Millipore®
Filtration, Separation
& Preparation

Data Sheet

Millipore Express® SHR Hydrophilic Filters

Sterilizing-grade PES membrane for fast, efficient, economical filtration of cell culture media and mycoplasma removal

Devices containing Millipore Express® SHR (Sterile, High-retention) membrane provide sterilizing-grade performance and mycoplasma removal across a range of bioprocess solutions, including: cell culture media, media additives, process intermediates and other biological fluids. These devices provide high sterility assurance, broad chemical compatibility, high flow rates and extended throughput for superior process efficiency and economy. The optional on-board polyethersulfone membrane prefilter protects the high-flux sterilizing-grade 0.1 µm rated membrane from premature plugging, allowing for enhanced throughput in high-fouling streams.

Benefits

- High-flux and devices with increased area reduce the number of filters required for improved process economy
- Designed and qualified for sterilizing-grade performance and mycoplasma removal
- Available with an on-board PES membrane prefilter for extended throughput in high-fouling media
- Robust construction that will withstand multiple sterilization cycles
- Easy wetting and integrity testing
- Broad chemical compatibility across a wide pH range (pH 1–14)

Filter Formats

- OptiScale® small-scale disposable capsule filters
- Opticap® XL 150/300/600 small-scale disposable capsule filters with optional filling bell—gamma compatible or presterilized
- Opticap® XL disposable capsule filters—autoclavable, gamma compatible, or presterilized
- Opticap® XLT standard area disposable capsule filters—autoclavable, gamma compatible, or presterilized. Gamma compatible capsules are also available in high area formats.
- Standard and high area cartridge filters

Filter Applications

- Mycoplasma protection
- Cell culture media
- Media additives
- Serum
- Process intermediates

MilliporeSigma

Scalable, Disposable Products for Ease of Use

Sterilizing-grade Millipore Express® SHR 0.1 µm rated membranes are available in the following filter formats and capsule sizes with an optional onboard prefilter:

- Membrane discs (25 mm and 47 mm)
- Standard area cartridge filters 5–30 inch available with silicone, EPDM or fluoroelastomer O-rings
- High area cartridge filters 10-30 inch available with silicone, EPDM or fluoroelastomer O-ring
- OptiScale® disposable scaling devices
- Opticap® XL 150, 300, 600, 3, 5 and 10 autoclavable, gamma-compatible or sterile capsules
- Standard area Opticap® XLT 10, 20 and 30 inch autoclavable, gamma compatible or sterile capsules
- High area Opticap® XLT 10, 20 and 30 inch gamma compatible capsules

Typical Process Flow

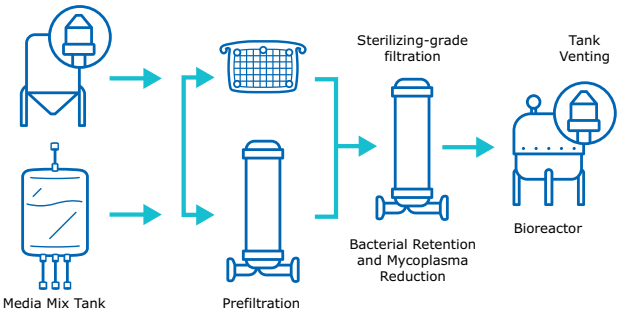


Figure 1. Sterilizing-grade Millipore Express® SHR Membranes for Bacterial Retention and Mycoplasma Removal

Microbiological Performance

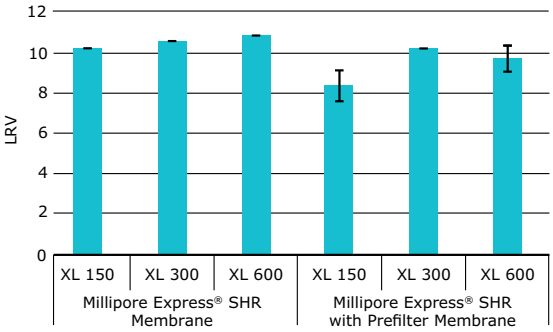


Figure 2. Results of *A. laidlawii* challenge at a level of 10^7 CFU/cm² of filter area (n=3).

Enhanced Sterility Assurance

Devices with Millipore Express® SHR sterilizing-grade membranes are designed for the removal of mycoplasma and small microorganisms that could pass through a 0.2 µm rated sterilizing-grade filter. Millipore Express® SHR filters have demonstrated high mycoplasma removal—typical Log Reduction Value (LRV) >7 using *Acholeplasma laidlawii* ATCC® 23206 and our validated test method.

Extended Filter Capacity

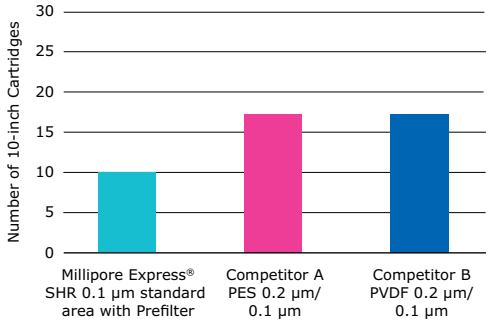


Figure 3. Number of 10-inch cartridges needed to filter 10,000 L of NS0 Serum-free, Protein-free, Cell Culture Media over 2 hours at 10 psi (n=2).

Superior Efficiency and Economy

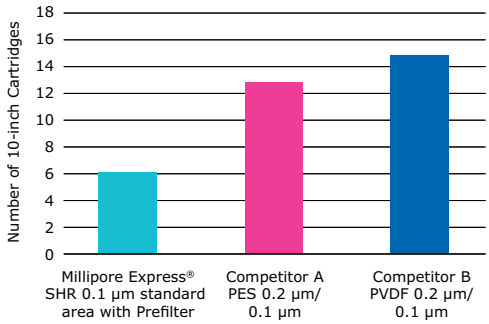


Figure 4. Number of 10-inch cartridges needed to filter 10,000 L of CHO Serum-free Cell Culture Media in 2 hours at 10 psi (n=2).

Higher Permeability

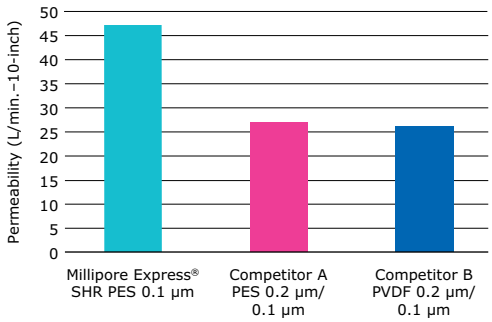


Figure 5. Permeability per 10-inch* cartridge

*Tested in duplicate at 10 psi on 47 mm disc and scaled to standard area 10-inch

Mobius® Single-use Solutions

Millipore Express® SHR hydrophilic filters are part of the Mobius® integrated, disposable bioprocess solution. No matter what your application step, Mobius® can help you achieve greater process efficiency and productivity with the right combination of single-use products, application solutions, and expert validation support. From disposable process containers to patented capsule filters and connectors, to validated, gamma-compatible turnkey assemblies, Mobius® solutions provide faster turnaround time and reliable performance, right out of the box.

OptiScale® Process Development Screening Tool

OptiScale® disposable capsule filters provide a convenient small volume option for process screening and scaling. These “drop in” filters are faster and easier to set up than conventional 25 mm and 47 mm discs, and completely disposable. OptiScale® capsule filters offer speed-to-market strategies for efficiently developing compounds and biotherapeutics.

OptiScale® disposable capsule filter

Opticap® XL and XLT Disposable Capsule Filters

Convenient and Easy-to-use

Opticap® XL and XLT’s capsule design allows unparalleled hydraulic stress resistance in a disposable filter and eliminates the time and expense associated with stainless steel housings.

Adjustable, easy-to-turn, upstream vents and drain valves with O-ring seals and hose barb connections allow for easy process control. Other ease-of-use features include flow direction arrows and a ribbed housing for easy gripping even with gloved hands. Additionally, the Opticap® XL 150, 300 and 600 capsules have the option to add a filling bell to protect an open container from airborne particles.

