

Polyfil™ II

Absolute Rated Pleated Polypropylene Cartridge Filters

A range of absolute rated cartridge filters from Porvair Filtration Group, featuring the latest developments in meltblown polypropylene filter media technology, Polyfil™ II cartridges are based on a robust all polypropylene construction, offering removal ratings from 0.5 to 105 micron absolute.

Polyfil™ II cartridges are suitable for absolute removal of unwanted particulates and for prefiltration to membrane filters.

The graded multi-layer polypropylene media provide prefiltration of the process fluid prior to the absolute rated final layer. The unique design of the Polyfil™ II cartridges helps to achieve lower running costs and a smaller process footprint.

The Polyfil™ II are also highly resistant to integrity failure caused by steam sterilisation and have excellent chemical compatibility characteristics.

They are suitable for applications ranging from bioburden reduction and the clarification of a wide range of process liquids and end products.



Applications

Polyfil™ II cartridges provide absolute filtration where reproducibility and consistency of performance are critical. Suitable for the filtration of aqueous and organic liquids, Polyfil™ II cartridges can be used as prefilters or final filters in the following applications:

- **Pharmaceuticals and Bioprocessing**
The batch preparation of intermediates used in the manufacture of pharmaceutical and bioprocessed products. Used as prefilters to extend the life of membrane filters.
- **Foods and Beverages**
The clarification of beers, wines and spirits to a clear and bright finish without affecting taste or colour.
- **Inks and coatings**
For removal of agglomerates and gels with minimal loss of product.
- **Fine Chemicals**
The filtration of high grade chemicals including solvents, reagents, photographic emulsions and plating solutions.
- **Cosmetics**
The clarification of process water and intermediates for the finished product.
- **Process Water Systems**
The filtration of process water installations for removal of general contamination and resin fines.



Features and Benefits

- Polyfil™ II cartridges**
 Extensive research and selection of the latest and most advanced polypropylene meltblown microfibre filter media, results in improved performance, leading to extended filter life at a given efficiency.
- Graded multi-layer media**
 The multi-layer media structure provides prefiltration of the process fluid prior to the absolute rated final layer. This combination provides economy of use and a smaller process footprint.
- High filtration area**
 Large surface area for low clean pressure drop.
- Guaranteed removal ratings**
 Polyfil™ II cartridges are validated using the recognised industry standard modified OSU-F2 single pass test to Beta 5000 (99.98% efficiency).
- Suitable for steam and hot water sanitisation**
 Polyfil™ II cartridges are resistant to repeat steam sterilisation up to 135°C (275°F) and hot water cycles at up to 90°C (194°F).
- Environmentally friendly**
 Polyfil™ II filters are environmentally friendly, all spent cartridges can be readily incinerated to trace ash.
- Full traceability**
 All Polyfil™ II cartridges are identified with a batch serial number. Each Polyfil™ II cartridge is supplied with a Certificate of Quality and an operating instruction leaflet.
- Controlled manufacturing environment**
 Polyfil™ II cartridges are manufactured in an ISO Cleanroom environment by fully gowned staff, minimising the risk of contamination.

Cartridge Construction

The high quality robust all polypropylene construction of Polyfil™ II cartridges, allows for excellent chemical compatibility with a wide range of fluids.

The meltblown polypropylene media provides a bonded matrix thus eliminating fibre migration.

The inherent structural stability of the Polyfil™ II, prevents 'channelling' and avoids the risk of particle unloading even under impulse conditions.

