

Millipore Express® SHC Hydrophilic Filters

High capacity, sterilizing-grade PES filters

Millipore Express® SHC (Sterile, High Capacity) filters provide superior throughput and capacity in applications where sterilizing-grade performance is needed and premature filter plugging is a concern. These filters are ideal for sterile filtration of cell culture media, protein solutions and other high fouling fluids. Millipore Express® SHC filters contain two polyethersulfone membrane layers, 0.5 µm/0.2 µm, and come in a range of device formats and sizes to suit your application needs.



Filter formats

Millipore Express® SHC filters are offered in a range of filter formats and capsule sizes, and allow easy scale-up of your small volume filtration steps to larger, full-scale filtration processes.

- 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 disposable capsule filters— autoclavable, gamma compatible, or presterilized. Gamma compatible XLT capsules are also available in high area formats.
- Standard and high area cartridge filters

Benefits

- High capacity, high flux hydrophilic PES membranes
- Validated sterilizing-grade performance
- Easy wetting and integrity testing
- Superior throughput in high fouling streams, including media and protein containing solutions
- Increased capacity for improved process efficiency and economy
- Broad chemical compatibility across a wide pH range (1-14) — caustic compatible

Applications

- Media additives
- Column protection
- Concentrated protein streams
- Cell harvest (post clarification)
- Caustics/pH adjusters
- Buffers
- CIP solutions

Fewer filter change outs and extended capacity

Millipore Express® SHC filters are designed to maximize the capacity of constrained filtration systems. With its high flux and superior capacity, you can double your output without significant capital expense (see figures 1 and 2).

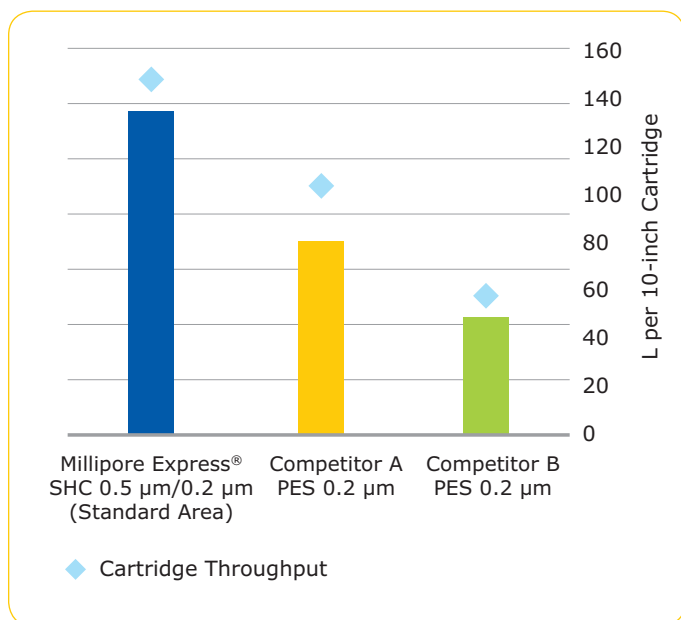


Figure 1.
CHO Cell Culture Growth Media: No Prefiltration

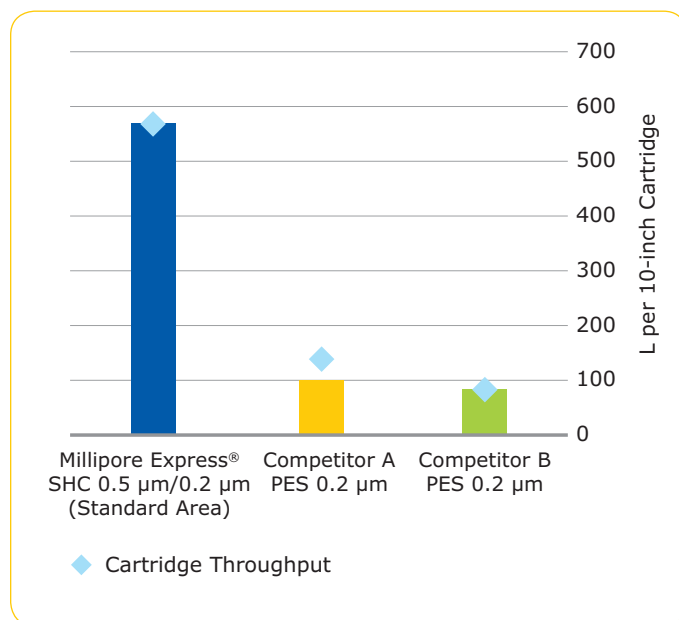


Figure 2.
Protein Concentrate Post Ultrafiltration

Mobius® Single-use Solutions

Millipore Express® SHC hydrophilic filters are part of the Mobius® integrated, disposable bioprocess solution. No matter what your application step, Mobius® solutions 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 filters

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 devices have the option to add a filling bell to protect an open container from airborne particles.