Opticap® XL 150, 300, and 600 capsules, shown with optional filling bell attachment

Opticap® XL Capsule Filters

Opticap® XL disposable capsule filters have a unique capsule design that minimizes hold-up volume and reduces production losses. Opticap® XL 150, 300, 600, 3, 5 and 10 capsules are available with Millipore Express® SHR membranes in autoclavable, sterile and gamma-compatible formats.

Opticap® XLT 10, 20 and 30 Capsule Filters

Opticap® XLT disposable T-line capsule filters with Millipore Express® SHR membrane are available with or without a pressure gauge port for ease in monitoring process conditions. The T-line design accommodates series or parallel filtration to match your application needs, and a specially-designed stand enables quick and easy integration into your existing process. 10-, 20- and 30-inch Opticap® XLT gamma-compatible capsules are also available, with 2x the membrane area of the standard area capsules for increased capacity.

Opticap® XLT filters

Opticap® XLT capsule stand

Cartridge Filters

Millipore Express® SHR 5-, 10-, 20- and 30-inch standard area cartridge filters provide fast flow rates and extended throughput and are designed to withstand multiple steam-in-place cycles. 10-, 20- and 30-inch cartridges are also available in high area formats for plugging fluids. These high area filters can reduce the number of filter elements needed. Each cartridge is integrity tested during manufacturing. Code 0 and code 7 O-ring adaptors are available to suit your application and housing needs.

Millipore Express® High Area (left) compared to Standard Area (right) cartridge filters

Millipore Express® SHR cartridge filters

Specifications

OptiScale® Disposable Capsules

Millipore Express® SHR 0.1 µm and 0.5 µm/0.1 µm with Prefilter Membranes

Description	OptiScale® 25 Capsules	OptiScale® 47 Capsules
Nominal Dimensions		
Diameter	31 mm (1.21 in.)	70 mm (2.75 in.)
Length	39 mm (1.52 in.)	82 mm (3.24 in.) w/flange inlet/hose barb outlet 74 mm (2.91 in.) w/flange inlet/flange outlet 94 mm (3.70 in.) w/hose barb inlet/hose barb outlet
Filtration Area	3.5 cm^2	17.7 cm^2
Materials of construction		
Filter membrane	Hydrophilic polyethersulfone	Hydrophilic polyethersulfone
Supports	Polypropylene	—
Structural components	Polypropylene	Polyvinylidene fluoride
Vent cap	Polypropylene	Fluoroelastomer
O-rings	—	Fluoroelastomer
Housing Vent	Capped vent with female Luer connections on inlet side of device	Adjustable vent with male Luer and female Luer-Lok™ connections on inlet side of the device
Maximum Inlet Pressure	4100 mbar (60 psi) at 25 °C	5500 mbar (80 psi) at 25 °C
Maximum Differential Pressure		
Forward	4100 mbar (60 psi) at 25 °C	5500 mbar (80 psi) at 25 °C
Reverse	0 mbar (0 psi)	690 mbar (10 psi) at 25 °C
Bacterial Endotoxin	Autoclaved filter effluent meets the WFI specification for USP <643>, Total Organic Carbon, and for USP <645>, Conductivity, after a WFI flush of 15 mL	—
Oxidizable Substances	—	Effluent meets the USP Oxidizable Substance Test requirements for sterile purified water after a water flush of: 100 mL
Sterilization	May be autoclaved for 1 cycle of 123 °C for 60 min.	May be autoclaved for 3 cycles of 60 min. at 126 °C
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.	—
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).	
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.	
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.	
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.	

Specifications

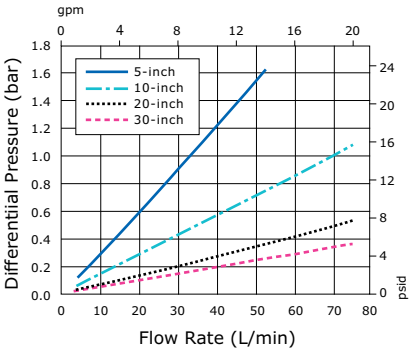
Cartridge Filters

Millipore Express® SHR 0.1 µm and 0.5 µm/0.1 µm with Prefilter Membranes

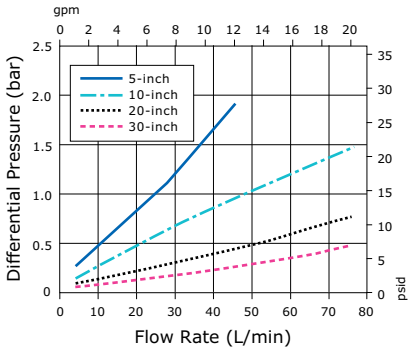
	5-inch Cartridge	Per Standard Area 10-inch Cartridge	Per High Area 10-inch Cartridge
Nominal Dimensions			
Diameter	6.9 cm (2.7 in.)	6.9 cm (2.7 in.)	6.9 cm (2.7 in.)
Length	12.7 cm (5 in.)	25.4 cm (10 in.)	25.4 cm (10 in.)
Filtration Area			
Millipore Express® SHR	0.29 m^2 (3.1 ft^2)	0.60 m^2 (6.5 ft^2)	—
Millipore Express® SHR w/ Prefilter	0.23 m^2 (2.5 ft^2)	0.49 m^2 (5.3 ft^2)	1.0 m^2 (10.8 ft^2)
Materials of Construction			
Filter membrane	Hydrophilic polyethersulfone		Hydrophilic polyethersulfone
Film edge	Polypropylene		Polypropylene
Supports	Polypropylene		Polypropylene
Cage and end caps	Polypropylene		Polypropylene
Core	Polysulfone		Polyethersulfone
O-rings	Silicone, EPDM or Fluoroelastomer		Silicone, EPDM or Fluoroelastomer
Maximum Differential Pressure			
Millipore Express® SHR			
Forward	6900 mbar (100 psi) at 25 °C 1700 mbar (25 psi) at 80 °C 1000 mbar (15 psi) at 135 °C		—
Reverse	2100 mbar (30 psi) at 25 °C 69 mbar (1 psi) at 135 °C		—
Millipore Express® SHR w/Prefilter			
Forward	6900 mbar (100 psi) at 25 °C 1700 mbar (25 psi) at 80 °C 1000 mbar (15 psi) at 135 °C		6900 mbar (100 psi) at 25 °C 1700 mbar (25 psi) at 80 °C 300 mbar (5 psi) at 135 °C
Reverse	2100 mbar (30 psi) at 25 °C 69 mbar (1 psi) at 135 °C		2100 mbar (30 psi) at 25 °C 69 mbar (1 psi) at 135 °C
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen		
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):		
Millipore Express® SHR	≤15.9 cc/min.	≤33.3 cc/min.	—
Millipore Express® SHR w/Prefilter	≤12.8 cc/min.	≤27.1 cc/min.	≤54.2 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology		
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method		
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined using the Limulus Amebocyte Lysate (LAL) test.		
TOC/Conductivity at 25 °C	Autoclaved filter effluent meets the WFI specification for USP <643>, Total Organic Carbon, and for USP <645>, Conductivity, after a WFI flush of:		
Millipore Express® SHR	5.5 L	10 L	—
Millipore Express® SHR w/Prefilter	9.5 L	20 L	20 L
Oxidizable Substances	Effluent meets the USP Oxidizable Substance Test requirements for sterile purified water after a water flush of:		
Millipore Express® SHR	1000 mL		—
Millipore Express® SHR w/ Prefilter	2000 mL		2000 mL
Sterilization			
Millipore Express® SHR	Autoclave: 25x, 60 min. cycles at 126 °C In-line steam: 25 forward cycles, 30 min., 135 °C at ≤300 mbar (5 psi) or, 22 forward cycles, 30 min., 135 °C at ≤300 mbar (5 psi) and 3 reverse cycles, 30 min., 135 °C at <69 mbar (1 psi)		—
Millipore Express® SHR w/Prefilter	Autoclave: 25x, 60 min. cycles at 126 °C In-line steam: 25x forward cycles, 30 min., 135 °C at ≤300 mbar (5 psi) or, 22 forward cycles, 30 min., 135 °C at ≤300 mbar (5 psi) and 3 reverse cycles, 30 min., 135 °C at <69 mbar (1 psi) or, 3 forward cycles, 30 min., 135 °C at ≤1000 mbar (15 psi)		Autoclave: 5X, 60 min. cycles at 126 °C In-line steam: 5X forward cycles, 30 min., ≤135 °C at ≤300 mbar (5 psi)
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5		
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.		
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a "non-fiber releasing" filter as defined in 21 CFR 210.3(b)(6).		
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.		
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.		
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.		

