



Sterilizing-grade Aervent® Filters

Superior filters for the sterile filtration of gases

- ▶ *Ideal membrane for removing particles and microorganisms from gases*
- ▶ *Unparalleled thermal and hydraulic stress resistance*
- ▶ *Validated to withstand multiple sterilization cycles*

The 0.2 µm hydrophobic Aervent polytetrafluoroethylene (PTFE) membrane provides sterility assurance high flow rates and throughput. The Aervent membrane contributes to clean processes due its non-fiber releasing properties.

Regulatory Compliance

Filters with hydrophobic Aervent membrane are designed, developed, and manufactured in accordance with a Quality Management System approved by an accredited registering body to an ISO® 9000 Quality Systems Standard. Each filter is shipped with a Certificate of Quality. Each Opticap™ XL and cartridge filter is integrity tested during manufacturing and is supported with a comprehensive Validation Guide for compliance with regulatory requirements.

For traceability and easy identification, each filter is labeled with the product name, lot number and serial number.

Multiple Formats Available

Hydrophobic Aervent membranes are available in two device formats, one pore size, and multiple configurations that vary by filtration area and type of inlet/outlet connection.

Membrane Types

- Aervent 0.2 µm hydrophobic

Filter Formats

- Opticap XL disposable capsule filters
- Cartridge filters

From process development to full-scale production, Millipore has the right solution for you!

Opticap XL Disposable Capsule Filters



Opticap XL Filters

Opticap XL disposable capsule filters with hydrophobic Aervent membrane are available in multiple filtration areas, providing an optimal choice for every application. Each Opticap XL capsule is integrity tested during the manufacturing process.

The patented Opticap XL capsule design allows unparalleled thermal and hydraulic stress resistance in a disposable filter, resulting in reliability, high confidence in the sterility process and improved cleanliness.

Convenient and Easy to Use

Opticap XL capsule filters eliminate the time and the expense associated with assembling, cleaning, and validating 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 directional arrows and ribbed edges for easy gripping even with gloved hands.

The Right Size

A wide range of filtration areas is available to fit all of your application needs, and to allow easy scale-up of your small volume filtration steps to larger, full-scale filtration processes.

The Right Connections

Self-contained and disposable, Opticap XL capsule filters are supplied with a choice of inlet and outlet connections to optimize your filtration process, including fractional sanitary flange, hose barb, and sanitary flanges which provide a higher flow rate.

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Cartridge Filters



Cartridge Filters

Hydrophobic Aervent cartridge filters provide high flow rate and minimal differential pressure. Cartridges are robust, strong, and resilient and are designed to withstand multiple steam-in-place cycles. Each Aervent cartridge filter is integrity tested during the manufacturing process.

A full range of filtration areas is available to suit varying applications and a variety of connection options are offered for easy adaptation to existing housings.