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



Opticap® XLT filters

Cartridge Filters

Millipore Express® SHC 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 formats with 2x the membrane area of the standard area cartridges. 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® SHC cartridge filters



Millipore Express® High Area (left) compared to Standard Area (right) Cartridge Filters

Specifications

OptiScale® Disposable Capsules

	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
Film edge	Polypropylene	Polycarbonate
Vent cap	Polypropylene	Polyvinylidene fluoride
O-rings	Polypropylene	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	5100 mbar (80 psi) at 25 °C
Maximum Differential Pressure		
Forward	4100 mbar (60 psi) at 25 °C	5100 mbar (80 psi) at 25 °C
Reverse	0 mbar (0 psi)	690 mbar (10 psi) at 25 °C
Bacterial Endotoxin		
	Aqueous extraction contains <0.25 EU/mL as determined by Limulus Amebocyte Lysate (LAL).	—
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 water 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 at 123 °C for 60 min.	May be autoclaved for 3 cycles at 126 °C for 60 min.
Particle Shedding		
	Effluent meets the acceptance criteria set forth in USP <788> for large volume parenterals.	—
Non-fiber Releasing		
	Millipore Express® SHC 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® SHC 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.	

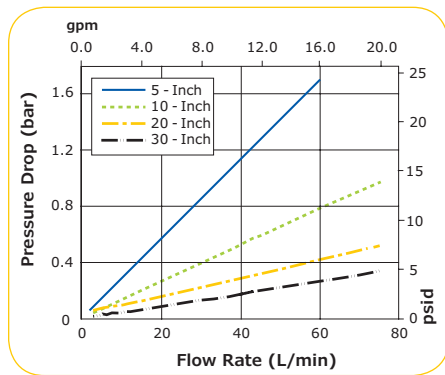
Specifications

Cartridge Filters

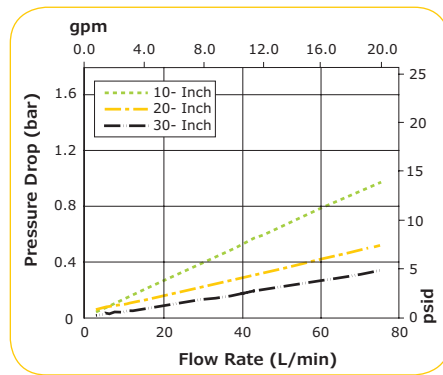
	5-inch Cartridge	Per Standard Area 10-inch Cartridge	Per High Area 10-inch Cartridge
Nominal Dimensions			
Diameter	6.9 cm (2.7 in.)	6.9 cm (2.7 in.)	
Length	12.7 cm (5 in.)	25.4 cm (10 in.)	
Filtration Area			
	0.23 m ² (2.5 ft ²)	0.49 m ² (5.3 ft ²)	1.0 m ² (10.8 ft ²)
Materials of Construction			
Filter membrane	Hydrophilic polyethersulfone		Hydrophilic polyethersulfone
Film edge	Polypropylene		Polypropylene
Cage and end caps	Polypropylene		Polypropylene
Core	Polysulfone		Polyethersulfone
O-rings	Silicone, EPDM or Fluoroelastomer		Silicone, EPDM or Fluoroelastomer
Maximum Differential Pressure			
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 340 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
Bubble Point at 23 °C			
	≥4000 mbar (58 psi) air with water		
Air Diffusion at 25 °C			
	Through a water wet membrane at 2.8 bar (40 psi):		
	≤13.3 cc/min.	≤28.2 cc/min.	≤56.4 cc/min.
Bacterial Retention			
	Quantitative retention of 10 ⁷ CFU/cm ² <i>Brevundimonas diminuta</i> ATCC® 19146 per ASTM® methodology		
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:		
	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 2000 mL.		
Sterilization			
Autoclave	25x, 60 min. cycles at 126 °C		5x, 60 min. cycles at 126 °C
In-line steam	25x forward cycles, 30 min., 135 °C at ≤ 340 mbar (5 psi) or, 22x forward cycles, 30 min., 135 °C at ≤ 340 mbar (5 psi) and 3x reverse cycles, 30 min., 135 °C at <69 mbar (1 psi) or, 3x forward cycles, 30 min., 135 °C at 1000 mbar (15 psi)		5x forward cycles, 30 min., 135 °C at ≤ 340 mbar (5 psi)
USP 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® SHC 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® SHC 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 0.5/0.2 μm Millipore Express® SHC Membranes

