Pleated Filtration

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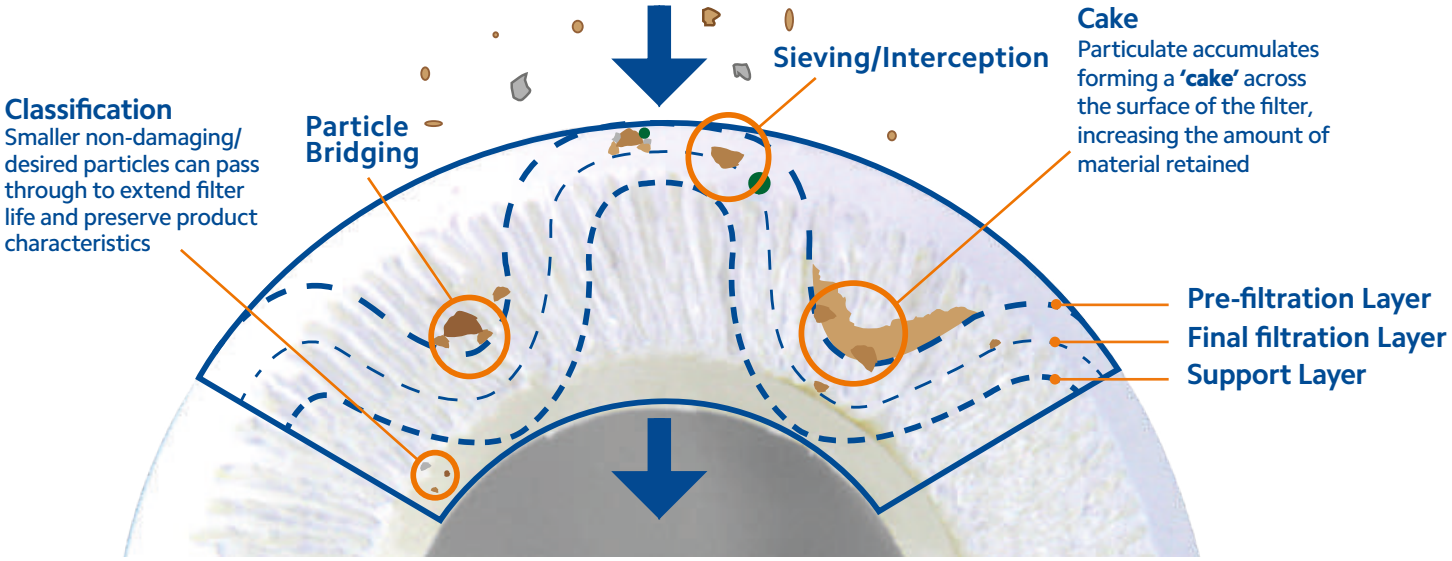
Pleated Technology

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.

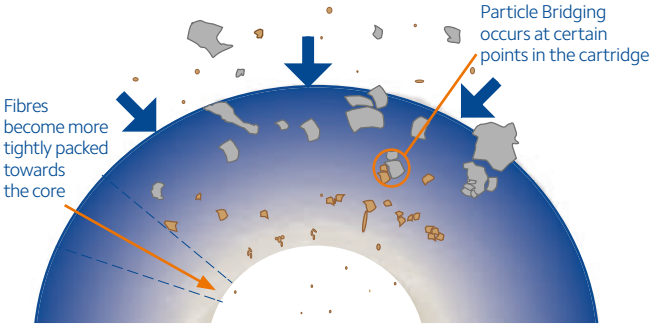


Surface Filtration Technology

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.

