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## Instructions for Use

## Minisart® NML, SRP &amp; HY

## Sartorius Syringe Filters for Filtration Applications and Sterilization of Air

Sartorius Minisart® syringe filters with a hydrophilic cellulose acetate membrane are suitable for particle removal, clarification, bioburden reduction and sterile filtration of aqueous liquids. Minisart® syringe filters with a hydrophobic polytetrafluoroethylene (PTFE) membrane are suitable for sterilization of air and gases and for sterile filtration of oily liquids. Versions with a polypropylene (PP) housing material are additionally suitable for aggressive liquids.

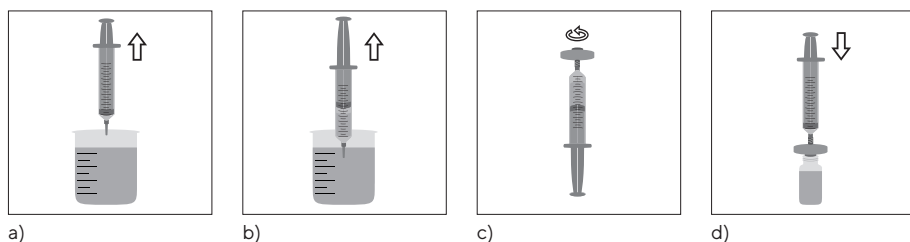
Minisart® is free of toxic substances and has passed the required tests for in-vivo usage according to applicable regulations and directives.

## Applications

- Minisart® NML with a 0.2 µm hydrophilic cellulose acetate membrane and a methacrylate butadiene styrene (an MBS) housing are suitable for particle removal, clarification and sterile filtration of aqueous liquids.
- Minisart® NML with a 0.45 µm hydrophilic cellulose acetate membrane and an MBS housing are suitable for particle removal, clarification and bioburden reduction of aqueous liquids.
- Minisart® NML with a 5 µm hydrophilic cellulose acetate membrane and an MBS housing are suitable for particle removal from and clarification of aqueous liquids.
- Minisart® HY with a 0.2 µm hydrophobic PTFE membrane and an MBS housing are suitable for sterilization of air and gases and for sterile filtration of oily liquids.
- Minisart® SRP with a 0.2 µm hydrophobic PTFE membrane and a PP housing are suitable for sterilization of air and gases and for sterile filtration of oily and aggressive liquids.

## Instructions for Use

Minisart® syringe filters may be used only by qualified personnel.



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 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® syringe filter to the luer lock or luer slip connector on the filled syringe. (Note: A leak-tight connection is achieved with half a turn or with normal force applied in order to insert the syringe into the syringe filter inlet.) To open sterile blister units, peel off the protective backing. Hold the opened blister pocket on the outside, connect the sterile syringe filter still inside the pocket to the syringe (c). Apply consistent pressure to press in the plunger of the syringe in order to filter the liquid through the Minisart® 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.

## Notes

- These products are not medical devices. The customer shall be responsible for testing or validating Minisart® syringe filters to confirm their suitability for his or her application.
- Before use, please check that the Minisart® syringe filter is not damaged and that the unit contains a filter membrane. (Note: The filter membrane appears white and is visible inside the plastic housing.) If sterile Minisart® blister-packaged units are used, please check that the blister packaging is not damaged. Do not use if you discover any external or internal damage!
- Minisart® syringe filters are designed for a single use only. Never use more than once or for more than one sample to avoid any cross-contamination.
- Do not use Minisart® beyond the range of its technical specifications.
- Typical filtration volumes of liquids range from 5 mL to 100 mL. It is not possible to accurately determine the attainable volumes as the particulate load in solutions varies. A decreasing flow rate when you apply normal pressure to the plunger is clear evidence that you are approaching the maximum filter capacity. Do not exceed 4.5 bar (65 psi) pressure in order to avoid rupturing the membrane and to ensure reliable particle retention according to rated pore size indicated.
- When using syringes with a volume of less than 10 mL, do not exceed the maximum recommended pressure resistance of 7 bar (102 psi), otherwise clarification or sterile filtration can no longer be guaranteed. We recommend using 10 mL syringes or larger. For syringes smaller than 10 mL, press down plunger slowly and uniformly. As soon as you detect any resistance (= maximum filter capacity), do not continue to force down the plunger as this will cause the filtration pressure to exceed 7 bar (102 psi).
- 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!
- Wear suitable protective clothing and safety glasses while using Minisart® syringe filters.
- For sterile filtration, do not use non-sterile Minisart® syringe filters or those with a 0.45 µm or a 5 µm pore size.
- Connect Minisart® syringe filters to luer connectors only. Luer connectors guarantee a secure connection to other products based on standardized luer dimensions. We cannot guarantee a leak-tight connection if you use non-luer connectors.
- Store Minisart® at 5°C to 30°C in a frost-free environment. Use Minisart® only up to the max. temperature given (see Table 1 - Specifications).
- If you notice any incorrect functioning or make any errors during use, stop filtration immediately and discard the filtrate.

