

BorsoPTFE

BorsoPTFE Membrane Cartridge Filters

BorsoPTFE cartridges are manufactured using a highly hydrophobic ePTFE membrane. The enhanced ePTFE membrane offers exceptionally high gas flow rates at low pressure differentials (see graph). BorsoPTFE cartridges are recommended for sterile gas filtration and venting applications. The hydrophobic characteristics of the ePTFE membrane makes the BorsoPTFE filter cartridge particularly suitable for wet gas sterilising applications, such as fermenter air feed.

For solvent and aggressive chemical filtration applications, BorsoPTFE cartridges offer a wide range of chemical compatibility with high thermal stability. Suitable for the most demanding microfiltration applications, the cartridges can be used for the filtration of aggressive chemical solutions including acids, alkalis, solvents and etchants.

Applications

BorsoPTFE membrane cartridges meet the demanding filtration requirements of pharmaceutical, semiconductor and fine chemical manufacturers. They are suitable for a wide range of sterile venting and gas filtration applications, including the filtration of wet gases. They can also be used for the fine filtration of aggressive chemical solutions including acids, alkalis, solvents and etchants.



- **Sterile process gases**

The supply of sterile gas for critical applications in the pharmaceutical, biotechnology, food and beverage markets.

- **Sterile vents**

The safe sterile venting of processing vessels in pharmaceutical, fermentation, and food and beverage processes.

- **Fine chemicals and solvents**

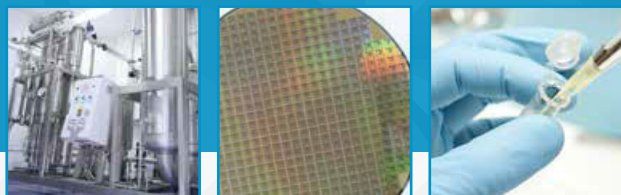
The removal of submicronic particles from processing chemicals and solvents.

- **Photoresists and developers**

The microfiltration of photoresists and developer solvents, susceptible to contamination and precipitation during manufacture, storage and processing.

- **Pure water supply systems**

For use in de-mineralised and de-ionised water systems, for the supply of ultra-pure water, for example in the semiconductor industry.



Features and Benefits

- **BorsoPTFE cartridges**

The ePTFE membrane is recognised as the world leading gas sterilising hydrophobic membrane. It is the membrane of choice in all Van Borselen BorsoPTFE filter cartridges.

- **Guaranteed microbial ratings in a liquid challenge**

BorsoPTFE cartridges are validated for bacterial removal in liquids in accordance with PDA, HIMA guidelines and ASTM F838-05, with a log reduction value >7. This test is stringent in comparison to an airborne particulate challenge test.

- **Bacterial spores and viruses**

The retention of bacterial spores and viruses carried in aerosols over extended time periods has been independently validated in tests carried out by the UK Health Protection Agency.

- **Flow ΔP characteristics**

The unique characteristics of the ePTFE membrane, combined with the construction of the BorsoPTFE filter cartridge, results in exceptionally high gas flow rates at low pressure differentials. These features result in lower energy consumption and fewer filter cartridges per system.

- **Steam sterilisation**

BorsoPTFE cartridges have been designed and validated to be repeatedly steam sterilised in-situ at temperatures of up to 135°C (275°F) for 100 cycles at 20 minutes per cycle. Steam sterilisation in the reverse direction for in excess of 70 cycles in a venting application, without loss of integrity, has been independently validated by customers.

- **Cartridge integrity and low TOC levels**

All BorsoPTFE cartridges are integrity tested and supplied clean, having been flushed with pure water. When required they can be pulse flushed with 18M Ω.cm pyrogen-free ultra-clean water.

- **Solvents and aggressive chemicals**

The exceptional chemical resistance of ePTFE allows BorsoPTFE filter cartridges to be compatible with aggressive chemical solutions, including strong acids, alkalis, solvents and etchants.

- **Full traceability**

All BorsoPTFE cartridges are individually and batch identified with a unique serial number. Each BorsoPTFE cartridge is supplied with a Certificate of Quality and an operating instruction leaflet.

- **Controlled manufacturing environment**

BorsoPTFE cartridges are manufactured in an ISO Cleanroom environment by fully gowned staff, minimising the risk of contamination.

