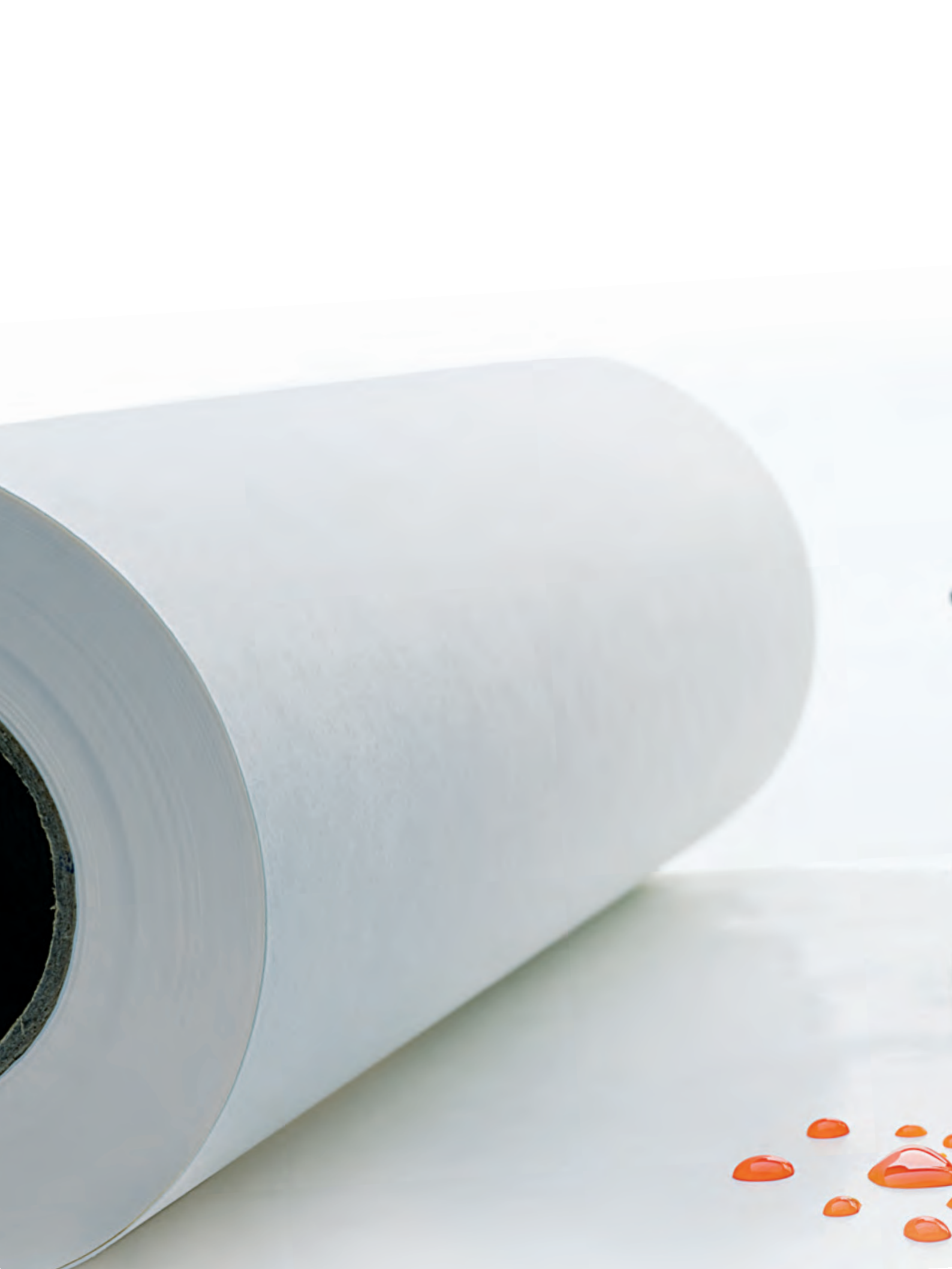
	Material								Minisart® Types									
	PES membrane	SFCA membrane	PTFE membrane	RC membrane	Nylon membrane	GF depth filter	Housing MBS	Housing PP	Minisart® HighFlow	Minisart® NML Ophthalsart	Minisart® NML Plus	Minisart® NML GF	Minisart® HY Minisart® Air Minisart® RC	Minisart® NY	Minisart® NY Plus	Minisart® SRP	Minisart® PES
Filter Membrane	PES	SFCA	PTFE	RC	PA				PES	SFCA	SFCA		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	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Carbon tetrachloride	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Tetrahydrofuran	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Toluene	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Trichloroethane	-	-	++	++	+	++	-	+	-	-	-	-	-	+	+	+	+	-
Trichloroethylene	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Xylene	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Acids																		
Acetic acid, 25%	+	+	++	++	-	++	+	++	+	+	+	+	+	++	-	-	++	+
Acetic acid, 80%	-	-	++	+	-	++	-	+	-	-	-	-	-	+	-	-	+	-
Hydrofluoric acid, 25%	+	-	++	+	-	++	+	+	+	-	-	+	+	+	-	-	+	+
Hydrofluoric acid, 50%	+	-	++	+	-	++	-	+	-	-	-	-	-	+	-	-	+	+
Perchloric acid, 25%	-	-	++	-	-	++	-	+	-	-	-	-	-	-	-	-	+	-
Phosphoric acid, up to 10%	+	+	++	-	-	++	+	+	+	+	+	+	+	-	-	-	+	+
Phosphoric acid, 86%	+	+	++	-	-	++	-	+	-	-	-	-	-	-	-	-	+	+
Nitric acid, 30%	+	-	++	-	-	++	+	+	+	-	-	+	+	-	-	-	+	+
Nitric acid, conc.	-	-	++	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-
Hydrochloric acid, 15%	++	+	++	-	-	++	+	+	+	+	+	+	+	-	-	-	+	+
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	++	++	++	++	++	++	++	++										

