

Simplifying Progress

# Minisart® Syringe Filter Family

## The Easy Choice – Clean and Safe

SARTORIUS

# Standard Minisart®-Help-to-Find

Please refer to Minisart® RC, NY or SRP Standard for the highest chemical compatibility, **page 8**.
Please refer to Minisart® NML Standard or Minisart® High Flow Standard on **page 14**.

## Sample Composition

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

## Pore Sizes

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

## Sample Volume

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

# Minisart® Syringe Filter Family

## A Full Range of Filters Dedicated for Various Filtration Applications



### Minisart® PP Standard Syringe Filters

**Sample Preparation HPLC | UHPLC | Analytics**
Elimination of particles from your samples prior to HPLC or other chromatographic analysis is essential in order to maintain the integrity of your chromatography column and to maximize its operating life time.

Minisart® syringe filters optimized for sample preparation consist of a PP 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 $cm^2$.
**See page 4.**



### Minisart® NML Standard Syringe Filters

**Filtration of Aqueous Liquids | Clarification | Sterile Filtration**
For optimal results Minisart® filters made of MBS housing provide a choice of membranes with pore sizes ranging from 0.1 µm to 5 µm for high flow rates and low adsorption characteristics. The effective filtration area of 6.2 $cm^2$ for fast filtration is the largest amongst premium syringe filters and the MBS housing is color-coded for easy pore size identification.
**See page 10.**

# Minisart® PP Standard Syringe Filters Sample Preparation for Analytics

## Reliable Removal of Particles from Liquids and Gases

Particle removal via filtration prior to analytics substantially increases the lifetime of your columns. Minisart® RC is optimized for aqueous liquids as well as solvents and is stable against DMSO, other amides, ketones, esters and ethers. Minisart® NY is exceptionally pure compared to 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



