

Polyfil™ Junior

Absolute Rated Pleated Polypropylene Cartridge Filters Small-Scale Applications

A range of absolute rated cartridge filters from Porvair Filtration Group, designed for retrofitting into existing Junior-style housings. Featuring the latest developments in meltblown polypropylene filter media technology, Polyfil™ Junior cartridges are based on a robust all polypropylene construction, offering removal ratings from 0.5 to 5 micron absolute.

Polyfil™ Junior 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™ Junior cartridges helps to achieve lower running costs and a smaller process footprint.

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

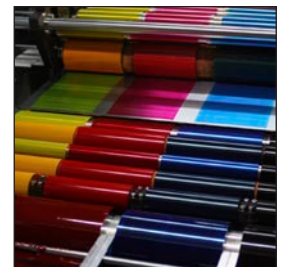
They are suitable for applications ranging from bioburden reduction and the clarification of a wide range of process liquids and end products.



Applications

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

- **Small-scale biopharmaceuticals**
For the prefiltration of ingredients, intermediates, make-up waters and final products, including clarification and bioburden reduction.
- **Ophthalmic solutions**
Prefiltration for the protection and longevity of final membrane filters.
- **Electronics and semiconductors**
For the prefiltration of process water and chemicals, including solvents, developers and photoresists.
- **Small-scale fine chemicals**
For the clarification of a wide range of process chemicals.
- **Pilot-scale studies**
For the scale-up and optimisation of prefiltration in sterile filtration processes.
- **Inks and coatings**
For removal of agglomerates and gels with minimal loss of product.



Features and Benefits

- Polyfil™ Junior 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™ Junior 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™ Junior J-style cartridges are resistant to repeat steam sterilisation up to 135°C (275°F) and hot water cycles at up to 90°C (194°F). S-style cartridges are designed for sterilisation by autoclave.
- Environmentally friendly**
 Polyfil™ Junior filters are environmentally friendly, all spent cartridges can be readily incinerated to trace ash.
- Full traceability**
 All Polyfil™ Junior cartridges are identified with a batch serial number. Each Polyfil™ Junior cartridge is supplied with a Certificate of Quality and an operating instruction leaflet.
- Controlled manufacturing environment**
 Polyfil™ Junior 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™ Junior cartridges, allows for excellent chemical compatibility with a wide range of fluids.

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

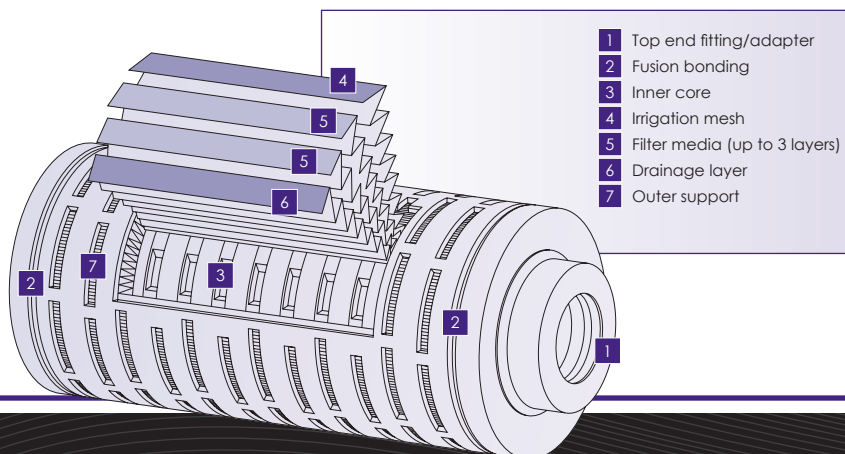
The inherent structural stability of the Polyfil™ Junior, prevents 'channelling' and avoids the risk of particle unloading even under impulse conditions.

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™ Junior 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 99.90% Beta 1000 (microns)	Nominal Rating 99% Beta 100 (microns)
PP5	0.5	0.5	0.45	0.35
PP8	0.8	0.8	0.6	0.4
P01	1	1	0.9	0.55
P02	2	2	1.7	1.2
P05	5	5	2.6	1.25
P10	10	10	8	7.5
P20	20	17.5	12.5	10
P40	40	35	30	20



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:	77.5mm (2.5") 136mm (5")

Effective Filtration Area

Up to 0.15m² (1.6ft²) per 136mm 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

J-style:	Silicone (other materials are available on request).
S-style:	Not supplied.

Maximum Differential Pressure

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

Operating Temperature

Maximum continuous: 80°C (176°F)

Sterilisation

J-style:	<i>In situ</i> steam 70 x 25 minute cycles at 125°C (257°F).
S-style:	Autoclave 100 x 25 minute cycles at 125°C (257°F).

Extractables

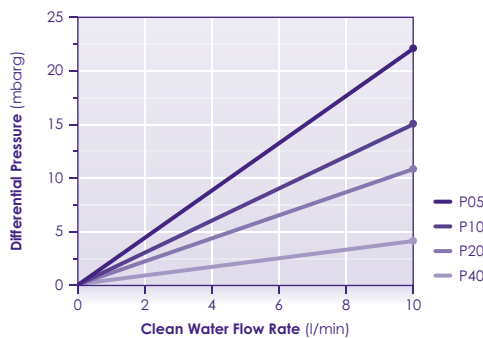
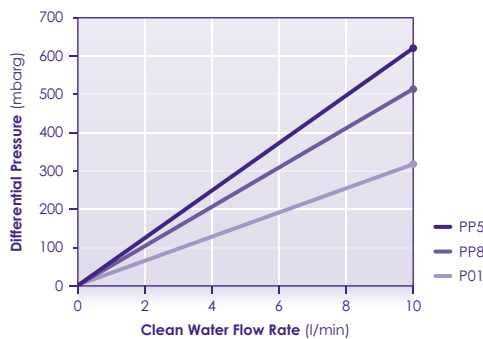
Minimum total extractables. Please refer to the Polyfil™ II Validation Guide.

Integrity Testing

Polyfil™ Junior 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 136mm (5") Polyfil™ Junior 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

Polyfil™ Junior cartridges are designed for retrofitting into existing Junior-style housings as direct replacements for existing cartridges. Available in two formats of 2.5 and 5 inch lengths, and a choice of five microbial ratings: 0.5, 0.8, 1, 2 and 5 micron:

- J-style, a single open-ended element with a single internal o-ring seal on the downstream end cap.
- S-style, a single open-ended element incorporating an integral flange on the downstream end cap.

Quality Assurance

Polyfil™ Junior cartridges are manufactured in an ISO Cleanroom environment by staff fully gowned to minimise any risk of contamination during production. Polyfil™ Junior 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™ Junior 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™ Junior 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.

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