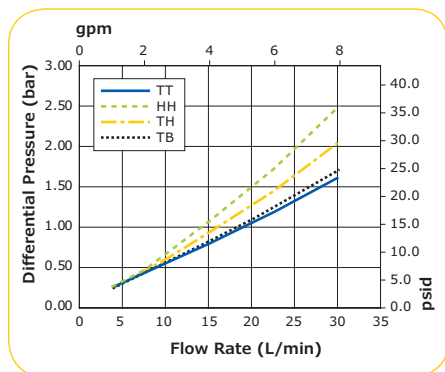


High Area Cartridge Filters with 0.5/0.2 μm Millipore Express® SHC Membranes

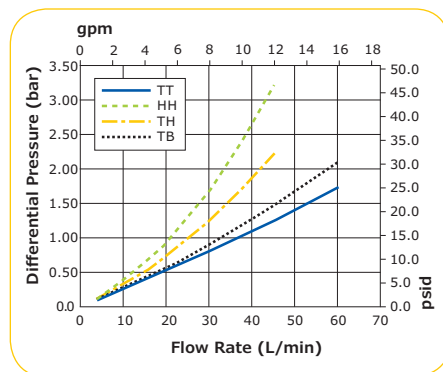


Opticap® XL and XLT Disposable Capsules (Autoclavable Only)

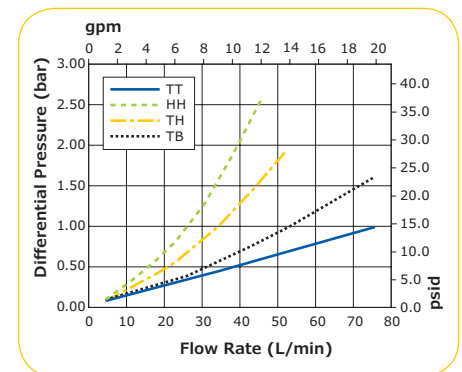
Opticap® XL 3 Capsules with 0.5/0.2 μm Millipore Express® SHC Membrane



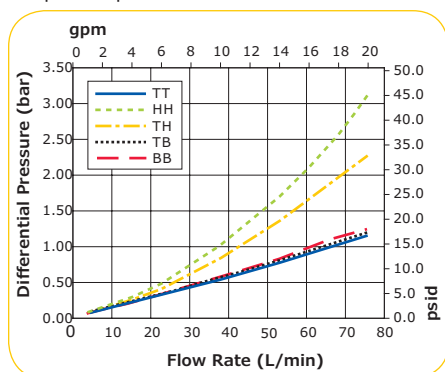
Opticap® XL 5 Capsules with 0.5/0.2 μm Millipore Express® SHC Membrane



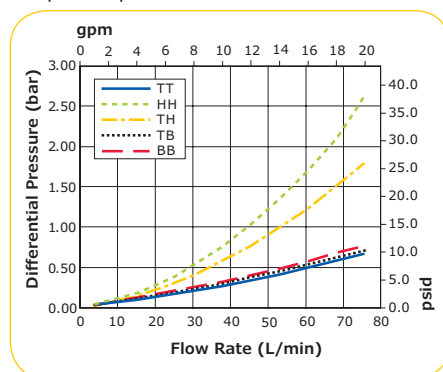
Opticap® XL 10 Capsules with 0.5/0.2 μm Millipore Express® SHC Membrane



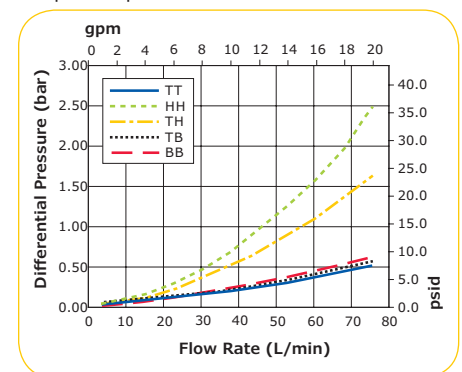
Opticap® XLT 10 Capsules with 0.5/0.2 μm Millipore Express® SHC Membrane



Opticap® XLT 20 Capsules with 0.5/0.2 μm Millipore Express® SHC Membrane



Opticap® XLT 30 Capsules with 0.5/0.2 μm Millipore Express® SHC 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 (5/8 in.) hose barb outlet
- HH = 16 mm (5/8 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)