Male Spike Outlet



Male Luer Slip Outlet

12 mm housing diameter



4 mm effective filtration diameter



4 mm packs are colour-coded

24.5 mm housing diameter



15 mm effective filtration diameter



Minisart® SRP 15 mm



Minisart® NY 15 mm



Minisart® RC 15 mm

33 mm housing diameter



25 mm effective filtration diameter



Minisart® SRP 25 mm



Minisart® NY 25 mm

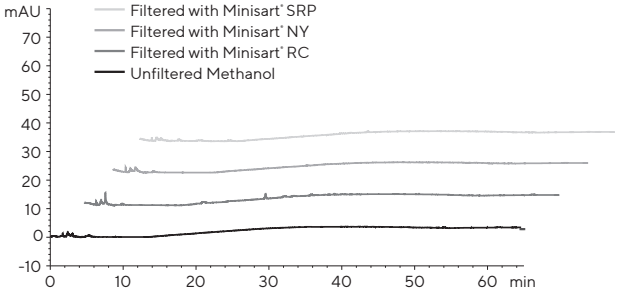


Minisart® RC 25 mm

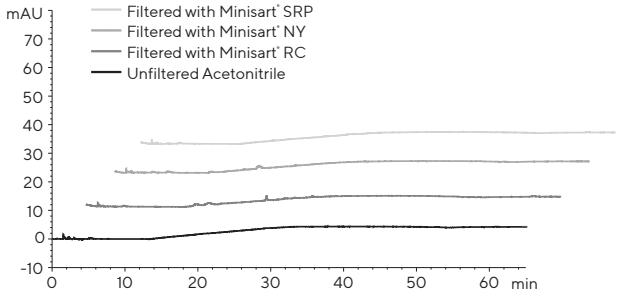


# Clean Materials for Lowest Background Levels

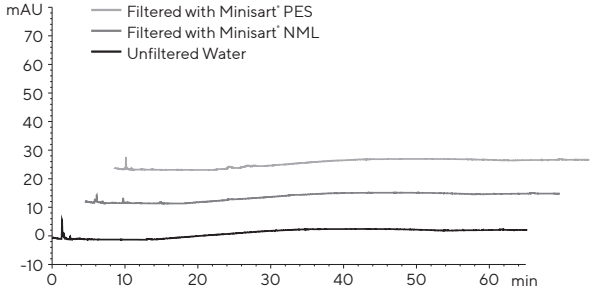
## Methanol




## Acetonitrile




## Water




## 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® Standard Syringe Filters with PP Housing

## Technical Specifications

### Minisart® Standard RC | SRP | NY | PES with 4 | 15 | 25 mm accessible membrane filtration diameter

| **Minisart® PES –** with 25 mm accessible membrane filtration diameter | |
|---|---|
| Housing material | Polypropylene (PP) |
| Membranes | RC = Regenerated Cellulose \| NY = Polyamide \|<br>SRP = Hydrophobic PTFE = Polytetrafluoroethylene \| PES = Polyethersulfone \|<br>PES- = Hydrophobic PES |
| Glass fiber pre-filter | NY Plus: Ultrapure quartz, 0.7 µm particle retention |
| Max. operating pressure | PES-: 2.0 bar \| 29 psi (IN - OUT) or 0.5 bar \| 14.5 psi (OUT - IN)<br>RC \| SRP \| NY: 4.5 bar \| 65 psi |
| Housing burst pressure | ≥ 7 bar \| 102 psi |
| Max. temperature | 60 °C |
| Sterilization | Non-sterile Minisart® RC, SRP and NY can be can sterilized by autoclaving or by using ethylene oxide (EO). Non-sterile Minisart® PES- can be sterilized by ethylene oxide or gamma irradiation. |

| **Minisart® type with regards to membrane** | **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<br>3.0 bar \| 44 psi | with water<br>4.6 bar \| 67 psi | with water<br>2.0 bar \| 29 psi | with ethanol<br>1.1 bar \| 16 psi | with ethanol<br>0.9 bar \| 13 psi |
| **Flow rate** ((≥) mL/min), **4 mm** ∅ = 0.07 cm² filter area \| Hold-up volume[1]: < 10 µl | | | | | |
| with water at 1 bar | 0.5 | – | 1.5 | –[2] | –[2] |
| with methanol at 1 bar | 1.5 | – | 3.0 | 2.0 | 4.5 |
| with air at 0.1 bar | – | – | – | 30 | 60 |
| **Flow rate** ((≥) mL/min), **15 mm** ∅ = 1.7 cm² filter area \| Hold-up volume[1]: < 100 µl | | | | | |
| with water at 1 bar | 20 | 10 | 40 | –[2] | –[2] |
| with methanol at 1 bar | 55 | 25 | 105 | 55 | 150 |
| with air at 0.1 bar | – | – | – | 800 | 1600 |
| **Flow rate** ((≥) mL/min), **25 mm** ∅ = 4.8 cm² filter area \| Hold-up volume[1]: < 200 µl | | | | | |
| with water at 1 bar | 80 | 50 | 160 | –[2] | –[2] |
| with methanol at 1 bar | 160 | 90 | 325 | 160 | 260 |
| with air at 0.1 bar | – | – | – | 1800 | 3000 |
| **Water penetration point[2]** (≥) | – | – | – | 4.0 bar \| 58 psi | 3.0 bar \| 44 psi |
| **Sterile filtration capability acc. to BCT** | no[4] | yes | no | yes | no |
| **Cytotoxicity (17575-ACK)** | No inhibition with MRC-5 (human lung cells) and L929 | | | | |

[1] Hold-up volume after air purge.
[2] 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).
[3] PES is suitable for solutions only containing up to 30% MeOH.
[4] According to 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 BCT. All other non-sterile Minisart® types with 0.2 µm pore size can be sterilized by autoclaving or EO before use for sterile filtration.
[5] For sterile packs ACK