Typical Clean Water Flow Rates

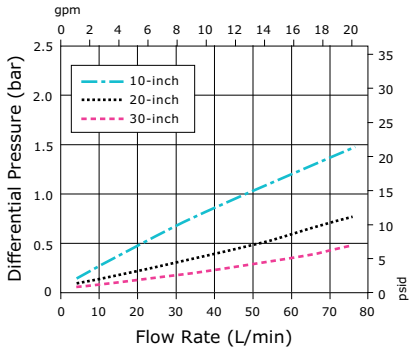
Standard Area Cartridge Filters with Millipore Express® SHR 0.1 µm Membrane



Standard Area Cartridge Filters with Millipore Express® SHR 0.5/0.1 µm Membrane with prefilter



High Area Cartridge Filters with Millipore Express® SHR 0.5/0.1 µm Membrane with prefilter



Specifications

Opticap® XL and XLT Disposable Capsules (Autoclavable Only)

Millipore Express® SHR 0.1 µm Membrane

	Opticap® XL 3 Capsules	Opticap® XL 5 Capsules	Opticap® XL 10 Capsules	Opticap® XLT 10 Capsules	Opticap® XLT 20 Capsules	Opticap® XLT 30 Capsules
Nominal Dimensions						
Maximum length	17.3 cm (6.8 in.)	21.6 cm (8.5 in.)	33.5 cm (13.2 in.)	38.1 cm (15.0 in.)	62.5 cm (24.6 in.)	87.1 cm (34.3 in.)
Body diameter	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)
Fitting to Fitting						
Sanitary flange to sanitary flange	—			15.2 cm (6.0 in.)		
Sanitary flange to hose barb	—			17.5 cm (6.9 in.)		
Hose barb to hose barb	—			19.8 cm (7.8 in.)		
Filtration Area	0.16 m^2 (1.7 ft^2)	0.29 m^2 (3.1 ft^2)	0.60 m^2 (6.5 ft^2)	0.60 m^2 (6.5 ft^2)	1.21 m^2 (13.0 ft^2)	1.81 m^2 (19.5 ft^2)
Materials of Construction						
Filter membrane	Hydrophilic polyethersulfone					
Film edge	Polypropylene					
Supports	Polypropylene					
Core	Polysulfone					
Structural components*	Polypropylene					
Vent O-rings	Silicone					
Vent/Drain	6 mm (¼ in.) hose barb with double O-ring seal					
Maximum Inlet Pressure	6900 mbar (100 psi) intermittent at 23 °C 5500 mbar (80 psi) at 23 °C 2800 mbar (40 psi) at 60 °C 1000 mbar (15 psi) at 80 °C					
Maximum Differential Pressure						
Forward	6900 mbar (100 psi) intermittent at 25 °C 5500 mbar (80 psi) at 25 °C 1000 mbar (15 psi) at 80 °C					
Reverse	2100 mbar (30 psi) intermittent at 25 °C					
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen					
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):					
	≤8.7 cc/min.	≤15.9 cc/min.	≤33.3 cc/min.	≤33.3 cc/min.	≤66.6 cc/min.	≤99.9 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology					
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method					
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.					
TOC/Conductivity at 25 °C	Autoclaved filter effluent meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI water flush of:					
	3.0 L	5.5 L	10 L	10 L	20 L	30 L
Oxidizable Substances	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a water flush of:					
	1000 mL	1000 mL	1000 mL	1000 mL	2000 mL	3000 mL
Sterilization	May be autoclaved for 3 cycles of 60 minutes at 126 °C (Cannot be steam sterilized in-line)					
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5					
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.					
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).					
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.					
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.					
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.					

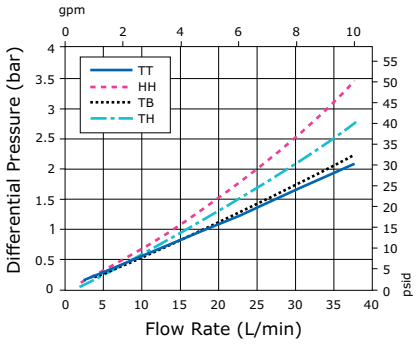
* Cage, end caps and capsule housing

Typical Clean Water Flow Rates

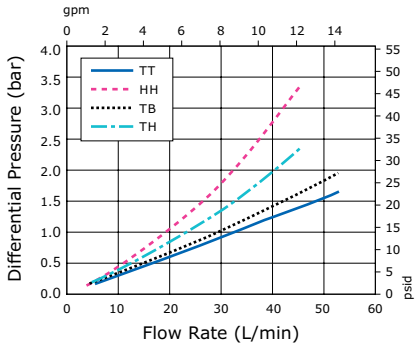
Opticap® XL and XLT Disposable Capsules (Autoclavable Only)

Millipore Express® SHR 0.1 µm Membrane

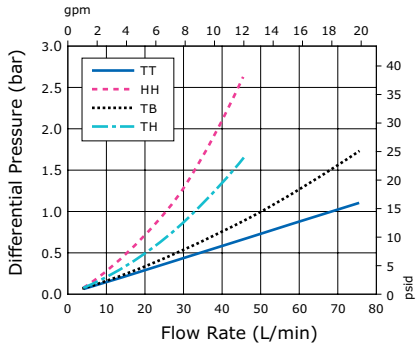
Opticap® XL 3 Capsule Filters with 0.1 µm Millipore Express® SHR Membrane



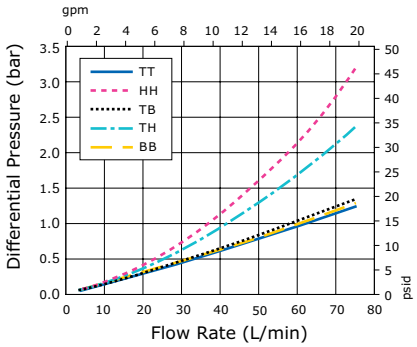
Opticap® XL 5 Capsule Filters with 0.1 µm Millipore Express® SHR Membrane



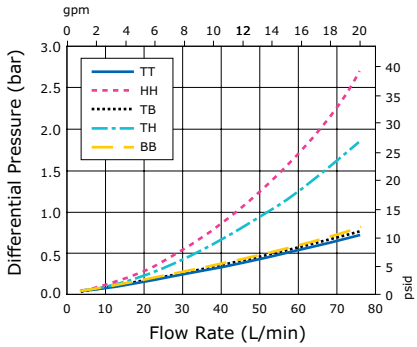
Opticap® XL 10 Capsule Filters with 0.1 µm Millipore Express® SHR Membrane



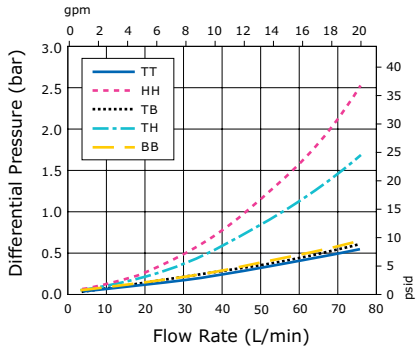
Opticap® XLT 10 Capsule Filters with 0.1 µm Millipore Express® SHR Membrane



Opticap® XLT 20 Capsule Filters with 0.1 µm Millipore Express® SHR Membrane



Opticap® XLT 30 Capsule Filters with 0.1 µm Millipore Express® SHR Membrane



Opticap® XL Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

HH = 14 mm (⁹⁄₁₆ in.) hose barb inlet and outlet

TH = 38 mm (1½ in.) sanitary flange inlet and 14 mm (⁹⁄₁₆ in.) hose barb outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