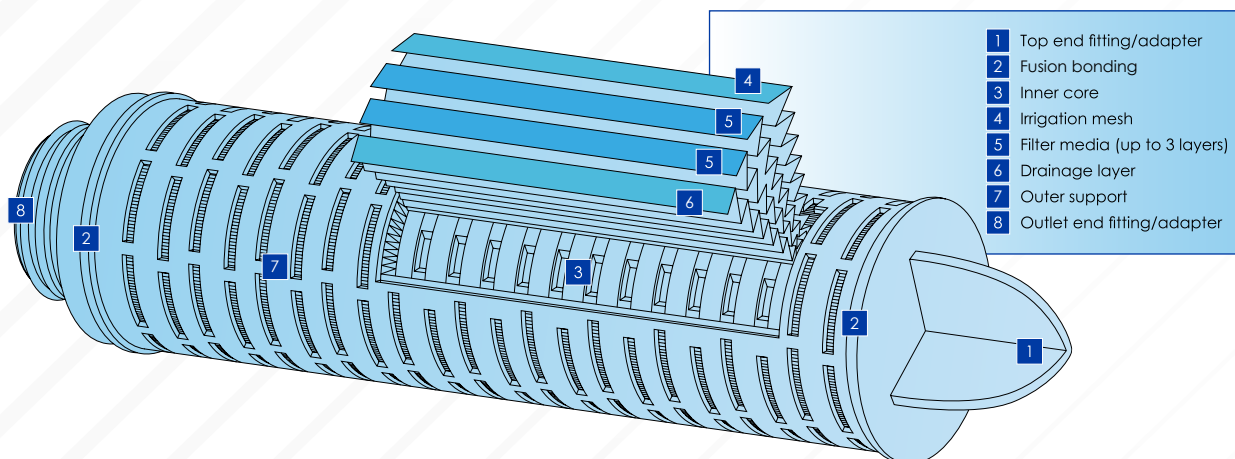
Cartridge Construction

BorsoPTFE cartridges are manufactured from a multilayer combination of irrigation mesh, filter membrane, membrane support and drainage material. BorsoPTFE cartridges have optimal pleat geometry to maximise the available filtration area and to ensure an efficient flow through the cartridges.

An all thermal fusion bonded assembly process eliminates the use of resins and binders.

Manufactured as standard with injection moulded polypropylene inner and outer supports, BorsoPTFE cartridges are designed with the strength necessary to withstand thermal stresses encountered during steam sterilisation and subsequent cooling. They can be steam sterilised and will retain total integrity following steaming at 135°C (275°F).

All components used in the construction of BorsoPTFE cartridges are FDA approved to 21CFR and meet or exceed the latest EC Directives for Food Contact.



Specification

Materials of Manufacture

Filter membrane	: ePTFE
Membrane support	: Polypropylene
Irrigation mesh (support)	: Polypropylene
Drainage layer	: Polypropylene
Inner core	: Polypropylene
Outer support	: Polypropylene
End fittings	: Polypropylene
Sealing	: Fusion bonding

Cartridge Dimensions (Nominal)

Diameter	: 70mm (2.8")
Length	: 1 module: BorsoPTFE Junior
	1 module: 254mm (10")
	2 modules: 508mm (20")
	3 modules: 762mm (30")
	4 modules: 1016mm (40")

Effective Filtration Area

Absolute Microbial Rating (in liquids)	Effective Filtration Area (each 254mm (10") module)
0.02, 0.1, 0.2 and 0.45µm	0.73m ² (7.8ft ²)

Cartridge Treatment

Standard	: Cleaned and flushed, without further treatment.
Rinsed	: Ultra-clean, pulse flushed to give a system resistivity of 18MΩ.cm.

Gaskets and O-Rings

Ethylene Propylene, FEP encapsulated, Silicone, Viton® or Nitrile.

Maximum Differential Pressure

Normal flow direction at:

20°C (68°F):	6.0bar (87psi)
80°C (176°F):	4.0bar (58psi)
100°C (212°F):	3.0bar (44psi)
120°C (248°F):	2.0bar (29psi)
125°C (257°F):	1.5bar (22psi)

Reverse flow direction at:

20°C (68°F):	2.1bar (30psi)
80°C (176°F):	1.0bar (15psi)
100°C (212°F):	0.5bar (7psi)

Operating Temperature

Maximum continuous : 80°C (176°F)

Sterilisation

In situ steam 100 x 20 minute cycles at 135°C (275°F) to 150 x 20 minute cycles at 125°C (257°F).