| 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 |
|---|---|---|---|---|---|
| K \| Q \| R \| ACK | K \| Q \| R \| ACK | K \| Q | K \| Q | K \| Q \| ACK | K \| Q |
| with water<br>3.0 bar \| 44 psi | with water<br>2.0 bar \| 29 psi | with water<br>3.0 bar \| 44 psi | with water<br>2.0 bar \| 29 psi | with water<br>3.4 bar \| 46 psi | with ethanol<br>0.95 bar \| 13.8 psi |
| | | | | | |
| – | – | – | – | 1.5 | – |
| – | – | – | – | –[3] | – |
| – | – | – | – | – | – |
| | | | | | |
| 20 | 40 | – | – | 40 | – |
| 40 | 110 | – | – | –[3] | – |
| – | – | – | – | – | – |
| | | | | | |
| 50 | 100 | 50 | 100 | 100 | – |
| 70 | 200 | 70 | 200 | –[3] | 3 |
| – | – | – | – | – | 1200 |
| – | – | – | – | – | 2.0 bar \| 29 psi |
| yes | no | yes | no | yes | yes |

Minisart® Standard Syringe Filters are not for medical use.

# Sample Preparation Chromatography

## Ordering Information

| Ø mm\| EFD[1)] | Membrane | Housing | Pore Size | Connector Outlet | Color \| Printing | Sterile* | Qty \| Pk | Order No. |
|---|---|---|---|---|---|---|---|---|
| **Minisart® RC (Regenerated Cellulose)** | | | | | | | | |
| 25 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | Yes | 50 | 17764--------ACK |
| 25 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 50 | 17764----------K |
| 25 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 200 | 17764----------S |
| 25 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 500 | 17764----------Q |
| 25 mm | RC | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 50 | 17765----------K |
| 25 mm | RC | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 200 | 17765----------S |
| 25 mm | RC | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 500 | 17765----------Q |
| 15 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | Yes | 50 | 17761--------ACK |
| 15 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 50 | 17761----------K |
| 15 mm | RC | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 500 | 17761----------Q |
| 15 mm | RC | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 50 | 17762----------K |
| 15 mm | RC | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 500 | 17762----------Q |
| 4 mm | RC | PP | 0.2 µm | Male Luer Slip | Blue Tray | No | 50 | 17821----------K |
| 4 mm | RC | PP | 0.2 µm | Male Luer Slip | Blue Tray | No | 500 | 17821----------Q |
| 4 mm | RC | PP | 0.45 µm | Male Luer Slip | Yellow Tray | No | 50 | 17822----------K |
| 4 mm | RC | PP | 0.45 µm | Male Luer Slip | Yellow Tray | No | 500 | 17822----------Q |
| **Minisart® SRP (Hydrophobic PTFE)** | | | | | | | | |
| 25 mm | PTFE | PP | 0.2 µm | Male Luer Slip | White, Printed | Yes | 50 | 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 | 0.45 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 | 0.2 µm | Hose Barb | White | No | 500 | 1757A----------Q |
| 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 |

| Ø mm\| EFD[1)] | Membrane | Housing | Pore Size | Connector Outlet | Color \| Printing | Sterile* | Qty \| Pk | Order No. |
|---|---|---|---|---|---|---|---|---|
| **Minisart® NY (Nylon) & NY25 Plus (Glass Fiber 0.7 µm[2)] + Nylon)** | | | | | | | | |
| 25 mm | Nylon | PP | 0.2 µm | Male Luer Slip | White, Printed | Yes | 50 | 17845--------ACK |
| 25 mm | Nylon | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 500 | 17845----------Q |
| 25 mm | Nylon | PP | 0.45 µm | Male Luer Slip | White, Printed | Yes | 50 | 17846--------ACK |
| 25 mm | Nylon | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 500 | 17846----------Q |
| 15 mm | Nylon | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 50 | 1776B----------K |
| 15 mm | Nylon | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 500 | 1776B----------Q |
| 15 mm | Nylon | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 50 | 1776C----------K |
| 15 mm | Nylon | PP | 0.45 µm | Male Luer Slip | White, Printed | No | 500 | 1776C----------Q |
| 25 mm | GF+Nylon | PP | 0.2 µm | Male Luer Slip | White, Printed | No | 50 | 1784B----------K |
| 25 mm | GF+Nylon | PP | 0.2 µm | Male Luer Slip | White, printed | No | 500 | 1784B----------Q |
| 25 mm | GF+Nylon | PP | 0.45 µm | Male Luer Slip | White, printed | No | 50 | 1784C----------K |
| 25 mm | GF+Nylon | PP | 0.45 µm | Male Luer Slip | White, printed | No | 500 | 1784C----------Q |
| **Minisart® PES (Polyethersulfone) Aqueous Filtration** | | | | | | | | |
| 15 mm | PES | PP | 0.22 µm | Male Luer Slip | White | Yes | 50 | 1776D--------ACK |
| **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[c] | White, Printed | No | 50 | 1757G----------K |
| 25 mm | PES- | PP | 0.2 µm | Hose Barbs[c] | White, Printed | No | 500 | 1757G----------K |