Opticap® XLT Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

TH = 38 mm (1½ in.) sanitary flange Inlet and 16 mm (⅝ in.) hose barb outlet

HH = 16 mm (⅝ in.) hose barb inlet and outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

BB = 25 mm (1 in.) hose barb inlet and outlet

Specifications

Opticap® XL and XLT Disposable Capsules (Autoclavable Only)

Millipore Express® SHR 0.5/0.1 µm Membrane with Prefilter

	Opticap® XL 3 Capsules	Opticap® XL 5 Capsules	Opticap® XL 10 Capsules	Opticap® XLT 10 Capsules	Opticap® XLT 20 Capsules	Opticap® XLT 30 Capsules
Nominal Dimensions						
Maximum length	17.3 cm (6.8 in.)	21.6 cm (8.5 in.)	33.5 cm (13.2 in.)	38.1 cm (14.8 in.)	62.5 cm (24.6 in.)	87.1 cm (34.3 in.)
Body diameter	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)
Fitting to Fitting						
Sanitary flange to sanitary flange	—			15.2 cm (6.0 in.)		
Sanitary flange to hose barb	—			17.5 cm (6.9 in.)		
Hose barb to hose barb	—			19.8 cm (7.8 in.)		
Filtration Area	0.13 m^2 (1.4 ft^2)	0.23 m^2 (2.5 ft^2)	0.49 m^2 (5.3 ft^2)	0.49 m^2 (5.3 ft^2)	0.98 m^2 (10.6 ft^2)	1.48 m^2 (15.9 ft^2)
Materials of Construction						
Filter membrane	Hydrophilic polyethersulfone					
Film edge	Polypropylene					
Supports	Polypropylene					
Core	Polysulfone					
Structural components*	Polypropylene					
Vent O-rings	Silicone					
Vent/Drain	6 mm (¼ in.) hose barb with double O-ring seal					
Maximum Inlet Pressure	6900 mbar (100 psi) intermittent at 23 °C 5500 mbar (80 psi) at 23 °C 2800 mbar (40 psi) at 60 °C 1000 mbar (15 psi) at 80 °C					
Maximum Differential Pressure						
Forward	6900 mbar (100 psi) intermittent at 25 °C 5500 mbar (80 psi) at 25 °C 1000 mbar (15 psi) at 80 °C					
Reverse	2100 mbar (30 psi) intermittent at 25 °C					
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen					
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):					
	≤7.2 cc/min.	≤12.8 cc/min.	≤27.1 cc/min.	≤27.1 cc/min.	≤54.2 cc/min.	≤81.3 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology					
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method					
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.					
TOC/Conductivity at 25 °C	Autoclaved filter effluent meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI water flush of:					
	5.5 L	9.5 L	20 L	20 L	40 L	60 L
Oxidizable Substances	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a water flush of:					
	2 L	2 L	2 L	2 L	4 L	6 L
Sterilization	May be autoclaved for 3 cycles of 60 minutes at 126 °C (Cannot be steam sterilized in-line)					
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5					
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.					
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).					
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.					
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.					
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.					

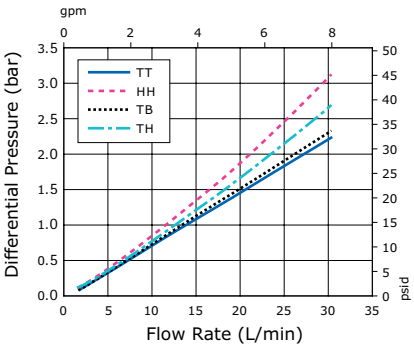
* Cage, end caps and capsule housing

Typical Clean Water Flow Rates

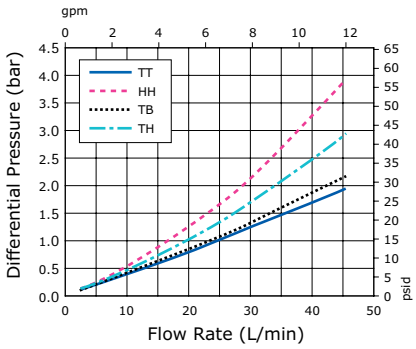
Opticap® XL and XLT Disposable Capsules (Autoclavable Only)

Millipore Express® SHR 0.5/0.1 µm Membrane with Prefilter

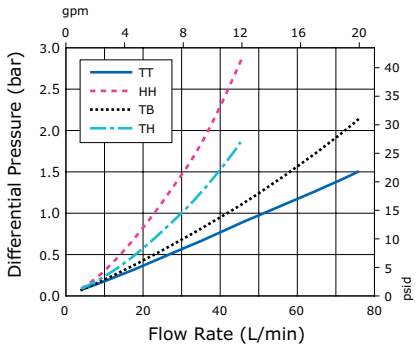
Opticap® XL 3 Capsule Filters with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



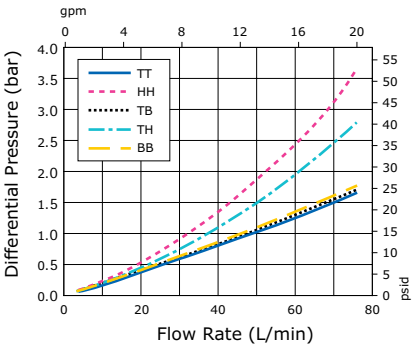
Opticap® XL 5 Capsule Filters with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



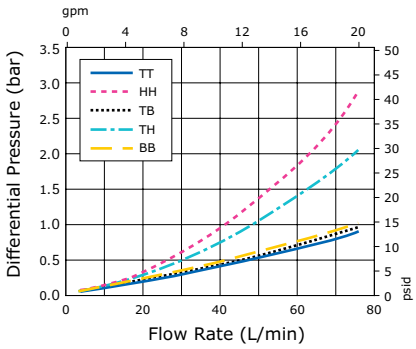
Opticap® XL 10 Capsule Filters with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



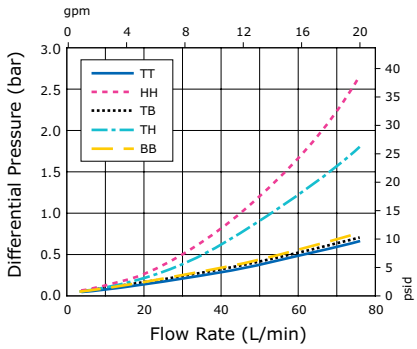
Opticap® XLT 10 Capsule Filters with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Opticap® XLT 20 Capsule Filters with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Opticap® XLT 30 Capsule Filters with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Opticap® XL Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

HH = 14 mm (⁹⁄₁₆ in.) hose barb inlet and outlet

TH = 38 mm (1½ in.) sanitary flange inlet and 14 mm (⁹⁄₁₆ in.) hose barb outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

Opticap® XLT Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

TH = 38 mm (1½ in.) sanitary flange Inlet and 16 mm (⅝ in.) hose barb outlet

HH = 16 mm (⅝ in.) hose barb inlet and outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

BB = 25 mm (1 in.) hose barb inlet and outlet

Specifications

Opticap® XL 150/300/600 Disposable Capsules (Sterile and Gamma Compatible)

Millipore Express® SHR 0.1 µm Membrane

	Opticap® XL 150 Capsules	Opticap® XL 300 Capsules	Opticap® XL 600 Capsules
Nominal Dimensions			
Maximum length	9.7 cm (3.8 in.)	11.9 cm (4.7 in.)	16.5 cm (6.5 in.)
Maximum length with bell	11.4 cm (4.5 in.)	13.7 cm (5.4 in.)	18.3 cm (7.2 in.)
Body diameter	5.6 cm (2.2 in.)	5.6 cm (2.2 in.)	5.6 cm (2.2 in.)
Filtration Area	0.025 m^2 (0.268 ft^2)	0.048 m^2 (0.517 ft^2)	0.101 m^2 (1.090 ft^2)
Materials of Construction			
Filter membrane	Hydrophilic polyethersulfone		
Supports	Polyethylene		
Core	Polysulfone		
Structural components*	Gamma stable polypropylene		
Vent O-rings	Silicone		
Bell	Polycarbonate		
Vent/Drain	6 mm (¼ in.) hose barb with double O-ring seal		
Maximum Inlet Pressure	6900 mbar (100 psi) intermittent at 23 °C 5500 mbar (80 psi) at 23 °C 2800 mbar (40 psi) at 60 °C 1000 mbar (15 psi) at 80 °C		
Maximum Differential Pressure			
Forward	6900 mbar (100 psi) intermittent at 25 °C 5500 mbar (80 psi) at 25 °C 1000 mbar (15 psi) at 80 °C		
Reverse	2100 mbar (30 psi) intermittent at 25 °C		
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen		
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):		
	≤1.4 cc/min.	≤2.8 cc/min.	≤5.8 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology		
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method		
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.		
TOC/Conductivity at 25 °C	Gamma sterilized filter effluent meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI flush of:		
	2.0 L	2.5 L	3.0 L
Oxidizable Substances	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a WFI flush of 1 L.		
Sterilization			
Gamma-compatible capsules	Gamma compatible to 45 kGy, may be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)		
Sterile capsules	May be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)		
Sterility			
Sterile capsules	These capsules meet current USP and AAMI guidelines for sterility utilizing a validated sterilization cycle.		
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5		
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.		
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).		
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.		
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.		
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.		

