Filtration Devices

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Introduction

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

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

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

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

Minisart® Standard Syringe Filters are not for medical use.

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

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

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

Sartolab® 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® P20 pressure filtration devices with a 0.2 µm and 0.45 µm 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 liquids. 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 solutions prior to use

Minisart® Standard Selection Guide

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

Sample Composition

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

Minisart® PP Standard Syringe Filter Sample Preparation for Analytics

4 mm packages are color-coded

Male Spike Outlet

Male Luer Slip Outlet

Minisart® RC 15 mm

Minisart® NY 15 mm

Minisart® SRP 15 mm

Minisart® RC 25 mm

Minisart® NY 25 mm

Minisart® SRP 25 mm

Reliable Removal of Particles from Liquids and Gases

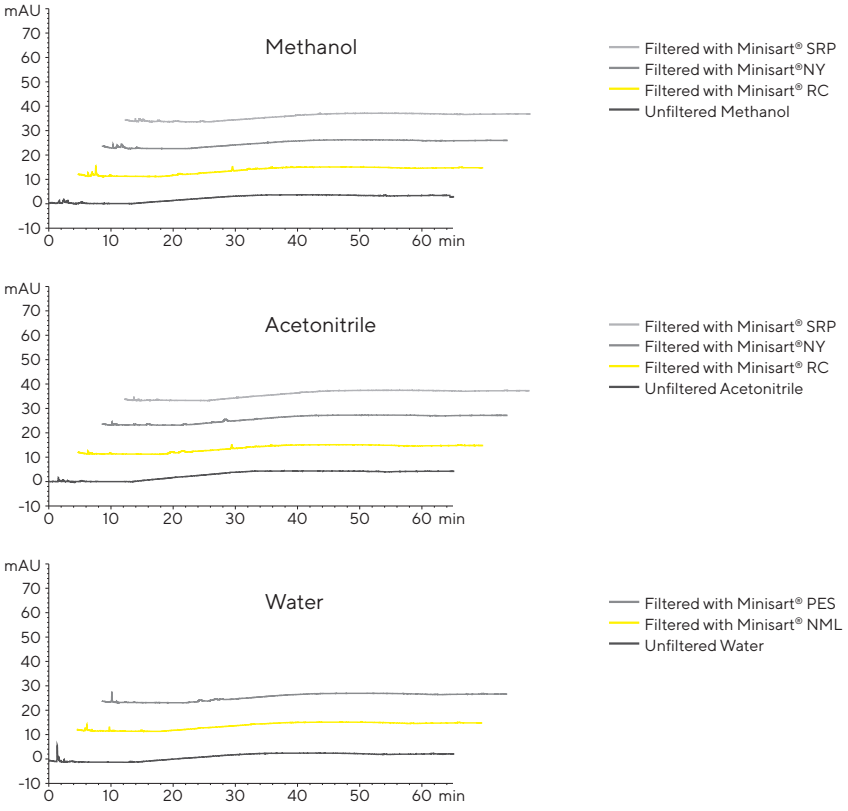
Particle removal by filtration before analysis substantially increases the lifetime of your columns. Minisart® RC is optimized for aqueous liquids and solvents and is compatible with DMSO, other amides, ketones, esters and ethers. Minisart® NY is exceptionally pure compared with other common polyamide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

Our coating-free hydrophobic PTFE membrane used in Minisart® SRP is suitable for venting applications.

Minisart® Features

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

HPLC Certification



HPLC Procedure

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

Minisart® with Polypropylene Housing

Specifications

Minisart® RC | SRP | NY | PES with 4 | 15 | 25 mm Ø Membrane Filtration Area	
Housing material	Polypropylene (PP)
Membranes	RC = Regenerated Cellulose | NY = Polyamide | SRP = Hydrophobic PTFE = Polytetrafluoroethylene | PES = Polyethersulfone | PES - = hydrophobic PES
Glass fiber prefilter	NY Plus: Ultrapure quartz, 0.7 µm particle retention
Max. operating pressure	4.5 bar | 65 psi Minisart® PES - : 2.0 bar | 29 psi (IN - OUT) or 0.5 bar | 7 psi (OUT - IN)
Housing burst pressure	≥ 7 bar | 102 psi
Max. temperature	60 °C
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: individually packaged, 50 (ACK)	K | S | Q | R	ACK	K | S | Q | R	K | S | Q | ACK	K | S | Q
Bubble point (≥)	With water 3.0 bar | 44 psi	With water 4.6 bar | 67 psi	With water 2.0 bar | 29 psi	With ethanol 1.1 bar | 16 psi	With ethanol 0.9 bar | 13 psi
Flow rate ((≥) mL/min), 4 mm Ø = 0.07 cm² filter area | Hold-up volume[1]: ≤ 10 µL					
▪ For water at 1 bar	0.5	–	1.5	–[3]	–[3]
▪ For methanol at 1 bar	1.5	–	3.0	2.0	4.5
▪ For air at 0.1 bar	–[2]	–	–[2]	30	60
Flow rate ((≥) mL/min), 15 mm Ø = 1.7 cm² filter area | Hold-up volume[1]: ≤ 100 µL					
▪ For water at 1 bar	20	10	40	–[3]	–[3]
▪ For methanol at 1 bar	55	25	105	55	150
▪ For air at 0.1 bar	–[2]	–[2]	–[2]	800	1,600
Flow rate ((≥) mL/min), 25 mm Ø = 4.8 cm² filter area | Hold-up volume[1]: ≤ 200 µL					
▪ For water at 1 bar	80	50	160	–[3]	–[3]
▪ For methanol at 1 bar	160	90	325	60	260
▪ For air at 0.1 bar	–[2]	–[2]	–[2]	1,800	3,000
Water penetration point[3] (≥)	–	–	–	4.0 bar | 58 psi	3.0 bar | 44 psi
Sterile filtration capability[5] acc. to the bacteria challenge test	No	Yes	No	Yes	No
Non-pyrogenic according to the USP					

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

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

Minisart® Standard Syringe Filters are not for medical use.

Sample Preparation for Chromatography

Ordering Information

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

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

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

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

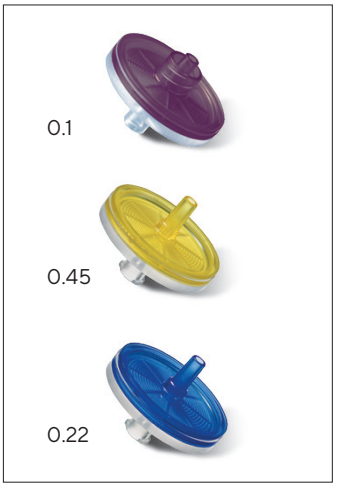
[1] Diameter of EFA – Effective Filtration Area

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

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

Minisart® Standard Syringe Filters are not for medical use.

For technical product specifications, please see page 70.



Minisart® High Flow with PES

Minisart® NML with (SF)CA

Minisart® HY with PTFE

Minisart® NML Standard Syringe Filter Clarification and Sterilization by Filtration

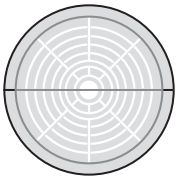
Filtration is the Optimal Method for Clarification and Sterilization of Liquids and Gases

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

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

Minisart® Features

- Largest effective filtration area (EFA) of 6.2 cm²
- Low adsorption
- High flow rate
- High total throughput
- Low hold-up volume
- Gamma-irradiated or EO-sterilized



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

Minisart® Standard Syringe Filters with MBS Housing

Specifications

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

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

Minisart® Membrane Types	GF+SFCA 0.2 µm	GF+SFCA 0.45 µm	GF+CA 1.2 µm	GF 0.7 µm	PTFE 0.2 µm	PTFE 1.0 µm	Acticosart	PTFE (Air) 0.2 µm
Non-sterile packages: 500 (Q, HYQ), 1000 (R), sterile packs: individually packaged, 50 (K, GUK, HYK, HNK)	K | Q	K | Q	Q	K | Q	K | Q	HYQ	Q	Q | HNK
Bubble point (≥)	With water 3.2 bar | 46 psi	With water 2.0 bar | 29 psi	With water 0.7 bar | 10 psi	With water 0.5 bar | 7 psi	With ethanol 1.4 bar | 20 psi	With ethanol 0.5 bar | 7 psi	With ethanol 0.9 bar | 13 psi	With ethanol 1.0 bar | 14 psi
Flow rate for [2] | [3] (≥ mL/min)								
28 mm Ø for water at 1 bar	60	160	350	450	–	–	–	–
15 mm Ø for air at 0.1 bar	–	–	–	–	–	–	–	800
26 mm Ø for air at 0.1 bar	–	–	–	–	2,000	4,000	2,300	–
Water penetration point[3] (≥)	–	–	–	–	4.0 bar | 58 psi	1.5 bar | 22 psi	N.a.	3.2 bar | 44 psi
Sterile filtration capability[4] according to the bacteria challenge test	Yes	No	No	No	Yes	No	N.a.	Yes
Non-pyrogenic according to the USP					Yes[5]			

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

Standard Minisart® Syringe Filters are not for medical use.