* Sterile Minisart® are individually packaged. If not stated otherwise, Minisart® have been sterilized by ethylene oxide. Non-sterile Minisart® RC, SRP and NY can be sterilized by autoclaving at 121 °C for 30 min or by using ethylene oxide (EO). Minisart® PES- can be sterilized by ethylene oxide or gamma irradiation.

[c] Hose barbs, inlet and outlet, stepped 4.4 - 6 mm diameter

[1)] EFD – Effective Filtration Diameter

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

**Standard Minisart® Syringe Filters are not for medical use.**

# Minisart® NML Standard Syringe Filters Clarification and Sterilization by Filtration

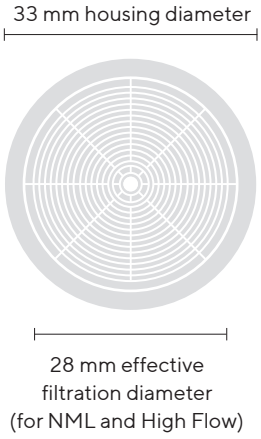
## The Optimal Method for Clarification and Sterilization of Liquids and Gases

Sterilization by filtration is the fastest solution for bacterial cell removal from liquids. Minisart® NML with (surfactant-free) cellulose acetate ((SF)CA) is the best choice for all aqueous solutions with a pH of 4 – 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 high flow rates and a pH of 1 – 13. Due to the asymmetric membrane structure, the PES surface almost behaves like a pre-filter.

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

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





## Minisart® High Flow with PES



0.22 µm



0.45 µm



0.1 µm

## Minisart® NML with SFCA



0.2 µm



0.45 µm

## Minisart® HY with PTFE



0.2 µm

## Minisart® NML with CA



0.65 µm



0.8 µm



1.2 µm



5 µm

# Minisart® Standard Syringe Filters with MBS Housing

## Technical Specifications

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

| | |
|---|---|
| Housing material | Methacrylate butadiene styrene (MBS) |
| Membranes | High Flow: PES = Polyethersulfone,<br>NML: (SF)CA = (Surfactant-free) Cellulose Acetate,<br>NML Plus: (SF)CA = (Surfactant-free) Cellulose Acetate,<br>HY | Acticosart | Air: Hydrophobic PTFE = Polytetrafluoroethylene |
| Glass fiber pre-filter | NML Plus: Binder-free GF, 0.7 µm particle retention |
| Max. operating pressure | High Flow: 6.0 bar | 87 psi<br>NML, NML Plus, HY, Air: 4.5 bar | 65 psi<br>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, NML Plus can be sterilized by ethylene oxide (EO) or gamma irradiation.<br>Non-sterile Minisart® HY, Acticosart, Air* can be sterilized by ethylene oxide (EO). |