Specifications

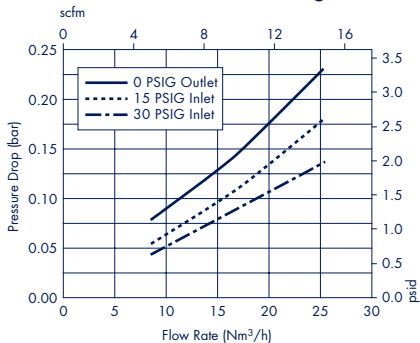
	Opticap XL 2	Opticap XL 4	Opticap XL 5	Opticap XL 10
Nominal Dimensions				
Maximum length:	14.3 cm (5.6 in.)	19.6 cm (7.7 in.)	21.6 cm (8.5 in.)	33.5 cm (13.2 in.)
Body diameter:	8.4 cm (3.3 in.)	8.4 cm (3.3 in.)	10.7 cm (4.2 in.)	10.7 cm (4.2 in.)
Vent to vent diameter:	12.5 cm (4.9 in.)	12.5 cm (4.9 in.)	14.5 cm (5.7 in.)	14.5 cm (5.7 in.)
Filtration Area	0.10 m ² (1.1 ft ²)	0.21 m ² (2.3 ft ²)	0.32 m ² (3.5 ft ²)	0.65 m ² (7.0 ft ²)
Materials of Construction				
Filter media:	Hydrophobic PTFE			
Supports:	Polypropylene			
Structural components:	Polypropylene			
Vent O-rings:	Silicone			
Vent/Drain	¼ in. hose barb with double O-ring seal			
Maximum Inlet Pressure	5.5 bar (80 psi) at 23 °C 2.8 bar (40 psi) at 60 °C 1.0 bar (15 psi) at 80 °C			
Maximum Differential Pressure				
Forward:	5.5 bar (80 psid) at ambient temperature, 1.0 bar (15 psid) at 80 °C			
Reverse:	4.1 bar (60 psid) intermittent			
Bubble Point at 23 °C	≥ 1100 mbar (16 psig) in 70/30 IPA/water			
Air Diffusion	Through a 70/30 IPA/water wet membrane at ambient room at 965 mbar (14 psig) nitrogen:			
	—	≤ 9 cc/min	≤ 12 cc/min	≤ 24 cc/min
HydroCorr™ Test	At 2600 mbar (38 psig):			
	≤ 0.12 mL/min	≤ 0.25 mL/min	≤ 0.38 mL/min	≤ 0.75 mL/min
Gravimetric Extractables	After autoclaving and a 24 hour soak in 70/30 IPA/water at controlled room temperature:			
	≤ 15 mg	≤ 15 mg	≤ 28 mg	≤ 45 mg
Bacterial Endotoxin	Aqueous extraction contains < 0.5 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test.			
Bacterial Retention	Quantitative retention of 10 ⁷ CFU/cm ² <i>Brevundimonas diminuta</i> ATCC® 19146 per ASTM® methodology.			
Sterilization	May be autoclaved for 30 cycles of 30 minutes at 135 °C.			
Good Manufacturing Practices	These products are manufactured in a Millipore facility which adheres to FDA Good Manufacturing Practices.			
Non-Fiber Releasing	Millipore Aervent membrane meets 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 USP <88> Reactivity Tests for Class VI Plastics. Aervent filters are non-toxic per the USP <88> Safety Test.			
European Pressure Equipment Directive	Millipore Corporation certifies that this product complies with the European Pressure Equipment Directive, 97/23/EC of 29 May 1997. This product has been classified under Article 3 § 3 of the Pressure Vessel Directive. It has been designed and manufactured in accordance with sound engineering practice to ensure safe use. In compliance with Article 3 § 3 of this Pressure Equipment Directive, this product does not bear the CE mark.			
Viral Retention	Rated for aerosol retention of a total challenge of 10 ⁸ –10 ¹⁰ plaque forming units of φX-174 virus particles at 50 SCFM per cartridge.			
Bacterial Aerosol Growth	Retains <i>B. diminuta</i> liquid aerosol for 21 days at a minimum challenge of 10 ⁷ CFU/cm ² .			

Specifications

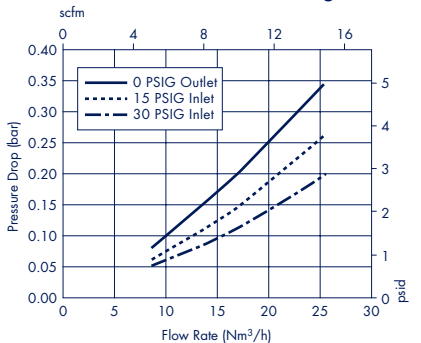
	5-inch Cartridge	Per 10-inch Cartridge
Nominal Dimensions Maximum length: Outside diameter:	12.5 cm (5 in.) 6.9 cm (2.7 in.)	25 cm (10 in.) 6.9 cm (2.7 in.)
Filtration Area	0.32 m ² (3.5 ft ²)	0.65 m ² (7.0 ft ²)
Materials of Construction Filter media: Supports: Structural components: O-rings: Outer support ring:	Hydrophobic PTFE Polypropylene Polypropylene Silicone Stainless Steel	
Maximum Differential Pressure Forward: Reverse:	5.5 bar (80 psid) at ambient temperature, 1.8 bar (25 psid) at 80 °C 4.1 bar (60 psid) intermittent	
Air Diffusion	Through a 70/30 IPA/water wet membrane at ambient room at 965 mbar (14 psig) nitrogen: ≤ 12 cc/min	≤ 24 cc/min
Bubble Point at 23 °C	≥ 1100 mbar (16 psig) in 70/30 IPA/water	
HydroCorr Test	At 2600 mbar (38 psig): ≤ 0.38 mL/min	≤ 0.75 mL/min
Gravimetric Extractables	After autoclaving and a 24 hour soak in 70/30 IPA water at controlled room temperature: ≤ 18 mg	≤ 35 mg
Bacterial Endotoxin	Aqueous extraction contains < 0.5 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test	
Bacterial Retention	Quantitative retention of 10 ⁷ CFU/cm ² <i>Brevundimonas diminuta</i> ATCC® 19146 per ASTM methodology	
Sterilization	May be steam sterilized 100 times (forward) and 50 times (reverse) for 30 minutes at 145 °C.	
Good Manufacturing Practices	These products are manufactured in a Millipore facility which adheres to FDA Good Manufacturing Practices.	
Non-Fiber Releasing	Millipore Aervent membrane meets 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 USP <88> Reactivity Tests for Class VI Plastics. Aervent filters are non-toxic per the USP <88> Safety Test.	
Viral Retention	Rated for aerosol retention of a total challenge of 10 ⁸ –10 ¹⁰ plaque forming units of φX-174 virus particles at 50 SCFM per 10-inch cartridge.	
Bacterial Aerosol Growth	Retains <i>B. diminuta</i> liquid aerosol for 21 days at a minimum challenge of 10 ⁷ CFU/cm ² .	