	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						
	0.13 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 (10.5 ft ²)	1.47 m ² (15.8 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 2750 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					
Bubble Point at 23 °C						
	≥4000 mbar (58 psi) air with water					
Air Diffusion at 23 °C						
	Through a water wet membrane at 2.8 bar (40 psi):					
	≤7.3 cc/min.	≤13.3 cc/min.	≤28.2 cc/min.	≤28.2 cc/min.	≤56.3 cc/min.	≤84.5 cc/min.
Bacterial Retention						
	Quantitative retention of 10 ⁷ CFU/cm ² <i>Brevundimonas diminuta</i> ATCC® 19146 per ASTM® methodology					
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 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).					
USP 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® SHC 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® SHC 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

Specifications

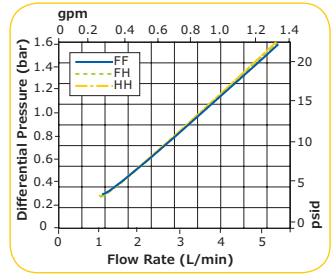
Opticap® XL Disposable Capsules (Sterile and Gamma Compatible)

	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)	5.6 cm (2.2 in.)	5.6 cm (2.2 in.)
Filtration Area			
	0.014 m ² (0.155 ft ²)	0.029 m ² (0.316 ft ²)	0.059 m ² (0.631 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		
	2750 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		
Bubble Point at 23 °C			
	≥4000 mbar (58 psi) air with water		
Air Diffusion at 23 °C			
	Through a water wet membrane at 2.8 bar (40 psi):		
	≤1.0 cc/min.	≤1.9 cc/min.	≤3.7 cc/min.
Bacterial Retention			
	Quantitative retention of 10 ⁷ CFU/cm ² <i>Brevundimonas diminuta</i> ATCC® 19146 per ASTM® methodology		
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 water flush of:		
	1 L	2 L	3 L
Oxidizable Substances			
	Meets the USP Oxidizable Substances Test requirements for sterile purified water after a water flush of 1.0 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	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® SHC 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® SHC 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.		

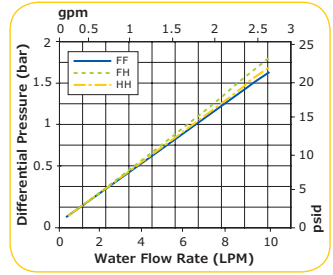
*Cage, end caps and capsule housing

Typical Clean Water Flow Rates

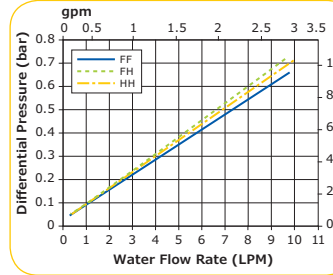
Opticap® XL 150 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



Opticap® XL 300 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



Opticap® XL 600 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



Opticap® XL Capsule Legends Refer to Connection Type

- FF:** 19 mm (3/4 in.) sanitary flange inlet and outlet
- FH:** 19 mm (3/4 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)

	Opticap® XL 3 Capsules	Opticap® XL 5 Capsules	Opticap® XL 10 Capsules	Per 10" Standard Area Opticap® XLT Capsule	Per 10" High Area Opticap® XLT Capsule**
Nominal Dimensions					
Maximum length	17.3 cm (6.8 in.)	21.6 cm (8.5 in.)	33.5 cm (13.2 in.)	25.4 cm (10 in.)	25.4 cm (10 in.)
Body diameter	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)	6.9 cm (2.7 in.)	6.9 cm (2.7 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)	0.49 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	Polyethylene			Polyethylene	
Supports	Polyester			Polyester	
Core	Polysulfone			Polyethersulfone	
Structural components*	Gamma stable polypropylene			Gamma stable 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				
	2700 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					
	≥4000 mbar (58 psi) air with water				
Air Diffusion at 23 °C					
	Through a water wet membrane at 2.8 bar (40 psi):				
	≤7.6 cc/min.	≤14.0 cc/min.	≤31.2 cc/min.	≤31.2 cc/min.	≤56.4 cc/min.
Bacterial Retention					
	Quantitative retention of 10 ⁷ CFU/cm ² <i>Brevundimonas diminuta</i> ATCC® 19146 per ASTM® methodology				
Bacterial Endotoxin					
	Aqueous extraction contains <0.25 EU/mL as determined using the Limulus Amebocyte Lysate (LAL) test.				
TOC/Conductivity at 25 °C					
	Gamma sterilized filter meets the WFI requirements of USP <643> for Total Organic Carbon and USP <645> for Water Conductivity after a WFI flush of:				
	5.0 L	9.5 L	21 L		
Oxidizable Substances					
	Effluent meets the USP Oxidizable Substance 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	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® SHC 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® SHC 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.				