| **Minisart® type with regards to membrane** | **PES 0.1 µm** | **PES 0.22 µm** | **PES 0.45 µm** | **SFCA 0.2 µm** | **SFCA 0.45 µm** | **CA 0.65 µm** | **CA 0.8 µm** |
|---|---|---|---|---|---|---|---|
| Non-sterile packs: 500 (Q, HYQ), 1000 (R), sterile packs: individually packaged: 50 (K, GUK, HNK) | K | K \| GUK \| Q | K \| GUK \| Q | K \| GUK \| Q | K \| GUK \| Q | K | K \| GUK \| Q |
| **Bubble point** (≥) | with water 5.0 bar \| 73 psi | with water 3.4 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 |
| **Flow rate** ((≥) mL/min) | | | | | | | |
| 28 mm ∅ with water at 1 bar | 40 | 140 | 220 | 60 | 160 | 250 | 400 |
| 15 mm ∅ with air at 0.1 bar | – | – | – | – | – | – | – |
| 26 mm ∅ with air at 0.1 bar | – | – | – | – | – | – | – |
| **Water penetration point[4]** (≥) | – | – | – | – | – | – | – |
| **Sterile filtration capability[2] acc. to BCT** | yes | yes | no | yes | no | no | no |
| **Non-pyrogenic according to USP** | yes[3] | yes[3] | yes[3] | yes[3] | yes[3] | yes[3] | yes[3] |
| **Cytotoxicity** | No inhibition with MRC-5 (human lung cells) and L929 | | | | | | |

[1] Hold-up volume after air purge.
[2] According to bacterial challenge test (BCT) with ≥ 1 × $10^7$ cfu/$cm^2$ *Brevundimonas diminuta*.
All non-sterile Minisart® types listed above can be sterilized according to the sterilization recommendation in this table. Not autoclavable.
[3] For sterile packs K | GUK
[4] Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point.
* Minisart® Air can be sterilized by Gamma irradiation according to the following parameters: Range 25 – 45 kGy (validated with 50 kGy).



| CA 1.2 µm | CA 5.0 µm | GF+SF CA 0.2 µm | GF+SF CA 0.45 µm | GF+CA 1.2 µm | GF 0.7 µm | PTFE 0.2 µm | PTFE 1.0 µm | PTFE (Acticosart) | PTFE (Air) 0.2 µm |
|---|---|---|---|---|---|---|---|---|---|
| K \| Q | K \| Q | K \| Q | K \| Q | Q | K \| Q | K \| Q | HYQ | Q | Q \| HNK |
| with water 0.7 bar \| 10 psi | with water 0.4 bar \| 6 psi | with water 3.2 bar \| 46 psi | with water 2.0 bar \| 29 psi | with water 0.7 bar \| 10 psi | with water 0.5 bar \| 7 psi | with ethanol 1.1 bar \| 16 psi | with ethanol 0.5 bar \| 7 psi | with ethanol 0.9 bar \| 13 psi | with ethanol 1.0 bar \| 14.1 psi |
| 500 | 600 | 60 | 160 | 350 | 450 | – | – | – | – |
| – | – | – | – | – | – | – | – | – | 800 |
| – | – | – | – | – | – | 2000 | 4000 | 2300 | – |
| – | – | – | – | – | – | 4.0 bar \| 58 psi | 1.5 bar \| 22 psi | n.a. | 3.2 bar \| 46 psi |
| no | no | yes | no | no | no | yes | no | n.a. | yes |
| yes[3] | yes[3] | | | | | yes[3] | | | |