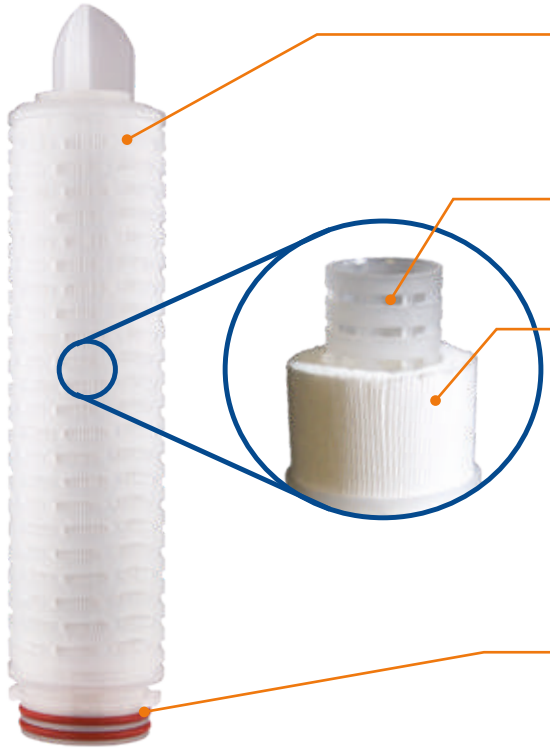
Advantage: Economic to produce.

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 core and outer polypropylene cage. 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.



Outer support cage

- Provides product strength and rigidity.
- Protects the pleat pack, ensuring media integrity.
- New outer cage design with increased void volume.

Inner support cage

- End-caps are bonded to the support core for product security and strength, ensuring no bypass and enabling integrity testing.

Media

- Pleated construction increases surface area, delivering high flow rates, low initial clean pressure drop and optimised dirt holding.
- Designed with an optimum balance of filtration media and void volume, the pleat pack is engineered to ensure that the entire surface area of the cartridge is used.

Thermally bonded end-cap

- No adhesive ensures no leaching of additives.
- Numerous end-caps and seals available to suit various housings (refer to pages 32 and 33).

Identification

Lot Coded

- Laser etched lot code on membrane and Cryto cartridges
- 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

SPECTRUM

WRAS APPROVED PRODUCT

Premier Pleat Polypropylene

0.1-100 micron

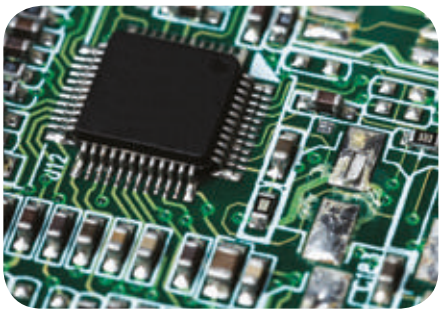
Many applications benefit from using the high efficiency, large surface area, low pressure drop and inert properties of the WRAS approved Premier Pleat Polypropylene cartridge. Four pleated media layers combine to construct a pleat pack with depth characteristics and the main filtration media layer delivers high efficiency and exacting micron classification. An improved cage construction for 2018 delivers excellent flow dynamics and is designed to protect the integral pleat pack whilst providing overall rigidity and strength to the cartridge.

The most popular and versatile cartridge in the Premier Pleat range, the PPP, provides exacting classification for targeted particulate removal, with a wide variety of end-caps, lengths and configurations available, ensuring a dependable and adaptable solution.

WRAS approved and constructed from FDA compliant materials, the PPP delivers high flow and low pressure drop. With an optimal surface area of up to 0.56 m^2 per 10", the pleat pack contains a balance of media and void space for uniform particulate distribution and maximised use of the filter area.

General classification

The PPP provides effective final stage classification as well as pre-treatment for absolute membrane media filtration downstream.



Finishing

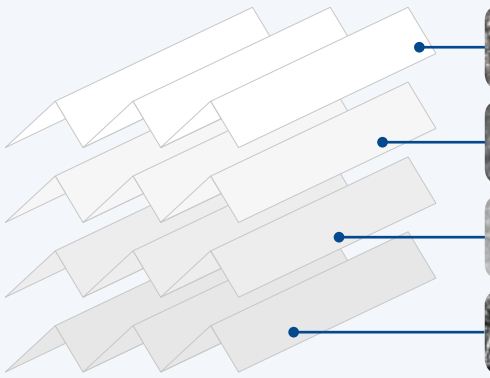
Inert polypropylene is resistant to a variety of plating solutions and chemicals, making the PPP the ideal choice for the finishing industry.

Beverage

High efficiency filtration is key to removing contaminants from the raw feed, which protects and improves the lifespan of finer filtration and product appearance.