Preparation of Aqueous Liquids

Ordering Information

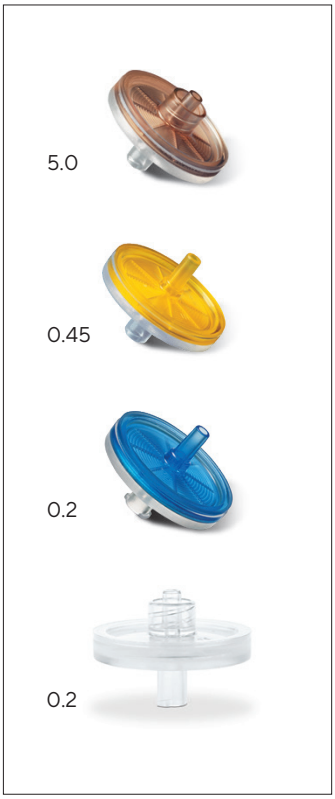
Ø in mm | EFA[1]	Membrane	Housing	Pore Size	Connector Outlet	Color | Printing	Sterile*	Qty./Pkg.	Order No.
Minisart® High Flow (PES – Polyethersulfone)								
28 mm	PES	MBS	0.1 µm	Male Luer Lock	Dark Red	Yes	50	16553----------K
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	Yes#	50	16532--------GUK
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 ((SF)CA – (Surfactant-free) Cellulose Acetate)								
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	S6534------FMOSK
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes#	50	S6534------FMGUK
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	S6534------FM--Q
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	Yes	50	S7597------FXOSK
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	No	500	S7597------FX--Q
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	S6555------FMOSK
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes#	50	S6555------FMGUK
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	S6555------FM--Q
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	Yes	50	S7598------FXOSK
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	No	500	S7598------FX--Q
28 mm	CA	MBS	0.65 µm	Male Luer Slip	Pink	Yes	50	16569----------K
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	Yes	50	16592----------K
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	Yes#	50	16592--------GUK
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	No	500	16592----------Q
28 mm	CA	MBS	1.2 µm	Male Luer Lock	Red	Yes	50	17593----------K
28 mm	CA	MBS	1.2 µm	Male Luer Lock	Red	No	500	17593----------Q
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	Yes	50	S7594------FMOSK
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	No	500	17594----------Q

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

* Sterilized Minisart® units are individually packaged. If not stated otherwise, Minisart® are sterilized by ethylene oxide.
#-mark indicates sterilization by gamma irradiation.
Non-presterilized Minisart® units: High Flow, NML, NML Plus and HY can be sterilized by ethylene oxide; High Flow, NML and NML Plus can also be sterilized by gamma irradiation
[1] Diameter of EFA – Effective Filtration Area
[2] 0.7 µm = GF particle retention ≠ pore size!

Minisart® Standard Syringe Filters are not for medical use.

For technical product specifications, please see page 76.



CE-Minisart® Syringe Filters

For medical use – Sterile Filtration and Sterile Venting
The medical device CE-Minisart® NML and Ophthalsart with (surfactant-free) cellulose acetate ((SF)CA), and CE-Minisart® HY and SRP with hydrophobic PTFE are frequently used for sterile filtration and | or clarification of aqueous and oily liquids and other medical applications. CE-Minisart® NML with a 5 µm cellulose acetate (CA) membrane removes particulates or coagulates offering high total throughput under sterile conditions. Hydrophobic PTFE filters are suitable for venting purposes. All CE-Minisart® filters are intended to be used in a laboratory environment before use for patient care.

Minisart® Features
- Low adsorption
- Gamma-irradiated or EO-sterilized
- Biocompatible acc. to ISO 10993-1

CE-Minisart® Syringe Filters

Specifications

CE-Minisart® NML / Ophthalsart with 28 mm accessible membrane filtration diameter, ≤ 150 µL hold-up volume[1]
CE-Minisart® HY with 26 mm accessible membrane filtration diameter, ≤ 200 µL hold-up volume[1]
CE-Minisart® SRP with 25 mm accessible membrane filtration diameter, ≤ 200 µL hold-up volume[1]

Housing material	NML/Ophthalsart/HY: Methacrylate butadiene styrene (MBS) SRP: Polypropylene (PP)
Membranes	NML /Ophthalsart: (SF)CA = (Surfactant-free) Cellulose Acetate NML (5 µm): CA = Cellulose Acetate HY: Hydrophobic PTFE = Polytetrafluoroethylene SRP: Hydrophobic PTFE = Polytetrafluoroethylene
Max. operating pressure	4.5 bar | 65 psi
Housing burst pressure	≥ 7 bar | 102 psi
Max. temperature	60 °C
Sterilization	Non-sterile Minisart® NML can be sterilized by ethylene oxide (EO) or gamma irradiation. Non-sterile Minisart® HY can be sterilized by ethylene oxide (EO)

Minisart® type with regards to membrane	**SFCA 0.2 µm**	**SFCA 0.45 µm**	**CA 5.0 µm**	**PTFE 0.2 µm**	**PTFE 0.2 µm**
Non-sterile packages: 500 (Q, HYQ), sterile packs: individually packaged: 50 (K, GUK, HYK, ACK)	K | GUK | Q	K | GUK | Q	K	HYK | HYQ	ACK
Bubble point (≥)	With water 3.2 bar | 46 psi	With water 2.0 bar | 29 psi	With water 0.4 bar | 6 psi	With ethanol 1.4 bar | 20 psi	With ethanol 1.1 bar | 16 psi

Flow Rate for[2] (≥ mL/min)					
28 mm Ø for water at 1 bar	60	160	600	–	–
25 mm Ø with ethanol at 1 bar	–	–	–	–	60
25 mm Ø for air at 0.1 bar	–	–	–	–	1,800
26 mm Ø for air at 0.1 bar	–	–	–	2,000	–

Water penetration point[2] (≥)	–	–	–	4.0 bar | 58 psi	4.0 bar | 58 psi
Sterile filtration capability[3] acc. to the bacteria challenge test	Yes	No	No	Yes	Yes
Non-pyrogenic	Yes	Yes	Yes	Yes	Yes
Biocompatible	acc. to ISO 10993-1				

[1] Hold-up volume after air purge
[2] Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point.
[3] According to the bacterial challenge test (BCT) with ≥ 1×10^7 cfu/cm² Brevundimonas diminuta. All non-sterile Minisart® types listed above can be sterilized according to the sterilization recommendation in this table.

CE-Minisart® Syringe Filters for Medical Use

Ordering Information

Minisart® NML ((SF)CA – (Surfactant-free) Cellulose Acetate) Aqueous Filtration								
Ø in mm | EFA[1]	**Membrane**	**Housing**	**Pore Size**	**Connector Outlet**	**Color | Printing**	**Sterile***	**Qty./Pkg.**	**Order No.**
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	16534----------K*
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes#	50	16534--------GUK*
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	16534----------Q*
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	Yes	50	17597----------K *
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	No	500	17597----------Q*
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	16555----------K*
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes#	50	16555--------GUK*
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	16555----------Q*
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	Yes	50	17598----------K*
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	No	500	17598----------Q*
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	Yes	50	17594----------K*
Minisart® Ophthalsart (SFCA – Cellulose Acetate) Aqueous Filtration								
28 mm	SCFA	MBS	0.2 µm	Male Luer Slip	Pink	Yes	50	17528----------K*
Minisart® HY (Hydrophobic PTFE), for Venting and Gas Filtration								
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	Yes	50	16596--------HYK*
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	No	500	16596--------HYQ*
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock[a]	Clear	No	500	16599--------HYQ*
Minisart® SRP (Hydrophobic PTFE) Venting & Gas Filtration								
25 mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17575--------ACK*

* Article numbers are only available in: EU/EEA and in registered countries.
** 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: (SF)CA 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® have Female Luer Lock inlet(s)).
[1] Diameter of EFA – Effective Filtration Area

For technical product specifications, please see page 81.

Claristep® Filtration System

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

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

The Power of Simplicity

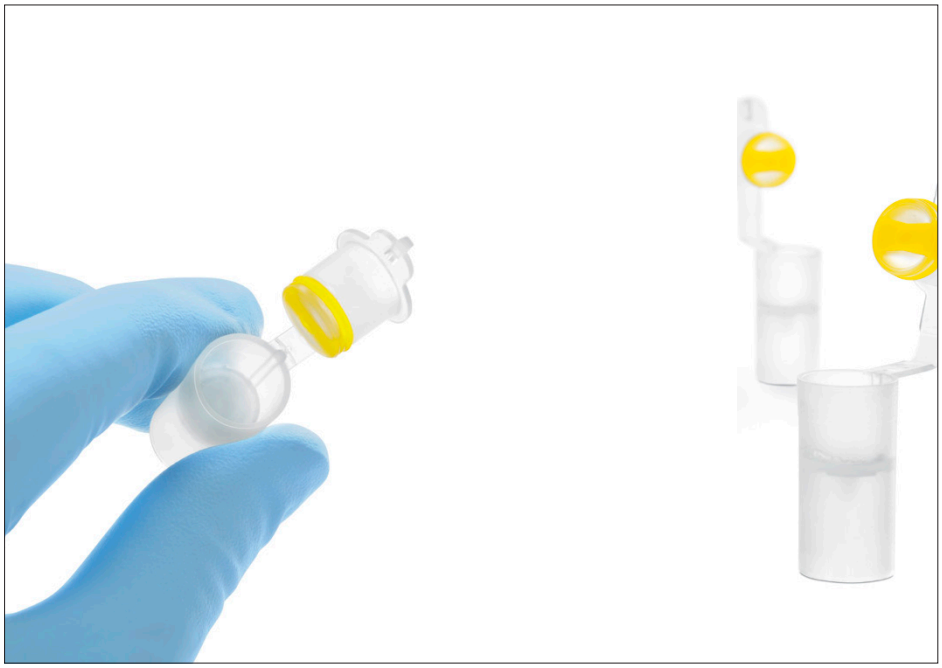
Preparing samples by clarification is an essential step prior to nearly all analytical techniques, such as high pressure liquid chromatography (HPLC). This filtration step to eliminate particles is crucial for maintaining the integrity of chromatography columns and for maximizing their operating life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

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

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

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

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

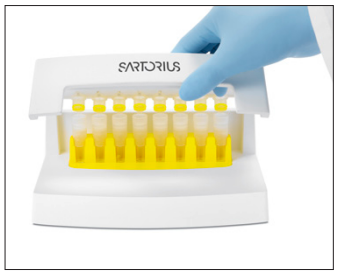


Claristep® Filter units are made of the purest materials. Another major benefit is that the contact time of the samples with the filters and the caps is extremely short, ensuring optimal, contamination-free results. Filtered liquids are collected in any 12 × 32 mm outer diameter vials of your choice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

