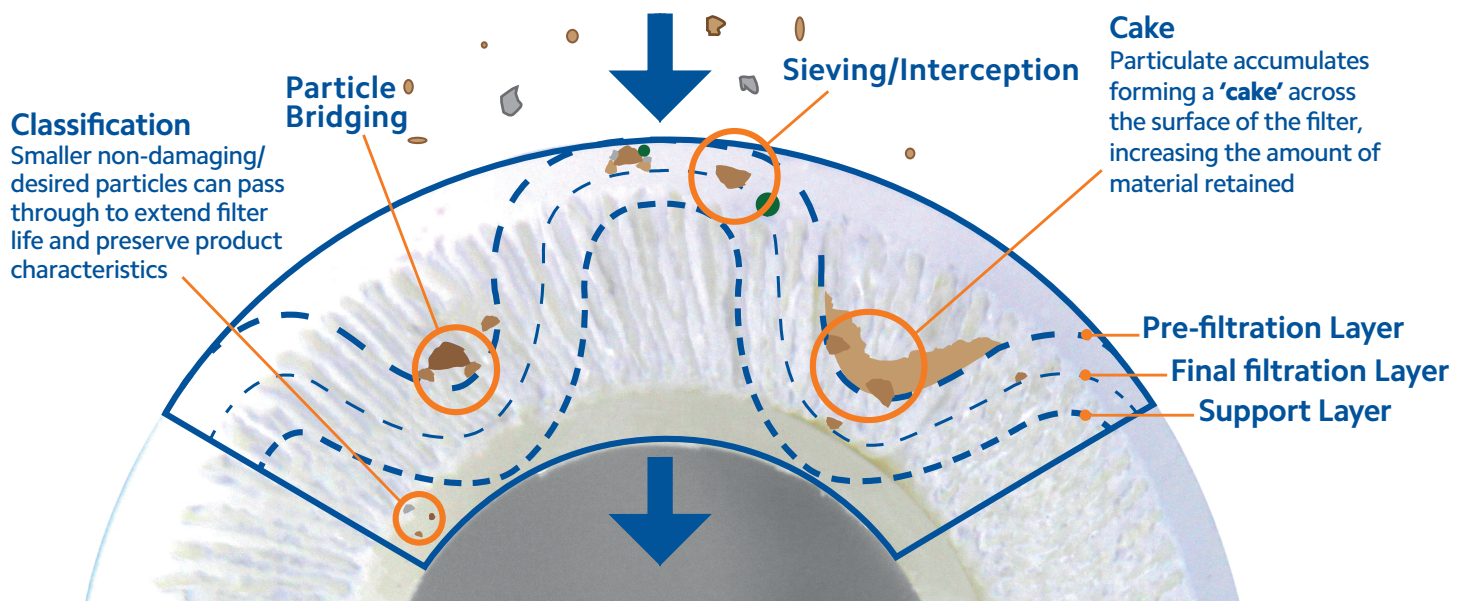


What is Surface Filtration?

Pleated filters are widely used as effective surface filtration due to their excellent flow rates and high efficiency.

Pleating dramatically increases available surface area whilst maintaining high dirt loading and low pressure drops. Much of the media used in pleated cartridges also has some depth characteristics, thanks to its multi-layer construction, thereby aiding particle retention and classification.

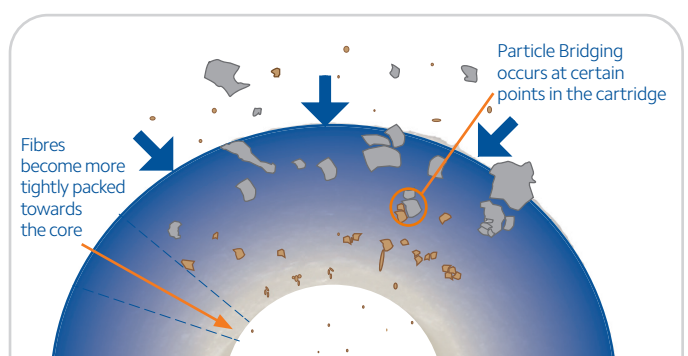


Surface Filtration Technology

Pleated filters are the ideal technology of choice over depth filtration for retention of known or uniformly sized particles.