* Cage, end caps and capsule housing

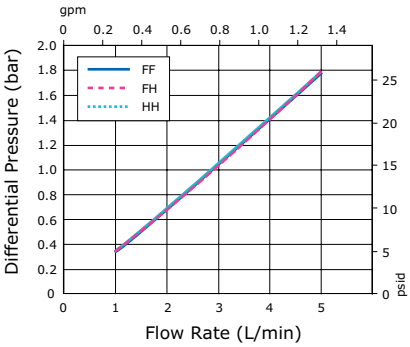
Typical Clean Water Flow Rates

Opticap® XL Disposable Capsules (Sterile and Gamma Compatible)

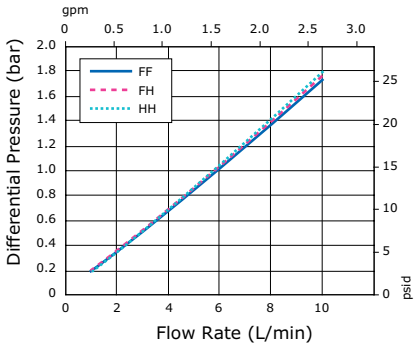
Millipore Express® SHR 0.1 µm Membrane

Filters tested post gamma radiation at 25–45 kGy and autoclaved at 123 °C for 60 minutes.

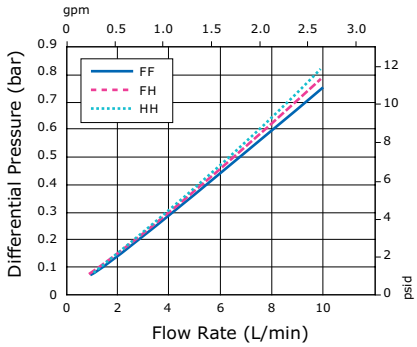
Opticap® XL 150 with 0.1 µm Millipore Express® SHR Membrane



Opticap® XL 300 with 0.1 µm Millipore Express® SHR Membrane



Opticap® XL 600 with 0.1 µm Millipore Express® SHR Membrane



Opticap® XL Capsule Legends Refer to Connection Type

FF = 19 mm (¾ in.) sanitary flange inlet and outlet

FH = 19 mm (¾ in.) sanitary flange inlet and 14 mm (⁹⁄₁₆ in.) hose barb outlet

HH = 14 mm (⁹⁄₁₆ in.) hose barb inlet and outlet

Specifications

Opticap® XL and XLT Disposable Capsules (Sterile and Gamma Compatible)

Millipore Express® SHR 0.1 µm Membrane

	Opticap® XL 3 Capsules	Opticap® XL 5 Capsules	Opticap® XL 10 Capsules	Opticap® XLT 10 Capsules	Opticap® XLT 20 Capsules	Opticap® XLT 30 Capsules
Nominal Dimensions						
Maximum length	17.3 cm (6.8 in.)	21.6 cm (8.5 in.)	33.5 cm (13.2 in.)	38.1 cm (14.8 in.)	62.5 cm (24.6 in.)	87.1 cm (34.3 in.)
Body diameter	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)
Fitting to Fitting						
Sanitary flange to sanitary flange	—			15.2 cm (6.0 in.)		
Sanitary flange to hose barb	—			17.5 cm (6.9 in.)		
Hose barb to hose barb	—			19.8 cm (7.8 in.)		
Filtration Area	0.17 m^2 (1.8 ft^2)	0.31 m^2 (3.3 ft^2)	0.69 m^2 (7.4 ft^2)	0.69 m^2 (7.4 ft^2)	1.38 m^2 (14.8 ft^2)	2.06 m^2 (22.2 ft^2)
Materials of Construction						
Filter membrane	Hydrophilic polyethersulfone					
Film edge	Polypropylene					
Supports	Polypropylene					
Core	Polysulfone					
Structural components*	Polypropylene					
Vent O-rings	Silicone					
Vent/Drain	6 mm (¼ in.) hose barb with double O-ring seal					
Maximum Inlet Pressure	6900 mbar (100 psi) intermittent at 23 °C 5500 mbar (80 psi) at 23 °C 2800 mbar (40 psi) at 60 °C 1000 mbar (15 psi) at 80 °C					
Maximum Differential Pressure						
Forward	6900 mbar (100 psi) intermittent at 25 °C 5500 mbar (80 psi) at 25 °C 1000 mbar (15 psi) at 80 °C					
Reverse	2100 mbar (30 psi) intermittent at 25 °C					
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen					
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):					
	≤9.4 cc/min.	≤17.3 cc/min.	≤38.8 cc/min.	≤38.8 cc/min.	≤77.6 cc/min.	≤116.4 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology					
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method					
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.					
TOC/Conductivity at 25 °C	Gamma sterilized filter effluent meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI flush of:					
	3.5 L	6.0 L	11 L	11 L	22 L	33 L
Oxidizable Substances	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a water flush of:					
	1.0 L	1.0 L	1.5 L	1.5 L	3.0 L	4.5 L
Sterilization						
Gamma-compatible capsules	Gamma compatible to 45 kGy, may be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)					
Sterile capsules	May be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)					
Sterility						
Sterile capsules	These capsules meet current USP and AAMI guidelines for sterility utilizing a validated sterilization cycle.					
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5					
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.					
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).					
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.					
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.					
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.					

* Cage, end caps and capsule housing

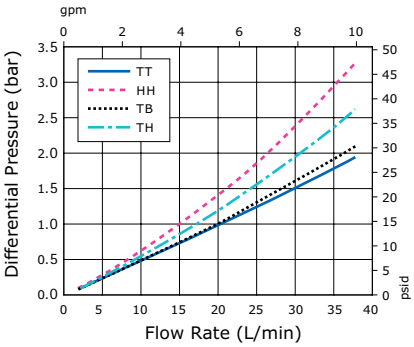
Typical Clean Water Flow Rates

Opticap® XL and XLT Disposable Capsules (Sterile and Gamma Compatible)

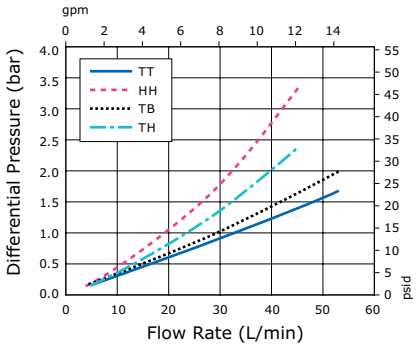
Millipore Express® SHR 0.1 µm Membrane

Filters tested post gamma radiation at 25–45 kGy and autoclaved at 123 °C for 60 minutes.