Legend

High compatibility	++
Limited compatibility	+
Not compatible	-

[1] Gamma irradiation feasible for Minisart® Air

Contact time: 24 hours at 20°C. Chemical compatibilities can be influenced by various factors. Therefore, we recommend that you confirm compatibility with the liquid you want to filter by performing a trial filtration run before you start your actual filtration.



Basic Filtration

Table of Contents

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
- Extraction thimbles
- 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.

Specifications

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

Ordering Information

Filter Discs, 100 Pieces

Dia. in mm	Grade 388	Grade 389	Grade 389 F	Grade 390	Grade 391	Grade 392	Grade 393
55	FT-3-101-055	FT-3-102-055	FT-3-112-055	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-3-112-090	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-3-112-110	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-3-112-125	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-3-112-150	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-3-112-185	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

Dia. in mm	Grade 388	Grade 389	Grade 389 F	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-4-112-185	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%.

Specifications

Grade	Weight (g/m²)	Thickness (mm)	Particle Retention (µm)	Filtration (s)	Precipitates	Properties
1288	84	0.21	12 to 15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
1289	84	0.21	8 to 12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
1292	84	0.17	5 to 8	50	Fine crystalline	Medium dense, medium fast filtering
1290	84	0.15	3 to 5	100	Fine crystalline	Narrow-pore, dense, slow filtering
1291	84	0.15	2 to 3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
293	80	0.15	1 to 2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

Ordering Information

Filter Discs, 100 Pieces

Dia. 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

Dia. 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-4-210-185
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.

Specifications

Grade	Weight (g/m^2)	Thickness (mm)	Particle Retention (µm)	Filtration (s)	Material
292	87	0.18	5 to 8	45	Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370
292a	97	0.19	4 to 7	60	Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370
132	80	0.17	5 to 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 to 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

Dia. 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

Dia. 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.

Specifications

Grade	Surface	Weight (g/m²)	Thickness (mm)	Particle Retention (µm)	Filtration (s)	Wet Burst Resistance (kPa)	Properties
3 hw	Smooth	65	0.14	8 to 12	20	40	Medium fast filtering, filter paper for routine work in the lab
4 b	Smooth	75	0.15	8 to 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 to 13	15	30	Fast filtering, degassing beer before analysis, clarification of spirits
100/N	Smooth	85	0.18	6 to 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 to 7	55	15	Medium fast to slow filtering, narrow-pore, re-wet test for diapers

Ordering Information

Filter Discs

Dia. 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

Dia. 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).

Specifications

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	55	0.25	< 0.002	1.6	510	Yes
MGB	140	0.70	< 0.002	1.0	210	
MGC	52	0.26	< 0.002	1.2	335	Yes
MGD	120	0.53	< 0.1	2.7	920	
MGF	75	0.38	≤ 0.001	0.7	110	
MGG	64	0.28	≤ 0.001	1.5	600	
13440	88	0.44		0.7	120	Yes
MG 160	75	0.35	0.002	1.2	400	
MG 550-HA	65	0.27		1.5	400	
MG 169	68	0.33		1.0	130	

* Measurement according to EN 143 (0.3 µm, 15 cm/s, paraffin oil)

Ordering Information

Filter Discs

Dia. 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

Dia. 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		

* Q = 500 pieces | K = 50 pieces
Other dimensions as well as sheets 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.