Sample Preparation for Analytics

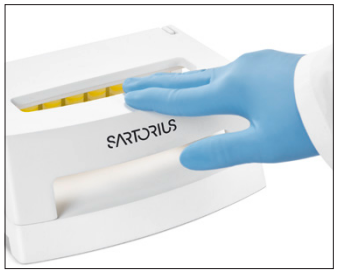
Use the Most Ergonomic Clarification Solution

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



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

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



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

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

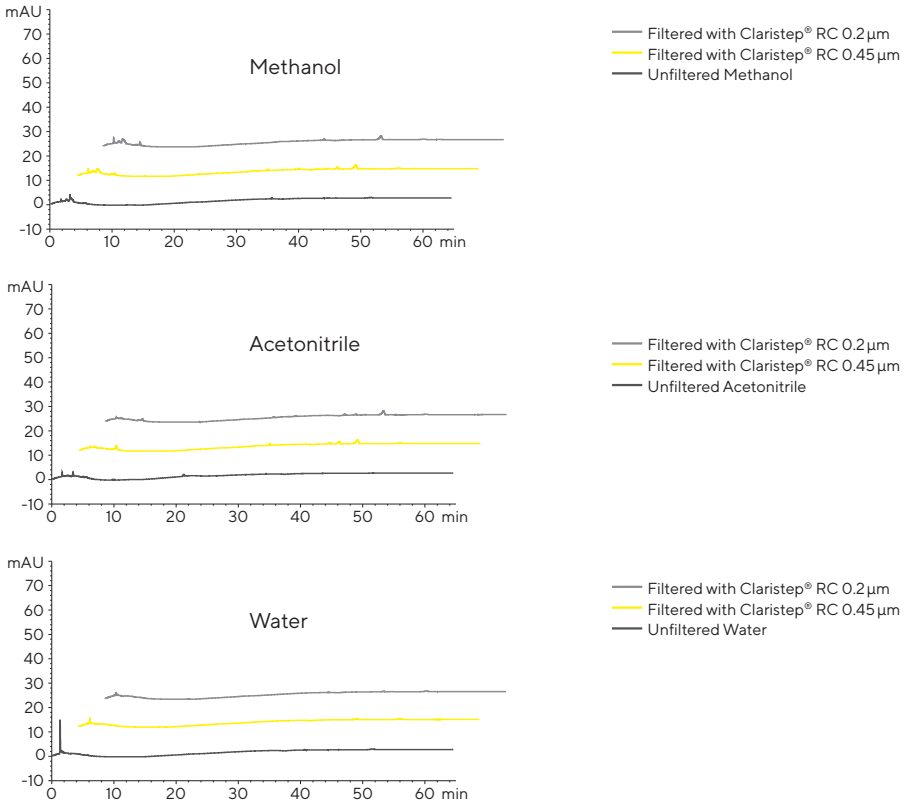
Before clarification, the samples are pipetted in the filter reservoire.

After clarification, the filtrates are collected in sample vials.

Reliable Removal of Particles

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

HPLC Certification



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

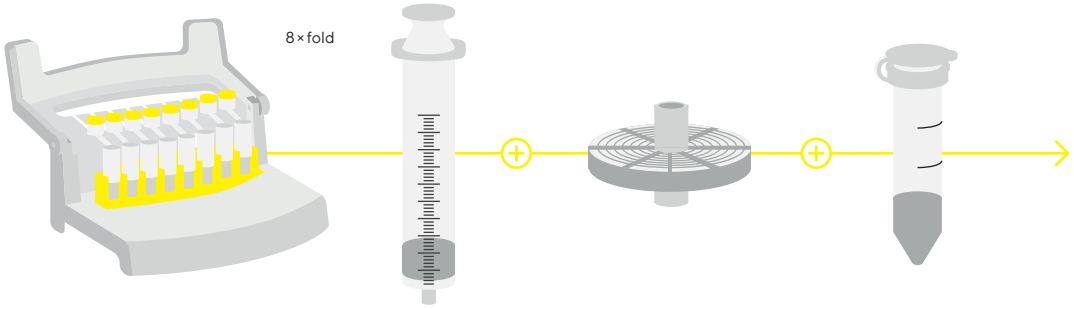
Sample Preparation Techniques

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

Claristep®
Filtration System

or

Syringe Filters
for processing one sample at a time



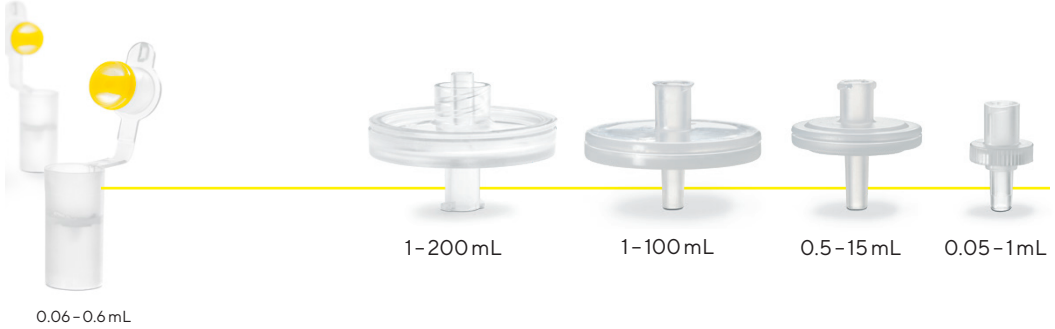
Analytical Sample Volumes Run Small

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

Syringeless Solution

or

Different Diameters
for different sample volumes



Ordering Information

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

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

[1] Effective Filtration Diameter
RC = Regenerated Cellulose

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

The Tray can be removed and exchanged

12 × 32 mm sample vials

Additional Components Needed

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


SARTORIUS

Sartolab® P20 Pressure Filter Units

Compact Design for the Filtration of Large Volumes

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

Membrane of Choice

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

Compact Design

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

Benefits

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

Specifications

Different Filter Materials	0.2 µm polyethersulfone 0.45 µm polyethersulfone High purity binder-free quartz microfibers
Housing Material	Transparent polycarbonate
Filter Diameter	61 mm
Filtration Area	20 cm^2
Holdup Volume	Sartolab® P20: 1 mL Sartolab® P20 Plus: 1.2 mL Sartolab® P20 Prefilter: 1 mL
Filtration Range	Sartolab® P20: 100 mL to 5 L Sartolab® P20 Plus: 100 mL to 10 L Sartolab® P20 Prefilter: 100 mL to 10 L
Recommended Max. Inlet Pressure	4 bar
pH Range	1 – 10
Housing Burst Pressure	> 5 bar
Autoclavable	121°C

Ordering Information

Sartolab® P20

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18064----------D	0.2 µm PES	Female Luer-Lock	Male Luer-Lock	yes	no	yes	10
18075----------D	0.2 µm PES	Female Luer-Lock	Hose barb	no	no	yes	10
18075--------UPN	0.2 µm PES	Female Luer-Lock	Hose barb	no	no	no	100
18089----------D	0.2 µm PES	Hose barb	Hose barb	yes	yes	yes	10
18090----------D	0.2 µm PES	Female Luer-Lock	Male Luer-Lock	no	no	yes	10

Sartolab® P20 Plus

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

Sartolab® P20 Prefilter

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

Sartolab® RF 50

Vacuum filtration unit for volumes of up to 50 mL

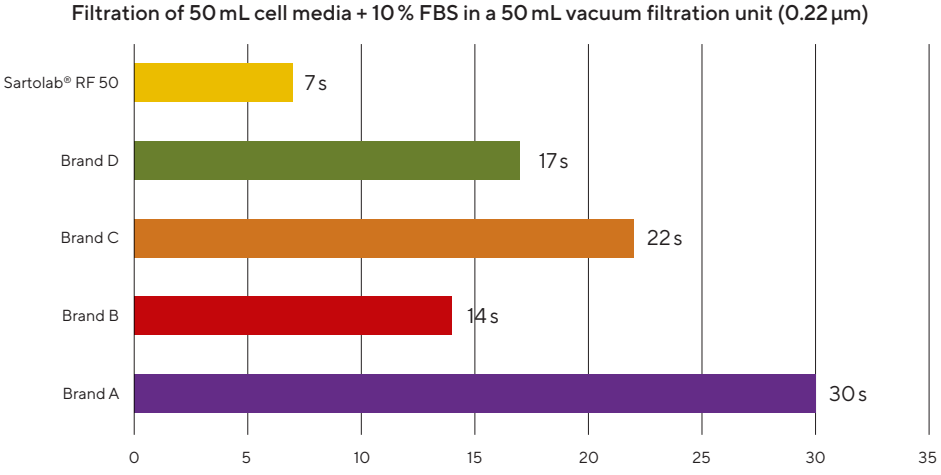
Sartolab® RF 50 vacuum filtration units are single-use units, designed for the filtration of sample volumes of up to 50 mL. They are available either with a 0.22 or a 0.45 µm polyethersulfone membrane which have been developed and manufactured by Sartorius at its own facilities. Both membranes provide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

