Minisart® High Flow | NML | Air | HY | Acticosart

Sartorius Syringe Filters for Liquid Filtration and Venting

Sartorius Minisart® filters with MBS housing and a choice of hydrophilic and hydrophobic membrane filters are suitable for clarification (0.8 – 1.2 µm), particle removal (0.45 – 0.65 µm) and sterilization of liquids (0.1 – 0.2 µm), air and gases. The housing material MBS could be glued with tubing by using suitable glue or residue-free solvents.

Minisart® High Flow with hydrophilic PES membrane offers highest flow rates and is optimized for filtration of additives and cell culture buffers. Article 16553-K with 0.1 µm is suitable for Mycoplasma removal.

Minisart® NML with surfactant-free cellulose acetate is virtually free of extractables and is optimized for clarification of aqueous solutions and drugs.

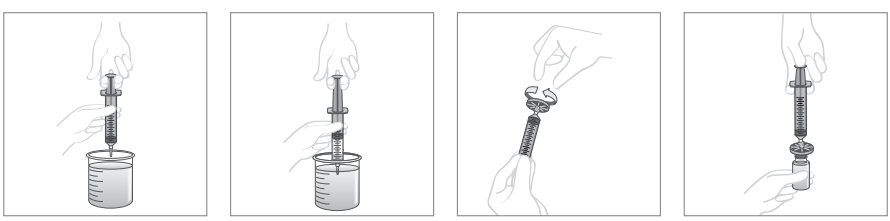
Minisart® Air and HY with hydrophobic PTFE membrane are designed for the sterile filtration and cleaning of air and gases and are optimized for the venting of bags and containers, e.g. fermenters.

Minisart® Acticosart is designed for the ultracleaning of air and gases and contains active carbon for binding of aerosols and volatile substances.

Applications

- **Minisart® High Flow** for clarification and sterilization of liquids with highest flow rates and total throughput
- **Minisart® NML** for surfactant-free clarification and particle removal of aqueous liquids
- **Minisart® Air | HY** for sterilization and cleaning of air and gases and venting of containers
- **Minisart® Acticosart** for ultracleaning of air and gases

Instructions for Use



a) b) c) d)

If possible, draw a slight amount of air (at least 1 ml) into a syringe (a). Then fill the syringe with the liquid to be filtered: pull the plunger upwards to draw this liquid from a suitable container into the syringe b). If required, remove any remaining liquid from the tip of the syringe and attach a Minisart® to the luer lock or luer slip connector on the filled syringe. Sterile blister units are opened by peeling off the protective backing. Hold the opened blister part on the outside and connect the inside sterile syringe filter to the syringe (c). Apply consistent pressure to press in the plunger of the syringe in order to filter the liquid through the Minisart® filter into a suitable vial for collection (d). Afterwards, press the plunger all the way in so that the air cushion initially created will discharge any liquid remaining in the inlet and outlet of the filter. As a result, this will reduce the hold-up volume.

Caution!

1. If sterile Minisart® blister units are used please check that the blister packing is not damaged!
2. Take care when using syringes with a volume of less than 10 ml, as they can easily generate a pressure greater than the maximum recommended pressure resistance of 6 bar (87 psi) for Minisart®. Therefore, slowly press in the plunger on a syringe with a volume of less than 10 ml. As soon as you detect considerable resistance (= max. filter pressure capacity), do not use force while continuing to press the plunger exceeding 6 bar. Otherwise, you can damage the filter, and filtration will no longer guarantee an ultrapure filtrate!
3. Minisart® is designed for bidirectional use. However, once you have selected one direction of filtration, be sure to maintain this direction. Never use the same syringe filter for both directions!