Specifications

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 227	75	0.40	< 0.01	350	Hydrophobic
MG 161	75	0.40	≤ 0.002	≤ 580	Hydrophilic
MG 400	80	0.38	< 0.001	400	Hydrophilic
MG 1387/1	90	0.37	≤ 0.003	400	Hydrophilic

* Tested and classified according to the Standard EN 143

Ordering Information

Filter Discs

Dia. in mm	MG 221/1/60 (100 Pieces)	13430**	13400**	MG 227 (100 Pieces)	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-3-01120-047	FT-3-01125-047
50			13400--50------Q		FT-3-01125-050
55				FT-3-01120-055	FT-3-01125-055
80			13400--80------N		
100		13430-100------K	13400-100------K		
110				FT-3-01120-110	FT-3-01125-110
120			13400-120------K		
124		13430-124------K	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
150	FT-3-01124-150				

** K = 50 pieces, N = 100 pieces, Q = 500 pieces, S = 200 pieces
Other dimensions as well as sheets 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.

Specifications

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

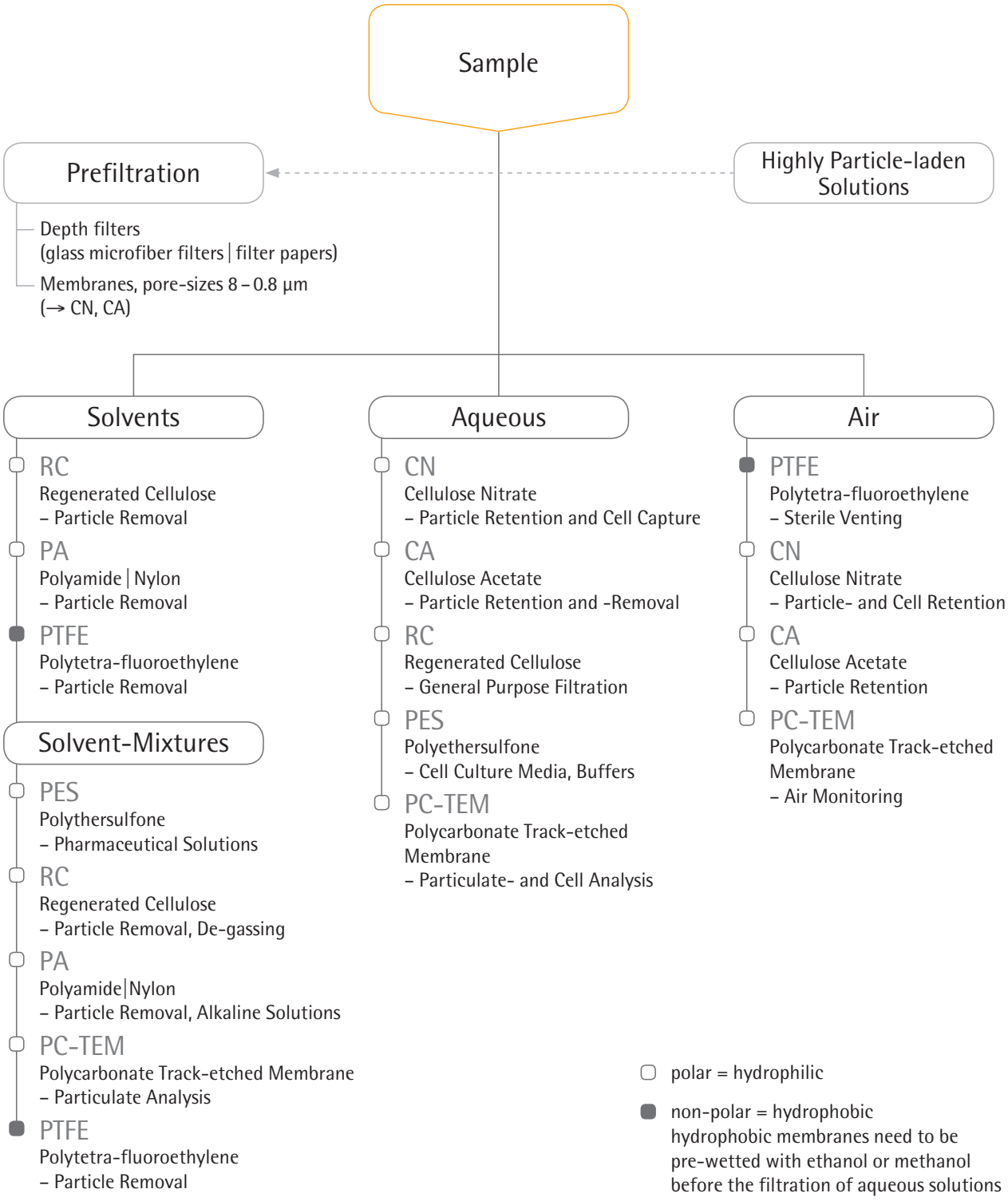
Ordering Information

Filter Discs

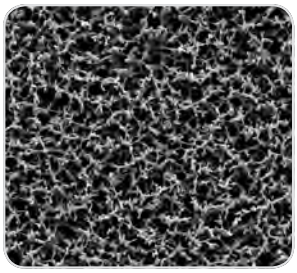
Dia. in mm	Q3400
20	Q3400--20------G
25	Q3400--25------G
37	Q3400--37------G
45	Q3400--45------G
47	Q3400--47------G
50	Q3400--50------G
82	Q3400--82------N
90	Q3400--90------N
142	Q3400-142------K
150	Q3400-150------K

* 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



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.

