EverLUX®

Hydrophilic PES Membrane Filter

MEISSNER

EverLUX® Filter Cartridge

The EverLUX® polyethersulfone (PES) filter is designed for very high contaminant capacity, extended service life and high flow with low pressure drop in a wide range of biological fluids.

Optimized for sterile filtration, prefiltration and clarification applications, the permanently hydrophilic EverLUX® filter offers up to 2.5 times higher flow rates than other PES membranes. It also offers exceptional capacity, low protein binding and absolute bacteria retention when filtering moderate to high contaminant liquids.

The EverLUX® filter incorporates the most technologically advanced PES membrane manufactured today. It is produced by a state-of-the art process, which creates a unique, highly asymmetric structure with the highest contaminant capacity of any PES filter.

The membrane's asymmetric structure extends its capacity and service life by withstanding higher particle loads and protein concentrations. Increased membrane thickness allows the EverLUX® to retain its sterilizing properties, while its tapered pore structure allows more contaminant capacity than even conventional PES membranes.

The fast-flowing, high-throughput, low-binding and bacteria-retentive properties of the EverLUX® PES membrane make it a very reliable, cost-effective and time-saving filter.

Design Features and Benefits

- Unique, patented PES membrane offers very high flow rates and exceptional service life
- Chemical compatibility across pH 1-14
- Low adsorption, high transmission of proteins, active ingredients and preservatives
- Superior throughput in high contaminant fluids, including growth media, serum and protein-containing solutions
- Lower filtration costs through increased service life and contaminant-holding capacity
- Permanently hydrophilic membrane
- Contains no binders, adhesives or other extraneous materials
- 100% integrity tested during manufacture
- Biologically inert and non-toxic, the filter meets FDA requirements for food contact use and passes USP Class VI Plastics biological reactivity tests
- Filters complies with the European Commission Directive

Typical Applications

EverLUX® filters are ideal for use in a range of low to high contaminant liquids, including:

- Blood products
- Complex biologicals
- Serum
- Cell and tissue culture media
- Process intermediates
- Supernatants
- Vaccines
- Ophthalmics
- Buffers

Meissner Technical Services (MTS) provides clients with complete technical and validation support for its manufactured products.

Product Specifications

Materials of Construction

Filter Membrane: Polyethersulfone (PES)
Upstream Support: Polypropylene
Downstream Support: Polypropylene
Core/Outer Guard: Polypropylene
End Caps: Polypropylene
Sealing Method: Thermal bonding
O-ring/Gasket Seal: Buna, EPR, polyethylene, silicone, Teflon® over silicone, Teflon® over Viton®

All materials of construction listed above meet FDA standards for food contact per 21 CFR 177.

Filters comply with European Commission Regulation No. 10/2011. EverLUX® filters are manufactured in conformance to cGMP. EverLUX® filters meet the requirements as specified in the current USP Class VI plastics, physicochemical, oxidizable substances, and cytotoxicity tests. Bacterial endotoxin levels in aqueous extracts of EverLUX® filters are less than 0.5 EU/mL, as determined using the *Limulus* amebocyte lysate (LAL) test. No binders, adhesives or surfactants are used in the construction of EverLUX® filters. EverLUX® filters are non-fiber-releasing as defined in 21 CFR 210.3(b)(6) and 211.72.

Filtration Ratings

Filter Grade:	Absolute Ratings (µm):
SMH	0.4, 0.6
STW	0.1, 0.2
SLH	0.4, 0.6
SLW	0.2
SPH	0.2, 0.4
STS	0.2

Integrity Testing

Minimum Bubble Point

Pore size (µm)	SMH0.6		SMH0.4		STS0.2		STW0.1	
Minimum Bubble Point	psi	bar	psi	bar	psi	bar	psi	bar
DI wet	22	1.5	40	2.6	50	3.45	80	5.51
60% IPA					16.3	1.12	30	2.07
70% IPA					15.7	1.08	27	1.86

Maximum Diffusion Rate, Water

STW

0.1 µm 25 mL/min per 10" @ 40 psi
(25 mL min^{-1} per 25 cm @ 2.76 bar)

0.2 µm 30 mL/min per 10" @ 30 psi
(30 mL min^{-1} per 25 cm @ 2.07 bar)

STS

0.2 µm 28 mL/min per 10" @ 35 psi
(28 mL min^{-1} per 25 cm @ 2.41 bar)

Cartridge Dimensions (nominal)

Diameter: 2.75" (7 cm)
Length: 10", 20", 30", 40"
(25 cm, 50 cm, 75 cm, 100 cm)

Bacterial Retention

ASTM F838-05 Challenge

SMH

0.4 µm > 10^7 cfu/cm^2 *Serratia marcescens*
0.6 µm > 10^7 cfu/cm^2 *Saccharomyces cerevisiae*

STW

0.1 µm, 0.2 µm > 10^7 cfu/cm^2 *Brevundimonas diminuta* and meet the FDA definition of a sterilizing grade filter.