## Further Recommendations

- 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 designed for a male luer slip to the outlet of the Minisart® and remove the protective cap before injection.
- Hold the syringe with filter and needle pointing upwards. Slowly press the liquid upwards. This ensures proper wetting of the membrane filter and eliminates air bubbles.
- If you are working with radioactive, poisonous or infectious material, discard the Minisart® syringe filter according to the applicable regulations for disposal.
- Minisart® NML, non-sterile, can be sterilized with ethylene oxide gas (acc. to ISO 11135) or by gamma irradiation (acc. to ISO 11137). Minisart® HY and Minisart® SRP with a PTFE membrane can be sterilized with ethylene oxide gas (acc. to ISO 11135). Do not sterilize presterilized Minisart® in blister packages a second time. Do not sterilize non-sterile Minisart® syringe filters in bulk bags. Customer-specific sterilization procedures must be validated by the manufacture or executing organization.
- You will find an overview of chemical compatibilities in the Minisart® Chemical Compatibility Guide on our website at [www.sartorius.com](http://www.sartorius.com).

Specifications | Spezifikationen | Spécifications |  
Especificaciones | Specifiche

Table 1

Specifications for Minisart® NML | HY | SRP,  
NML with 28 mm membrane filtration area Ø, HY with 26 mm Ø, SRP with 25 mm Ø

Housing material	<ul style="list-style-type: none"><li>NML   HY: MBS (Methacrylate butadiene styrene)</li><li>SRP: PP (Polypropylene)</li></ul>
Membranes	<ul style="list-style-type: none"><li>NML: (SF)CA = (Surfactant-free) Cellulose Acetate</li><li>HY   SRP: PTFE = Polytetrafluoroethylene</li></ul>
Application limits	Max. recommended operating pressure 4.5 bar   65 psi
Housing burst pressure	≥ 7 bar   102 psi
Max. temperature	<ul style="list-style-type: none"><li>NML   HY: 60°C not autoclavable!</li><li>SRP: 121°C, 30 min</li></ul>
Sterilization	<ul style="list-style-type: none"><li>Non-sterile Minisart® NML can be sterilized by ethylene oxide (EO) or Gamma sterilization</li><li>Non-sterile Minisart® HY can be sterilized by ethylene oxide (EO)</li><li>Non-sterile Minisart® SRP can be autoclaved or sterilized by ethylene oxide (EO)</li></ul>

Minisart® type	NML 0.2 µm	NML, 0.45 µm	NML, 5.0 µm	HY 0.2 µm	SRP, 0.2 µm
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 <sup>1</sup> 1.1 bar   16 psi	with ethanol 1.1 bar   16 psi
Hold-up volume (≤)	100 – 150 µL	100 – 150 µL	100 – 150 µL	100 – 200 µL	100 – 200 µL
Flow rate (≥)					
with water at 1 bar	60 mL   min	160 mL   min	600 mL   min	– <sup>2</sup>	– <sup>2</sup>
with ethanol at 1 bar	– <sup>1</sup>	– <sup>1</sup>	– <sup>1</sup>	– <sup>1</sup>	60 mL   min
with air at 0.1 bar	– <sup>3</sup>	– <sup>3</sup>	– <sup>3</sup>	2.0 l   min	1.8 l   min
Water penetration point <sup>2</sup> (≥)	-	-	-	4.0 bar   58 psi	4.0 bar   58 psi
Sterile filtration capability <sup>4</sup> acc. to BCT	yes	no	no	yes	yes
Pyrogen-free according to USP	yes	yes	yes	yes	yes

<sup>1</sup> Minisart® with MBS housing have a limited stability with solvents! After 1 min exposure liquid-stress-cracking is observed. Bubble point testing of Minisart® HY should be performed by a visual bubble point test in less than 60 sec. after pre-wetting of the PTFE membrane with ethanol.