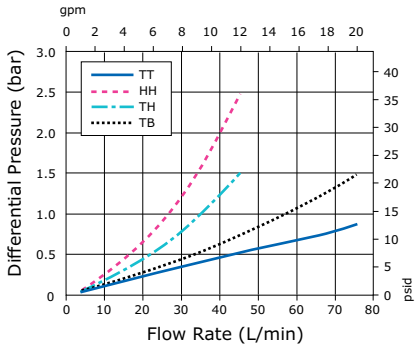
Gamma Compatible Opticap® XL 3 with 0.1 µm Millipore Express® SHR Membrane



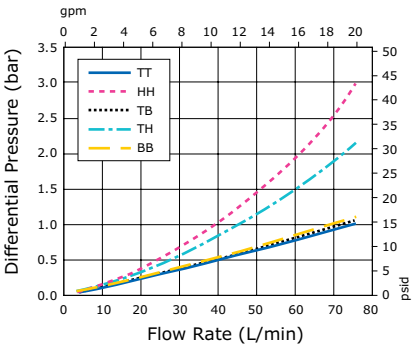
Gamma Compatible Opticap® XL 5 with 0.1 µm Millipore Express® SHR Membrane



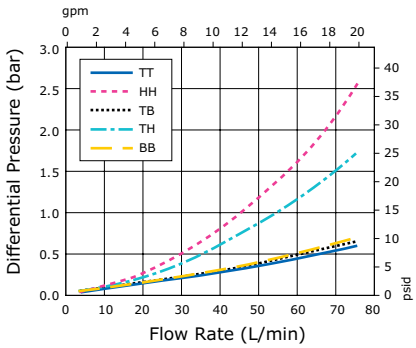
Gamma Compatible Opticap® XL 10 with 0.1 µm Millipore Express® SHR Membrane



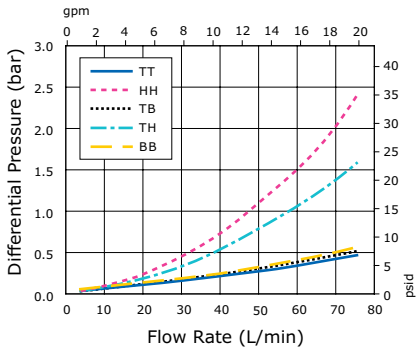
Gamma Compatible Opticap® XLT 10 with 0.1 µm Millipore Express® SHR Membrane



Gamma Compatible Opticap® XLT 20 with 0.1 µm Millipore Express® SHR Membrane



Gamma Compatible Opticap® XLT 30 with 0.1 µm Millipore Express® SHR Membrane



Opticap® XL Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

HH = 14 mm (⁹⁄₁₆ in.) hose barb inlet and outlet

TH = 38 mm (1½ in.) sanitary flange inlet and 14 mm (⁹⁄₁₆ in.) hose barb outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

Opticap® XLT Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

TH = 38 mm (1½ in.) sanitary flange Inlet and 16 mm (⅝ in.) hose barb outlet

HH = 16 mm (⅝ in.) hose barb inlet and outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

BB = 25 mm (1 in.) hose barb inlet and outlet

Specifications

Opticap® XL 150/300/600 Disposable Capsules (Sterile and Gamma Compatible)

Millipore Express® SHR 0.5/0.1 µm Membrane with Prefilter

	Opticap® XL 150 Capsules	Opticap® XL 300 Capsules	Opticap® XL 600 Capsules
Nominal Dimensions			
Maximum length	9.7 cm (3.8 in.)	11.9 cm (4.7 in.)	16.5 cm (6.5 in.)
Maximum length with bell	11.4 cm (4.5 in.)	13.7 cm (5.4 in.)	18.3 cm (7.2 in.)
Body diameter	5.6 cm (2.2 in.)	5.6 cm (2.2 in.)	5.6 cm (2.2 in.)
Filtration Area	0.015 m^2 (0.163 ft^2)	0.028 m^2 (0.308 ft^2)	0.062 m^2 (0.664 ft^2)
Materials of Construction			
Filter membrane	Hydrophilic polyethersulfone		
Supports	Polyethylene		
Core	Polysulfone		
Structural components*	Gamma stable polypropylene		
Vent O-rings	Silicone		
Bell	Polycarbonate		
Vent/Drain	6 mm (¼ in.) hose barb with double O-ring seal		
Maximum Inlet Pressure	6900 mbar (100 psi) intermittent at 23 °C 5500 mbar (80 psi) at 23 °C 2800 mbar (40 psi) at 60 °C 1000 mbar (15 psi) at 80 °C		
Maximum Differential Pressure			
Forward	6900 mbar (100 psi) intermittent at 25 °C 5500 mbar (80 psi) at 25 °C 1000 mbar (15 psi) at 80 °C		
Reverse	2100 mbar (30 psi) intermittent at 25 °C		
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen		
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):		
	≤1.0 cc/min.	≤1.9 cc/min.	≤3.7 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology		
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method		
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.		
TOC/Conductivity at 25 °C	Gamma sterilized filter effluent meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI flush of:		
	1 L	2 L	3 L
Oxidizable Substances	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a WFI flush of 1 L.		
Sterilization			
Gamma-compatible capsules	Gamma compatible to 45 kGy, may be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)		
Sterile capsules	May be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)		
Sterility			
Sterile capsules	These capsules meet current USP and AAMI guidelines for sterility utilizing a validated sterilization cycle.		
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5		
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.		
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).		
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.		
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.		
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.		

* Cage, end caps and capsule housing

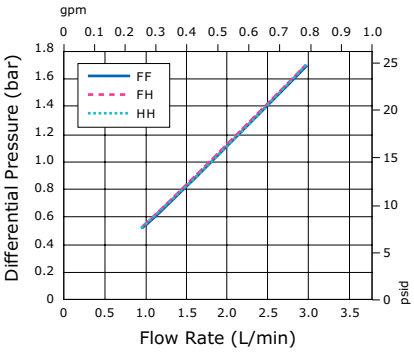
Typical Clean Water Flow Rates

Opticap® XL Disposable Capsules (Sterile and Gamma Compatible)

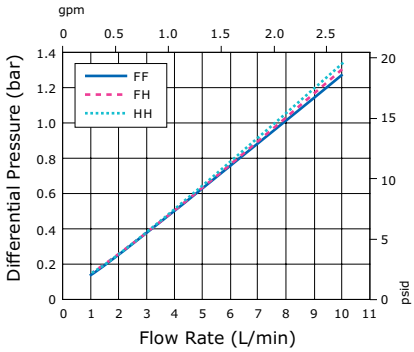
Millipore Express® SHR 0.5/0.1 µm Membrane with Prefilter

Filters tested post gamma radiation at 45–65 kGy and autoclaved at 123 °C for 60 minutes.

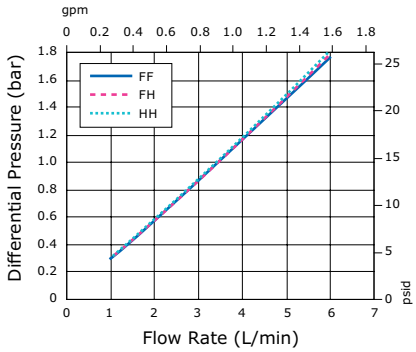
Gamma Compatible Opticap® XL 150 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Gamma Compatible Opticap® XL 300 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Gamma Compatible Opticap® XL 600 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Opticap® XL Capsule Legends Refer to Connection Type

FF = 19 mm (¾ in.) sanitary flange inlet and outlet

FH = 19 mm (¾ in.) sanitary flange inlet and 14 mm (⁹⁄₁₆ in.) hose barb outlet

HH = 14 mm (⁹⁄₁₆ in.) hose barb inlet and outlet

Specifications

Opticap® XL and XLT Disposable Capsules (Sterile and Gamma Compatible)