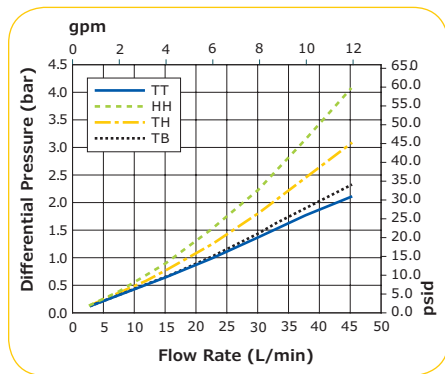
*Cage, end caps and capsule housing

**Only available in gamma compatible capsules

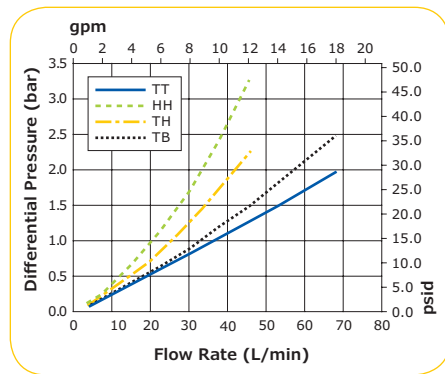
Typical Clean Water Flow Rates

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

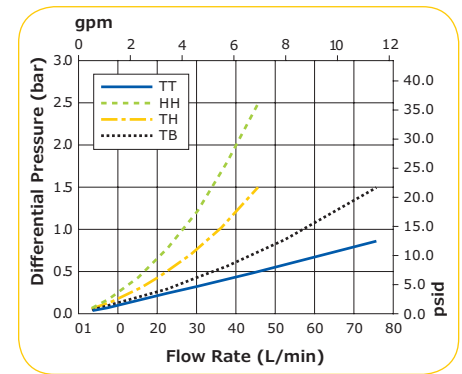
Opticap® XL 3 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



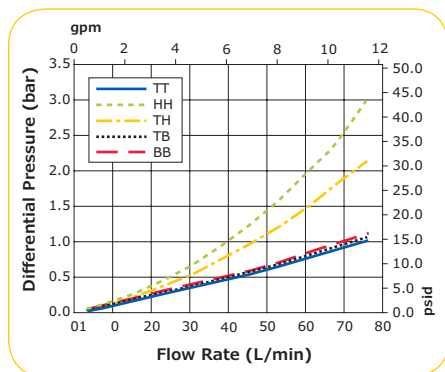
Opticap® XL 5 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



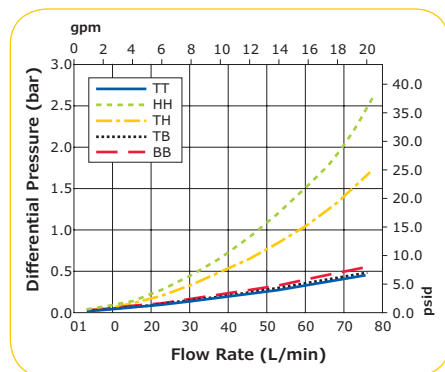
Opticap® XL 10 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



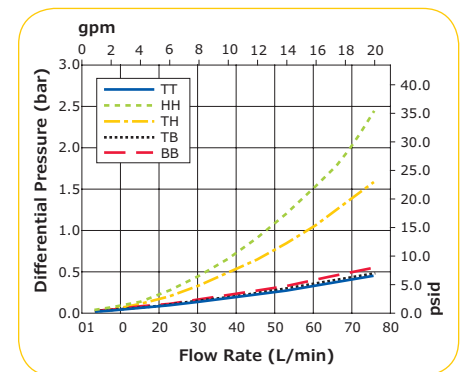
Standard Area Opticap® XLT 10 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



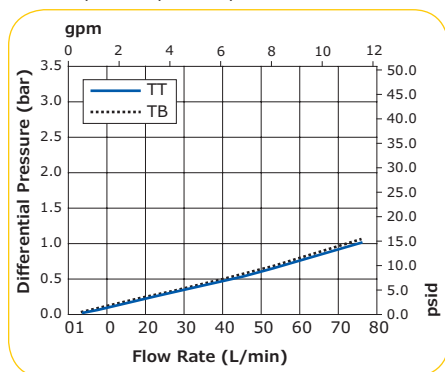
Standard Area Opticap® XLT 20 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