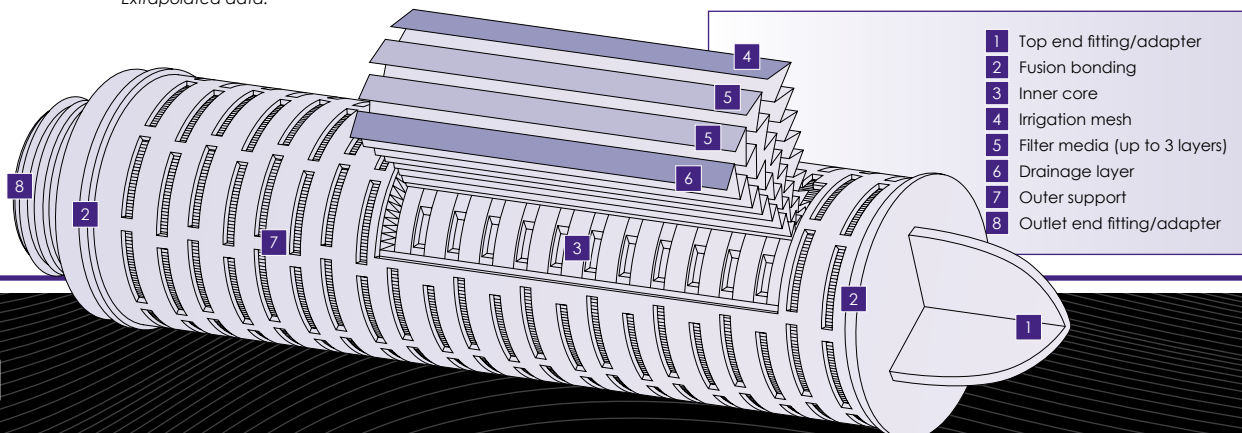
The multi-layer combination of filter media, irrigation mesh and drainage material carefully pleated and thermally bonded maximises the media area and ensures an efficient flow throughout the cartridge.

The Polyfil™ II fusion bonded construction ensures cartridge integrity. No surfactants or bonding agents are used, minimising extractables.

Table 1 Particle Retention Rating

Code	Pore Rating (microns)	Absolute Rating 99.98% Beta 5000 (microns)	Nominal Rating 99% Beta 100 (microns)	Nominal Rating 90.00% Beta 10 (microns)
PP5	0.5	0.5	0.1*	<0.1
PP8	0.8	0.8	0.3	0.2*
P01	1	1	0.4	0.2*
P02	2	2	1.1	0.4
P03	3	3	0.9	0.45
P05	5	5	1.5	0.5
P07	7	7	2	0.6
P10	10	10	4	1
P15	15	15	7.5	1.5
P20	20	20	8	2
P30	30	30	12.5	6
P40	40	40	15	8
P60	60	60	45	25
P90	90	90	65	30
P105	105	105	95	75

* Extrapolated data.



Specifications

Materials of Manufacture

Filter media:	Polypropylene
Support layers:	Polypropylene
Inner core:	Polypropylene
Outer support:	Polypropylene
End fittings:	Polypropylene
Support ring:	Stainless steel

Cartridge Dimensions (Nominal)

Diameter:	70mm (2.8")
Length:	1 module (short): 125mm (5")
	1 module: 254mm (10"),
	508mm (20")
	2 modules: 762mm (30"),
	1016mm (40")

Effective Filtration Area

Up to 0.6m² per 250mm module (depending on pore rating).

Cartridge Treatment

Standard:	Cleaned without further treatment.
Flushed:	Flushed with pyrogen-free water.
Rinsed:	Ultra-clean, pulse flushed to give a system resistivity of 18MΩ.cm.

Gaskets and O-Rings

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

Maximum Differential Pressure

Normal flow direction at:	
20°C (68°F):	6.0 bar (87psi)
80°C (176°F):	4.0 bar (58psi)
100°C (212°F):	3.0 bar (44psi)
120°C (248°F):	2.0 bar (29psi)
125°C (257°F):	1.5 bar (22psi)
Reverse flow direction at:	
20°C (68°F):	2.1 bar (30psi)
80°C (176°F):	1.0 bar (15psi)
100°C (212°F):	0.5 bar (7psi)

Operating Temperature

Maximum continuous: 80°C (176°F)

Sterilisation

In situ steam 80 x 30 minute cycles at 135°C (275°F).
Hot water 200 x 20 minute cycles at 85-90°C (185-194°F).