The Standard (SPE) range of cartridges features a single layer media, which filters on the principles of direct interception and 'caking' where multiple particles accumulate across the media pore. Over time this leads to partial closure, which can increase efficiency and the chance to target finer particles.

The entire Premier range includes support and pre-filtration layers providing an element of depth characteristics. These layers retain larger particles, ensuring the specified micron rating of the cartridge can be utilised for exacting classification.



Depth Filtration Technology

The fibres become more tightly packed throughout a depth cartridge, progressively reducing the size of particles that can pass through the filter.

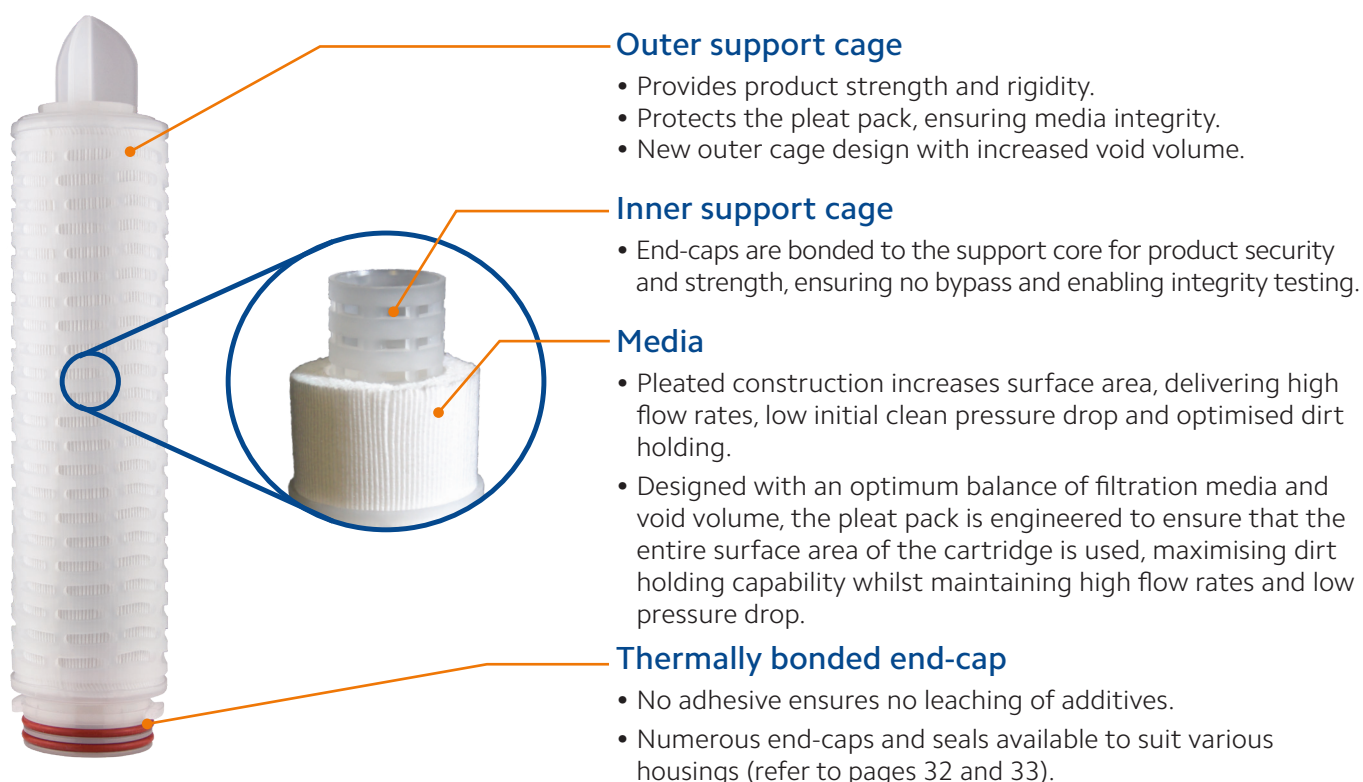
Advantage: Economic to produce.

Disadvantage: Higher pressure drop means a shorter service life compared to pleated cartridges.

Premier Pleat Construction

The Premier Pleat, Crypto and Bubble Point ranges are all constructed with a rigid inner and outer polypropylene core. Offering protection for the pleat pack, the cage also allows a variety of end-caps to be thermally bonded to the cartridge. This secure construction technique prevents bypass, creating a seal strong enough for repeated steam or chemical sterilisation as well as cartridge integrity testing.