Specifications

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (ml/min/cm²/bar)	Burst Pressure (bar)
11327	0.2	130	4.2	25	≥ 0.35
11306	0.45	130	2.4	70	≥ 0.3
11305	0.65	130	2	130	≥ 0.25
11304	0.8	130	1.4	200	≥ 0.2
11303	1.2	130	1	200	≥ 0.2
11302	3	130	0.5	430	≥ 0.2
11342	5	130	0.5	570	≥ 0.15
11301	8	130	0.3	750	≥ 0.1

Ordering Information

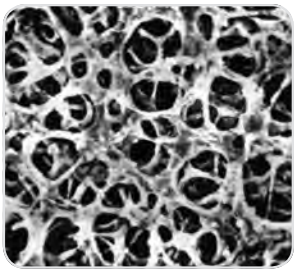
Filter Discs

Dia. 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
30				11304--30------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
68		11302--68------G		
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

Dia. 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
30		11306--30------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
55		11306--55------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		

* 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.

Specifications

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	1.9	69	0.7
11105	0.65	120	1.5	115	0.7
11104	0.8	120	1	200	0.5
12303	1.2	140	0.8	320	0.4
12342	5	140	0.4	570	0.25

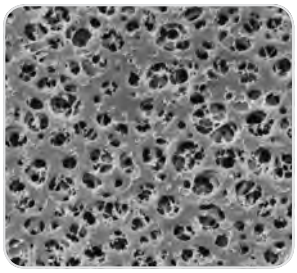
Ordering Information

Filter Discs

Dia. 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			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			

* 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 asymmetric and reinforced with nonwoven cellulose. They are available in two pore sizes: 0.45 µm and 0.2 µm.

Specifications

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (ml/min/cm²/bar)
18407	0.2	170	4.4	15
18406	0.45	170	2.9	30

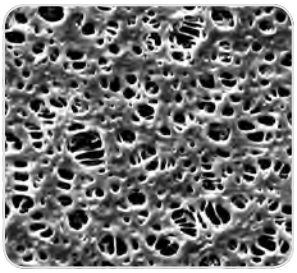
Ordering Information

Filter Discs

Dia. 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
100	18406-100------G	18407-100------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 thanks to their symmetric structure, have 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.

Specifications

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (ml/min/cm²/bar)	Burst Pressure (bar)
15458	0.1	150	3.8	10	≥ 0.6
15407MI	0.2	150	3.5	25	≥ 0.5
15406	0.45	150	2.6	46	≥ 0.5

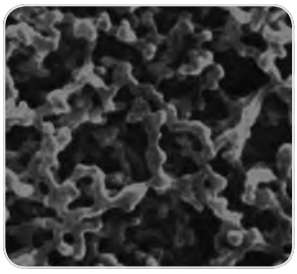
Ordering Information

Filter Discs

Dia. in mm	15406 (0.45 µm)*	15407MI (0.2 µm)*	15458 (0.1 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	

*K = 50 pieces, N = 100 pieces
Other dimensions 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.

Specifications

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (ml/min/cm²/bar)	Burst Pressure (bar)
25007	0.2	115	3.2	15	≥ 0.25
25006	0.45	115	2.3	35	≥ 0.23

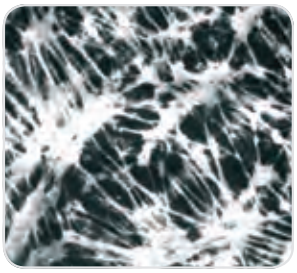
Ordering Information

Filter Discs

Dia. 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
55		25007--55------N
90	25006--90------G	25007--90------G

* 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.

Specifications

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Isopropanol Flow Rate (ml/min/cm²/bar)
11807	0.2	65	1.4	11
11806	0.45	80	0.9	20
11803	1.2	100	0.45	80
11842	5	100	0.10	250

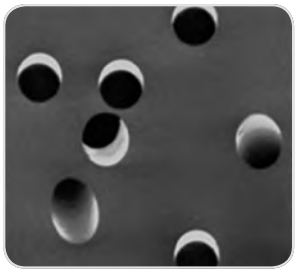
Ordering Information

Filter Discs

Dia. 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		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

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

Polycarbonate Track-Etched



Those white and hydrophilic polycarbonate track-etched membranes 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 membranes 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.