Note

1. If you need to spike a closure first before injecting the filtrate, use a suitable disinfectant, such as 70% alcohol, to disinfect the site to be pierced. If necessary, attach a sterile needle (for a male luer slip) to the outlet of the Minisart® and remove the protective cap before injection.
2. If you would like to achieve maximum recovery of your sample to be filtered, detach the syringe from the syringe filter and draw air once more into the syringe. After reconnecting the syringe and filter, use the air cushion created in this way to press out the remaining liquid. To do so, you will have to apply pressure beyond the bubble point of the particular Minisart® membrane incorporated (see Table 1). This will reduce the hold-up volume to the lowest possible amount.
3. Our filters are leading in terms of purity, so prerinsing is usually not necessary. For very sensitive methods or samples, you may need to additionally prerinse the particular syringe filter you use with 1-3 ml ultrapure water or buffer. This way, you can be sure that you have removed even the slightest traces of extractables.
4. Use a Minisart® for only one sample to reliably prevent carrying over residues of one sample to the next.
5. You will find an overview of chemical compatibilities in the 'Minisart® Chemical Compatibility Guide' on our website.

Table 1

Specifications for Minisart® High Flow | NML with 28 mm filtration area ∅, **Air** with 15 mm ∅, **HY | Acticosart** with 26 mm ∅	
Housing material	MBS (Methacrylate butadiene styrene)
Membranes	High Flow: – PES = Polyethersulfone – NML: (SF)CA = (Surfactant-free) Cellulose Acetate – Air|HY: PTFE = Polytetrafluoroethylene – Acticosart: PTFE and a dome reservoir filled with active carbon
Application limits High Flow	Max. recommended operating pressure 6.0 bar | 87 psi
Application limits NML|HY|Air	Max. recommended operating pressure 4.5 bar | 65 psi
Application limits Acticosart	Max. recommended operating pressure 1 bar | 14.5 psi
Housing burst pressure	>7 bar | 102 psi (not determined for Acticosart)
Max. temperature	60°C not autoclavable!
Sterilization	Non-sterile Minisart® High Flow | NML can be sterilized by ethylene oxide (EO) or Gamma sterilization Non-sterile Minisart® Air | HY | Acticosart can be sterilized by ethylene oxide (EO) sterilization*

Minisart® type	**PES 0.1 µm**	**PES 0.2 µm**	**PES 0.45 µm**	**CA 0.65 µm**	**CA 0.8 µm**	**CA 1.2 µm**	**CA 5.0 µm**	**PTFE 0.2 µm**	**Actico-sart**	**PTFE 1.0 µm**
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 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	with ethanol 1.1 bar | 16 psi	with ethanol 0.9 bar | 13 psi	with ethanol 0.5 bar | 7 psi

Flow rate: High Flow | NML, 28 mm ∅ = 6.2 cm^2 filter area | Air, 15 mm ∅ = 1.7 cm^2 filter area | HY | Acticosart, 26 mm ∅ = 5.3 cm^2 filter area
Hold-up volume[1]: High Flow | NML: 100-150 µl | Air | HY | Acticosart: n.a.

with water at 1 bar:	40 ml/ min	140 ml/ min	220 ml/ min	250 ml/ min	400 ml/ min	500 ml/ min	600 ml/ min	–[3]	–[3]	–[3]
with air at 0.1 bar:	–[2]	–[2]	–[2]	–[2]	–[2]	–[2]	–[2]	2.0 l/min	2.3 l/min	4 l/min
Water penetration point	–	–	–	–	–	–	–	>3.0 bar | 44 psi[3]	n.a.	>1.5 bar | 22 psi
Sterile filtration capability[4] acc. to BCT	yes	yes	no	no	no	no	no	yes	n.a.	no
Main applications	hydrophilic filters with PES membrane for fast sterilization or clarification of liquids			hydrophilic filters for particle removal or clarification of aqueous solutions				hydrophobic filters for cleaning or ultracleaning (Acticosart) of air and gases and venting of containers		

[1] Hold-up volume after air purge. For minimum hold-up please see "Note | Hinweis | Remarques | Nota | Note 1"
[2] Hydrophilic membranes can filter dry air or gas but become impermeable to air or gas when wetted!
[3] Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point
[4] According to bacterial challenge test (BCT) with 10^7 *Brevundimonas diminuta*.
All non-sterile Minisart® types can be sterilized according to the sterilization processes listed above.
n.a. = not applicable
* Minisart® Air can be sterilized by Gamma sterilization according to the following parameters:
Range 25 – 40 kGy (validated with 50 kGy).