Developments in 2018 see a new outer cage design that increases its void volume by over 10%. Whilst maintaining cartridge strength, increasing the open area allows a more uniform distribution of flow across the entire pleat pack ensuring low pressure drop and maximised dirt holding capacity.



Identification

Lot Coded

- Laser etched lot code on cartridge
- Traceable back to raw materials

QR Code

- Links directly to further information for each product

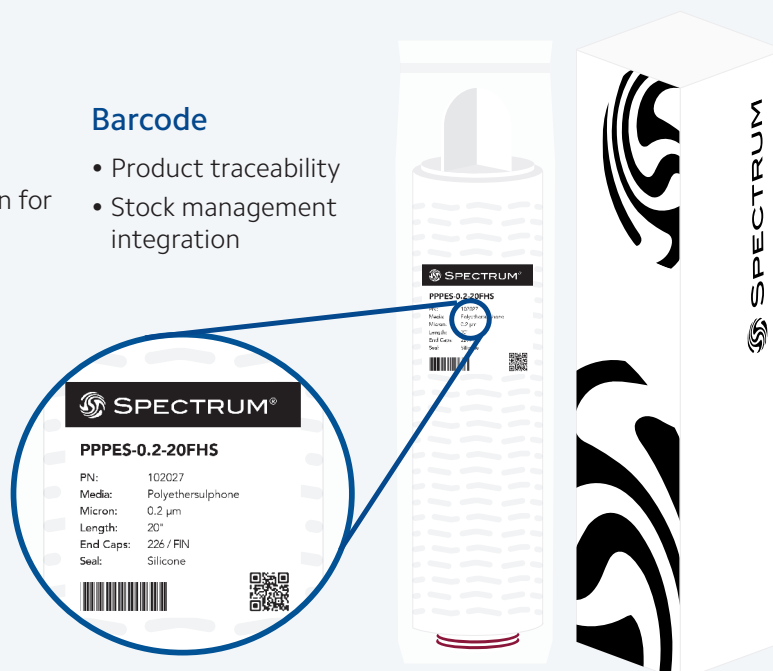
Barcode

- Product traceability
- Stock management integration

Packaging

Four Protective Layers

- Vacuum sealed inner packaging
- Tough outer polybag layer provides additional protection
- Individual product boxes
- Heavy duty outer carton



Absolute Bacterial Removal



 **SPECTRUM**

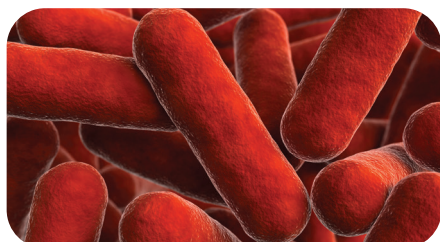
Premier Pleat Polyethersulfone

0.05-0.65 micron

Manufactured using German engineered and produced high quality polyethersulfone media, the SPECTRUM PPES provides assured and certified absolute bacteria retention characteristics. Lot coded and 100% individually tested, the high surface area media contains no adhesives or binders, with low extractable content offering consistent final product quality. Meeting industry standard requirements, the cartridges are WRAS approved, FDA Title 21 Compliant and meet USP Class VI-121°C Plastics.

Absolute rated polyethersulfone media has become the recognised requirement for bacterial reduction, offering a certified and proven method of controlling product specification and protection.

The asymmetric pore structure of the SPECTRUM PPPES utilises a unique manufacturing technique to develop multifunctional characteristics into the media. With pore sizes of 0.05 to 0.65 micron, the PPPES meets the requirements of many varied applications.



Bacteria Protection

Certified to Log 7 reduction of *Brevundimonas diminuta*, the 0.2 micron PPPES is an effective barrier filter for various bacterial applications.



Food Preparation

As a physical barrier, PES media is commonly installed to protect against varying bacteria challenges in the filtration of flavourings, essences and colourants.



Medical

Once a microorganism becomes dissociated it breaks down, releasing endotoxins. These can be removed using absolute 0.05 micron membrane filtration.



