

## Data Sheet

# Charged Durapore® Hydrophilic 0.22 µm Cartridge Filters

Cationically charged cartridge filters for sterile filtration, endotoxins removal, low preservative adsorption

Charged Durapore® 0.22 µm hydrophilic cartridges are sterilizing-grade cartridge filters manufactured from polyvinylidene fluoride (PVDF) membrane modified to give it a net positive charge.

Endotoxins will easily pass through a 0.22 µm sterilizing-grade membrane filter where size exclusion is the only retention mechanism. Because endotoxins are negatively charged, a positively charged membrane can aid in the removal of endotoxins that are far smaller than the rated pore size of the filter. Charged Durapore® 0.22 µm hydrophilic cartridges are designed for the removal of endotoxins from pharmaceutical-grade water systems.



## Benefits

- Low protein binding membrane yields high protein recovery with minimal loss of valuable product.
- Superior membrane for filtration processes requiring high flow rates and throughputs.
- Ideal for designing scalable solutions from bench top to full-scale manufacturing.

## Endotoxin Removal

Charged Durapore® 0.22 µm hydrophilic cartridges are designed for the removal of endotoxins from pharmaceutical-grade water systems. The filters are certified for an LRV >5 when challenged with 10<sup>6</sup> pg/mL of purified *E. coli* (Type 055:B5 LPS) endotoxin in water.

## Low Preservative Binding

Adsorptive loss of quaternary amines and other positively charged preservatives can be minimized by using cationically charged Durapore® membrane.

## Robust Design

The filters may be steam sterilized 10x for 30 minutes at 135 °C. They will withstand a forward differential pressure of 80 psid at 25 °C and intermittent back pressure of 50 psi at 25 °C.

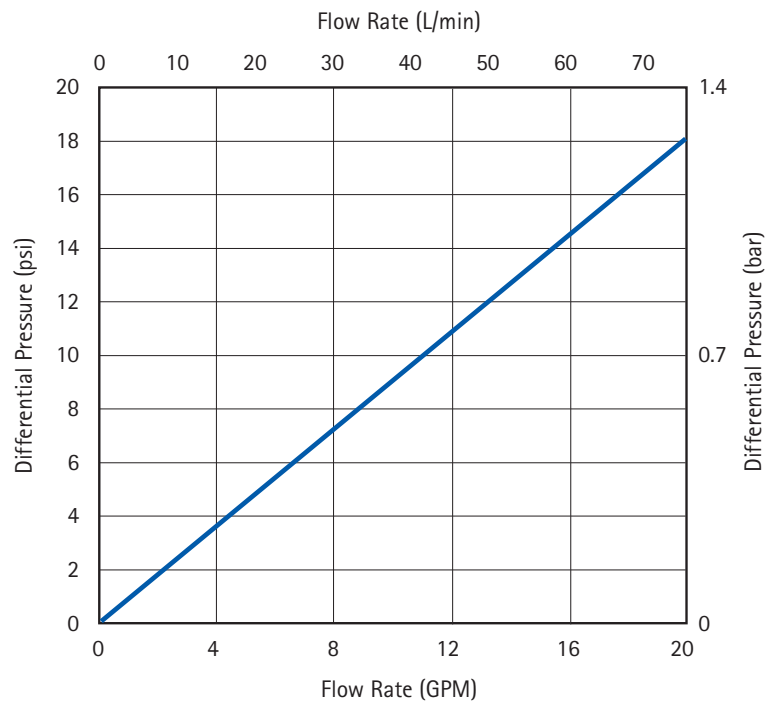
## High Performance

Charged Durapore® membrane is based on the same membrane used in standard Durapore® and offers high flow rates, high throughput, low extractables and reliable bacterial retention.

## Regulatory Compliance

No surfactants or adhesives are used in cartridge construction. All cartridges are designed, developed, and manufactured in accordance with a Quality Management System approved by an accredited registering body to an ISO® 9001 and ISO® 14001 Quality Systems Standard. Each cartridge is shipped with a Certificate of Quality, integrity tested during manufacturing and is supported with a comprehensive Validation Guide for compliance with regulatory requirements.