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

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

User Benefits

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



Materials

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

Specifications

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

Ordering Information

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

Sartolab® RF | BT

Vacuum Filtration Units

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

Membrane of Choice

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

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

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

Ergonomic Design

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

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

State-of-the-Art Production

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

Best Engineering

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

Technical Specifications

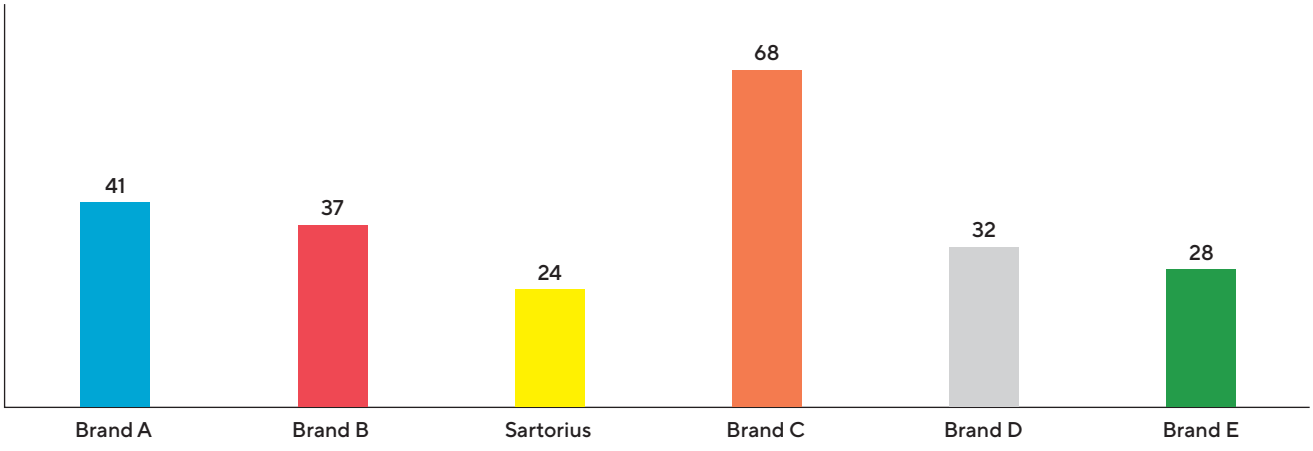
Material

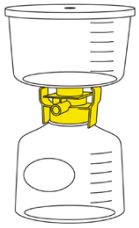
Membrane filter	0.1 µm polyethersulfone (Cat. No. 180D*) 0.22 µmpolyethersulfone (Cat. No. 180E*) 0.45 µm polyethersulfone (Cat. No. 180F*)
Funnel, lid, and bottle	Polystyrene (PS)
Tubing connector, funnel adapter, and screw cap	High Density Polyethylene (HDPE)
Packaging	PET|PE and PE|PA multilayer films

Specifications

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

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





The Sartolab® RF vacuum filtration unit is comprised of:

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

Ordering Information

Sartolab® RF

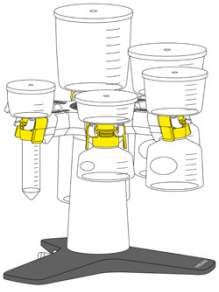
Order Number	Description	Membrane Type	Pore Size (µm)	Funnel Volume (mL)	Bottle Volume (mL)	Pkg. Unit
180E02----------E	Sartolab® RF 150	Asymmetric PES	0.22	150	150	12
180F02----------E	Sartolab® RF 150	PES	0.45	150	150	12
180D03----------E	Sartolab® RF 250	PES	0.1	250	250	12
180E03----------E	Sartolab®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

The Sartolab® BT bottle top filter is comprised of:

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

Sartolab® BT

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



Accessories and Consumables

Multistation

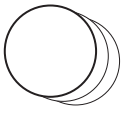
For hands-free parallel filtration of up to six samples

Order Number	Description	Pkg. Unit
SDLC01	Sartolab® Multistation	1

Sartolab® Bottle

Delivered sterile, for filtration and storage

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



Binder-Free Glass Microfiber Prefilters

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

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

Sartolab® Multistation

For hands-free parallel filtration of up to 6 samples

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

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

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

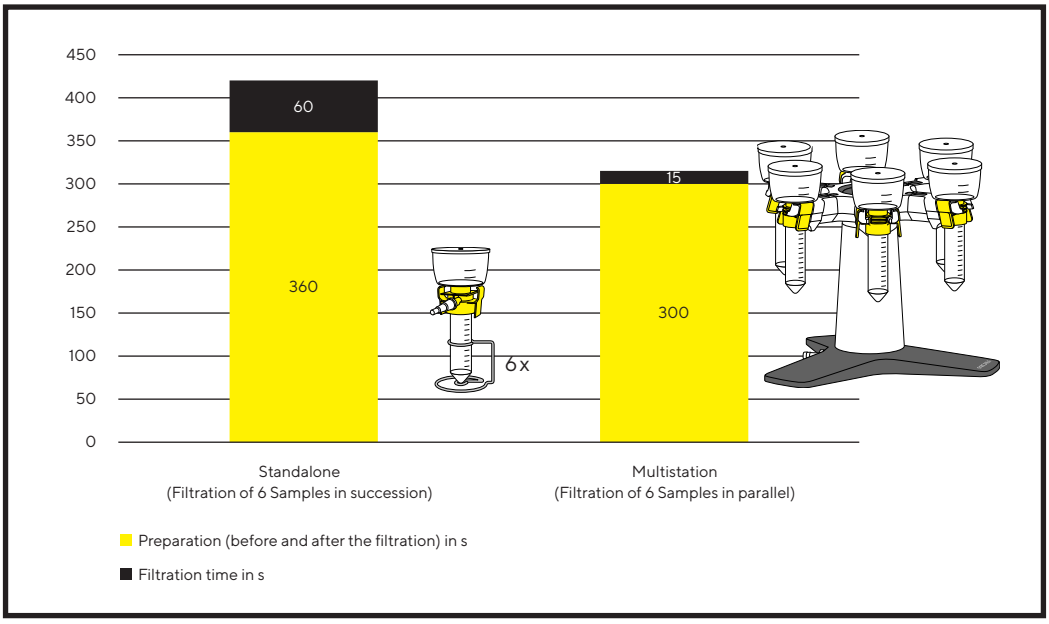
Easily manipulate your samples with the rotating, multi-directional head, and easily keep track of your samples during filtration with the numbered brackets

User Benefits

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

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

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



Specifications

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

Ordering Information

Description	Quantity	Order No.
Sartolab® MultiStation	1 unit	SDLC01

Sartoclear Dynamics® Lab P15

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

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

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

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

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

Sartoclear® Dynamics Lab P15 Features:

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

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

Quick and Easy Filtration

1. Fill the syringe with cell culture broth.

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

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

Typical Results

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

Specifications

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

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

Ordering Information

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

* Celpure® is a trademark of Advanced Minerals

Sartoclear Dynamics® Lab V

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

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

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

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

Sartoclear® Dynamics Lab V Features:

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

Typical Results

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

Specifications

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

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

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

* Celpure® is a trademark of Advanced Minerals

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

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

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

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

Ordering Information

Sartoclear Dynamics® Lab V50 Kits – 0.22 µm PES

Sartoclear Dynamics Lab V, 50 mL, 1 g

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

Sartoclear Dynamics Lab V, 50 mL, 2 g

Filtration of up to 50 mL with 2 g of DE per unit Contents: 1 × 180E01----------2 (24 × Sartolab® RF 50, 0.22 µm PES) 2 × SDLKG-01.0------2 (48 × pouches of filter aid, 1 g)	24	SDLV-0050-02E0-2

Sartoclear Dynamics® Lab V50 Kits – 0.45 µm PES

Sartoclear Dynamics Lab V, 50 mL, 1 g

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

Sartoclear Dynamics Lab V, 50 mL, 2 g

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

Sartoclear Dynamics® Lab V150 Kits

Sartoclear Dynamics® Lab V, 150 mL, 2 g

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

Sartoclear Dynamics® Lab V, 150 mL, 5 g

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

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

Sartoclear Dynamics® Lab V500 Kits		
Sartoclear Dynamics® Lab V, 500 mL, 5 g		
Filtration of up to 500 mL with 5 g DE per unit Contents: 2 × 180E04---------E (24 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-05.0------2 (24 × pouches of filter aid, 5 g)	24	SDLV-0500-05E0-2
Sartoclear Dynamics® Lab V, 500 mL, 10 g		
Filtration of up to 500 mL with 10 g DE per unit Contents: 2 × 180E04---------E (24 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-010.0------2 (24 × pouches of filter aid, 10 g)	24	SDLV-0500-10E0-2
Sartoclear Dynamics® Lab V, 500 mL, 20 g		
Filtration of up to 500 mL with 20 g DE per unit Contents: 1 × 180E04---------E (12 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-010.0------2 (24 × pouches of filter aid, 10 g)	12	SDLV-0500-20E0-E

Sartoclear Dynamics® Lab V1000 Kits		
Sartoclear Dynamics® Lab V, 1,000 mL, 10 g		
Filtration of up to 1 L with 10 g of DE per unit Contents: 2 × 180E05---------E (24 × Sartolab® RF 1000, 0.22 µm PES) 1 × SDLKG-10.0------2 (24 × pouches of filter aid, 10 g)	24	SDLV-1000-10E0-2
Sartoclear Dynamics® Lab V, 1,000 mL, 20 g		
Filtration of up to 1 L with 20 g of DE per unit Contents: 1 × 180C3----------E (12 × Sartolab® RF 1000, 0.22 µm PES) 1 × SDLKG-10.0------2 (24 × pouches of filter aid, 10 g)	24	SDLV-1000-20E0-E
Sartoclear Dynamics® Lab V, 1,000 mL, 40 g		
Filtration of up to 1 L with 40 g of DE per unit Contents: 1 × 180E05---------E (12 × Sartolab® RF 1000, 0.22 µm PES) 2 × SDLKG-10.0------2 (48 × pouches of filter aid, 10 g)	12	SDLV-1000-40E0-E