Four Layer Pleated Media

The four layers of material create a filtration media that offers some depth characteristics along with the benefits of an exact classification of the filtrate. With a 95-99% efficient main filtration layer, additional pre-filtration and support layers result in a cartridge with overall high dirt holding capacity and effective contaminant removal.

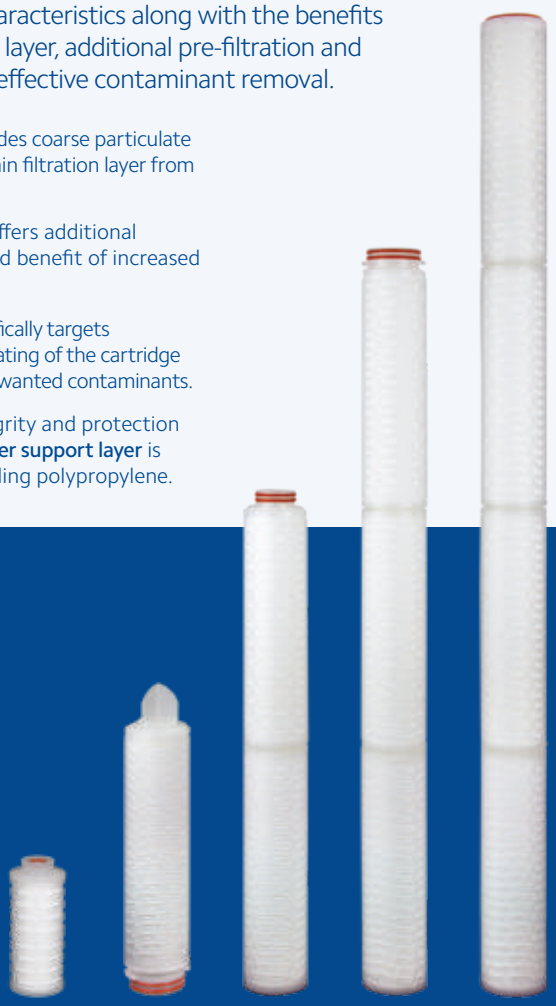


Outer support layer provides coarse particulate removal to protect the main filtration layer from premature blinding.

The **pre-filtration layer** offers additional protection with the added benefit of increased dirt holding.

Main filtration layer specifically targets particulate at the micron rating of the cartridge for selective removal of unwanted contaminants.

Providing structural integrity and protection of the pleat pack, the **inner support layer** is constructed from unyielding polypropylene.



Hygiene and Traceability

- Manufactured in a clean room environment, protecting against unwanted contaminants.
- 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.

Efficiency

The removal efficiency of a filter is dependent on the criteria at which it is tested, along with the size and type of particulate challenge. The below table shows the efficiency of each PPP when using particle count analysis with AC Fine and AC Coarse Test Dust at various particulate challenges.

		Challenge Particulate Size										
		0.1 µm	0.2 µm	0.45 µm	1 µm	3 µm	5 µm	10 µm	20 µm	30 µm	50 µm	100 µm
Cartridge Micron Rating	0.1 µm	**95%**	96%	98%	99%	99%	99%					
	0.2 µm	93%	**95%**	97%	98%	98%	99%					
	0.45 µm	82%	88%	**96%**	97%	98%	99%	99%				
	1 µm	80%	82%	94%	**96%**	97%	98%	99%	99%			
	3 µm				86%	**96%**	97%	98%	98%	99%		
	5 µm					90%	**96%**	97%	98%	99%	99%	
	10 µm							**97%**	98%	98%	99%	99%
	20 µm							91%	**97%**	98%	99%	99%
	30 µm								97%	**97%**	98%	99%
	50 µm									96%	**97%**	98%
	100 µm										95%	**97%**

Standard Diameter

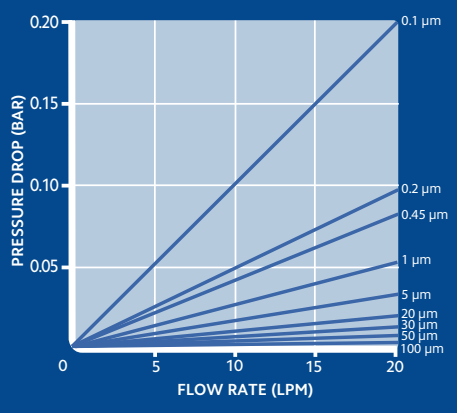
With over 2000 possible configurations, the 70mm diameter range has the greatest diversity of micron ratings, lengths and end-caps available.