Extractables

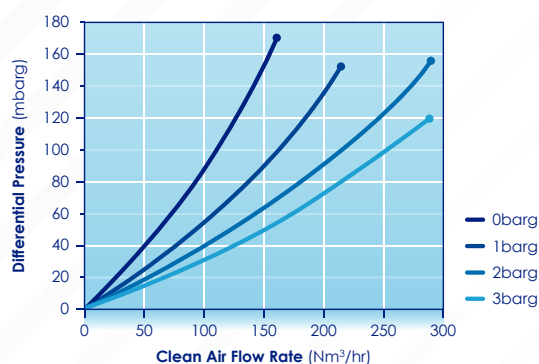
Minimum total extractables. Please refer to the BorsoPTFE Validation Guide.

Integrity Testing

Each BorsoPTFE module of every cartridge is individually integrity tested using the Diffusive Flow Test, which correlates to the HIMA and ASTM F838-05 bacterial challenge tests. Non-destructive integrity tests, such as Diffusive Flow, Water Intrusion, Pressure Hold and Bubble Point, can be performed by customers. Procedural details are available from Porvair.

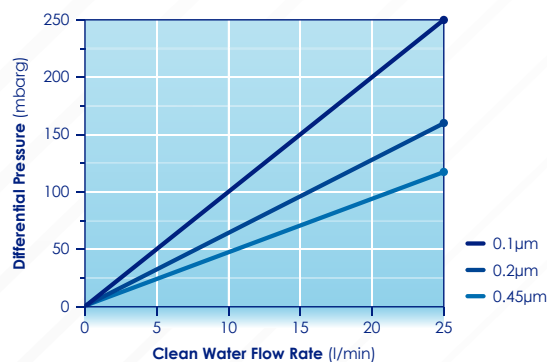
Clean Water Flow Rates

- Typical clean air flow rate:
A 254mm (10") BorsoPTFE single cartridge exhibits the flow-ΔP characteristics indicated below.



Clean Water Flow Rates

- Typical clean water flow rate:
A 254mm (10") BorsoPTFE single cartridge with 0.2µm microbial rating exhibits the flow-ΔP characteristics indicated below, for solutions with a viscosity of 1 centipoise.
- Other solutions:
For solutions with a viscosity of greater than 1 centipoise, multiply the indicated differential pressure by the viscosity in centipoise.



Range

Suitable for use in Van Borselen Filter housings and as direct replacements for existing cartridges, BorsoPTFE cartridges can be supplied with end fittings to suit most hardware installations without modification. They are available in single or multiple module units of 5, 10, 20, 30 and 40 inches, with a choice of four microbial ratings: 0.02, 0.1, 0.2 and 0.45 micron. BorsoPTFE Junior versions are also available.

Quality Assurance

BorsoPTFE cartridges are manufactured in an ISO Cleanroom environment by staff fully gowned to minimise any risk of contamination during production. All cartridges are integrity tested and, if required, pulse flushed with 18MΩ.cm pyrogen-free ultra-pure water to give rapid resistivity recovery rates and low TOC levels. As a further safeguard, every cartridge is individually and batch identified with a unique serial number, allowing users to maintain their own process records.

Registered to ISO 9001, Van Borselen Filter procedures are subject to high standards of quality assurance as demonstrated through its Drug Master File status.

Material Conformity and Validation

The bio-safety of all materials in the manufacture of BorsoPTFE cartridges is assured by FDA approval, USP Class VI and meets or exceeds the latest EC Directives for Food Contact

BorsoPTFE cartridges have been tested and shown to be 100% retentive in liquids in accordance with HIMA and ASTM F838-05 guidelines for the Brevundimonas diminuta challenge. The retention of Bacillus astrophaeus bacterial spores and MS-2 Coliphage viruses carried in aerosols over extended time periods has been independently validated in tests carried out by the UK Health Protection Agency. To guarantee the bacterial retention performance of every cartridge, a correlation has been made between the bacterial challenge and integrity tests. A comprehensive validation guide for BorsoPTFE cartridges is available on request

Chemical Compatibility

The BorsoPTFE materials of construction are compatible with a wide range of aggressive solvents and chemicals, however care must be taken to select the appropriate seal material. A comprehensive chemical compatibility guide is available. Since operating conditions vary considerably between applications, verification by the end user is recommended.

Filter Housings

Please contact a **Van Borselen Filters** representative for further information on our range of filter housings.

Van Borselen Filters

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VAN BORSELEN FILTERS