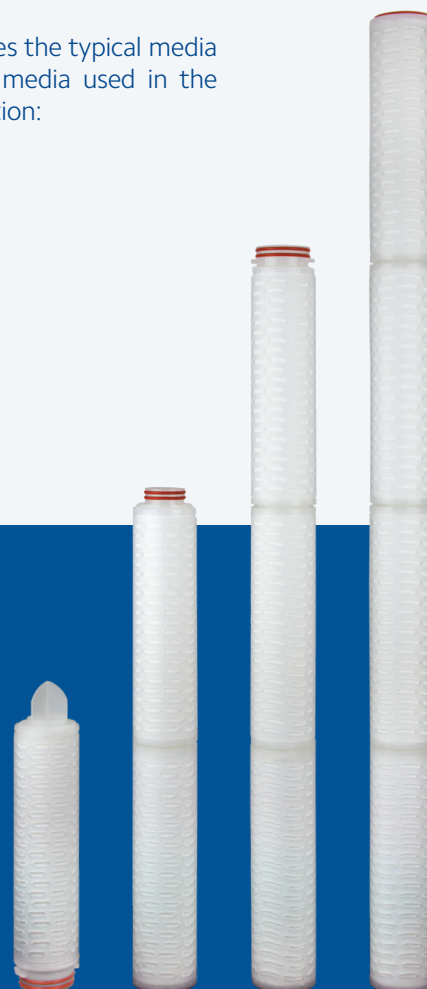
Quality Assurance Certificate

Each PPPES cartridge is shipped with a Quality Assurance Certificate, which provides the typical media properties and membrane performance characteristics of the polyethersulfone media used in the construction of the cartridge. The certificate contains the following typical information:

- Materials of construction
- Bacteria retention
- Bubble point values
- Diffusional flow rate
- Membrane performance characteristics

Hygiene and Traceability

- 100% integrity tested and manufactured in a clean room environment to protect against unwanted contaminants.
- Quality Assurance Certificate supplied with every cartridge.
- Lot coded on the polypropylene cage for tracking and tracing.
- Each cartridge has double layered packaging. The inner plastic wrap is vacuum sealed and a tough outer layer provides further protection and cleanliness.
- Individually labelled and boxed for security and ease of product identification.



Asymmetric Pore Construction

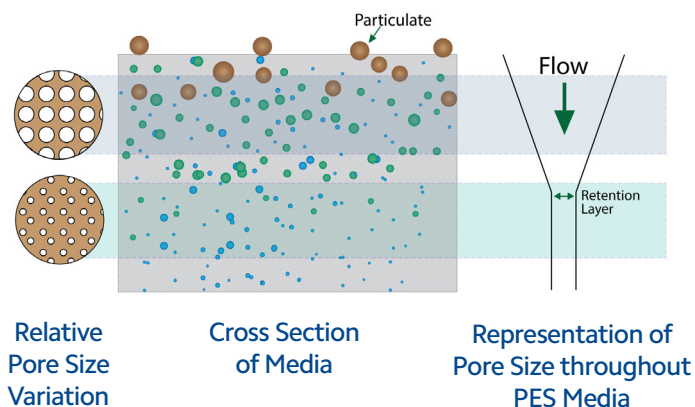
The success of the SPECTRUM PPES resides in its multifunctional membrane characteristics, including excellent wetting out properties, proven fluid throughput and exacting contaminant removal.

Offering a significant financial saving over targeted PES media, such as beverage and electronics grades, the PPES range uses an asymmetric construction. This provides a balanced absolute rated cartridge, with high initial flow rates and lower clean pressure drop due to its naturally hydrophilic properties, as well as relatively high physical strength.

The even distributed pore size of the PPES range, creates an asymmetric structure that provides a perfect blend between a membrane cartridge with highly selective classification characteristics and one that ensures enhanced retention over time.



Cross-section of PPES Membrane Structure



PPES Quality from Start to Finish

Utilising even the most advanced polyethersulfone media would be ineffective if the cartridge manufacturing process did not meet the required standards and quality controls. SPECTRUM's meticulous and exacting specification means that every individual cartridge is subject to a rigorous multi-stage quality check.

1 Raw Material Check

The flat sheet PES membrane's physical and performance characteristics are analysed and validated, including:

- Pore size
- Media thickness
- Tensile strength
- Burst pressure

2 Performance Validation

Both the permeability and bubble point are determined and compared to the cartridges stated specification.