Large Diameter

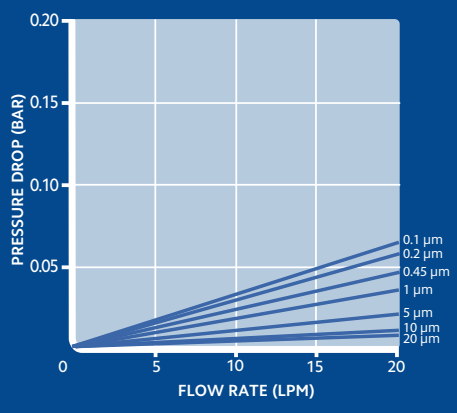
The PPP-BB, in 9¾" and 20", offers compact high efficiency filtration for flow rates up to 3 times the equivalent 70mm diameter cartridge.

Junior

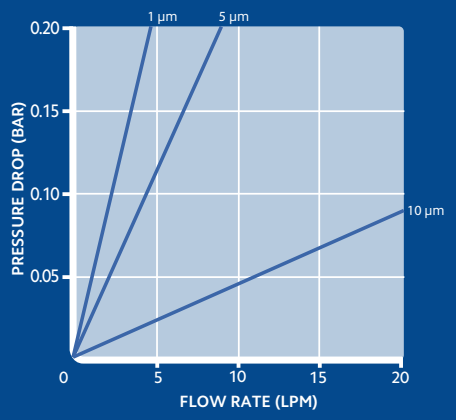
Designed to retrofit Filterite LMO, Advanta and Nuclepore housings.



Water at 20°C. 10" cartridge.



Water at 20°C. 10" cartridge.



Water at 20°C. 5" cartridge.

Materials of Construction

Filter Media
Polypropylene

Support Media
Polypropylene

End-cap
Polypropylene
Polypropylene with stainless steel ring (Q and Z)

Core
Polypropylene

Cage
Polypropylene

Seal
Silicone (as standard)

Compliance

BS6920 Approved
FDA Compliant Materials
WRAS Approved
USP Class VI - 121°C Plastics
Regulation (EC) 1935/2004
Regulation (EU) No10/2011

Configurations

Micron (µm)

0.1	0.2	0.45	1	3	5	10
20	30	50	100			

Length (")

4⅞	9¾	10	20	30	40
5 = Junior					

End-cap (refer to page 32)

AA	CG	EG	EH	FG	FH	MG
MH	QG	ZH	120			

Seal

S = Silicone	E = EPDM	V = Viton®

Diameter

Standard	Large = BB

Specification

Efficiency
95-99%

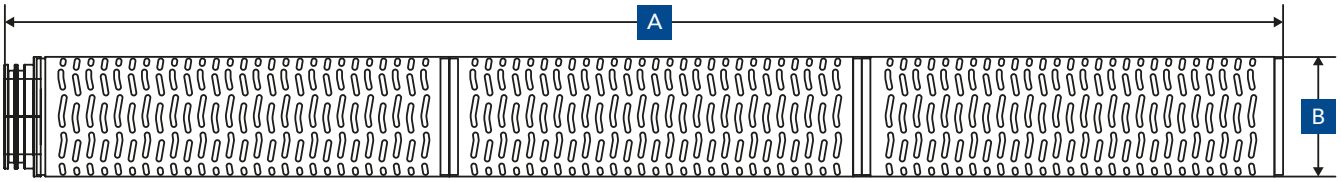
Max. Operating Temperature
82°C

Max. Sterilising Cycles
5 x 20 min cycles at 120°C
Requires stainless steel encapsulated end-caps Q (222) and Z (226). Not applicable for Junior and Large Diameter cartridges.