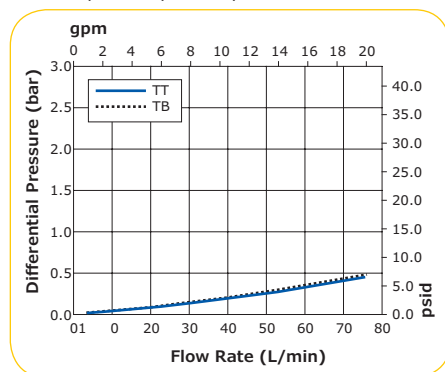
Standard Area Opticap® XLT 30 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



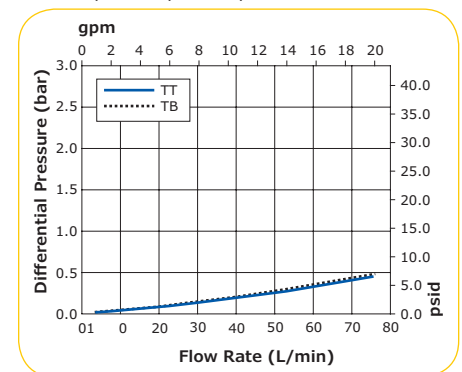
High Area Opticap® XLT 10 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



High Area Opticap® XLT 20 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



High Area Opticap® XLT 30 Capsules with 0.5/0.2 µm Millipore Express® SHC Membrane



Opticap® XL Capsule Legends Refer to Connection Type

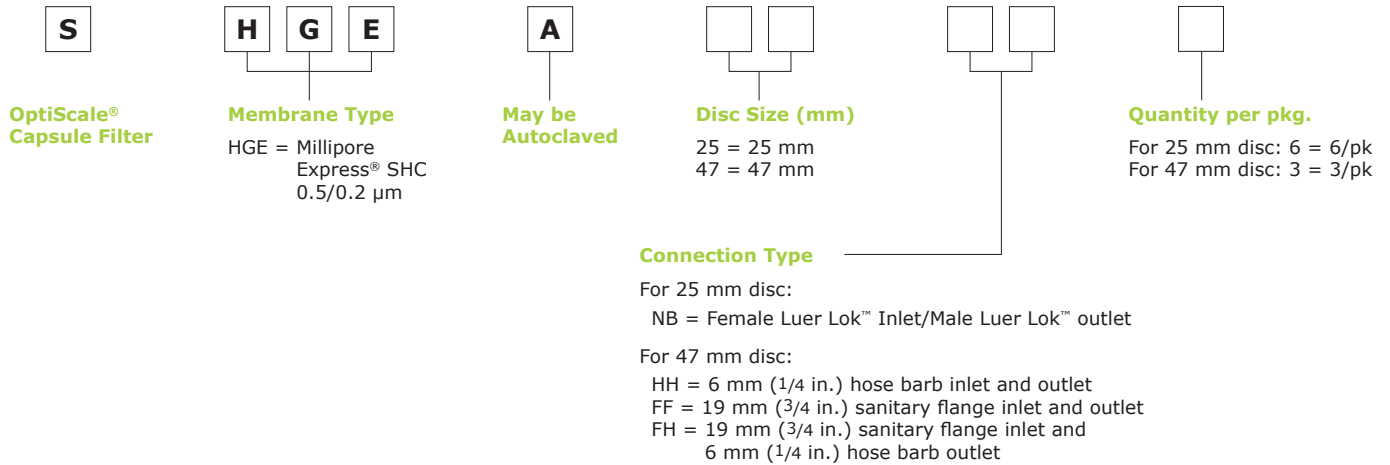
- FF = 19 mm (¾ in.) sanitary flange inlet and outlet
- FH = 19 mm (¾ in.) sanitary flange inlet and 14 mm (9/16 in.) hose barb outlet
- TT = 38 mm (1½ in.) sanitary flange inlet and outlet
- HH = 14 mm (9/16 in.) hose barb inlet and outlet
- TH = 38 mm (1½ in.) sanitary flange inlet and 14 mm (9/16 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

