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## Ultipor® VF Grade DV50 Virus Removal Filter Cartridges

### **Description**

Ultipor® VF Grade DV50 Virus Removal filter cartridges feature innovative hydrophilic PVDF microporous membranes to remove significant levels of viruses from biological solutions, while enabling > 95% transmission of proteins up to 300 kD or larger. Using patented Ultipleat® crescent-shaped pleated elements, the filters to incorporate 1.6 m² (17.5 ft²) of filter area per 10 in. (254 mm) element in standard single open-ended (SOE) AB sanitary style cartridges. Ultipor VF cartridges achieve practical flows and pressure drops while effectively removing nanometer-size viral contaminants with high protein yields. An optional sub-0.1 µm rated prefilter (Grade DVD) and Fluorodyne® II filters enhance throughputs and employ the same PVDF membrane material for ease of validation. Typical applications include purification of biopharmaceuticals, tissue and plasma



derivatives, protein additives, culture media, diagnostic reagents, buffers and diluents.

#### Features and Benefits

- ▶ Sanitary direct flow cartridges
- ▶ 6 log Titer Reduction (T<sub>R</sub>) for 50 nm viruses (DV50 grade)
- ▶ Robust size exclusion mechanism
- ▶ PVDF microporous membranes
- Narrow pore-size distribution
- Inherently water wettable
- Low binding for high protein yields
- Very low extractables
- ▶ Steamable in situ
- ▶ 100% integrity-tested
- Individually serialized
- ▶ Manufactured for use in conformance with cGMP
- ISO 9000 Certified Quality System
- Pharmaceutical P optimized
- Certificate of Test provided
- ▶ Validation Guide available
- ▶ Discs and mini-cartridges (SBF Junior Style) available

### **Quality and Bio-Safety Biological Tests**

## Integrity

▶ Every DV50 grade filter integrity tested during manufacture. Test correlated to viral (phage) retention.

### **Biological Tests**

▶ Meets USP Biological Reactivity Test, in vivo, for Class VI-121 °C Plastics

## Effluent Quality Tests\*

- ▶ Meets Cleanliness per USP Particulates in Injectables
- Non-Fiber-Releasing
- Non-Pyrogenic per USP Bacterial

#### Endotoxins (< 0.25 EU/mL)

Meets Total Organic Carbon and Conductivity per USP Purified Water; pH per Sterile Purified Water

#### Autoclave Resistance

- Lot samples multi-cycle autoclave challenged
- \* Per lot sample or rinse-flush aliquots

Products in this datasheet may be covered by one or more patents including : EP 0 667 800 EP 0 982 061 EP 1 380 331 US 5,543,047 US 5,690,765 US 5,725,784

US 5,725,784 US 6,113,784 US 7,083,564 US 7,318,800 US 5,736,051

### **Specifications**

### **Materials of Construction**

Membrane	Hydrophilic modified polyvinylidenefluoride (PVDF)	
Support and Drainage	Polyester	
Core, Cage and End Caps	Polypropylene	
Code 7 Adapter	Polypropylene with encapsulated stainless steel reinforcing ring for steaming in situ	
O-rings	Silicone <sup>1</sup>	

<sup>&</sup>lt;sup>1</sup> Other polymers available

#### **Removal Ratings**

DVD	Sub-0.1 µm prefilter
DV50	T <sub>R</sub> 10 <sup>6</sup> for 50 nm viruses <sup>2</sup>

 $<sup>^{\</sup>rm 2}\,{\rm Lot}$  samples retain log 10  $^{\rm 6}\,{\rm T_R}$  of 53 nm spherical non-enveloped bacteriophage

### Configuration (AB Code 7)

Double 226 O-ring adapters, fin end with bayonet lock

### **Nominal Dimensions**

Lengths	10 in. (254 mm), 20 in. (508 mm), 30 in. (762 mm), 40 in. (1016 mm)	
Diameter	70 mm (2.75 in.)	

## Nominal Filter Area<sup>3</sup>

DVD	0.9 m² (9.5 ft²)
UDV50	1.63 m² (17.5 ft²)

<sup>&</sup>lt;sup>3</sup> Per 10 in. (254 mm) element

#### **Typical Flow Rate**

Clear water flow is 1 L/min @ 2 bard (29 psid)

### Operating Conditions\*

Maximum Differential Pressure during Integrity Testing	6.0 bard (90 psid)
Maximum Differential Pressure for Continuous Service	3 bard (43.5 psid)
Recommended Operating ΔP	1-2 bard (15 – 29 psid)

 $<sup>^{\</sup>star}$  Laboratory tests confirm viral T  $_{\rm R}$  is in independent of pressure differential to 3.1 bard (45 psid)

### Autoclave and Steaming in situ\*\*

Maximum Temperature	125 °C (257 °F)

<sup>\*\*</sup> Laboratory tests confirm multi-cycle resistance. Filters should be qualified in actual use. Contact Pall for recommended procedures

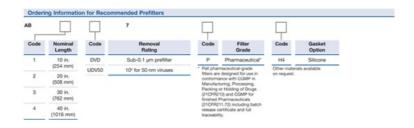
# Aqueous Extractables (NVR) per 10 in. (254 mm) Element\*\*\*

< 25 mg after autoclaving (water wet)

< 5 mg after installation integrity testing (30% IPA/water wet), water flush and autoclaving

## **Ordering Information**

<sup>\*\*\*</sup> In water at 20 – 25 °C ( 68 – 77 °F) after autoclaving



## **Contact Information**

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