Pleated Filtration

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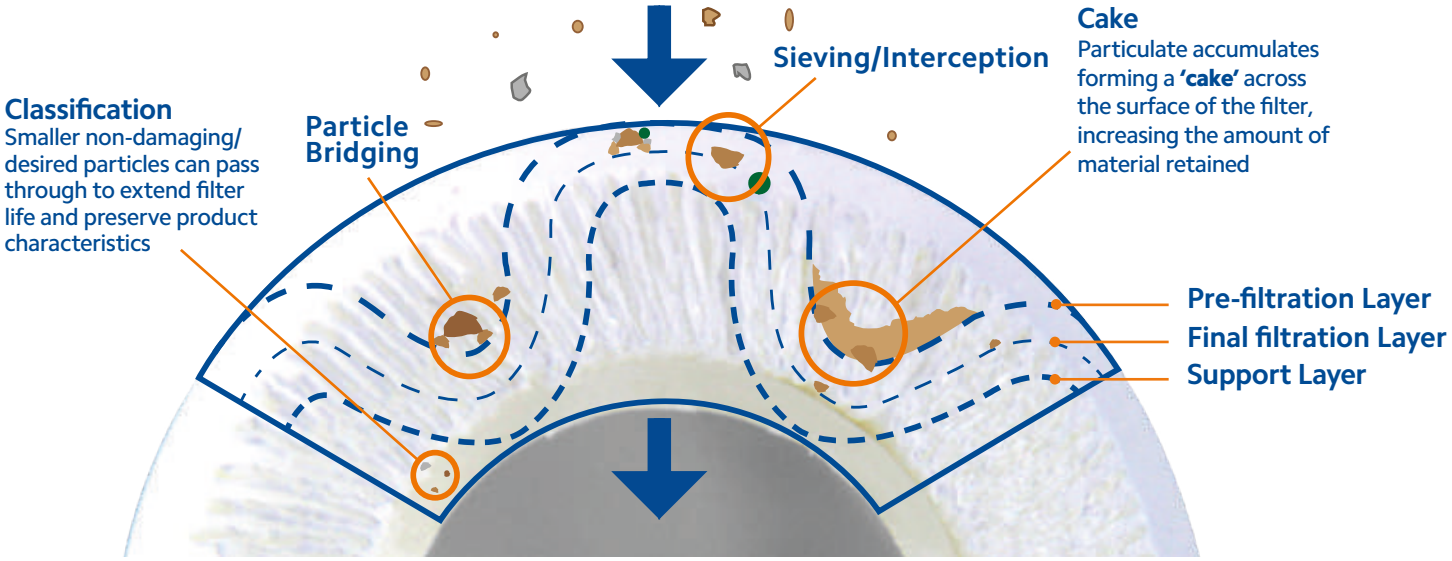
Pleated Technology

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.

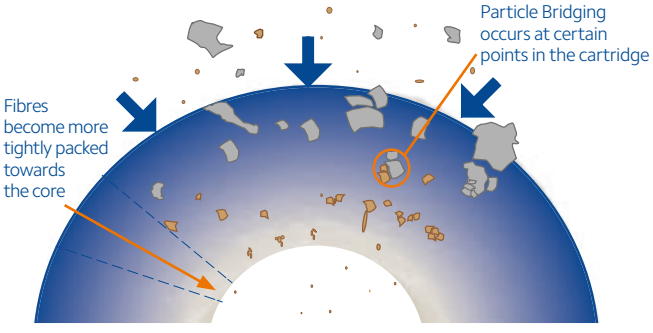


Surface Filtration Technology

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.

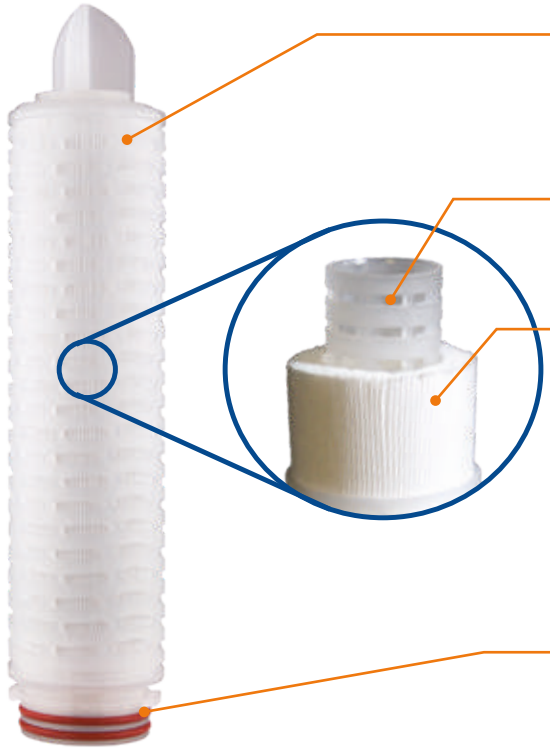
Advantage: Economic to produce.