**Minisart® Standard Syringe Filters are not for medical use.**

# Preparation of Aqueous Liquids

## Ordering Information

| Ø mm \| EFD[1)] | Membrane | Housing | Pore Size | Connector Outlet | Color \| Printing | Sterile* | Qty \| Pk | 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----------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 | No | 500 | 16532----------Q |
| 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 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----------K |
| 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 | No | 500 | 16533----------Q |
| **Minisart® NML ((SF)CA – (Surfactant-free) Cellulose Acetate)** | | | | | | | | |
| 28 mm | SFCA | MBS | 0.2 µm | Male Luer Lock | Blue | Yes | 50 | S6534------FMOSK |
| 28 mm | SFCA | MBS | 0.2 µm | Male Luer Lock | Blue | Yes# | 50 | S6534------FMGUK |
| 28 mm | SFCA | MBS | 0.2 µm | Male Luer Lock | Blue | No | 500 | S6534------FM-Q |
| 28 mm | SFCA | MBS | 0.2 µm | Male Luer Slip | Blue | Yes | 50 | S7597------FXOSK |
| 28 mm | SFCA | MBS | 0.2 µm | Male Luer Slip | Blue | No | 500 | S7597------FX--Q |
| 28 mm | SFCA | MBS | 0.45 µm | Male Luer Lock | Yellow | Yes | 50 | S6555------FMOSK |
| 28 mm | SFCA | MBS | 0.45 µm | Male Luer Lock | Yellow | Yes# | 50 | S6555------FMGUK |
| 28 mm | SFCA | MBS | 0.45 µm | Male Luer Lock | Yellow | No | 500 | S6555------FM--Q |
| 28 mm | SFCA | MBS | 0.45 µm | Male Luer Slip | Yellow | Yes | 50 | S7598------FXOSK |
| 28 mm | SFCA | MBS | 0.45 µm | Male Luer Slip | Yellow | No | 500 | S7598------FX--Q |
| 28 mm | CA | MBS | 0.65 µm | Male Luer Slip | Pink | Yes | 50 | 16569----------K |
| 28 mm | CA | MBS | 0.8 µm | Male Luer Lock | Green | Yes | 50 | 16592----------K |
| 28 mm | CA | MBS | 0.8 µm | Male Luer Lock | Green | Yes# | 50 | 16592--------GUK |
| 28 mm | CA | MBS | 0.8 µm | Male Luer Lock | Green | No | 500 | 16592----------Q |
| 28 mm | CA | MBS | 1.2 µm | Male Luer Lock | Red | Yes | 50 | 17593----------K |
| 28 mm | CA | MBS | 1.2 µm | Male Luer Lock | Red | No | 500 | 17593----------Q |
| 28 mm | CA | MBS | 5 µm | Male Luer Lock | Brown | Yes | 50 | S7594------FMOSK |
| 28 mm | CA | MBS | 5 µm | Male Luer Lock | Brown | No | 500 | 17594----------Q |

| Ø mm \| EFD[1)] | Membrane | Housing | Pore Size | Connector Outlet | Color \| Printing | Sterile* | Qty \| Pk | Order No. |
|---|---|---|---|---|---|---|---|---|
| **Minisart® NML Plus** (Glass Fiber 0.7 µm[2)] + ((SF)CA) | | | | | | | | |
| 28 mm | GF+SFCA | MBS | 0.2 µm | Male Luer Lock | Blue | Yes | 50 | 17823----------K |
| 28 mm | GF+SFCA | MBS | 0.2 µm | Male Luer Lock | Blue | No | 500 | 17823----------Q |
| 28 mm | GF+SFCA | MBS | 0.45 µm | Male Luer Lock | Yellow | Yes | 50 | 17829----------K |
| 28 mm | GF+SFCA | MBS | 0.45 µm | Male Luer Lock | Yellow | No | 500 | 17829----------Q |
| 28 mm | GF+CA | MBS | 1.2 µm | Male Luer Lock | Red | No | 500 | 17825----------Q |
| 28 mm | GF | MBS | 0.7 µm[2)] | Male Luer Lock | White | No | 50 | 17824----------K |
| 28 mm | GF | MBS | 0.7 µm[2)] | Male Luer Lock | White | No | 500 | 17824----------Q |
| **Minisart® HY (Hydrophobic PTFE), for Venting and Gas Filtration** | | | | | | | | |
| 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 | Yes | 50 | S6596------FMOSK |
| 26 mm | PTFE | MBS | 0.2 µm | Male Luer Lock | Clear | No | 500 | S6596------FM--Q |
| **Minisart® High Flow (PES – Polyethersulfone) Aqueous Filtration and Mycoplasma Removal** | | | | | | | | |
| 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 | Yes# | 50 | 16596--------HNK |
| **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® are individually packaged. If not stated otherwise, Minisart® are sterilized by ethylene oxide.
#-mark indicates sterilization by gamma irradiation.
Non-sterile Minisart® High Flow, NML, NML Plus can be sterilized by ethylene oxide (EO) or gamma irradiation. Non-sterile Minisart® HY, Acticosart can be sterilized by ethylene oxide (EO).
Minisart® Air can be sterilized by ethylene oxide (EO)or by Gamma irradiation according to the following parameters: Range 25 – 45 kGy (validated with 50 kGy).

[1)] EFD – Effective Filtration Diameter
[2)] 0.7 µm = GF particle retention ≠ pore size!