Specifications

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (ml/min/cm²/0.7 bar)	Burst Pressure (bar)
23007	0.2	25	4.8	≥ 10	≥ 0.7
23006	0.4	25	2.5	≥ 30	≥ 0.7

Ordering Information

Filter Discs, 100 Pieces

Dia. in mm	23006 (0.4 µm)*	23007 (0.2 µm)*
25	23006--25------N	23007--25------N
47	23006--47------N	23007--47------N
50		23007--50------N

Other dimensions 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.

Specifications

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

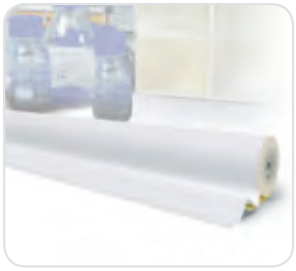
Ordering Information

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 shapes 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.

Specifications

	0.22 µm	**0.45 µm**
Material	Cellulose nitrate	Cellulose nitrate
Thickness	120 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 diameter	13 mm
Sterilization	By autoclaving (max. 134°C) or by dry heat (max. 180°C)
Hold-up volume	Less than 0.03 ml after overcoming the bubble point (0.3 ml before)

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 diameter	13 mm
Sterilization	By autoclaving at 121°C
Hold-up volume	Less than 0.2 ml after overcoming the bubble point (0.3 ml before)

Ordering Information

Description	Order No.
13 mm Polycarbonate Syringe Filter Holder, pack of 12	16514----------E
Silicon gasket, 10 × 14.9 × 0.5 mm, pack of 10	6980569

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 diameter	25 mm
Sterilization	By autoclaving (max. 134°C) or by dry heat (max. 180°C)
Hold-up volume	Less than 0.1 ml after overcoming the bubble point (0.3 ml before)

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 diameter	25 mm
Sterilization	By autoclaving at 121°C
Hold-up volume	Less than 0.3 ml after overcoming the bubble point (0.6 ml before)

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

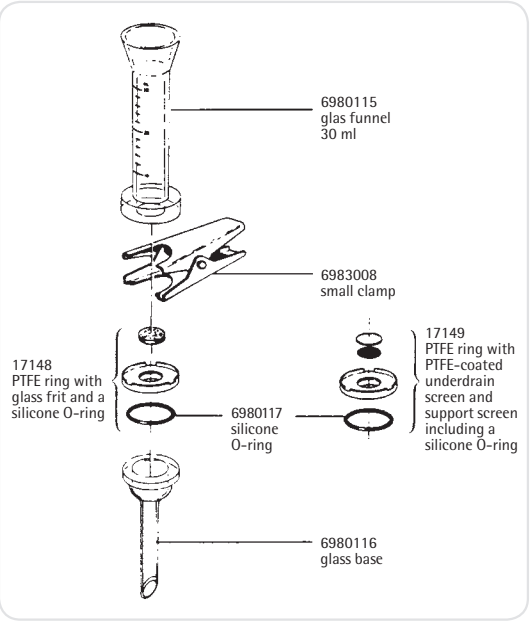
25 mm Glass Vacuum Filter Holder

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 dia.
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 cm^2
Max. operating pressure	Only for vacuum
Suitable membrane filter diameter	25 mm (or 24 mm)
Sterilization	By autoclaving (max. 134°C) or by dry heat (max. 180°C)



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.

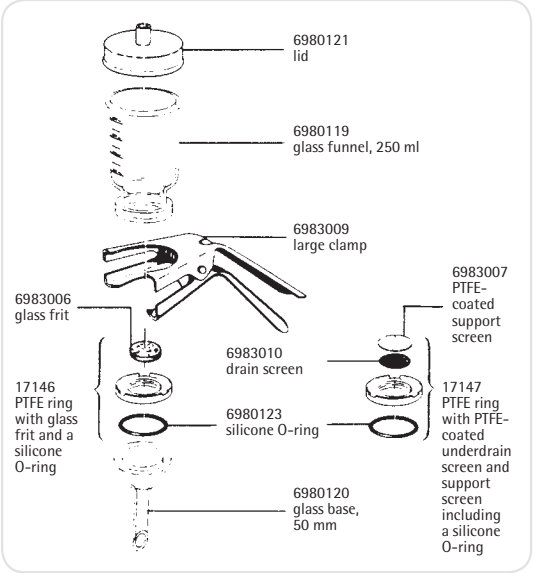
50 mm Glass Vacuum Filter Holder

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 spouts	15 mm dia.
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 cm^2
Max. operating pressure	Only for vacuum
Suitable membrane filter diameter	50 mm (or 47 mm)
Sterilization	By autoclaving (max. 134°C) or by dry heat (max. 180°C)



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.