Ordering Information | Bestellinformation | Données de Commande | Datos de Pedido | Dati d'Ordinazione

Table 2
Sartorius Syringe Filters for Liquid Filtration and Venting
Minisart® High Flow | NML | Air | HY | Acticosart

∅ mm	Pore Size	Outlet	Qty. | Pk	Order Number	Sterility Status
Minisart® High Flow (PES)					
28 mm	0.1 µm	Male Luer Lock	50	16553----------K	single-blister-packed, EO sterile
28 mm	0.2 µm	Male Luer Lock	50	16532----------K	single-blister-packed, EO sterile
28 mm	0.2 µm	Male Luer Lock	50	16532--------GUK	single-blister-packed, Gamma sterile
28 mm	0.2 µm	Male Luer Lock	500	16532----------Q	non-sterile
28 mm	0.2 µm	Male Luer Slip	50	16541----------K	single-blister-packed, EO sterile
28 mm	0.2 µm	Male Luer Slip	500	16541----------Q	non-sterile
28 mm	0.45 µm	Male Luer Slip	50	16533----------K	single-blister-packed, EO sterile
28 mm	0.45 µm	Male Luer Slip	50	16533--------GUK	single-blister-packed, Gamma sterile
28 mm	0.45 µm	Male Luer Slip	500	16533----------Q	non-sterile
28 mm	0.45 µm	Male Luer Lock	50	16537----------K	single-blister-packed, EO sterile
28 mm	0.45 µm	Male Luer Lock	500	16537----------Q	non-sterile
Minisart® NML (SFCA)					
28 mm	0.65 µm	Male Luer Slip	50	16569----------K	single-blister-packed, EO sterile
28 mm	0.8 µm	Male Luer Lock	50	16592----------K	single-blister-packed, EO sterile
28 mm	0.8 µm	Male Luer Lock	50	16592--------GUK	single-blister-packed, Gamma sterile
28 mm	0.8 µm	Male Luer Lock	500	16592----------Q	non-sterile
28 mm	1.2 µm	Male Luer Lock	50	17593----------K	single-blister-packed, EO sterile
28 mm	1.2 µm	Male Luer Lock	500	17593----------Q	non-sterile
28 mm	5.0 µm	Male Luer Lock	500	17594----------Q	non-sterile
Minisart® Air (hydrophobic PTFE)					
15 mm	0.2 µm	Male Luer Slip	500	1751A----------Q	non-sterile
15 mm	0.2 µm	Needle	50	16596--------HNK	single-blister-packed, Gamma sterile
Minisart® HY (hydrophobic PTFE)					
26 mm	1.0 µm	Male Luer Lock	500	1659A--------HYQ	non-sterile
26 mm	1.0 µm	Male Luer Slip	500	1659B--------HYQ	non-sterile
Minisart® Acticosart with Dome Reservoire + hydrophobic PTFE					
26 mm	0.45 µm	Male Luer Slip	500	17840----------Q	non-sterile, with active carbon
26 mm	0.45 µm	Male Luer Slip	500	40080----------Q	Non-sterile, empty reservoir

- Would you like to filter solvents, acids or bases?
- Do you need to filter small volumes?
- Would you like to use PP housings and other membranes?
  Please refer to Minisart® RC, Minisart® NY, or Minisart® SRP for highest chemical compatibility; also available in 4 mm or 15 mm filtration area

- Do you need Minisart® with pre-filters for filtration of highly particle laden samples?
  Please refer to Minisart® NML Plus and Minisart® NY Plus which incorporate a glass fiber pre-filter

- Are you looking for CE-certified Minisart®?
  Please request CE-certified article numbers for Minisart® NML, MInisart® HY and Minisart® SRP

Quality Assurance Certificate

CE 0120 sartorius

Minisart is manufactured by Sartorius in accordance with the Applicable Good Manufacturing Practice Standards and in a facility whose Quality Management System is certified for compliance with the DIN EN ISO 9001 Quality System Standard and DIN EN ISO 13485.