Sterilization

Steam-in-place (SIP):
saturated steam @ 121-135 °C, 30-60 minutes
[15 psi (1bar) to 30 psi (2 bar), 30-60 minutes]

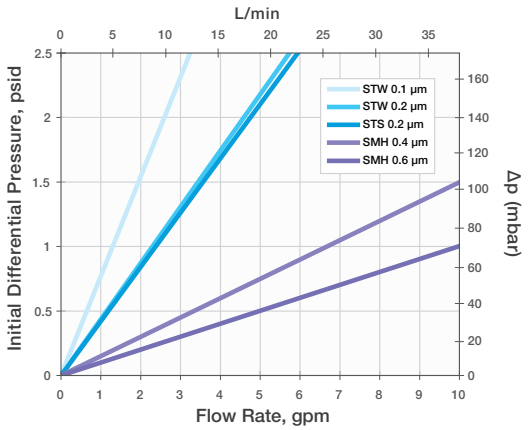
Autoclave: 121-135 °C, 30-60 minutes

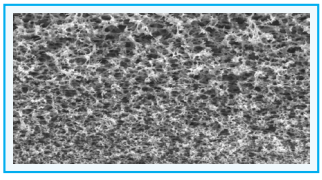
EverLUX® cartridges are capable of repeated sterilization cycles without loss of integrity. For applications requiring autoclave/SIP, a stainless steel reinforcement ring must be ordered. See “Reinforcement Ring Option” within Ordering Information.

Maximum Operating Temperatures and Pressures

Δp 80 psi @ 32 °F to 100 °F (Δp 5,5 bar @ 0 °C to 38 °C)
Δp 60 psi @ 150 °F (Δp 4,1 bar @ 66 °C)
Δp 30 psi @ 180 °F (Δp 2,1 bar @ 82 °C)

Typical water flow rates per 10" cartridge





EverLUX® SEM

End Cap Configurations

External -226 O-rings with locking tabs; open end for C6 and F6 SOE configurations

External -222 O-rings; open end for C2 and F2 SOE configurations

External -226 nO-Ring® with locking tabs; open end for C5 and F5 SOE configurations

External -222 nO-Ring®, open end for C1 and F1 SOE configurations

Flat Gasket; open end for GS and GL DOE configurations

Internal O-ring; open end for DN and DA DOE or RN and RA SOE configurations

Button Cap; closed end for C1, C2, C5 and C6 SOE configurations

Alignment Fin; closed end for F1, F2, F5 and F6 SOE configurations

Recessed Cap; closed end for RN and RA SOE configurations

DOE = Double Open End
SOE = Single Open End

Ordering Information

Filter Grade	Absolute Rating (µm)
STW	**0.1**
SMH	**0.4, 0.6**
STW	**0.1, 0.2**
SLH	**0.4, 0.6**
SLW	**0.2**
SPH	**0.2, 0.4**
STS	**0.2**

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Cartridge Length

3

- **1** = 10" (25 cm)
- **2** = 20" (50 cm)
- **3** = 30" (75 cm)
- **4** = 40" (100 cm)

End Cap Configuration

F2

- **GS** = DOE; flat gaskets (9.75", 19.5", 29.25", 39" length filters)
- **GL** = DOE; flat gaskets (20", 30", 40" length filters)
- **C1** = SOE; -222 nO-Ring®, button cap end
- **C2** = SOE; -222 O-rings, button cap end
- **F1** = SOE; -222 nO-Ring®, fin end
- **F2** = SOE; -222 O-rings, fin end
- **C5** = SOE; -226 nO-Ring®, button cap end
- **C6** = SOE; -226 O-rings, button cap end
- **F5** = SOE; -226 nO-Ring®, fin end
- **F6** = SOE; -226 O-rings, fin end
- **DN** = DOE; internal -120 O-rings
- **RN** = SOE; internal -120 O-rings, recessed cap end
- **DA** = DOE; internal -213 O-rings
- **RA** = SOE; internal -213 O-rings, recessed cap end

Reinforcement Ring Option

R

(Blank) = Standard - no reinforcement ring

R = Reinforcement ring; required for autoclave/ SIP applications

Seal Material (O-ring or Gasket)

S

O-ring Seal

- **B** = Buna
- **E** = EPR
- **S** = Silicone
- **T** = Teflon® over silicone
- **V** = Viton®
- **X** = Teflon® over Viton®

Gasket Seal

- **B** = Buna
- **E** = EPR
- **P** = Polyethylene
- **S** = Silicone
- **T** = Teflon®
- **V** = Viton®

Filter Grade Descriptions

SMH = This standard, single layer PES membrane features a highly asymmetric pore structure. It is 100% integrity tested and flushed with DI water during manufacture. It is suited for critical applications when regulatory documentation requirements are minimal. A certificate of conformance is provided on a lot basis.

STW = This pharmaceutical validated, sterilizing grade filter features two serially layered, highly asymmetric PES membranes with the coarser upstream layer optimized for prefiltration. This filter meets full traceability requirements for the pharmaceutical industry. IT is 100% integrity tested and flushed with DI water during manufacturing. Each STW filter is shipped with a Certificate of Quality stating exact quality control criteria and test performance results.

SLH = This single layer PES membrane features a highly asymmetric pore structure, but is not 100% integrity tested or flushed during manufacture. It is offered as an economical pre-filter or final filer when sterility assurance is not required. A certificate of conformance is provided on a lot basis.

SLW = This filter features two serially layered, highly asymmetric PES membranes with the coarser upstream layer optimized for prefiltration. This filter is not 100% integrity tested or flushed during manufacture. It is offered as an economical pre-filter or final filter that provides longer life in biological solutions. A certificate of conformance is provided on a lot basis.

SPH = This is an absolute, particulate rated filter. It is 100% integrity tested and DI flushed during manufacture. A certificate of conformance is provided on a lot basis.

SMH 4.0

MEISSNER
1001 Flynn Road • Camarillo, CA 93012 • USA
+1.805.388.9911 • +1.805.388.5948 Fax
www.meissner.com