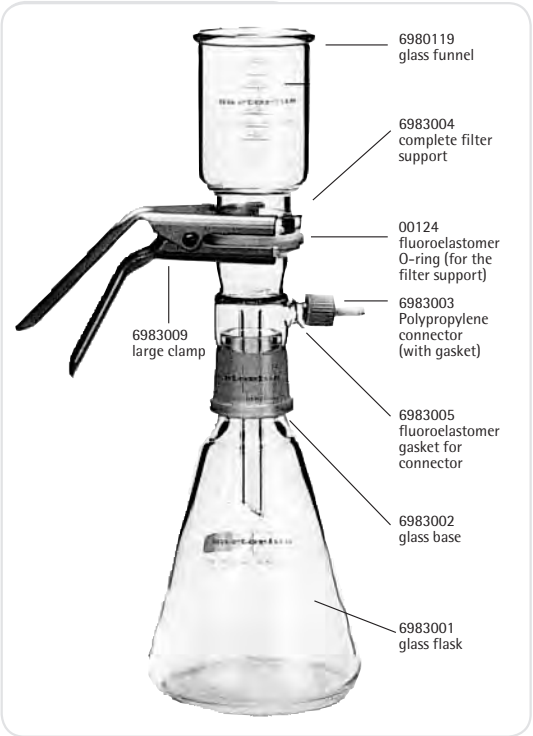
All-Glass Vacuum Filter Holder

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

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
Capacity of the filtrate flask	1 liter
Filtration area	12.5 cm^2
Max. operating pressure	Only for vacuum
Suitable membrane filter diameter	50 mm (or 47 mm), 40 or 42 mm prefilter
Sterilization (without connector)	By autoclaving (max. 134°C) or by dry heat (max. 180°C)



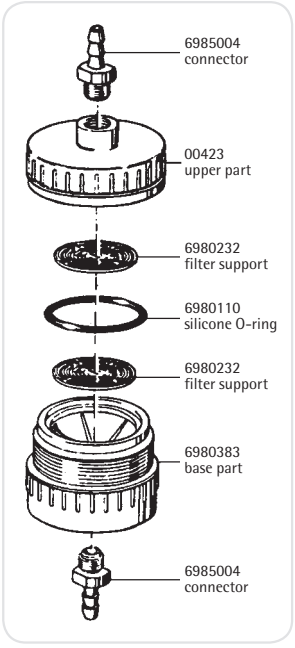
Ordering Information

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 cm^2
Weight	83 g
Threads for connectors	M 12 × 1 female thread
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 diameter	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.

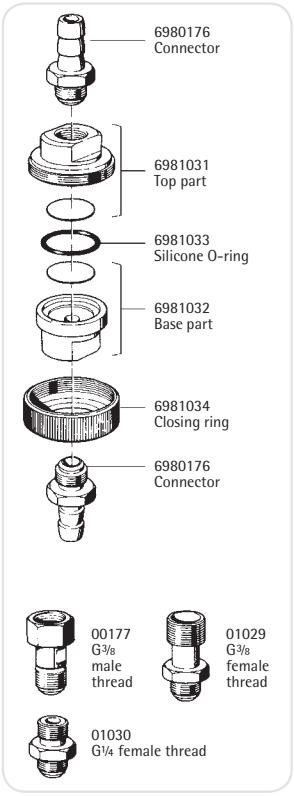
Ordering Information

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 G1/4 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 G1/4 female thread (order no. 01030) or G3/8 female thread order no. 01029) or onto pressure tanks with G3/8 male thread (order no. 00177).

Specifications

Connectors	Hose nipples DN10
Filtration area	3 cm^2
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 dia. membrane filter.	16251

Replacement parts are shown in the diagram.

47 mm Stainless Steel Filter Holder

For In-Line Filtration

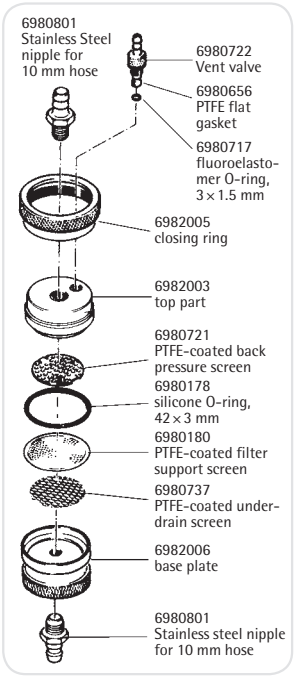


Diagram for 16254

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 G3/8 female thread (order no. 17089) or onto pressure tanks with G3/8 male thread (order no. 17069) or on taps with G3/4 male thread (order no. 17068).