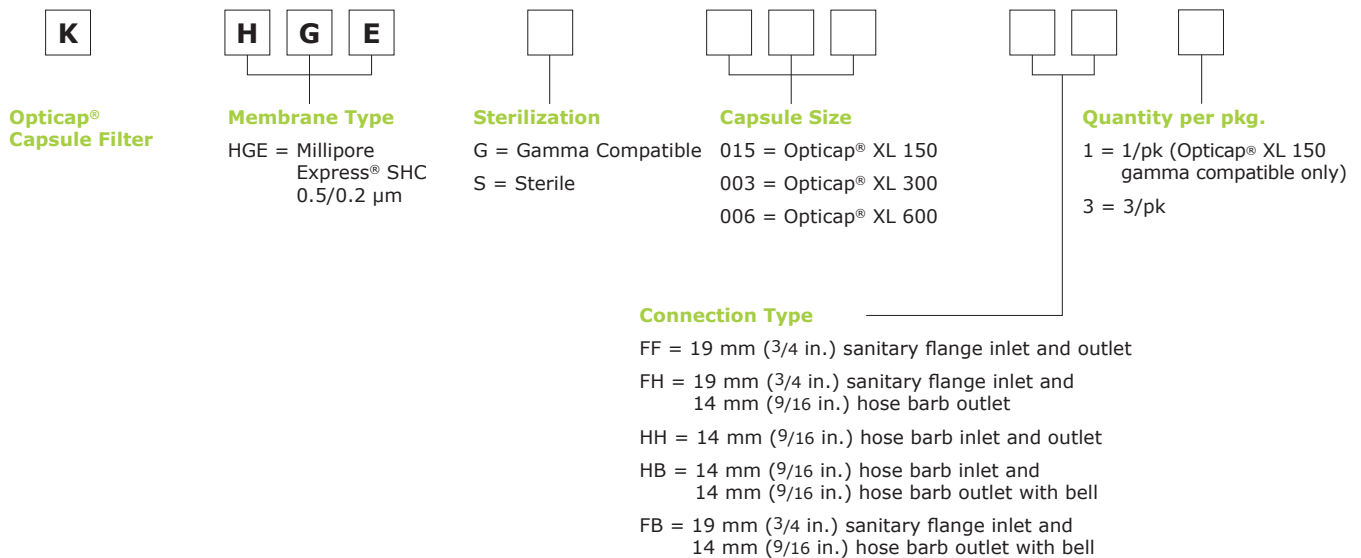
- TT = 38 mm (1½ in.) sanitary flange inlet and outlet
- TH = 38 mm (1½ in.) sanitary flange Inlet and 16 mm (5/8 in.) hose barb outlet
- HH = 16 mm (5/8 in.) hose barb inlet and outlet
- TB = 38 mm (1½ in.) sanitary flange inlet and 25 mm (1 in.) hose barb outlet
- BB = 25 mm (1 in.) hose barb inlet and outlet