Chemical Compatibility

	Material								Minisart® Types									
	PES membrane	SFCA membrane	PTFE membrane	RC membrane	Nylon membrane	GF depth filter	Housing MBS	Housing PP	Minisart® HighFlow	Minisart® NML Ophthalsart	Minisart® NML Plus	Minisart® NML GF	Minisart® HY Minisart® Air	Minisart® RC	Minisart® NY	Minisart® NY Plus	Minisart® SRP	Minisart® PES
Filter Membrane	PES	(SF)CA	PTFE	RC	PA				PES	(SF)CA	(SF)CA		PTFE	RC	PA	PA	PTFE	PES
Pre-Filter						GF			-	-	GF	GF	-	-	-	GF	-	-
Housing Material							MBS	PP	MBS	MBS	MBS	MBS	MBS	PP	PP	PP	PP	PP
Sterilization																		
Ethylene oxide	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Gamma irradiation	++	++	-[1]	++	-	++	++	-	++	++	++	++	-[1]	-	-	-	-	-
Autoclaving 121 °C, 30 min	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Solvents																		
Acetone	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Acetonitrile	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Benzene	+	+	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	+
Benzyl alcohol	+	+	++	++	++	++	-	+	-	-	-	-	-	++	++	++	++	+
n-Butyl acetate	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
n-Butanol	++	++	++	++	++	++	+	++	+	+	+	+	+	++	++	++	++	++
Cellosolve	+	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Chloroform	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Cyclohexane	-	-	++	++	++	++	+	+	-	-	-	-	+	+	+	+	+	-
Cyclohexanone	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Diethylacetamide	-	-	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Diethyl ether	-	+	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Dimethyl formamide	-	-	++	+	+	++	-	++	-	-	-	-	-	+	+	+	++	-
Dimethylsulfoxide	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Dioxane	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Ethanol, 98 %	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Ethyl acetate	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Ethylene glycol	++	+	++	++	++	++	+	++	+	+	+	+	+	++	++	++	++	++
Formamide	++	-	+	+	++	++	++	++	++	-	-	-	+	+	++	++	++	++
Glycerin	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
n-Heptane	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+
n-Hexane	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	-	+
Isobutanol	++	+	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Isopropanol	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Isopropyl acetate	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Methanol, 98 %	+	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Methyl acetate	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Methylene chloride	-	-	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Methyl ethyl ketone	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Methyl isobutyl ketone	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Monochlorobenzene	+	+	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	+
Nitrobenzene	-	-	++	++	+	++	-	+	-	-	-	-	-	+	+	+	+	-
n-Pentane	++	++	-	++	++	++	+	+	+	+	+	+	+	+	+	+	-	+
Perchloroethylene	-	-	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-
Petroleum ether	+	++	-	++	++	++	+	++	+	+	+	+	-	++	++	++	-	+

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

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

Legend

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

Basic Filtration

Table of Contents

Introduction

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

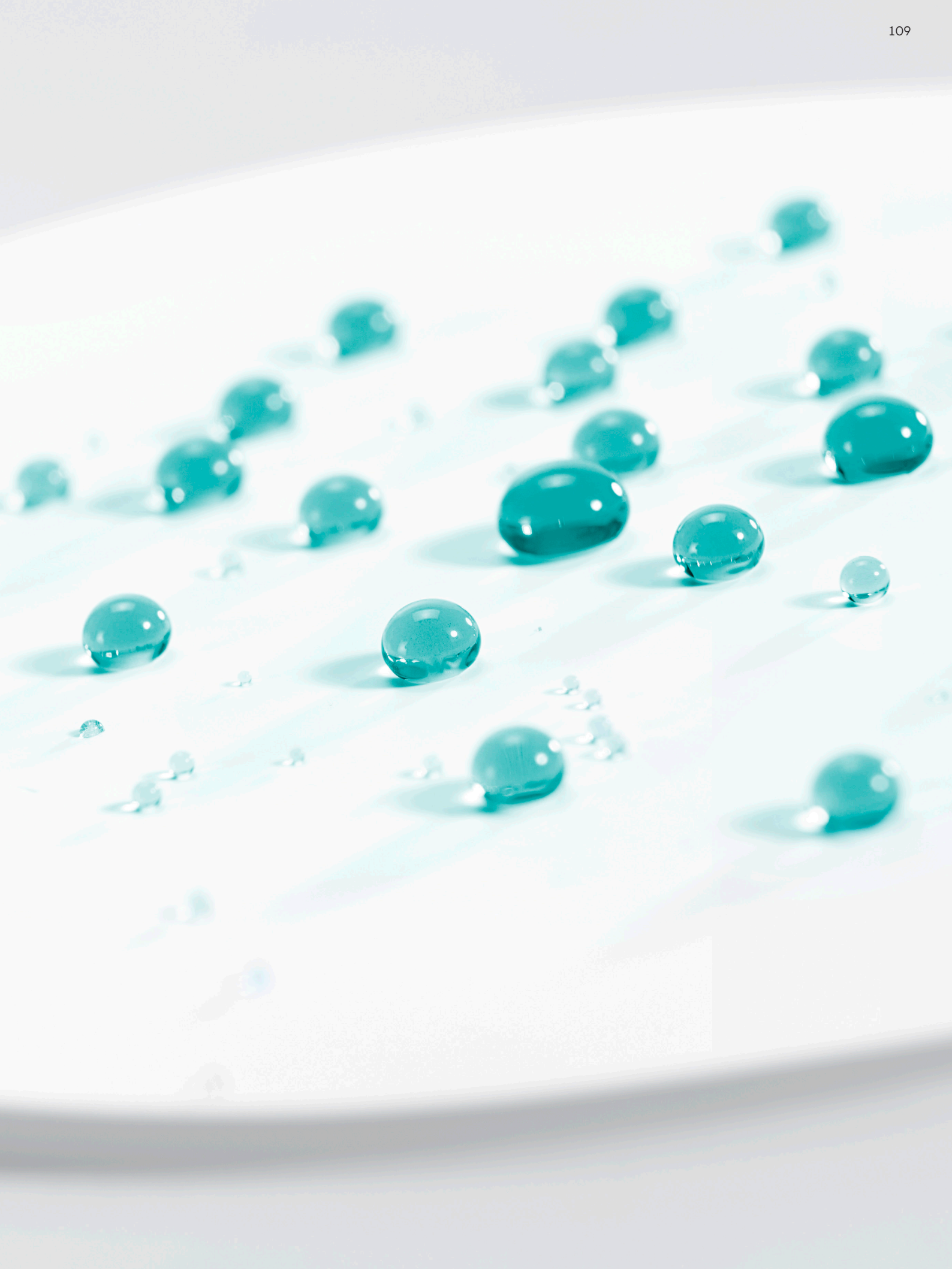
Our Product Range Covers:
- Filter papers
- Glass and quartz microfiber filters
- Membrane filters
- Blotting & chromatography papers & membranes
- Filtration equipment

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

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

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

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



Ash-free Filter Papers

For Quantitative and Gravimetric Analyses

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

Typical Values

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

Ordering Information

Filter Discs, 100 pieces

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

Folded Filters, 100 pieces

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

Sheets in 580 × 580 mm, 100 pieces

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

Other dimensions are available on request

Wet-strengthened Filter Papers

For Qualitative Analyses

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

Typical Values

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

Ordering Information

Filter Discs, 100 pieces

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

Folded Filters, 100 pieces

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

Sheets in 580 × 580 mm, 100 pieces

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

Other dimensions are available on request

High-Purity Filter Papers

For Qualitative Analyses

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

Typical Values

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

Ordering Information

Filter Discs, 100 pieces

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

Folded Filters, 100 pieces

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

Sheets in 580 × 580 mm, 100 pieces

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

Other dimensions are available on request

Filter Papers

For Qualitative-Technical Analyses

These filter papers are used for routine analyses like clarification, determination of substances, but also as discs with a center hole for technical applications. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. They are made of refined pulp and linters with an > 95 % α-cellulose content, are very pure with an ash content between < 0.1 to 0.15 %. Below you will find an overview of the most commonly used grades.

Typical Values

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

Ordering Information

Filter Discs

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

Folded Filters, 100 pieces

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

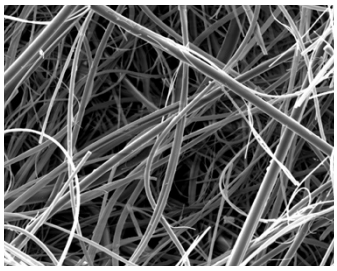
Sheets in 580 × 580 mm, 100 pieces

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

Other dimensions are available on request

Glass Microfiber Filters

Without Binder



Binder-free glass microfiber filters are recommended for analytical and gravimetric analyses and also as prefilters. These filters combine fast flow rates with high load capacity and the retention of very fine particles; they are biologically inert, are resistant to most chemicals and withstand temperatures up to 500 °C (grade 550-HA up to 550 °C).

Typical Values

Grade	Weight (g/m²)	Thickness (mm)	Penetration 0.3 µm (%)*	Particle retention in liquids (µm)	Filtration speed (mL/min)	Fulfills the requirements in EN 872:2005 (weigh loss)
MGA	54	0.23	< 0.001	1.6	510	Yes
MGB	143	0.70	< 0.001	1.0	210	
MGC	54	0.24	< 0.001	1.2	335	Yes
MGD	120	0.47	< 0.1	2.7	920	
MGF	75	0.38	< 0.001	0.7	110	
MGG	65	0.27	≤ 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	500	

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

Ordering Information

Filter Discs

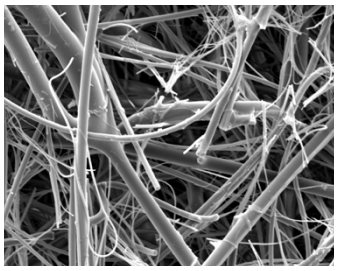
Ø in mm	MGA (100 pieces)	MG 160 (50 pieces)	MGB (50 pieces)	MGC (100 pieces)	MGD (50 pieces)
21			FT-3-1102-021		
25	FT-3-1101-025		FT-3-1102-025	FT-3-1103-025	FT-3-1104-025
37	FT-3-1101-037	FT-3-01110-037			
47	FT-3-1101-047	FT-3-01110-047	FT-3-1102-047	FT-3-1103-047	FT-3-1104-047
50	FT-3-1101-050	FT-3-01110-050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