Sterile, individually packed products were sterilized with ethylene oxide gas using a validated process following DIN/EN ISO 11135 regulations, or were sterilized with gamma irradiation using a validated process following DIN/EN ISO 11137 regulations.

Each unit is tested 100% during manufacture for membrane and housing integrity by a leakage test under automatic conditions. The lot no. alone or lot no. with one of the following: pore size, ID no., material type, order no. are printed on top of the housing and|or Tyvek. Before packing each unit has been checked by visual inspection.

Minisart is biosafe according to the USP Class VI Biological tests for Plastics. It also complies with the Title 21 Code of Federal Regulations, Section 210.3(b)(6) and 211.72 for non-fiber-releasing filters.

Following 100% control, each lot has been sampled, tested and released by QA Department for the following characteristics:

Non-Sterile and Sterile Products
Burst Pressure Test
Bubble Point Test
Endotoxine Test
Pressure Hold Test
Flow Rate Performance

Additional Tests for 0.2 µm Pore Size
Sterile Filtration Capability (Bacterial Challenge Test)

Additional Tests for Sterile Products
Sterility

09.03.2015
Date

Dr. Hartmut Hennig,
Site Manager QA Filtration Products

QA released sartorius stedim Sartorius Stedim Biotech GmbH

Manufactured by
Sartorius Stedim Biotech GmbH
August-Spindler-Strasse 11
37079 Goettingen, Germany

www.sartorius.com

Symbols

Nicht zur Wiederverwendung
Single Use
Ne pas réutiliser
No reutilizable
Monouso

REF Bestellnummer
Order Number
Référence du catalogue
Número de referencia
Codice d'ordine

Achtung! | Warning!
Attention! | Atención!
Attenzione!

Hersteller | Manufacturer
Fabricant | Fabricante
Produttore

IVD In-Vitro-Diagnostika
In-Vitro-Diagnostics
Dispositif médical de diagnostic in vitro
Para uso en diagnóstico in vitro
Per uso diagnostico in vitro

verwendbar bis
Use before | Utiliser jusqu'au
Fecha caducidad
Data di scadenza

LOT Chargenbezeichnung
Lot Number | Code du lot
Número de lote
Numero di lotto

STERILE EO Sterilisation mit Ethylenoxid
sterilized, ETO
Méthode de stérilisation utilisant de l'oxyde d'éthylène
Esterilización por ETO
Sterilizzazione con ETO

STERILE R Sterilisation durch Bestrahlung
sterilized, irradiated
Méthode de stérilisation utilisant l'irradiation
Esterilización por radiación
Sterilizzazione per irradiazione

STERILE Sterilisation mit Dampf
sterilized, hot steam
Méthode de stérilisation utilisant la vapeur ou la chaleur séche
Esterilización por vapor caliente
Sterilizzazione con vapore caldo

Gebrauchsanwesiung beachten
Consult instructions for use
Consulter le mode d'emploi
Consulte las instrucciones de uso
Consultare le istruzioni per l'uso

pyrogenfrei
non-pyrogenic
non pyrogène
Apirógeno
Apirogeno

Porengröße
Pore size
Taille de pore
Tamaño de poro
Porosità

Temperaturbegrenzung
maximum and minimum temperature
Limite de température
Temperatura máxima y mínima
Temperatura massima e minima

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