Ordering Information

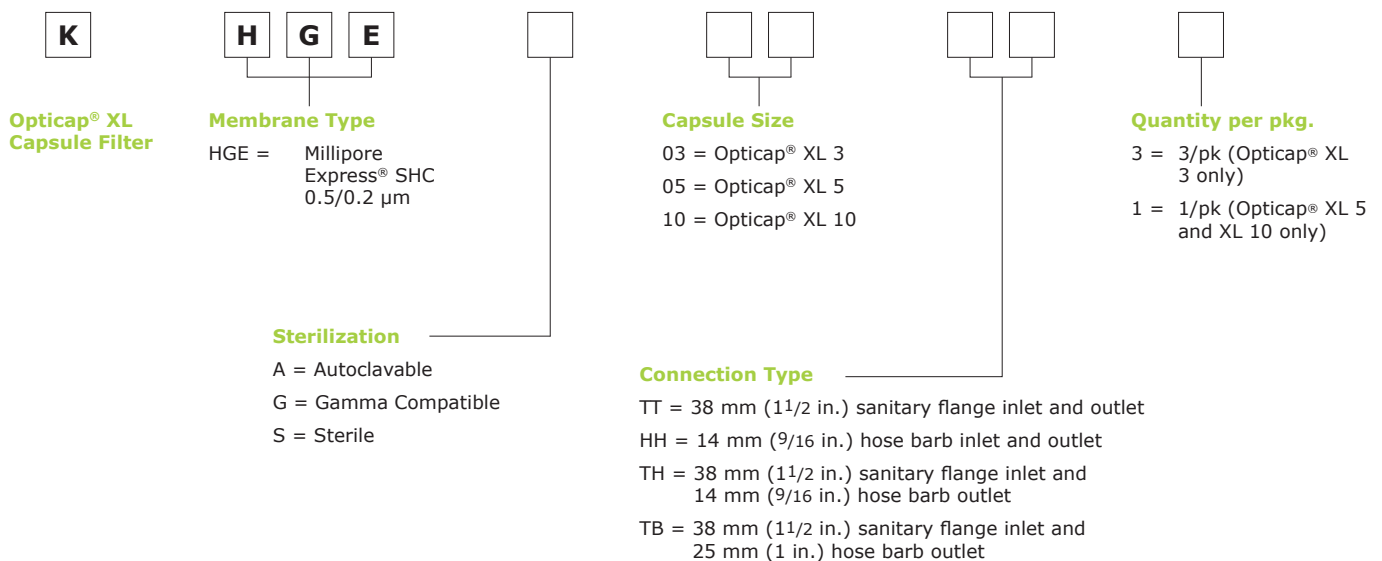
OptiScale® Capsule Filters



Opticap® XL 150/300/600 Capsule Filters

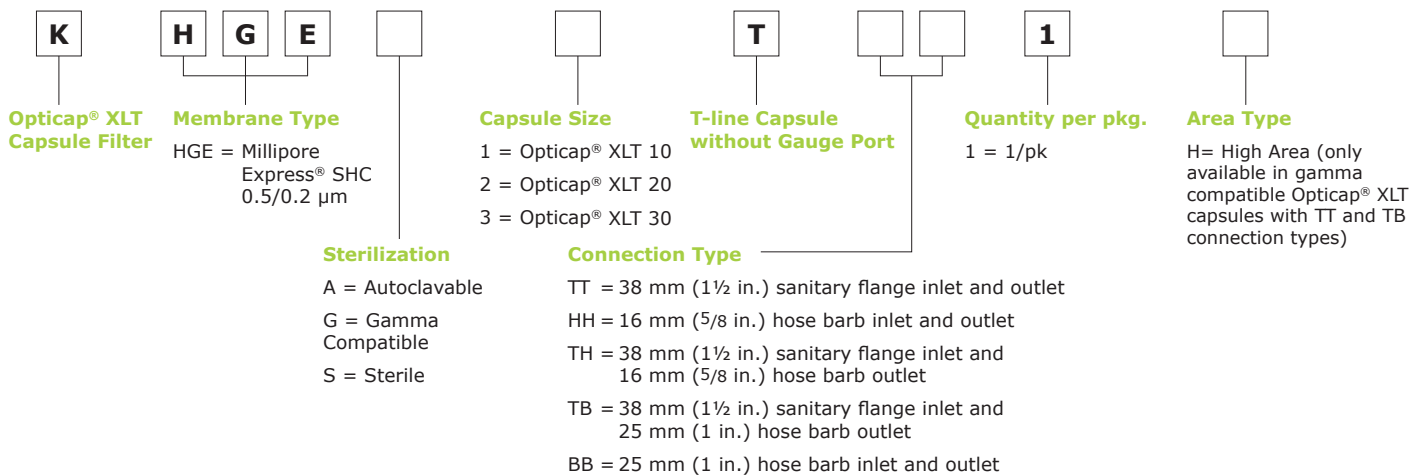


Opticap® XL Capsule Filters



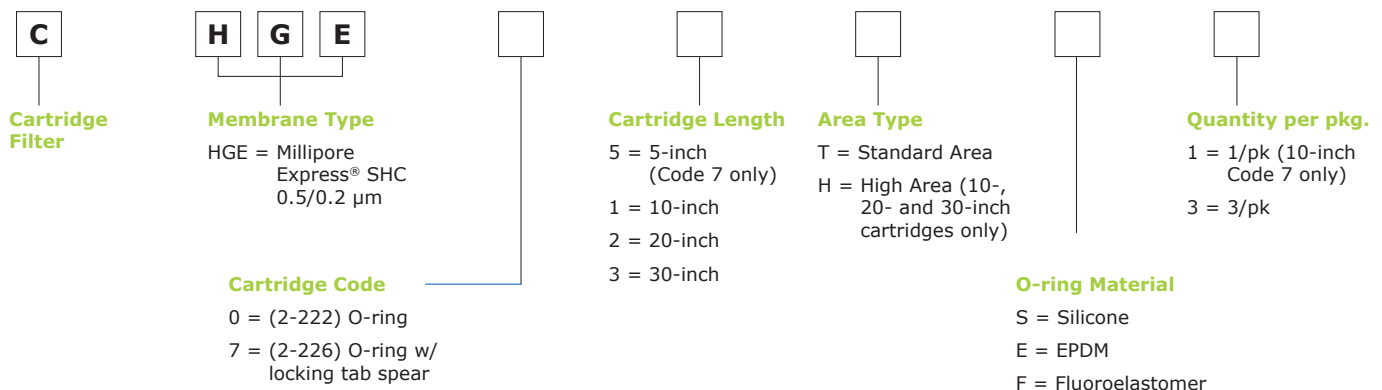
Ordering Information

Opticap® XLT Filters



Description	Qty/pkg	Catalogue Number
Standard Opticap® XLT Capsule Filter Stand	1	XLTSTAND1

Cartridge Filters



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, call
+44 (0) 115 943 0840

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

For Technical Service, please visit
www.emdmillipore.com/techservice

*Not all product configurations available; please call your EMD Millipore representative to confirm availability. The user guides for these products – 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.

