

# Chemifil™

## Polypropylene Membrane Cartridge Filters

Chemifil™ cartridges are manufactured using a polypropylene membrane of uniform thickness and high voids, with a homogeneous structure and controlled pore sizes. Designed for the removal of sub-micron organic and inorganic particulate matter, the inherent structural stability of the membrane eliminates any risk of media migration and minimises the release of particles.

For solvent and aggressive chemical filtration applications, Chemifil™ cartridges offer a wide range of chemical compatibility. 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.

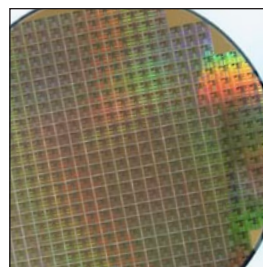
Chemifil™ cartridges can also be used for a wide range of sterile venting and gas filtration applications.



### Applications

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

- **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.
- **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.



## Features and Benefits

- Chemifil™ cartridges**  
 The all polypropylene cartridge construction makes it an ideal choice for the filtration of aggressive chemicals.
- Guaranteed microbial ratings**  
 Chemifil™ cartridges are validated for bacterial removal according to HIMA guidelines and ASTM F838-05, with a log reduction value >7.
- Flow ΔP characteristics**  
 Chemifil™ filter cartridges provide high flow rates at low pressure differentials. These features result in lower energy consumption and fewer filter cartridges per system.
- Steam sterilisation**  
 Chemifil™ cartridges have been designed and validated to be repeatedly steam sterilised in-situ at temperatures of 125°C (257°F) for 100 cycles at 30 minutes per cycle.
- Cartridge integrity and low TOC levels**  
 All Chemifil™ cartridges are integrity tested and supplied clean, having been flushed with pure water. When required they can be pulse flushed with 18MΩ.cm pyrogen-free ultra-clean water.
- Solvents and aggressive chemicals**  
 The exceptional chemical resistance of polypropylene allows Chemifil™ filter cartridges to be compatible with aggressive chemical solutions, including strong acids, alkalis, solvents and etchants.
- Full traceability**  
 All Chemifil™ cartridges are individually and batch identified with a unique serial number. Each Chemifil™ cartridge is supplied with a Certificate of Quality and an operating instruction leaflet.

- Controlled manufacturing environment**

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

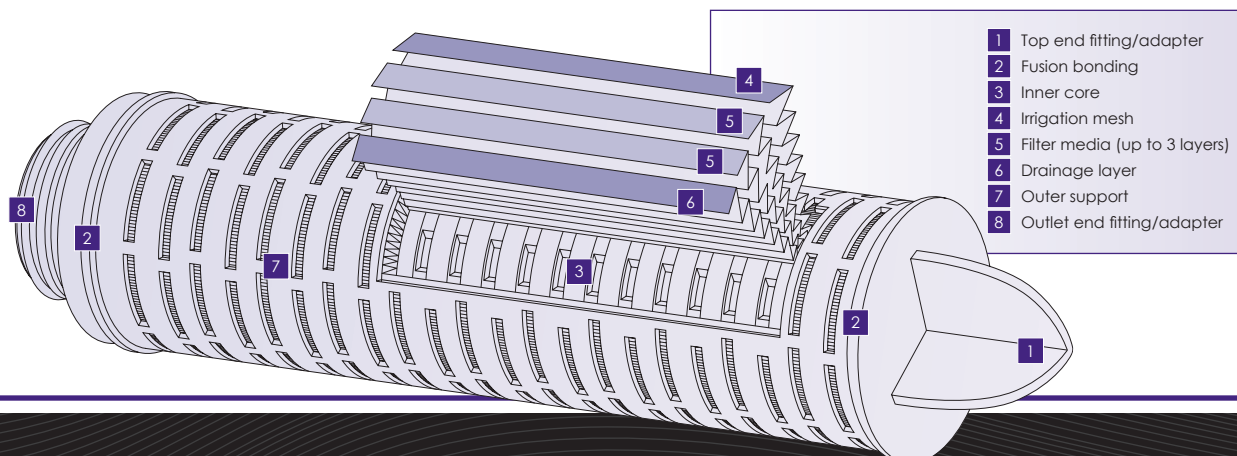
### Cartridge Construction

Chemifil™ cartridges are manufactured from a multi-layer combination of irrigation mesh, filter membrane, membrane support and drainage material. Chemifil™ 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, Chemifil™ 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 125°C (257°F).