Millipore Express® SHR 0.5/0.1 µm Membrane with Prefilter

	Opticap® XL 3 Capsules	Opticap® XL 5 Capsules	Opticap® XL 10 Capsules	Per Standard Area Opticap® XLT 10 Capsules	Per High Area Opticap® XLT 10 Capsules**
Nominal Dimensions					
Maximum length	17.3 cm (6.8 in.)	21.6 cm (8.5 in.)	33.5 cm (13.2 in.)	38.1 cm (15.0 in.)	38.1 cm (15.0 in.)
Body diameter	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)
Fitting to Fitting					
Sanitary flange to sanitary flange	—			15.2 cm (6.0 in.)	
Sanitary flange to hose barb	—			17.5 cm (6.9 in.)	
Hose barb to hose barb	—			19.8 cm (7.8 in.)	
Filtration Area	0.13 m^2 (1.4 ft^2)	0.24 m^2 (2.6 ft^2)	0.54 m^2 (5.8 ft^2)	0.54 m^2 (5.8 ft^2)	1.0 m^2 (10.8 ft^2)
Materials of Construction					
Filter membrane	Hydrophilic polyethersulfone				Hydrophilic polyethersulfone
Film edge	Polypropylene				Polypropylene
Supports	Polypropylene				Polypropylene
Core	Polysulfone				Polyethersulfone
Structural components*	Polypropylene				Polypropylene
Vent O-rings	Silicone				Silicone
Vent/Drain	6 mm (¼ in.) hose barb with double O-ring seal				
Maximum Inlet Pressure	6900 mbar (100 psi) intermittent at 23 °C 5500 mbar (80 psi) at 23 °C 2800 mbar (40 psi) at 60 °C 1000 mbar (15 psi) at 80 °C				
Maximum Differential Pressure					
Forward	6900 mbar (100 psi) intermittent at 25 °C 5500 mbar (80 psi) at 25 °C 1000 mbar (15 psi) at 80 °C				
Reverse	2100 mbar (30 psi) intermittent at 25 °C				
70/30 IPA Bubble Point at 23 °C	≥2590 mbar (37.5 psi) with nitrogen				
Air Diffusion at 23 °C	Through a water wet membrane at 3.4 bar (50 psi):				
	≤7.3 cc/min.	≤13.6 cc/min.	≤30.4 cc/min.	≤30.4 cc/min.	≤54.2 cc/min.
Bacterial Retention	Quantitative retention of 10^7 CFU/cm^2 *Brevundimonas diminuta* ATCC® 19146 per ASTM® methodology				
Mycoplasma Removal	Typical Log Reduction Value (LRV) >7 using *A. laidlawii* ATCC® 23206 and our validated test method				
Bacterial Endotoxin	Aqueous extraction contains <0.25 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.				
TOC/Conductivity at 25 °C	Gamma sterilized filter effluent meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI flush of:				
	5.5 L	9.5 L	21 L	21 L	21 L
Oxidizable Substances	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a water flush of 2 L.				
Sterilization					
Gamma-compatible capsules	Gamma compatible to 45 kGy, may be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)				
Sterile capsules	May be autoclaved for 3 cycles of 60 minutes at 123 °C (Cannot be steam sterilized in-line)				
Sterility					
Sterile capsules	These capsules meet current USP and AAMI guidelines for sterility utilizing a validated sterilization cycle.				
Cytotoxicity	Non-toxic per MEM elution ISO® 10993-5				
Particle Shedding	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.				
Non-fiber Releasing	Millipore Express® SHR membranes meet the criteria for a “non-fiber releasing” filter as defined in 21 CFR 210.3(b)(6).				
Component Material Toxicity	Component materials were tested and meet the criteria of the USP <88> Reactivity Test for Class VI plastics. Millipore Express® SHR filters meet the requirements of the USP <88> Safety Test, utilizing a 0.9% sodium chloride extraction.				
Indirect Food Additive	All component materials meet the FDA Indirect Food Additive requirements cited in 21 CFR 177–182.				
Good Manufacturing Practices	These products are manufactured in a facility which adheres to FDA Good Manufacturing Practices.				

* Cage, end caps and capsule housing
**Only available in gamma-compatible formats

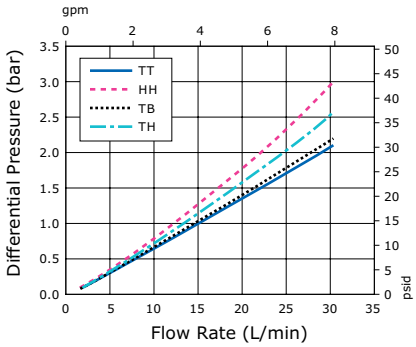
Typical Clean Water Flow Rates

Opticap® XL and XLT Disposable Capsules (Sterile and Gamma Compatible)

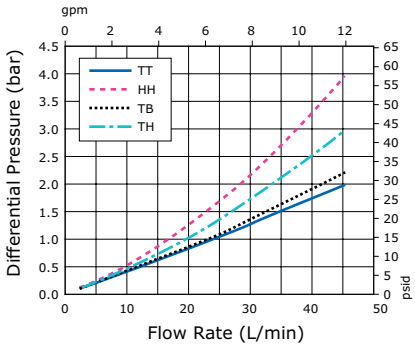
Millipore Express® SHR 0.5/0.1 µm Membrane with Prefilter

Filters tested post gamma radiation at 25–45 kGy and autoclaved at 123 °C for 60 minutes.

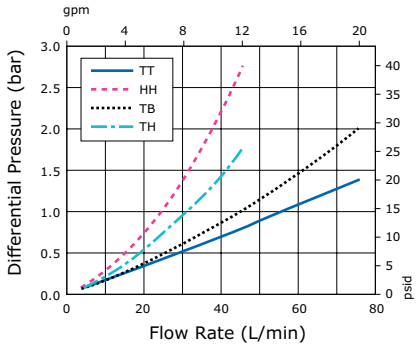
Gamma Compatible Opticap® XL 3 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



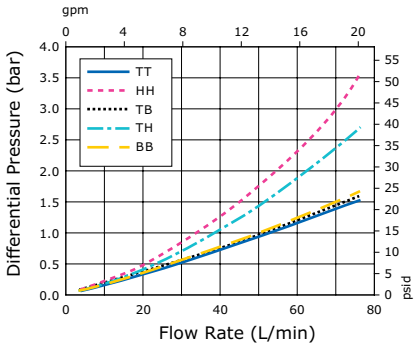
Gamma Compatible Opticap® XL 5 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



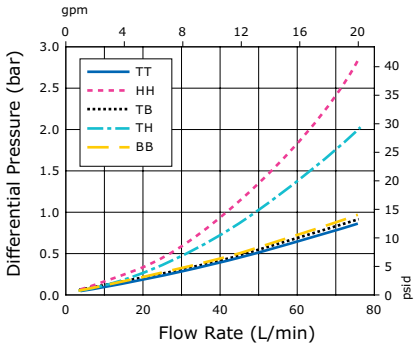
Gamma Compatible Opticap® XL 10 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



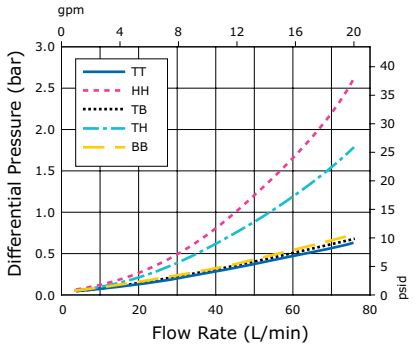
Gamma Compatible Standard Area Opticap® XLT 10 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



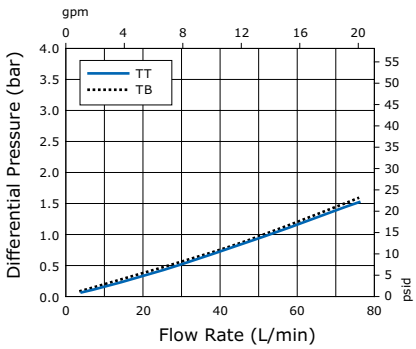
Gamma Compatible Standard Area Opticap® XLT 20 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



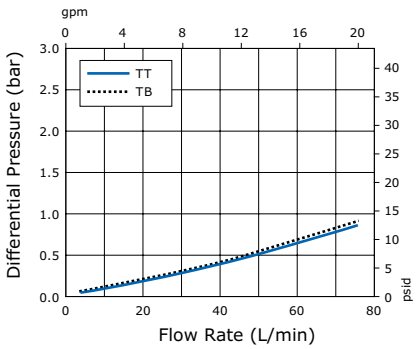
Gamma Compatible Standard Area Opticap® XLT 30 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