Specifications

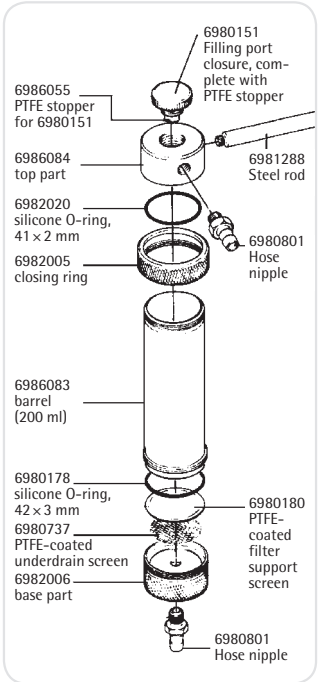
Connectors	Hose nipples DN10
Connection thread	M12 × 1
Filtration area	13 cm^2
Weight	ca. 490 g
Materials	Stainless steel, except silicone O-ring (42 × 3 mm), PTFE and fluoroelastomer valve seals
Max. operating pressure	20 bar | 2,000 kPa | 290 psi
Suitable membrane filter	47 mm (40 or 42 mm prefilter)
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 Liter 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 liter volumes of relatively easily filterable liquids (e.g. buffer solutions, solutions for cell counters and tissue culture solutions), it is used in combination with a pressure tank.

Specifications

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 cm^2
Weight	960 g
Threads for connectors	M 12 × 1 female thread
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 diameter	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

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 107.

Chemical-resistant PTFE Filter Holder

For the Filtration of Aggressive Liquids

The holder hinders the release of trace elements into the filtrate and is resistant to almost all chemicals. The fluoroelastomer O-ring in the top part allows easy hand tightening, and can be replaced by a PTFE O-ring, order no. 17039. The 6 mm outlet nipple is an integral part of the base, the 10 mm inlet hose nipple can be replaced by a G3/8 connector, order no. 17051.

Specifications

Chemical compatibility	As for PTFE and fluoroelastomer
Filtration area	12.5 cm^2
Thread for inlet connector	M 14 × 1.5 male thread
Materials	Top part, barrel, base part: corrugated iron, hose nipples and filter support with 40 × 3.5 mm O-ring: PTFE, locking rings: aluminium 39 × 3.5 mm fluoroelastomer O-ring (top part)
Max. operating pressure	5 bar | 500 kPa | 72.5 psi
Suitable membrane filter diameter	47 mm
Sterilization	By autoclaving (max 134°C) or by dry heat (180°C)

Ordering Information

Description	Order No.
PTFE pressure filter holder, 47 mm, with 200 ml capacity.	16579

Replacement Parts

Description	Order No.
PTFE O-ring, 39 × 3.5 mm	17039

Other replacement parts are shown in the diagram.

Combisart® Manifolds

1-, 3- and 6-Branch

Made of high-grade stainless steel (B.S. 304S3 | AISI 304); accommodates any type of vacuum funnel. Stainless steel three-way valves (taps) allow the vacuum for each filter holder to be individually controlled and each holder to be sterilely vented. The low height of the manifold ports is particularly advantageous for working on a clean bench.

Ordering Information

Combisart® Manifolds, without Base Support and Frit	Order No.
Combisart® 1-branch manifold	16844
Combisart® 3-branch manifold	16842
Combisart® 6-branch manifold	16843

Combisart® Sets, Stainless Steel Capacity	Order No.
1-branch 1 × 100 ml	16844-CS
1-branch 1 × 500 ml	16845-CS
3-branch 3 × 100 ml	16824-CS
3-branch 3 × 500 ml	16828-CS
6-branch 6 × 100 ml	16832-CS
6-branch 6 × 500 ml	16831-CS

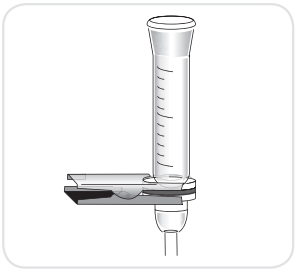
In each set stainless steel funnels with lids are preassembled.