Air Flow Rate and Pressure Drop

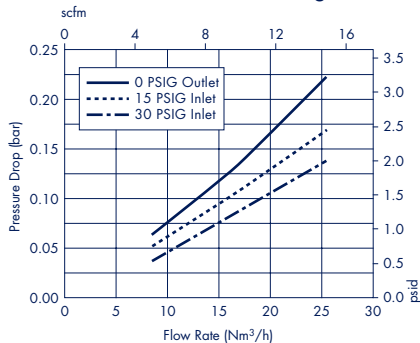
Opticap XL 2 Capsule with 0.2 μm
Aervent Membrane — FF Fitting*



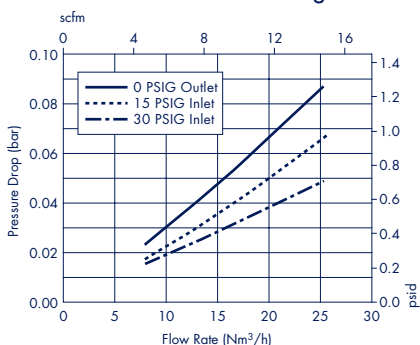
Opticap XL 2 Capsule with 0.2 µm
Aervent Membrane — HH Fitting*



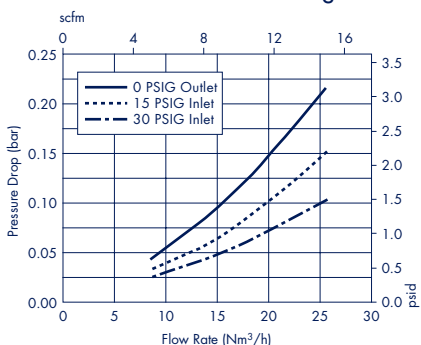
Opticap XL 2 Capsule with 0.2 μ m
Aervent Membrane — TT Fitting*



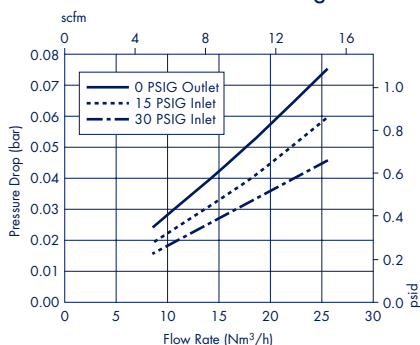
Opticap XL 4 Capsule with 0.2 μm
Aervent Membrane — FF Fitting*



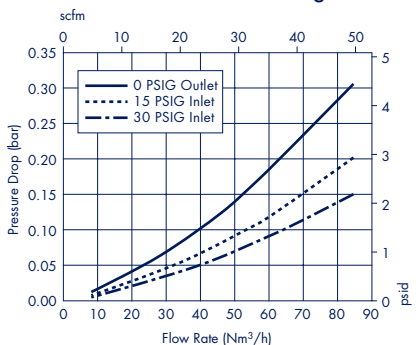
Opticap XL 4 Capsule with 0.2 μ m
Aervent Membrane — HH Fitting*



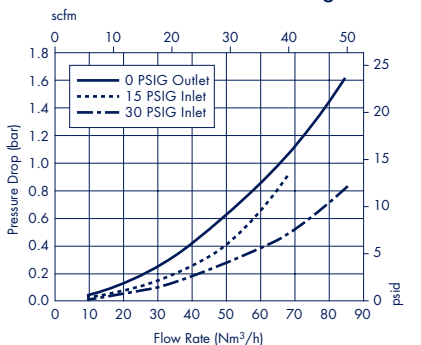
Opticap XL 4 Capsule with 0.2 μ m
Aervent Membrane — TT Fitting*