<sup>2</sup> Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point.

<sup>3</sup> Hydrophilic membranes can filter dry air or gas but become impermeable to air or gas when wetted!

<sup>4</sup> According to bacterial challenge test (BCT) with 10<sup>7</sup> *Brevundimonas diminuta*.  
Non-sterile Minisart® types need to be sterilized before use for sterile filtration.

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

Table 2

Sartorius Syringe Filters for Liquid Filtration and Venting  
Minisart® NML | HY | SRP

Ø mm	Pore Size	Outlet	Qty.   Pk	Order Number	Sterility Status
Minisart® NML (CA)					
28 mm	0.2 µm	Male Luer Lock	50	S6534-----FMOSK	single-blister-packed, EO sterile
28 mm	0.2 µm	Male Luer Lock	50	S6534-----FMGUK	single-blister-packed, Gamma sterile
28 mm	0.2 µm	Male Luer Lock	500	S6534-----FM--Q	non-sterile
28 mm	0.2 µm	Male Luer Slip	50	S7597-----FXOSK	single-blister-packed, EO sterile
28 mm	0.2 µm	Male Luer Slip	500	S7597-----FX--Q	non-sterile
28 mm	0.45 µm	Male Luer Slip	50	S6555-----FMOSK	single-blister-packed, EO sterile
28 mm	0.45 µm	Male Luer Slip	50	S6555-----FMGUK	single-blister-packed, Gamma sterile
28 mm	0.45 µm	Male Luer Slip	500	S6555-----FM--Q	non-sterile
28 mm	0.45 µm	Male Luer Lock	50	S7578-----FXOSK	single-blister-packed, EO sterile
28 mm	0.45 µm	Male Luer Lock	500	S7598-----FX--Q	non-sterile
28 mm	5.0 µm	Male Luer Lock	50	S7594-----FMOSK	single-blister-packed, EO sterile
28 mm	5.0 µm	Male Luer Lock	500	S7594-----GUQ	single-blister-packed, Gamma sterile
Minisart® HY (PTFE)					
26 mm	0.2 µm	Male Luer Lock	50	S6596-----FMOSK	single-blister-packed, EO sterile
26 mm	0.2 µm	Male Luer Lock	500	S6596-----FM--Q	non-sterile
Minisart® SRP (PTFE)					
25 mm	0.2 µm	Male Luer Slip	50	S7575-----FXOSK	single-blister-packed, EO sterile

FAQ

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 Ø

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 other pore sizes (0.8 µm, 1.0 µm, 1.2 µm)?  
Please request corresponding article numbers for Minisart® NML

Symbols



Nicht zur Wiederverwendung  
Single Use  
Ne pas réutiliser  
No reutilizable  
Monouso



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



Hersteller | Manufacturer  
Fabricant | Fabricante  
Produttore



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



Gebrauchsanleitung beachten  
Consult instructions for use  
Consulter le manuel d'utilisation  
Consulte las instrucciones de uso  
Consultare le istruzioni per l'uso



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



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



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



pyrogenfrei  
non-pyrogenic  
non pyrogène  
Apirógeno  
Apirogeno



Porengröße  
Pore size  
Taille de pore  
Tamaño de poro  
Porosità

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# List of Sartorius material numbers applying to EPA-FIFRA

S6534--FM-Q

S6534--FMGUK

S6534--FMOSK

S6555--FM-Q

S6555--FMGUK

S6555--FMOSK

S6596--FM-Q

S6596--FMOSK

S7575--FXOSK

S7594--FMOSK

S7597--FXOSK

S7598--FX-Q

S7598--FXOSK

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