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

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

Glass Microfiber Filters

With Binder



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

Typical Values

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

* Tested and classified according to the Standard EN 143

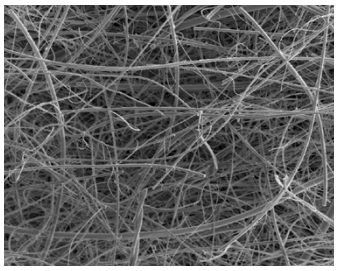
Ordering Information

Filter Discs

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

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

Quartz Microfiber Filters



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

Typical Values

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

* Tested and classified according to the Standard EN 143

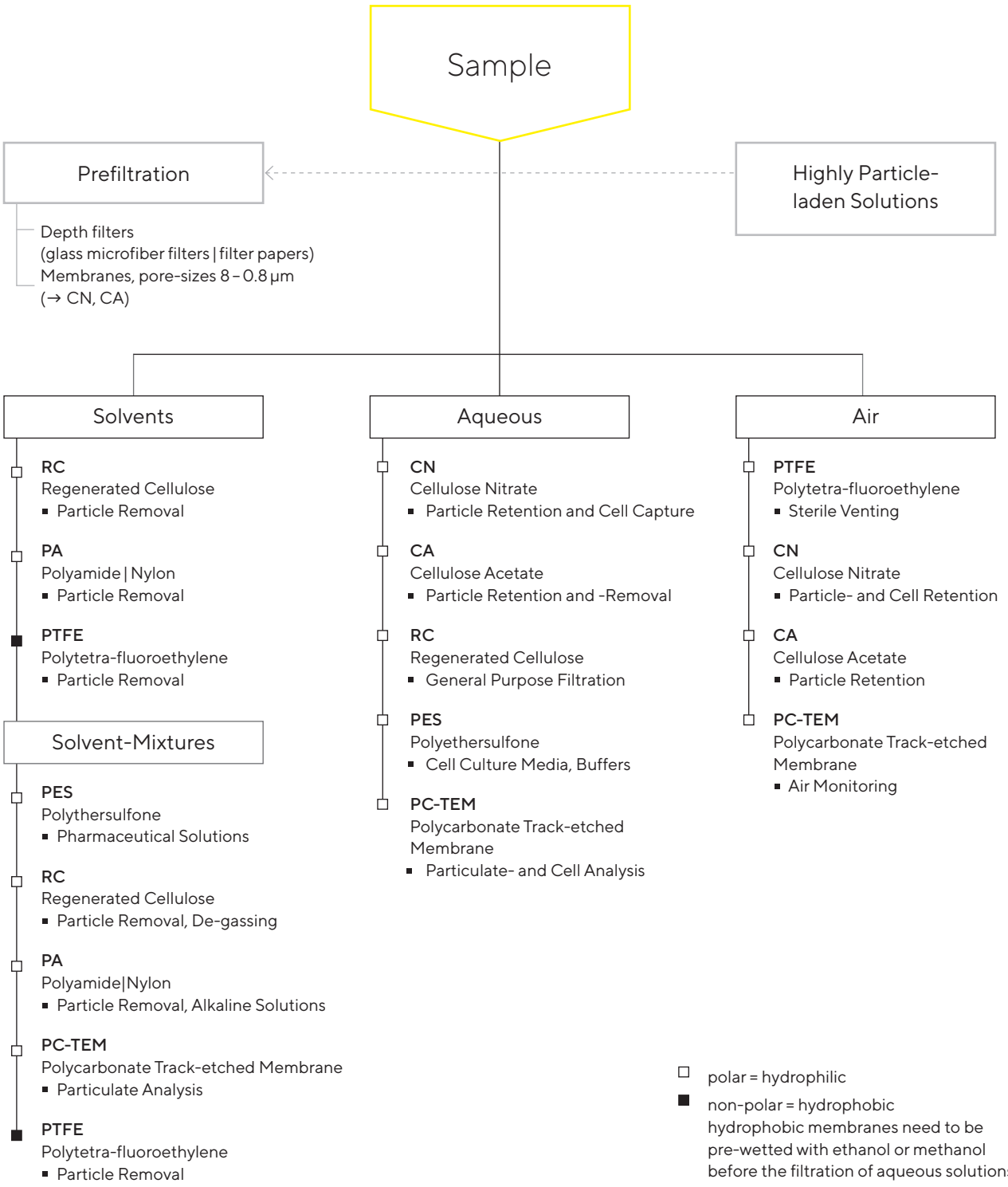
Ordering Information

Filter Discs

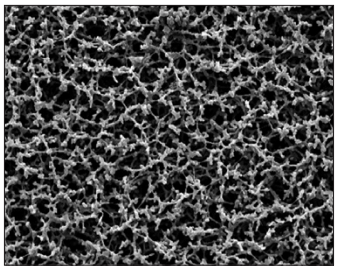
Ø in mm	Q3400
20	Q3400--20------G
25	Q3400--25------G
30	Q3400--30------G
37	Q3400--37------G
45	Q3400--45------G
47	Q3400--47------G
50	Q3400--50------G
82	Q3400--82------N
90	Q3400--90------N
142	Q3400-142------K
150	Q3400-150------K

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

Membrane Filtration – Quick Selection Guide



Cellulose Nitrate (Mixed Cellulose Ester)



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

Typical Values

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

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

Ordering Information

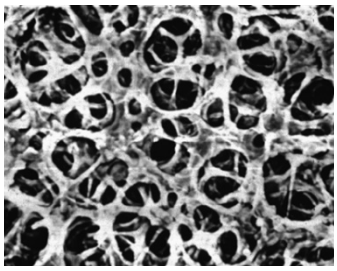
Filter Discs

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

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

* 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.

Typical Values

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

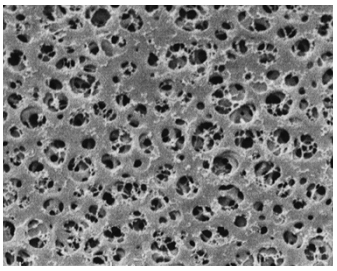
Ordering Information

Filter Discs

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

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

Regenerated Cellulose



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

Typical Values

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

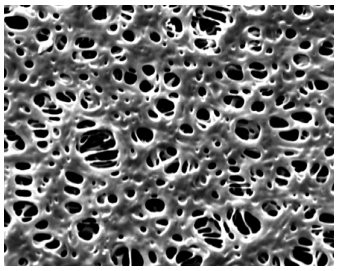
Ordering Information

Filter Discs

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

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

Polyethersulfone



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

Typical Values

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

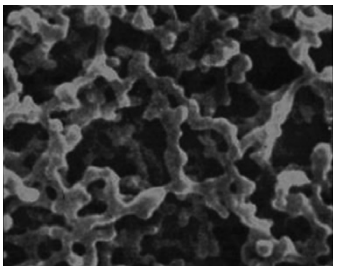
Ordering Information

Filter Discs

Ø 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	
142	15406-142------G	15407-142----MIG	15458-142------G
293		15407-293----MIG	15458-293------G

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

Polyamide



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

Typical Values

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

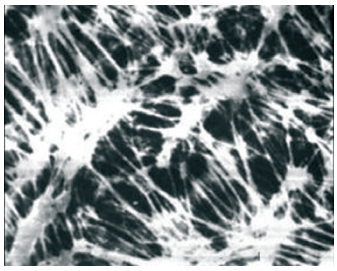
Ordering Information

Filter Discs

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

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

Hydrophobic PTFE



The main application of these membrane filters is the filtration of air, gases or chemicals. They are made of PTFE (polytetra-fluorethylene) only and are therefore permanently hydrophobic. Unlike other (hydrophilic) filter types, they are not wetted by air humidity, allowing unhindered passage of air at low differential pressures as well. PTFE membrane filters have an excellent chemical compatibility (pH 1 to 14), so that they are also used for the filtration of solvents and acids, to which other filter types are not resistant. Due to their hydrophobic characteristics, they must be pre-wetted with ethanol or methanol before the filtration of aqueous media.

Typical Values

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

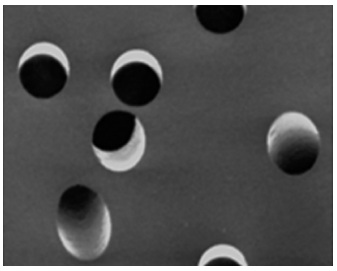
Ordering Information

Filter Discs

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

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

Polycarbonate Track-Etched



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

Typical Values

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm²/0.7 bar)	Burst Pressure (bar)
23058	0.1	25	7.0	≥ 0.5	≥ 0.7
23007	0.2	25	3.5	≥ 10	≥ 0.7
23006	0.4	25	2.0	≥ 30	≥ 0.7
23004	0.8	25	0.6	≥ 40	≥ 0.7

Ordering Information

Filter Discs, 100 Pieces

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

Other dimensions and packaging units are available on request

Blotting | Chromatography Papers

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

Typical Values

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

Ordering Information

Sheets in 580 × 600 mm

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

Other dimensions and packaging units are available on request

Nitrocellulose Membrane for Blotting

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

Typical Values

	0.22 µm	**0.45 µm**
Material	Cellulose nitrate	Cellulose nitrate
Thickness	130 µm	130 µm
Water flow rate	27 mL/(min. cm² bar)	70 mL/(min. cm² 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/cm²	200 µg/cm²

Ordering Information

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

All indicated data to be understood as typical average values

Re-usable 13 mm Syringe Filter Holders

For the Ultracleaning of Small Volumes Up to About 10 mL

PTFE Holder for Solvents and Chemicals

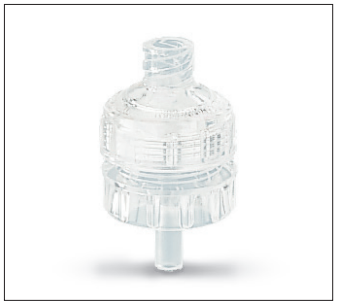
Made completely of PTFE, this holder is unaffected by chemicals and contains no trace elements which could be released into the liquid being filtered. It is therefore extremely well suited for particle removal from samples and reagents for analytical methods, such as NMR samples. Other benefits of this application are the low hold-up volume, the easy cleaning and the drying at a temperature of 180 °C. The construction of the holder ensures leak proof sealing without a sealing ring, and avoids twisting of the membrane filter when the top is tightened onto the base.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for PTFE
Filtration area	0.5 cm^2
Materials	PTFE top and bottom parts
Max. operating pressure	5 bar | 500 kPa | 72.5 psi
Membrane filter Ø	13 mm
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)
Hold-up volume	Less than 0.03 mL after overcoming the bubble point (0.3 mL before)