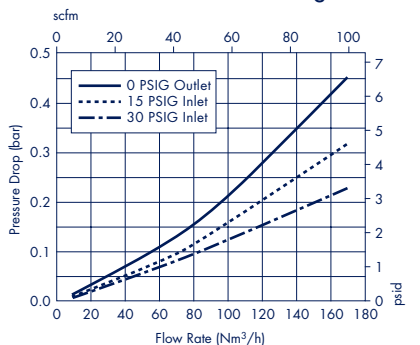
Opticap XL 5 Capsule with 0.2 μm
Aervent Membrane — FF Fitting*



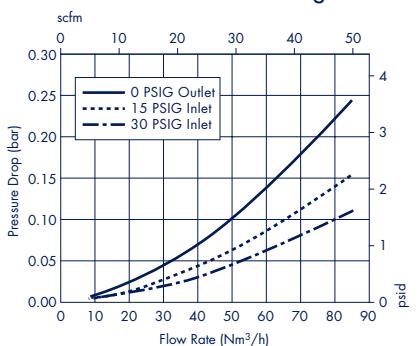
Opticap XL 5 Capsule with 0.2 μm
Aervent Membrane — HH Fitting*



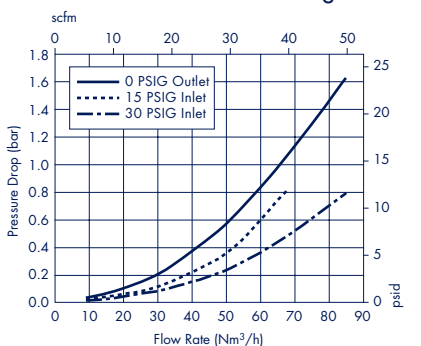
Opticap XL 5 Capsule with 0.2 μ m
Aervent Membrane — TT Fitting*



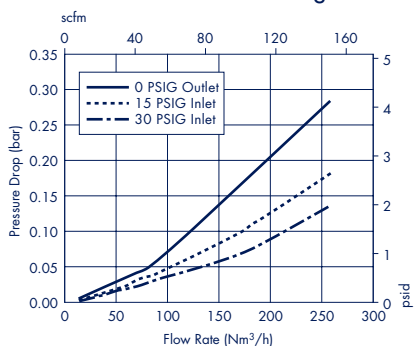
Opticap XL 10 Capsule with 0.2 μm
Aervent Membrane — FF Fitting*



Opticap XL 10 Capsule with 0.2 μ m
Aervent Membrane — HH Fitting*



Opticap XL 10 Capsule with 0.2 μm
Aervent Membrane — TT Fitting*

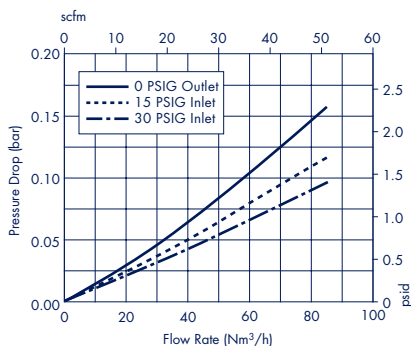


*Opticap XL Capsule Connection Types

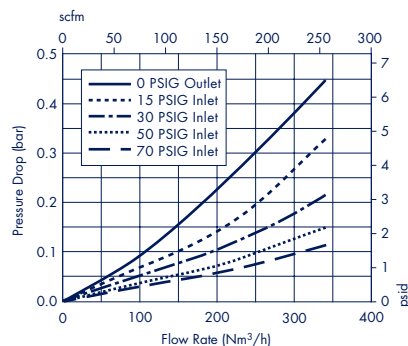
TT = 38 mm (1½ in.) Sanitary Flange Inlet & Outlet; FF = 19 mm (¾ in.) Sanitary Flange Inlet & Outlet; HH = 14 mm (⅝ in.) Hose Barb Inlet & Outlet

Air Flow Rate and Pressure Drop

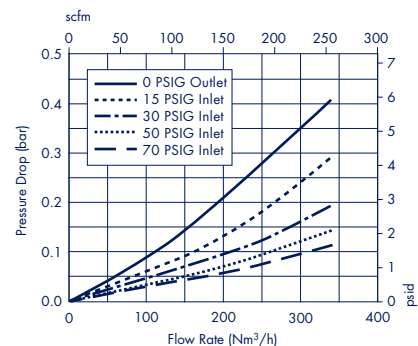
5-inch Cartridge with 0.2 μ m Aervent Membrane — Code 7*