3 Cartridge Construction

The tested PES membrane flat sheet is combined with two layers of polypropylene media, in a clean room environment, to provide additional media strength and support.

4 Final Checks

- Before shipping, each individual element is again 100% quality checked.
- Diffusional flow and bubble point are verified to ensure that the cartridges perform to the expected criteria.
- Cartridges are laser etched with the lot code, vacuum sealed and bagged again to ensure complete cartridge traceability and cleanliness.

Efficiency

		Bacteria Retention Efficiency				
		0.05 μm	0.1 μm	0.2 μm	0.45 μm	0.65 μm
Cartridge Micron Rating	0.05 μm	99.99998%	99.99999%	99.999998%	99.999999%	99.9999996%
	0.1 μm	99.9998%	99.99996%	99.99999%	99.999998%	99.999999%
	0.2 μm	99.999%	99.987%	99.9999%	99.999992%	99.999998%
	0.45 μm	99.98%	99.981%	99.992%	99.99999%	99.999992%
	0.65 μm	99.9%	99.91%	99.98%	99.9999%	99.99999%

Bacteria retention efficiencies are determined using *Brevundimonas diminuta* live bacteria dispersed in water at a constant flow rate up to a differential pressure of 2.75 bar.



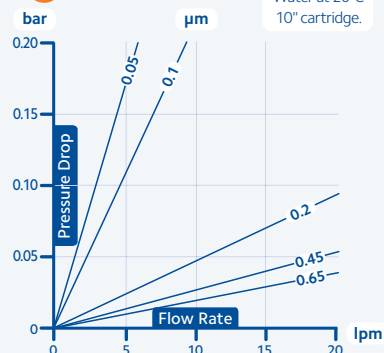
Key Features

- Manufactured from high quality lot controlled, integrity tested media
- Suitable for repeated sterilisation (20 x 30 minute cycles at 121°C)
- Absolute rated for reliable microbiological retention rates up to 99.99999% (*Brevundimonas diminuta*)



Flow Rate

Water at 20°C
10" cartridge.



Materials of Construction

Filter Media

Polyethersulfone

Core

Polypropylene

Support Media

Polypropylene

Cage

Polypropylene

End-cap

Polypropylene
Polypropylene with PSU ring insert (Z)
Polypropylene with SS ring insert (Q)

Seal

Silicone (as standard)



Configurations

Micron (µm)

0.05 0.1 0.2 0.45 0.65

Length (")

9¾ 10 20 30 40

End-cap

AA CG EG EH FG FH MG
MH QG ZH

Seals

S = Silicone E = EPDM V = Viton®



Specification

Efficiency

99.99999% (Log 7)

Max. Operating Temperature

82°C

Max. Sterilising Cycles

30 x 30 min cycles at 125°C. Requires compatible end-caps Q (222) and Z (226).

Surface Area

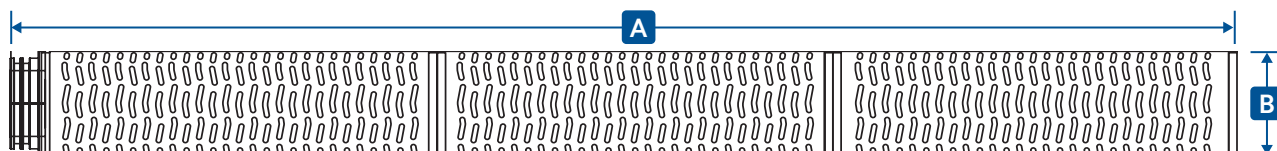
0.55 m² per 10"

Max. Operating Pressure Differential

6 bar at 21°C



Dimensions



	A (mm)					B (mm)
Length	AA	CG	EG/FG/MG/	QG	EH/FH/MH/ZH	
9¾"	248	-	-	-	-	70
10"	-	241	270	276	310	70
20"	508	506	520	526	560	70
30"	750	-	770	776	810	70
40"	1000	-	1020	1026	1060	70

Part Number

Code	Micron	Length	End-cap	Seal
PPES	0.05, 0.1, 0.2, 0.45, 0.65	9¾	AA	S, E, V
		10, 20, 30, 40	CG, EG, EH, FG, FH, MG, MH, QG, ZH	

e.g. PPES-0.2-10CGS