Ordering Information

Description	Order No.
13 mm PTFE Syringe Filter Holder	16574



Polycarbonate Holder for Aqueous Solutions

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

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Filtration area	0.5 cm^2
Materials	Polycarbonate top and bottom part,silicone gasket
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Membrane filter Ø	13 mm
Sterilization	By autoclaving at 121 °C
Hold-up volume	Less than 0.2 mL after overcoming the bubble point (0.3 mL before)

Ordering Information

Description	Order No.
13 mm PTFE Syringe Filter Holder	16574

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 cm²
Materials	Stainless steel (1.4305) top and bottom parts
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Membrane filter Ø	25 mm
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)
Hold-up volume	Less than 0.1 mL after overcoming the bubble point (0.3 mL before)

Ordering Information

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

Polycarbonate Holder for Aqueous Solutions

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

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Filtration area	3 cm²
Materials	Polycarbonate top and bottom parts, silicone gasket
Max. operating pressure	7 bar | 700 kPa | 101.5 psi
Membrane filter Ø	25 mm
Sterilization	By autoclaving at 121 °C
Hold-up volume	Less than 0.3 mL after overcoming the bubble point (0.6 mL before)

Ordering Information

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

25 mm Glass Vacuum Filter Holder

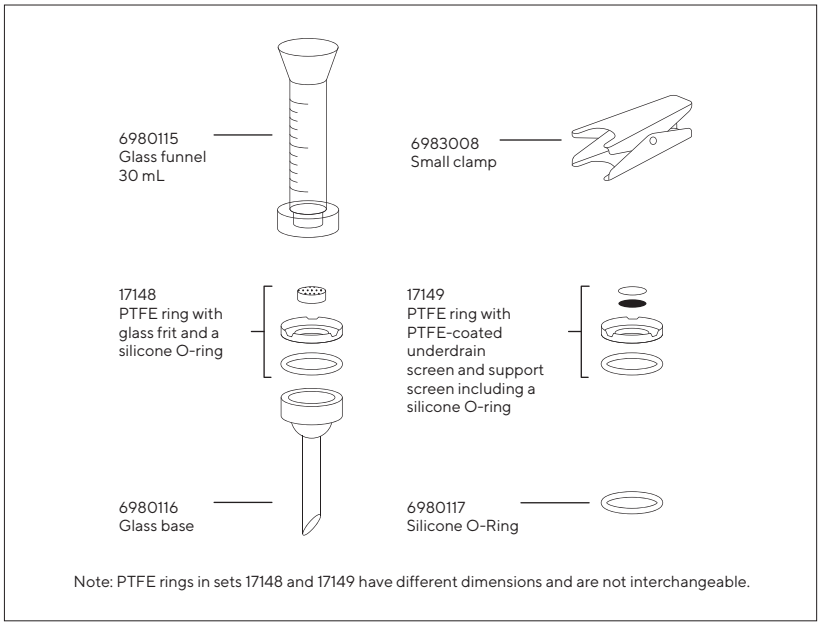
For Hybridization Tests, Particle Testing and Clarification

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

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

Specifications

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



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

Ordering Information

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

Replacement parts are shown in the diagram.

50 mm Glass Vacuum Filter Holder

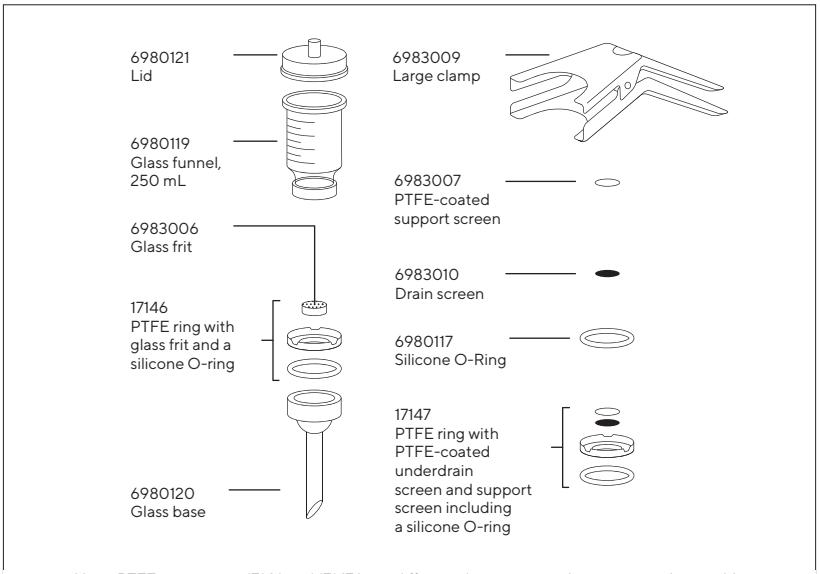
For Particle Testing or Clarification and Sterile Filtration

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

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

Specifications

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



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

Ordering Information

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

Replacement parts are shown in the diagram.

All-Glass Vacuum Filter Holder

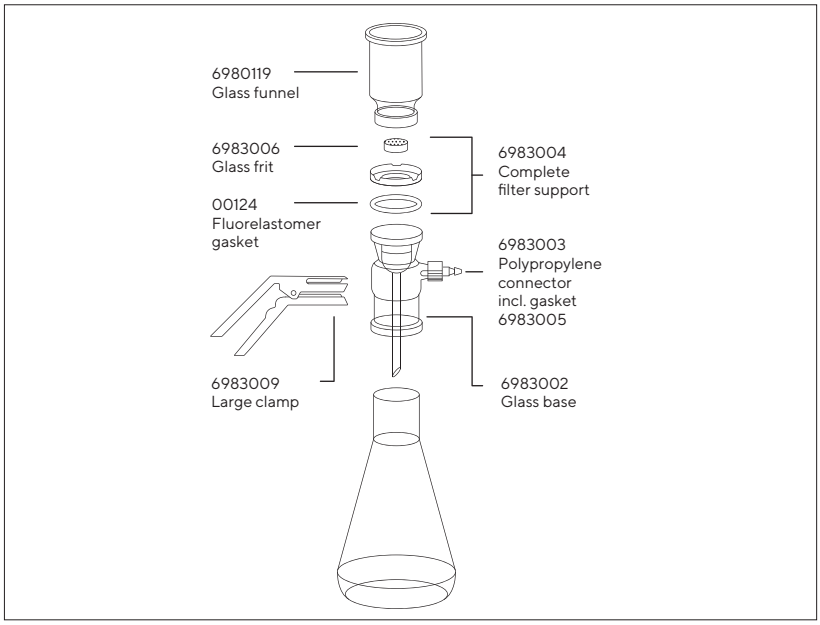
For Analytical Determinations, Particle Removal from Solvents

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

Convenience of handling is ensured by several beneficial features. A 6 mm wide non-ground rim above the ground glass neck of the suction flask prevents the filtrate from contacting grease on the ground glass surface and so avoids its contamination while being poured out of the flask. The hose nipple connector is made of polypropylene for safe connection of the vacuum hose. The filtrate outlet spout ends well below the entrance to this hose nipple.

Specifications

Outlet spout	Borosilicate glass funnel, base and flask, sintered glass frit in a PTFE ring and fluoroelastomer O-ring (45 × 3 mm) underneath, anodized aluminium clamp
Parts and materials	As for glass and PTFE
Chemical compatibility	250 mL
Funnel capacity	1 liter
Filtration area	12.5 cm²
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	50 mm (or 47 mm), 40 or 42 mm prefilter
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Ordering Information

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

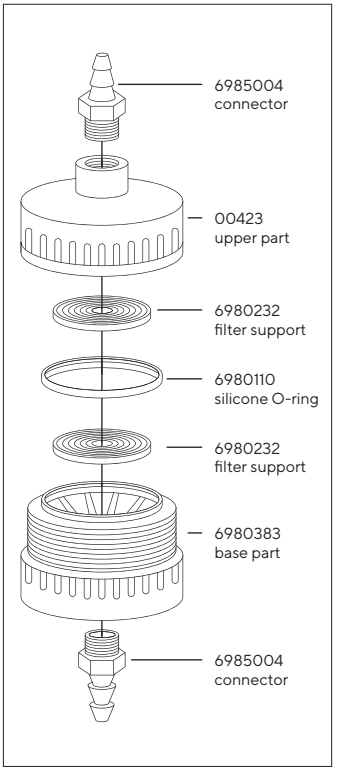
Replacement parts are shown in the diagram.

Polycarbonate In-Line Filter Holder

For the Filtration of Liter Volumes of Aqueous Solutions

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

The holder is characterized by an excellent resistance to pressure and density setting by simple hand-tightening. The transparent top part allows the visual control of the correct fit of the O-ring. The hose nipples can be replaced by luer connectors to use it as a large area syringe filter holder.



Specifications

Chemical compatibility	As for polycarbonate, polypropylene and silicone
Filtration area	12.5 cm²
Weight	83 g
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 Ø	50 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving at 121 °C The material withstands repeated cycles, provided aggressive cleaning agents are completely washed off and that the boiler water does not contain anti-corrosive or anti-scaling additives.