**Figure 1.**  
Typical water flow rate at 23 °C



## Specifications

Effective Filtration Area	1.9 ft <sup>2</sup> (0.2 m <sup>2</sup> ) per 4-inch (10.2 cm) Optiseal® cartridge 7.4 ft <sup>2</sup> (0.7 m <sup>2</sup> ) per 10-inch (25.4 cm) cartridge 14.8 ft <sup>2</sup> (1.4 m <sup>2</sup> ) per 20-inch (50.8 cm) cartridge 22.2 ft <sup>2</sup> (2.1 m <sup>2</sup> ) per 30-inch (76.2 cm) cartridge
Materials of Construction	Modified polyvinylidene fluoride (PVDF) membrane with a net positive charge. Non-woven polypropylene pleat supports upstream and downstream. Rigid polypropylene outer sleeve, core, end caps and adapter. Silicone O-rings.
Endotoxin Removal	Charged Durapore® membrane samples exhibit LRV >5 when challenged with 10 <sup>6</sup> pg/mL of purified <i>Escherichia coli</i> (Type 055:B5 LPS) endotoxins
Integrity Test	Each cartridge must pass our integrity test, which is correlated to the <i>B. diminuta</i> ASTM® bacterial challenge test.
Bacterial Retention	Cartridges are quantitatively retentive of <i>Brevundimonas diminuta</i> ATCC® 19146 at a minimum challenge level of 10 <sup>7</sup> CFU (colony forming units) per cm <sup>2</sup> of filtration area using ASTM® F-838-83 methodology.
Air Bubble Point in Water at 23 °C	≥2760 mbar (40.0 psig)
Bacterial Endotoxin	Aqueous extraction contains <0.5 EU/mL as determined by the Limulus Amebocyte Lysate (LAL) Test
Thermal Stress Resistance	135 °C, 30 minutes, up to 10 times, Steam-in-Place
Hydraulic Stress Resistance	80 psid (5.5 bar) at 25 °C in the forward direction 50 psid (3.4 bar) at 25 °C in the reverse direction
Component Material Toxicity	Component materials meet the criteria of the USP <88> Reactivity Test for Class VI Plastics.
Oxidizable Substances	Autoclaved (126 °C, 30 minutes) 4-inch (10.2 cm) Optiseal® cartridges will meet the current USP WFI Oxidizable Substance requirements after a 0.5-liter water flush. Autoclaved (126 °C, 30 minutes) 10-inch (25.4 cm) cartridges will meet the current USP WFI Oxidizable Substance requirements after a 1.0-liter water flush per 10-inch (25.4 cm) cartridge.
USP <88> Safety	Autoclaved (126 °C, 60 minutes) cartridges are non-toxic per USP <88> Safety Test.
Non-Fiber Releasing	Charged Durapore® CCGL and LCGL cartridge filters are manufactured with a PVDF membrane which meets the criteria for a non-fiber releasing filter as defined in the Code of Federal Regulations 21 CFR 210.3 (b) (6).
Gravimetric Extractables	Autoclaved at 126 °C for 30 minutes, 4-inch (10.2 cm) Optiseal® cartridge has ≤10 milligrams extractables in water after 24-hour static soak at room temperature. Autoclaved at 126 °C for 30 minutes, 10-inch (25.4 cm) cartridge has ≤ 20 milligrams extractables in water after 24-hour static soak at room temperature.
Air Diffusion in Water at 23 °C	≤ 4.0 cc/min at 30 psid (2.07 bar) in the forward direction per 4-inch (10.2 cm) Optiseal® cartridge. ≤ 10.0 cc/min at 30 psid (2.07 bar) in the forward direction per 10-inch (25.4 cm) cartridge.
Water Flow Rate/Pressure Drop	≤ 8 psid (0.55 bar) at 2 gpm (7.6 Lpm) per 4-inch (10.2 cm) Optiseal® cartridge at 23 °C. ≤ 3 psid (0.21 bar) at 2 gpm (7.6 Lpm) per 10-inch (25.4 cm) cartridge at 23 °C.

## Ordering Information\*

Description	Nominal length		Catalogue No.
	Inches	cm	
<b>Code-0</b> 2-222 O-ring**	10	25.4	CCGL01TP1
	20	50.8	CCGL02TP1
	30	76.2	CCGL03TP1
<b>Code 5</b> 2-222 O-ring with spear assembly	10	25.4	CCGL51TP1
	20	50.8	CCGL52TP1
	30	76.2	CCGL53TP1
<b>Code 7</b> 2-226 O-ring locking outlet with spear assembly	10	25.4	CCGL71TP1
	20	50.8	CCGL72TP1
	30	76.2	CCGL73TP1
<b>Code 8</b> Concentric O-ring with spear assembly	10	25.4	CCGL81TP1
	20	50.8	CCGL82TP1
	30	76.2	CCGL83TP1
Optiseal®	4	10.2	LCGL04TP6

\* For capsules or cut disks ordering information, speak with your local sales representative.

\*\* Silicone O-rings are standard

## To Place an Order or Receive Technical Assistance

In Europe, please call Customer Service:

France: 0825 045 645

Germany: 01805 045 645

Italy: 848 845 645

Spain: 901 516 645 Option 1

Switzerland: 0848 645 645

United Kingdom: 0870 900 4645

For other countries across Europe,  
please call: +44 (0) 115 943 0840

Or visit: [www.merckmillipore.com/offices](http://www.merckmillipore.com/offices)

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