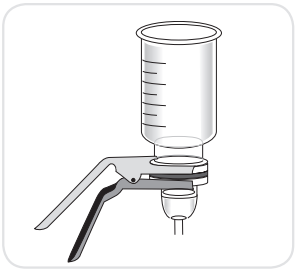
Accessories and Replacement Parts

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

Glass Filter Holders; 30, 250 ml

For Particle Counting

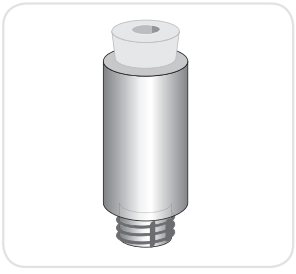




Glass Filter Holders
Two compact vacuum filter holders for easy particulate analysis. Both the top and bottom part of the filter holders are easily and securely fastened together using the metal clamp. The centering rim on the filter support ensures correct positioning of the membrane filter. The glass 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 diameter	25 mm (or 24 mm) Prefilter, 20 mm	
Filtration area	3 cm^2	
Capacity	30 ml	
Outlet	12 mm outer diameter	
Glass filter holder	250 ml	16307
Filter diameter	47 mm (or 50 mm) Prefilter, 40 mm	
Filtration area	12.5 cm^2	
Capacity	250 ml	
Outlet	15 mm outer diameter	



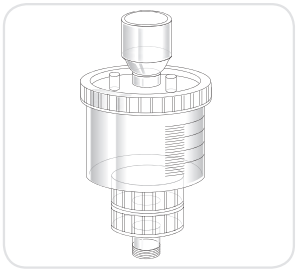
Adapter, 16836 | Adapter, 16837
For use of a glass filter holder, 16306 or 16307, on a Combisart® stainless steel manifold.

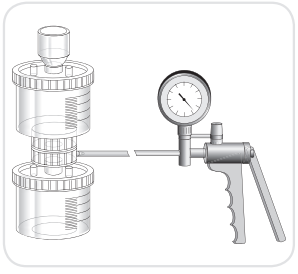
Ordering Information

Description	Order No.
Adapter with 11 mm opening in stopper; for using filter holder 16306 on a Combisart® manifold	16836
Replacement stopper for 16836	00280
Adapter with 14 mm opening in stopper; for using filter holder 16307 on a Combisart® manifold	16837
Replacement stopper for 16837	00281

Polycarbonate Filter Holders

For Particle Counting





Polycarbonate Filter Holder, 250 ml
This reusable, practical filter holder made of autoclavable plastic is ideal for analytical testing outside the laboratory. For use with 47 mm membrane filters.

Outlet: TR 20 × 2 mm male thread

Ordering Information

Description	Order No.
Polycarbonate filter holder without receiver flask	16511
Polycarbonate filter holder with receiver flask	16510
Hand vacuum pump with gauge and 60 cm PVC tubing	16672

Ready-to-Use Biosart® 250 Funnels

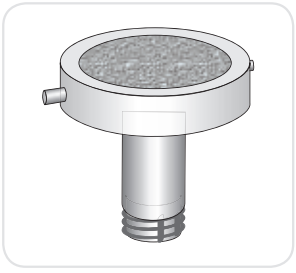
For Particle Counting

Biosart® 250 Funnel

The Biosart® 250 Funnel has been specially designed for analytical quality assurance. The sterile 250 ml plastic funnel guarantees fast filtration and high sample throughputs during routine testing. Its large inner diameter allows high flow rates, and the tapered inner walls permit thorough flushing of the funnel, after filtration.

Ordering Information

Description	Order No.
Biosart® 250 Funnel, 50 units, sterile-packaged	16407-25-ALK



Single Support, 16840

For adapting a Biosart® 250 Funnel for use on a Combisart® stainless steel manifold.

Ordering Information

Description	Order No.
Stainless steel filter support for stainless steel manifold.	16840

Replacement

Description	Order No.
Stainless steel frit for 50 mm membrane filters	6980102
Stainless steel frit for 47 mm membrane filters	6980103
Silicone flat gasket underneath the frit	6980124
PTFE flat gasket underneath the frit	6980104
Silicone O-ring for 16840 male thread	6980274

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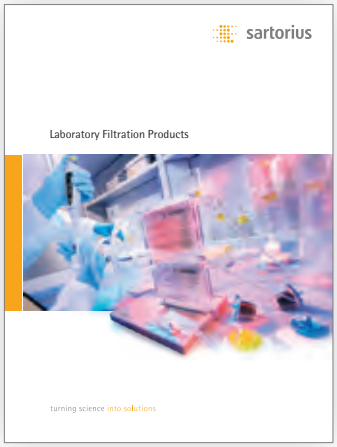

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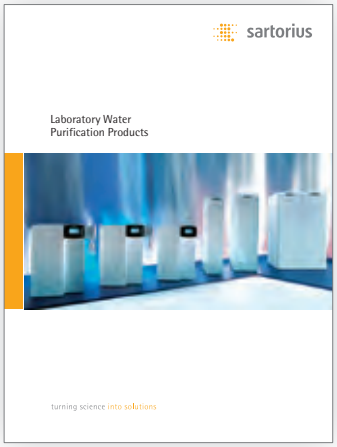

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