**Minisart® Standard Syringe Filters are not for medical use.**

# Chemical Compatibility

| | Material | | | | | | | | Minisart® Types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PES membrane | (SF)CA 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 | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ |
| Isobutanol | ++ | + | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | ++ | ++ |
| Isopropanol | ++ | ++ | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | ++ | ++ |
| Isopropyl acetate | - | - | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | ++ | - |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Methanol, 98% | + | - | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | ++ | + |
| Methyl acetate | - | - | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | + | - |
| Methylene chloride | - | - | - | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | - | - |
| Methyl ethyl ketone | - | + | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | + | - |
| Methyl isobutyl ketone | - | - | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | + | - |
| Monochlorobenzene | + | + | - | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | - | + |
| Nitrobenzene | - | - | ++ | ++ | + | ++ | - | + | - | - | - | - | - | + | + | + | + | - |
| n-Heptane | + | + | + | ++ | ++ | ++ | ++ | + | + | + | + | + | + | + | + | + | + | + |
| n-Hexane | + | + | + | ++ | ++ | ++ | ++ | + | + | + | + | + | + | + | + | + | - | + |
| n-Pentane | ++ | ++ | - | ++ | ++ | ++ | + | + | + | + | + | + | + | + | + | + | - | + |
| Perchloroethylene | - | - | - | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | - | - |
| Petroleum ether | + | ++ | - | ++ | ++ | ++ | + | ++ | + | + | + | + | - | ++ | ++ | ++ | - | + |

**Legend**

++ High Resistance
+ Limited Resistance
- Not Resistant
[1] Gamma irradiation feasible for Minisart® Air

# Chemical Compatibility

| | Material | | | | | | | | Minisart® Types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PES membrane | (SF)CA 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 |
| **Solvents (continued)** | | | | | | | | | | | | | | | | | | |
| Pyridine | - | - | ++ | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | ++ | - |
| Tetrahydrofuran | - | - | - | ++ | ++ | ++ | - | ++ | - | - | - | - | - | ++ | ++ | ++ | - | - |
| Toluene | - | + | - | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | - | - |
| Trichloroethylene | - | + | ++ | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | + | - |
| Xylene | - | + | - | ++ | ++ | ++ | - | + | - | - | - | - | - | + | + | + | - | - |
| **Acids** | | | | | | | | | | | | | | | | | | |
| Acetic acid, 25% | + | + | ++ | ++ | - | ++ | + | ++ | + | + | + | + | + | ++ | - | - | ++ | + |
| Acetic acid, 80% | - | - | ++ | + | - | ++ | - | + | - | - | - | - | - | + | - | - | + | - |
| Hydrochloric acid, 20% | ++ | - | ++ | - | - | ++ | + | + | + | - | - | - | + | - | - | - | + | + |
| Hydrofluoric acid, 50% | + | - | ++ | + | - | ++ | - | + | - | - | - | - | - | + | - | - | + | + |
| Perchloric acid, 25% | - | - | ++ | - | - | ++ | - | + | - | - | - | - | - | - | - | - | + | - |
| Phosphoric acid, up to 10% | + | + | ++ | - | - | ++ | + | + | + | + | + | + | + | - | - | - | + | + |
| Phosphoric acid, 86% | + | + | ++ | - | - | ++ | - | + | - | - | - | - | - | - | - | - | + | + |
| Nitric acid, 30% | + | - | ++ | - | - | ++ | + | + | + | - | - | - | + | - | - | - | + | + |
| Nitric acid, conc. | - | - | ++ | - | - | ++ | - | - | - | - | - | - | - | - | - | - | - | - |
| 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 – 14 | - | - | ++ | - | - | ++ | - | ++ | |
| pH 1 – 13 | ++ | - | ++ | - | - | ++ | - | ++ | |
| pH 3 – 14 | + | - | ++ | + | ++ | ++ | - | ++ | |
| pH 3 – 12 | ++ | - | ++ | ++ | ++ | ++ | + | ++ | |
| pH 4 – 8 | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | |

The chemical compatibility guide was established 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 Resistance
+ Limited Resistance
- Not Resistant

# Sartolab® RF | BT Vacuum Filtration Units

Sartolab® RF | BT vacuum filtration units are convenient filtration units designed for the filtration of volumes from 50 mL to 1 L. Sartolab® RF as a complete system includes a receiver flask or a conical tube 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. All filtration units can be used as stand-alone system or with the Sartolab® Multistation, which allows parallel filtration of up to 6 samples.