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



# Specifications

## Materials of Manufacture

Filter membrane:	Polypropylene
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:	Chemifil™ Junior
	1 module:	254mm (10")
	2 modules:	508mm (20")
	3 modules:	762mm (30")
	4 modules:	1016mm (40")

## Effective Filtration Area

Absolute Microbial Rating	Effective Filtration Area (each 254mm (10") module)
0.1 and 0.2µm	0.66m <sup>2</sup> (7.1ft <sup>2</sup> )

## 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, PTFE encapsulated, Silicone or Nitrile.

## Maximum Differential Pressure

Normal flow direction at:	
20°C (68°F):	6.0bar (87lb/in <sup>2</sup> )
80°C (176°F):	4.0bar (58lb/in <sup>2</sup> )
100°C (212°F):	3.0bar (43lb/in <sup>2</sup> )
120°C (248°F):	2.0bar (29lb/in <sup>2</sup> )
125°C (257°F):	1.5bar (22lb/in <sup>2</sup> )
Reverse flow direction at:	
20°C (68°F):	2.1bar (30lb/in <sup>2</sup> )
80°C (176°F):	1.0bar (15lb/in <sup>2</sup> )
100°C (212°F):	0.5bar (7lb/in <sup>2</sup> )

## Operating Temperature

Maximum continuous:	80°C (176°F)
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## Sterilisation

*In situ* steam 100 x 30 minute cycles at 125°C (257°F)

## Extractables

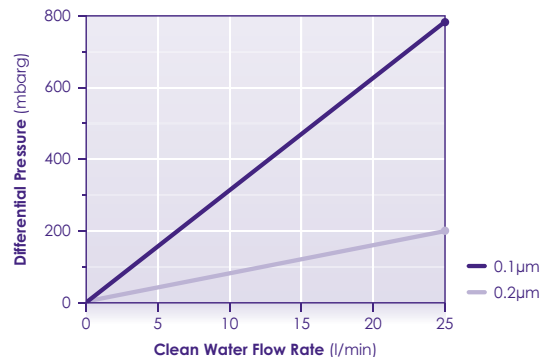
Minimum total extractables. Please refer to the Chemifil™ Validation Guide.

## Integrity Testing

Each Chemifil™ 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**.

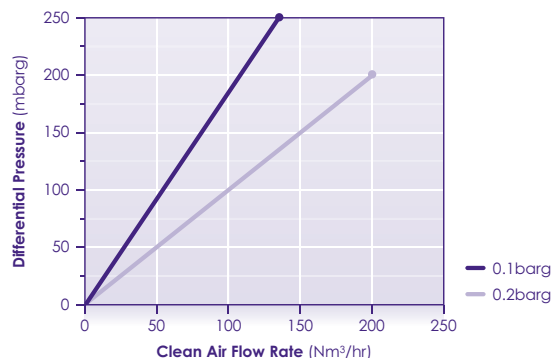
## Clean Water Flow Rates

- Typical clean water flow rate:  
A 254mm (10") Chemifil™ single cartridge exhibits the flow- $\Delta P$  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.



## Gas Flow Rates

- Typical clean air flow rate:  
A 254mm (10") Chemifil™ single cartridge exhibits the flow- $\Delta P$  characteristics indicated below.



## Additional Information

### Range

Suitable for use in **Porvair** filter housings and as direct replacements for existing cartridges, Chemifil™ 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 two microbial ratings: 0.1 and 0.2 micron. Chemifil™ Junior versions are also available.

### Quality Assurance

Chemifil™ 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, **Porvair Filtration Group** 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 Chemifil™ cartridges is assured by FDA approval, USP Class VI and meets or exceeds the latest EC Directives for Food Contact.

Chemifil™ 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. 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 Chemifil™ cartridges is available on request.

### Chemical Compatibility

The Chemifil™ 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 **Porvair Filtration Group** representative for further information on our range of filter housings.

**porvair**  
filtration group

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