

Ultipor® VF Grade DV20

VIRUS FILTER CARTRIDGES

Our Ultipor® VF grade DV20 filter cartridges are integrity testable, direct flow filters for size exclusion removal of viruses as small as 20 nm from biological solutions. The DV20 hydrophilic polyvinylidene fluoride (PVDF) microporous membrane also enables > 95% transmission of proteins up to 160 kDa. Using a standard single open-ended (SOE) AB sanitary style cartridge design, Ultipor VF DV20 filters achieve practical flows and pressure drops in process-scale purification of biopharmaceuticals, tissue and plasma derivatives and protein additives. Where required, suitable prefilters employing the same PVDF membrane material are available, simplifying process optimization and filtration system validation.

Key features

- Sanitary direct flow cartridges
- Robust size exclusion mechanism
- ≥ 3 log titer reduction (TR) for > 20 nm viruses ⁽¹⁾
- ≥ 6 log TR for > 50 nm viruses ⁽¹⁾
- Low binding for high protein yields
- High transmission of albumin and immunoglobulin G (IgG)
- Very low extractables
- Autoclavable and steamable *in situ* (steam-in-place [SIP])
- 100% integrity tested (correlated to virus retention)
- Manufactured for use in conformance with current good manufacturing practice (cGMP)
- Pharmaceutical 'P' optimized with certificate of test provided

⁽¹⁾ Claims based on challenges with bacteriophage (bacterial viruses) PP7 (25 nm) and PR772 (53 nm) in 1% bovine serum albumin in phosphate-buffered saline at pH 7.4, 20°C.

High quality standards

- Non-fiber-releasing per Code of Federal Regulations (CFR) Title 21

Biological tests:

- Meets USP biological reactivity, *in vivo*, for class VI-121°C plastics



Fig 1. 254mm (10 in.) Ultipor filter cartridge.

Effluent quality tests (P tests) ⁽²⁾

- Meets cleanliness per USP particulates in injectables
- Non-pyrogenic per USP bacterial endotoxins (<0.25 EU/mL)
- Meets total organic carbon and conductivity per USP purified water, pH per USP packaged waters

⁽²⁾ Confirmed for each filter lot

Technical specifications

Materials of construction

Membrane	Hydrophilic modified PVDF
Support and drainage layers	Polyester
Core, cage and endcaps	Polypropylene
Code 7 adapter	Polypropylene with encapsulated stainless steel reinforcing ring
O-rings	Silicone

Operating conditions

Recommended operating delta pressure (dP)	1 to 2 bard (14.5 to 29 psi)
Maximum differential pressure	6.2 bar (90 psi) during integrity testing 3.1 bar (45 psi) for continuous service 0.3 bar (4 psi) during steam sterilization

Autoclave/steaming

Autoclavable or steamable <i>in situ</i> for up to 3 cycles	Maximum temperature 125°C
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Aqueous extractables (NVR)

< 5 mg per 254 mm element, process-ready (after integrity testing in 30% IPA/water, water flush and autoclaving)

Filtration area (nominal)

1.0 m² per 254 mm element

Flow rate/differential pressure

15 L per h per 254 mm module at 2 bard (29 psi) for 1% bovine serum albumin (BSA) in phosphate-buffered saline at pH 7.4, 20°C

Forward flow integrity test

Diffusional flow integrity test, carried out by standard upstream or downstream methods

Correlated to >3 log TR for 25 nm PP7 phage and >6 log TR for 53 nm PR772 phage

Test wetting fluid: 30% IPA (20% ethanol values also available)

Test pressure: 5860 mbar (air test gas)

Our other direct flow virus filters and prefilters with hydrophilic PVDF membrane

Nominal filtration area	Product code
6 Log TR for 50 nm viruses	AB ⁽³⁾ UDV50 7 PH 4
Sub 0.1 µm virus prefilter	AB ⁽³⁾ DVD 7 PH 4
0.1 µm (+0.2 µm prefilter layer)	AB ⁽³⁾ DJL 7 PH 4
0.2 µm (double layer)	AB ⁽³⁾ DFL 7 PH 4
0.45 µm (+0.65 µm prefilter layer)	AB ⁽³⁾ DBL 7 PH 4

⁽³⁾ Length Code; 1 = 254 mm, 2 = 508 mm, 3 = 762 mm, 4 = 1016 mm Lengths are nominal. Please contact us for further details on these PVDF filters and prefilters.

Ordering information

Product	Length (nominal)	Product code
Ultipor DV20 filter, double o-ring with bayonet lock and finned cap, silicone seal	254 mm (10 in.)	AB1DV207PH4
Ultipor DV20 filter, double o-ring with bayonet lock and finned cap, silicone seal	508 mm (20 in.)	AB2DV207PH4
Ultipor DV20 filter, double o-ring with bayonet lock and finned cap, silicone seal	762 mm (30 in.)	AB3DV207PH4

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