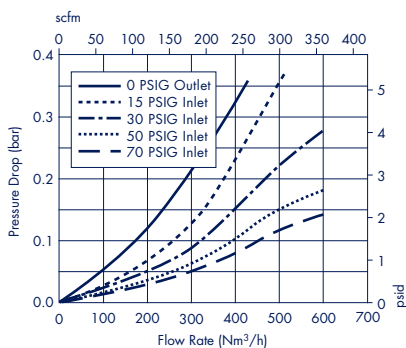
10-inch Cartridge with 0.2 μ m Aervent Membrane — Codes 0 and 5*



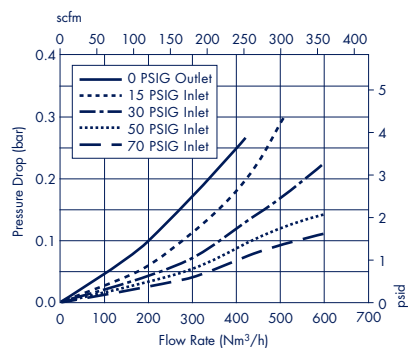
10-inch Cartridge with 0.2 μ m Aervent Membrane — Code 7*



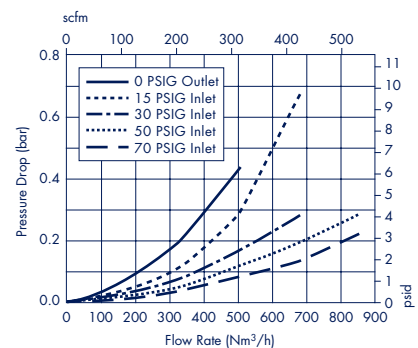
20-inch Cartridge with 0.2 μ m Aervent Membrane — Codes 0 and 5*



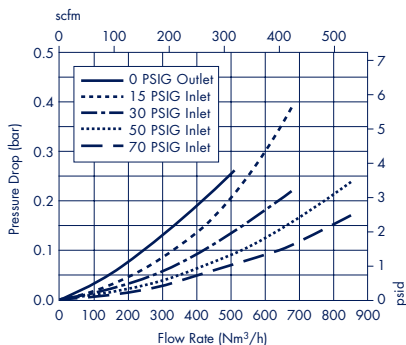
20-inch Cartridge with 0.2 μ m Aervent Membrane — Code 7*



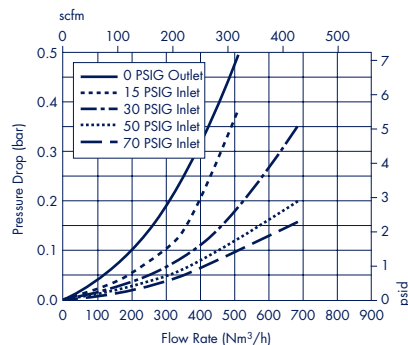
30-inch Cartridge with 0.2 μ m Aervent Membrane — Codes 0 and 5*



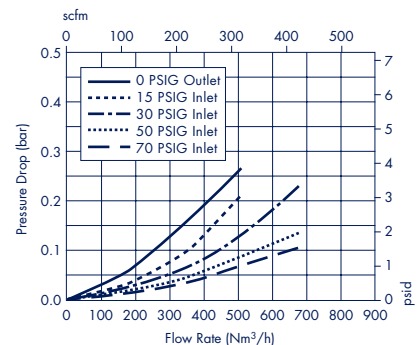
30-inch Cartridge with 0.2 μ m Aervent Membrane — Code 7*