Ordering Information

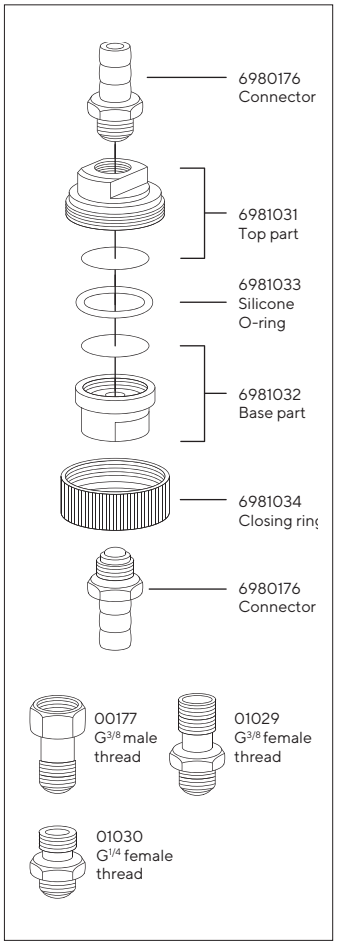
Description	Order No.
Polycarbonate in-line filter holder for 50 mm membrane filter, pack of 5.	16508----------B

Replacement parts are shown in the diagram.

25 mm Stainless Steel Filter Holder

For In-Line Filtration

The G¼ connection threads with density barrel, guarantee leak-proof sealing of the hose nipple and the holder without sealing rings. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G¼ female thread (order no. 01030) or G⅜ female thread order no. 01029) or onto pressure tanks with G⅜ male thread (order no. 00177).



Specifications

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

Ordering Information

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

Replacement parts are shown in the diagram.

47 mm Stainless Steel Filter Holder

For In-Line Filtration

The filter holder is suitable for a pressure of up to 20 bar. The inlet side valve is convenient for the intermittent run-off of waste water. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G⅜ female thread (order no. 17089) or onto pressure tanks with G⅜ male thread (order no. 17069) or on taps with G¾ male thread (order no. 17068).

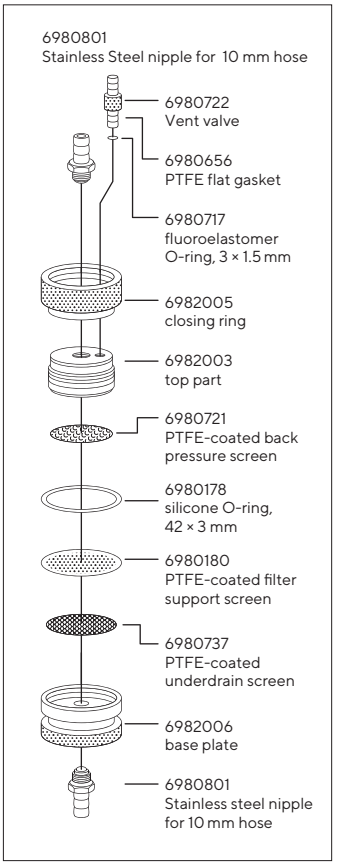


Diagram for 16254

Specifications

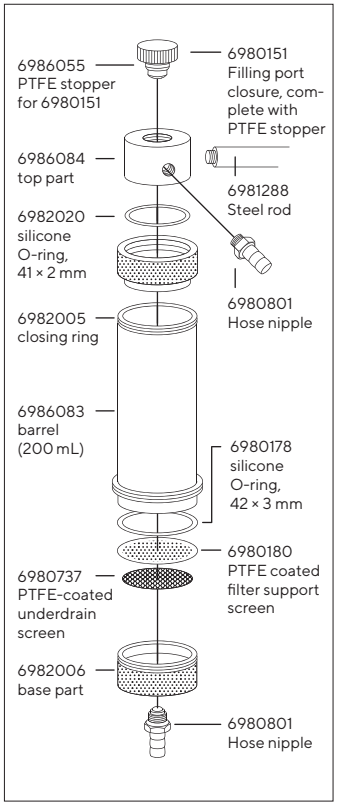
Connectors	Hose nipples DN10
Connection thread	M12 × 1
Filtration area	13 cm²
Weight	ca. 490 g
Materials	Stainless steel, except silicone O-ring (42 × 3 mm), PTFE and fluoroelastomer valve seals
Max. operating pressure	20 bar | 2,000 kPa | 290 psi
Suitable membrane filter	47 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

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

Stainless Steel Pressure Filter Holder

For the Filtration of Up to 5 L Volumes



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

Leak-proof sealing is achieved by hand-tightening the closing ring. For the filtration of small volumes (up to about 200 mL of soil samples or viscous liquids, such as oils), the holder is connected directly to a pressure source. For the filtration of up to 5 L volumes of relatively easily filterable liquids (e.g. buffer solutions, solutions for cell counters and tissue culture solutions), it is used in combination with a pressure tank.

Specifications

Chemical compatibility	As for stainless steel, PTFE and silicone. If required, the silicone O-ring in the filter support can be replaced by a fluoroelastomer O-ring 00179 or a PTFE O-ring 17038 (by reducing the max. operating pressure to 4 bar | 58 psi); the silicone O-ring in the top part can be replaced by a fluoroelastomer O-ring 17145.
Filtration area	13 cm²
Weight	960 g
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 Ø	47 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C)

Ordering Information

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

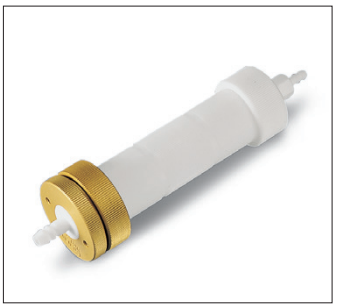
Replacement Parts

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

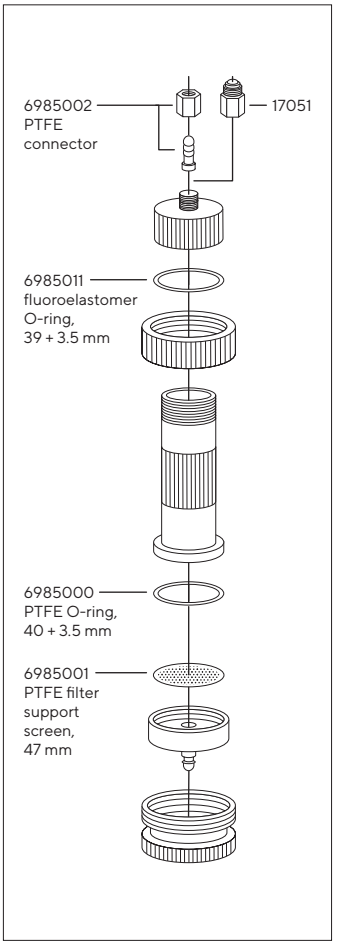
Other replacement parts are shown in the diagram or on page 138.

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 G⅜ connector, order no. 17051.



Specifications

Chemical compatibility	As for PTFE and fluoroelastomer
Filtration area	12.5 cm²
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 Ø	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

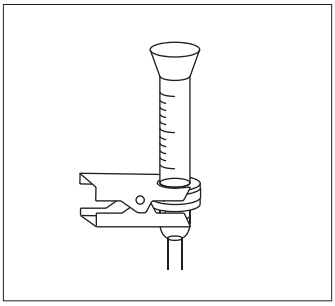
In each set stainless steel funnels with lids are preassembled.

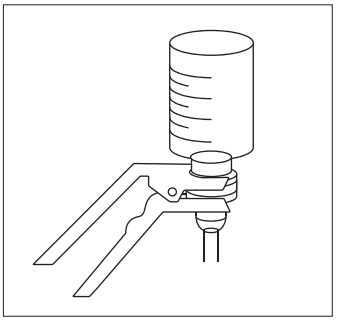
Accessories and Replacement Parts

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



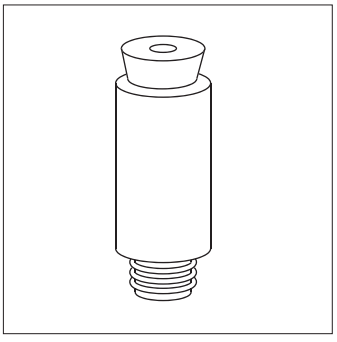


Glass Filter Holders

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 Ø	25 mm (or 24 mm) Prefilter, 20 mm	
Filtration area	3 cm²	
Capacity	30 mL	
Outlet	12 mm outer Ø	
Glass filter holder	250 mL	16307
Filter Ø	47 mm (or 50 mm) Prefilter, 40 mm	
Filtration area	12.5 cm²	
Capacity	250 mL	
Outlet	15 mm outer Ø	



Adapter, 16836 | Adapter, 16837

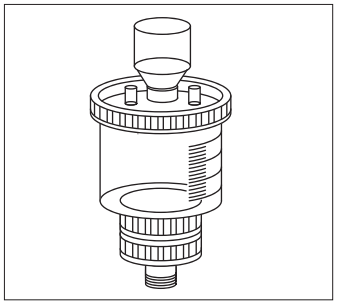
For use of a glass filter holder, 16306 or 16307, on a Combisart® stainless steel manifold.

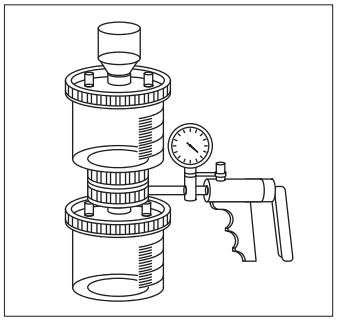
Ordering Information

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.

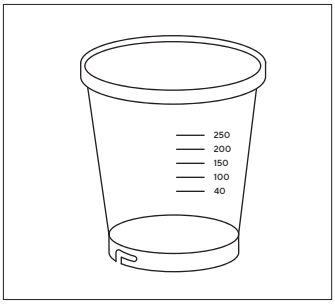
Outlet: TR 20 × 2 mm male thread

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	16673

Ready-to-Use Biosart® 250 Funnels

For Particle Counting

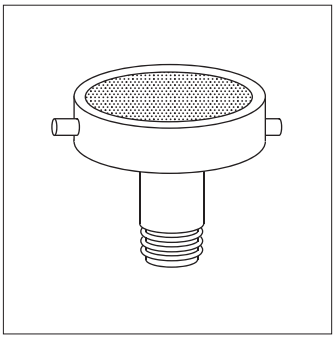


Biosart® 250 Funnel

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 Parts

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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Version 08 | 2021