Extractables

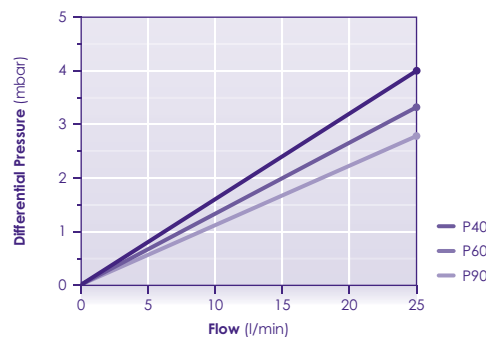
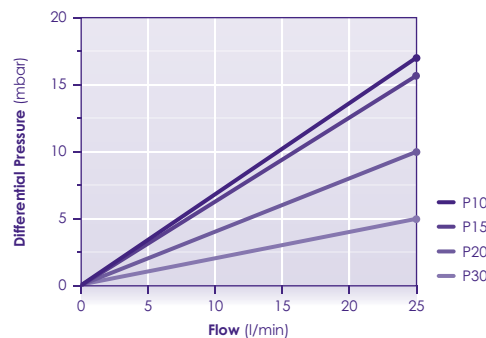
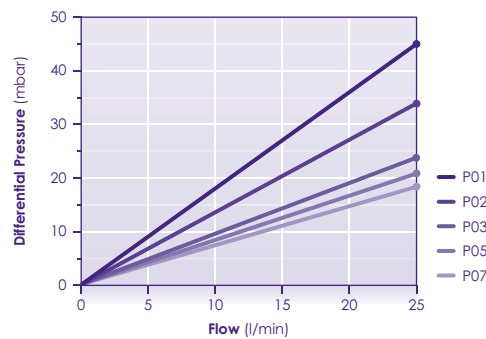
Minimum total extractables. Please refer to the Polyfil™ II Validation Guide.

Integrity Testing

Polyfil™ II filter cartridges are batch tested for integrity using the Bubble Point Test. Procedural details are available from **Porvair**.

Clean Water Flow Rates

- Typical clean water flow rate:
A 254mm (10") Polyfil™ II single cartridge 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.



Additional Information

Range

Suitable for use in **Porvair** filter housings and as direct replacements for existing cartridges, Polyfil™ II 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, and in a choice of removal ratings from 0.5 to 105 micron. Polyfil™ II Junior versions are also available. Each cartridge is supplied with all necessary seals or O-rings to ensure chemical compatibility.

Quality Assurance

Polyfil™ II cartridges are manufactured in an ISO Cleanroom environment by staff fully gowned to minimise any risk of contamination during production. Polyfil™ II cartridges are batch tested and flushed with pyrogen-free ultra-pure water. As a further safeguard, every cartridge is identified with a batch 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 used in the manufacture of Polyfil™ II cartridges is assured by FDA approval, USP Class VI and meets or exceeds the latest EC Directives for Food Contact.

A comprehensive validation guide for Polyfil™ II cartridges is available on request.

Chemical Compatibility

The Polyfil™ II materials of construction are compatible with a wide range of chemicals and solvents, 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

Porvair Filtration Group Ltd.

Queensway
Stem Lane, New Milton,
Hampshire, BH25 5NN, UK
Tel: +44 (0)1425 612010
Email: info@porvairfiltration.com

Porvair Filtration Group Inc.

301 Business Lane
Ashland, Virginia 23005, USA
Tel: +1 804 550 1600
Email: infoUS@porvairfiltration.com

Porvair Filtration Group

Chengdong Area
Square Industrial Park, North District
Xiaonan Economic Development Zone
Xiaogan, 432000, China
Tel: +86 (0)712 2878955
Email: infoCN@porvairfiltration.com

www.porvairfiltration.com

Porvair Filtration India PVT. Ltd.

Gangotri Glacier Annex, Kavesar
Opposite Vijay Nagari, Off Ghodbunder Road
Thane (W), 400607, India
Tel: +91 22 25 976464 / +91 22 25 976465
Email: infoIN@porvairfiltration.com

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