40-inch Cartridge with 0.2 μ m Aervent Membrane — Codes 0 and 5*



40-inch Cartridge with 0.2 μ m Aervent Membrane — Code 7*



*Cartridge Codes

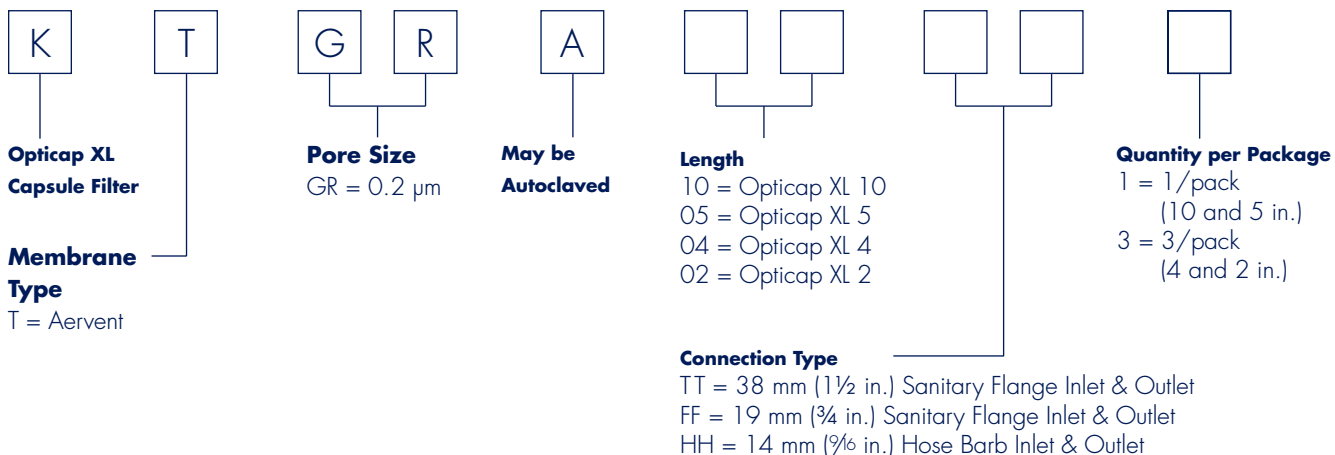
0 = (2-222) O-ring

5 = (2-222) O-ring w/spear

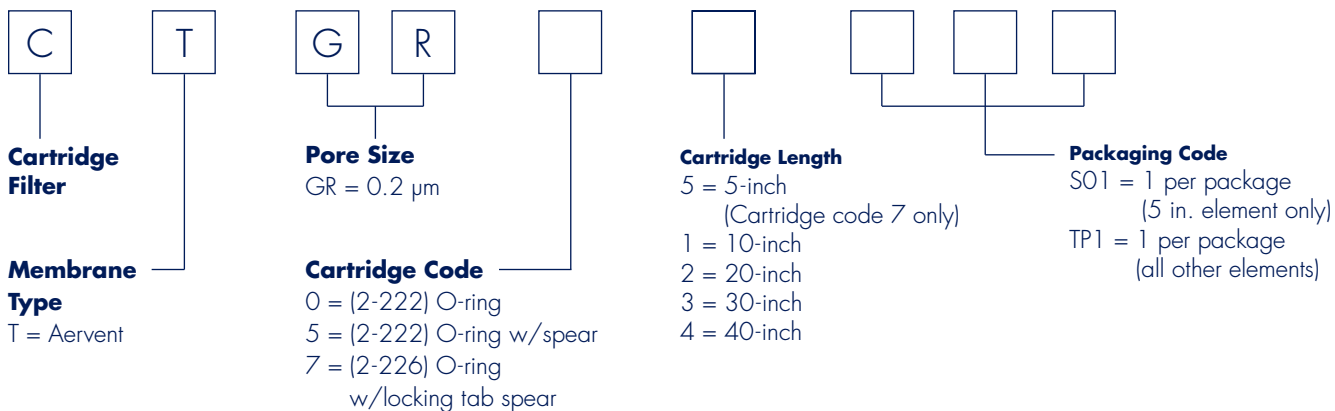
7 = (2-226) O-ring w/locking tab spear

Ordering Information

Opticap XL Capsule Filters



Cartridge Filters



Yr{{orpu-0a

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MILLIPORE

Optical XL Capsule

Cartridge Fliter

KTGRA10TT1	CTGR05S01
KTGRA10TT3	CTGR55S01
KTGRA10FF1	CTGR75S01
KTGRA10FF3	CTGR01TP1
KTGRA10HH1	CTGR02TP1
KTGRA10HH3	CTGR03TP1
KTGRA05TT1	CTGR04TP1
KTGRA05TT3	CTGR51TP1
KTGRA05FF1	CTGR52TP1
KTGRA05FF3	CTGR53TP1
KTGRA05HH1	CTGR54TP1
KTGRA05HH3	CTGR71TP1
KTGRA04TT1	CTGR72TP1
KTGRA04TT3	CTGR73TP1
KTGRA04FF1	CTGR74TP1
KTGRA04FF3	
KTGRA04HH1	
KTGRA04HH3	
KTGRA02TT1	
KTGRA02TT3	
KTGRA02FF1	
KTGRA02FF3	
KTGRA02HH1	
KTGRA02HH3	