Surface Area
0.56 m^2 per 10"
1.55 m^2 per 10"BB
0.26 m^2 per Junior

Max. Operating Pressure Differential
6 bar at 21°C

Dimensions & Packaging



	A (mm)					B (mm)	Packaging	
Length (")	AA	CG	EG/FG/MG/QG	EH/FH/MH/ZH	120		Box Qty	Box Weight (kg)
4⅞	125	114	-	-	-	70	18	2
5 (Junior)	-	-	-	-	136	55	18	4
9¾	248	-	-	-	-	70	9	4
10	-	241	270	310	-	70	9	4
20	508	506	520	560	-	70	9	7
30	750	-	770	810	-	70	9	10
40	1000	-	1020	1060	-	70	9	14
9¾BB	248	-	-	-	-	115	4	3
20BB	508	-	-	-	-	115	4	6

Part Number

Code		Micron		Length	End-cap	Seal
PPP	–	0.1, 0.2, 0.45, 1, 3, 5, 10, 20, 30, 50, 100	–	4⅞	AA, CG	S, E, V
				9¾,	AA	
				10, 20, 30, 40	AA, CG, EG, EH, FG, FH, MG, MH, QG, ZH	
		0.1, 0.2, 0.45, 1, 5, 10, 20	–	9¾BB, 20BB	-	-
		1, 5, 10	–	5 (Junior)	120	S

e.g. PPP-5-20AAS

End-Caps

Pleated Cartridge Configurations

Where product codes indicate an optional end-cap is available, a choice can be made from the following styles. End-cap variations are made to suit housing designs and application requirements, which dictate the reliability and integrity of the seal, along with the ease of cartridge change out.

AA

Double Open Ended

Open-end gaskets, for use with housings containing a knife edge seal mechanism.

CG

213 with Closed Recess

Single internal O-ring, seals onto housings that have a spigot.

EG / MG

222/224 with Closed Recess

Double external O-rings seal into female housing receiver with a closed, recessed end, which is for housings with spigots.

EH / MH

222/224 with Fin Adaptor

Double external O-rings seal into female housing receiver whilst the Fin locates into housing plate holes to maintain vertical orientation.

FG

226 with Closed Recess

Bayonet type tabs lock into female housing receiver whilst the recessed end locates into housings with spigots.

FH

226 with Fin Adaptor

Bayonet type tabs lock into female housing receiver whilst the Fin locates into housing plate holes to maintain vertical orientation.

Stainless Steel Encapsulated End-Caps

QG

222 with Closed Recess

Suitable for high temperature housings, the QG configuration is suitable for repeated sterilisation and offers one of the best seals possible with its double O-ring fitting and stainless steel insert.

ZH

226 with Fin Adaptor

Suitable for multi-round high temperature housings, the ZH configuration provides the most positive seal with double O-rings and twin locking tabs. The encapsulated stainless steel insert makes the Z fitting suitable for repeated sterilisation.

Seals

Pleated Cartridge Configurations

Providing a water-tight seal between the housing and cartridge, O-rings and gaskets are essential to the integrity of the filter and come in a range of materials, including Silicone, EPDM, Teflon® and Viton® to suit most applications.

Silicone

EPDM

Teflon®

Viton®

Chemical Compatibility

The below table details the different compatibility of each O-ring within different applications. (Source: Cole-Parmer)

	Silicone	EPDM	Teflon	Viton®
Beer	Excellent	Excellent	Excellent	Excellent
Whisky & Wine	Excellent	Excellent	Excellent	Excellent
Deionised Water	Fair	Excellent	Excellent	Excellent
Alcoholic Methyl	Excellent	Excellent	Excellent	Fair
Aromatic Hydrocarbons	Poor	Poor	Excellent	Excellent
Sodium Hydroxide	Excellent	Good	Excellent	Poor
Hydrochloric Acid	Poor	Poor	Excellent	Excellent
Synthetic Hydraulic Oil	Good	Excellent	Excellent	Excellent

O-ring Sizing

This actual size chart is a useful aid in identifying common replacement O-rings. Place your current O-ring onto the chart to match the size required.