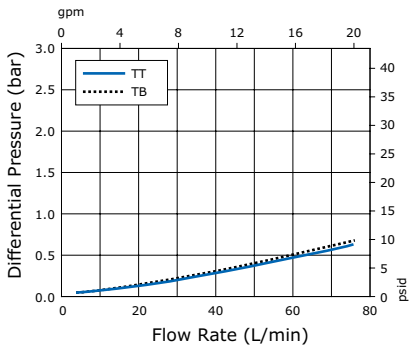
Gamma Compatible High Area Opticap® XLT 10 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Gamma Compatible High Area Opticap® XLT 20 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Gamma Compatible High Area Opticap® XLT 30 with 0.5/0.1 µm Millipore Express® SHR Membrane with prefilter



Opticap® XL Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

HH = 14 mm (9⁄16 in.) hose barb inlet and outlet

TH = 38 mm (1½ in.) sanitary flange inlet and 14 mm (9⁄16 in.) hose barb outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

Opticap® XLT Capsule Legends Refer to Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

TH = 38 mm (1½ in.) sanitary flange Inlet and 16 mm (⅝ in.) hose barb outlet

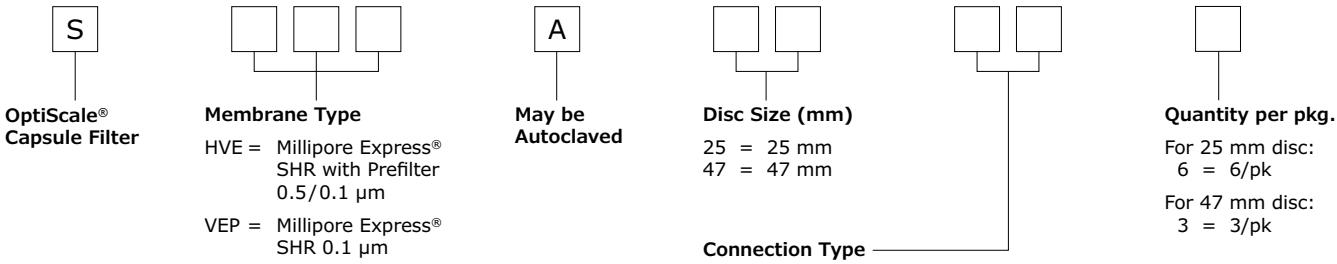
HH = 16 mm (⅝ in.) hose barb inlet and outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

BB = 25 mm (1 in.) hose barb inlet and outlet

Ordering Information

OptiScale® Capsule Filters



OptiScale® Capsule Filter

Membrane Type

HVE = Millipore Express® SHR with Prefilter 0.5/0.1 µm

VEP = Millipore Express® SHR 0.1 µm

May be Autoclaved

Disc Size (mm)

25 = 25 mm
47 = 47 mm

Connection Type

For 25 mm disc:
NB = Female Luer Lok™ Inlet/Male Luer Lok™ outlet

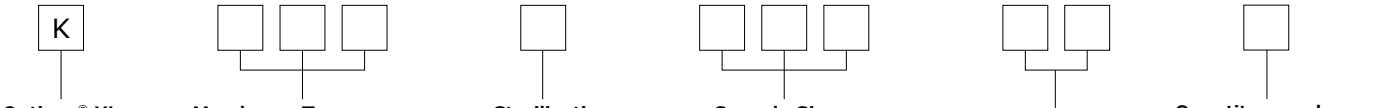
For 47 mm disc:
HH = 6 mm (¼ in.) hose barb inlet and outlet
FF = 19 mm (¾ in.) sanitary flange inlet and outlet
FH = 19 mm (¾ in.) sanitary flange inlet and 6 mm (¼ in.) hose barb outlet

Quantity per pkg.

For 25 mm disc:
6 = 6/pk

For 47 mm disc:
3 = 3/pk

Opticap® XL 150/300/600 Capsule Filters



Opticap® XL Capsule Filter

Membrane Type

HVE = Millipore Express® SHR with Prefilter 0.5/0.1 µm

VEP = Millipore Express® SHR 0.1 µm

Sterilization

G = Gamma Compatible

S = Sterile

Capsule Size

015 = Opticap® XL 150
003 = Opticap® XL 300
006 = Opticap® XL 600

Connection Type

FF = 19 mm (¾ in.) sanitary flange inlet and outlet

FH = 19 mm (¾ in.) sanitary flange inlet and 14 mm (9/16 in.) hose barb outlet

HH = 14 mm (9/16 in.) hose barb inlet and outlet

HB = 14 mm (9/16 in.) hose barb inlet and 14 mm (9/16 in.) hose barb outlet with bell

FB = 19 mm (¾ in.) sanitary flange inlet and 14 mm (9/16 in.) hose barb outlet with bell

Quantity per pkg.

1 = 1/pk (Opticap® XL 150 gamma compatible only)

3 = 3/pk

Opticap® XL Capsule Filters

Opticap® XL Capsule Filter

Membrane Type

HVE = Millipore Express® SHR with Prefilter 0.5/0.1 µm

VEP = Millipore Express® SHR 0.1 µm

Sterilization

A = Autoclavable

G = Gamma Compatible

S = Sterile

Capsule Size

03 = Opticap® XL 3
05 = Opticap® XL 5
10 = Opticap® XL 10

Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

HH = 14 mm (9/16 in.) hose barb inlet and outlet

TH = 38 mm (1½ in.) sanitary flange inlet and 14 mm (9/16 in.) hose barb outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

Quantity per pkg.

Opticap® XL 3:
3 = 3/pk

Opticap® XL 5 and 10:
1 = 1/pk

Ordering Information

Opticap® XLT Capsule Filters

K

Opticap® XL Capsule Filter

Membrane Type

HVE = Millipore Express® SHR with Prefilter 0.5/0.1 µm

VEP = Millipore Express® SHR 0.1 µm

Sterilization

A = Autoclavable
G = Gamma Compatible
S = Sterile

Capsule Size

1 = Opticap® XLT 10
2 = Opticap® XLT 20
3 = Opticap® XLT 30

T

T-line Capsule without Gauge Port

Connection Type

TT = 38 mm (1½ in.) sanitary flange inlet and outlet

HH = 16 mm (⅝ in.) hose barb inlet and outlet

TH = 38 mm (1½ in.) sanitary flange inlet and 16 mm (⅝ in.) hose barb outlet

TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet

BB = 25 mm (1 in.) hose barb inlet and outlet

1

Quantity per pkg.

1 = 1/pk

Area Type

H = High Area (10-, 20-, and 30-inch gamma compatible capsules with connections 'TT' and 'TB' only)

Leave blank for Standard Area

Description	Qty/pk	Cat. No.
Standard Opticap® XLT Capsule Filter Stand	1	XLTSTAND1

Cartridge Filters

C

Cartridge Filter

Membrane Type

HVE = Millipore Express® SHR with Prefilter 0.5/0.1 µm

VEP = Millipore Express® SHR 0.1 µm

Cartridge Code

0 = (2-222) O-ring

7 = (2-226) O-ring w/ locking tab spear

Cartridge Length

5 = 5-inch (Code 7 only)

1 = 10-inch

2 = 20-inch

3 = 30-inch

Area Type

T = Standard Area

H = High Area (10-, 20-, and 30-inch cartridges with Millipore Express® SHR w/Prefilter 0.5/0.1 µm membrane only)

O-ring Material

S = Silicone
E = EPDM
F = Fluoroelastomer

Quantity per pkg.

1 = 1/pk (10-inch Code 7 only)

3 = 3/pk

* Not all product configurations are guaranteed to be available; please contact your EMD Millipore representative to confirm availability.

The user guides for these product – Filters with Millipore Express® Membrane Wetting Instructions, Integrity Testing, Sterilizing and Drying Guidelines (UG4224EN00) and Opticap® XL Capsules and Opticap® XLT Capsules User Guide (UG1011EN00), are available on our website.

To place an order or receive technical assistance

In the U.S. and Canada, call toll-free 1-800-645-5476

For other countries across Europe and the world, please visit:
emdmillipore.com/offices

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emdmillipore.com/techservice

milliporesigma.com

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