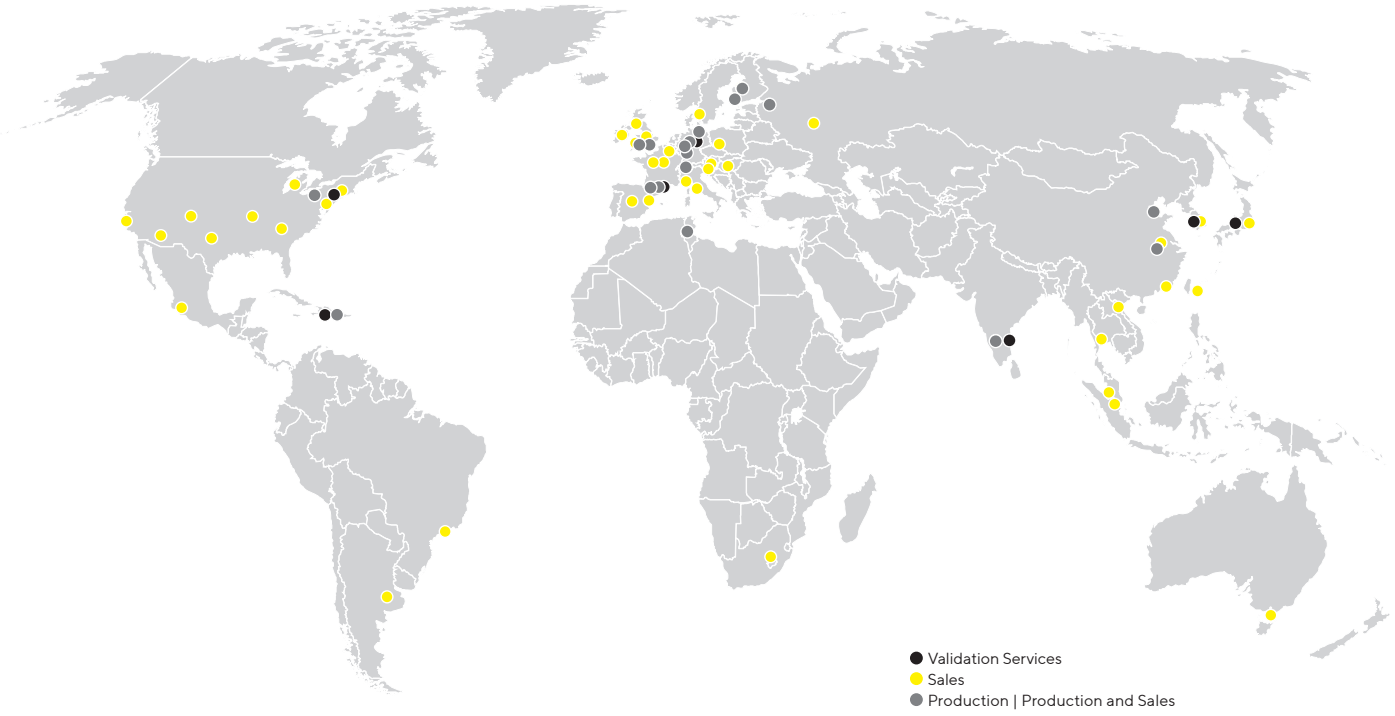


# Sartolab® P20 Pressure Filtration Devices

Sartolab® P20 filtration devices are ready-to-use filters for the clarification and sterile filtration of media and aqueous solutions in batches from 100 mL to 10 L. They are 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 the quartz microfiber prefilter only is also available for clarification purposes.



**Find out more**
For more information, please visit
www.sartorius.com




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