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

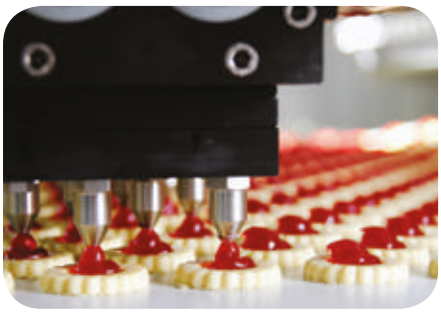
Crypto

0.45-1 micron

Meeting the requirements of NSF/ANSI Standard 53, the WRAS approved Crypto series provides absolute efficiency for the effective removal of *Cryptosporidium*, *Giardia* cysts as well as other microorganisms. Manufactured using only high purity Borosilicate glass fibre for optimum cartridge performance, the certified CP and CP+ cartridges deliver *Cryptosporidium* control where water quality is paramount.

The SPECTRUM Crypto range of filters are independently tested and validated for the effective removal of contaminants from critical applications.

Cryptosporidium, a parasite generally 1-5 micron in size and typically found in water supplies, is known to cause respiratory and gastroenteritis based illnesses. Using the Crypto CP+ at 0.45 or the CP at 1 micron, *Cryptosporidium* and other microorganisms can be effectively removed to protect against infection or contamination.



Food Make-up

Critical for the removal of the resilient *Cryptosporidium* parasite from food manufacturing applications.

Incoming Water

Widespread in the environment, *Cryptosporidium* is known to be present in many surface and underground water sources.

Soft Drinks

Often used in filtration of many soft drinks applications for *Cryptosporidium* and the control of bacteria.

Crypto and Crypto+

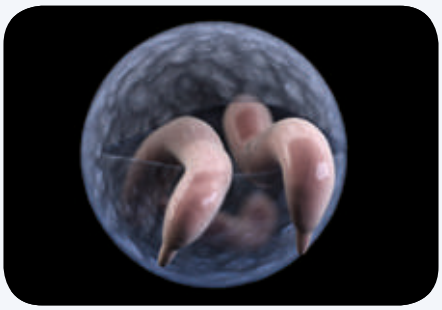
Available in two grades, the SPECTRUM Crypto range offers versatility and flexibility when deciding which cartridge suits the application requirements.

Crypto CP

- ✓ Certified *Cryptosporidium* removal
- ✓ Longer service life than CP+

Crypto CP+

- ✓ Certified *Cryptosporidium* removal with increased retention characteristics
- ✓ Providing a finer level of filtration than the Crypto CP



Hygiene and Traceability

- Manufactured in a clean room environment, protecting against unwanted contaminants.
- Lot coded for material traceability.
- Specific Quality Assurance Certificate supplied with every cartridge.
- Each cartridge is vacuum sealed and then enclosed in a durable outer plastic layer for further protection.

Certification

The SPECTRUM Crypto cartridges have been independently tested to NSF 53-2011 standards.

CP+ >99.99996% when tested with 3 µm microspheres

CP 99.99996% when tested with 3 µm microspheres

SPECTRUM CP+10EG

Samples: CP+10EG Filter Cartridge

Analysis Parameter: 3.0 µm Fluorescent Latex Microspheres as *Cryptosporidium parvum* Oocyst Surrogate

Test Standard: NSF 53-2011 section 7. Mechanical Filtration using General Test Water (GTW) Challenge (< 1.0 NTU water)

Water Sample	3.0 µm Fluorescent Microspheres [1]			
	Units / ml			Average Percent Removal
	Filter Influent	Filter Effluent A - BCS 1306062	Filter Effluent B - BCS 1306065	
Initial filter performance (following 163 litres GTW)	2.1 x 10^3	None Detected < 0.001	None Detected < 0.001	>99.99996%
Following 3 Cycles (following of 486 litres GTW)		None Detected < 0.001	None Detected < 0.001	>99.99996%
Following 8 Cycles (following 1513 litres GTW)		None Detected < 0.001	None Detected < 0.001	>99.99996%

SPECTRUM CP10EG

Samples: CP10EG Filter Cartridge

Analysis Parameter: 3.0 µm Fluorescent Latex Microspheres as *Cryptosporidium parvum* Oocyst Surrogate

Test Standard: NSF 53-2011 section 7. Mechanical Filtration using General Test Water (GTW) Challenge (< 1.0 NTU water)

Water Sample	3.0 µm Fluorescent Microspheres [1]			
	Units / ml			Average Percent Removal
	Filter Influent	Filter Effluent A - BCS 1306063	Filter Effluent B - BCS 1306064	
Initial filter performance (following 161 litres GTW)	3.1 x 10^3	0.001	0.002	99.99996%
Following 3 Cycles (following of 487 litres GTW)		0.007	0.004	99.9998%
Following 8 Cycles (following 1495 litres GTW)		0.002	0.001	99.99996%

[1] Three micron green fluorescent latex microspheres (Fluoresbrite® YG Microspheres 3.00 µm, PolySciences Inc. PA, USA) were used as surrogates for *Cryptosporidium* oocysts. It is used to determine filter parasitic removal efficacy. The microspheres were enumerated by fixing onto SingleSpot Slides (IDEXX, USA) and viewing by UV fluorescence microscopy.

Efficiency

		Challenge Particulate Size				
		0.1 µm	0.2 µm	0.45 µm	1 µm	3 µm
Cartridge (Micron Rating)	CP+ (0.45 µm)	99.99%	99.994%	**99.999%**	99.9993%	>99.99996%
	CP (1 µm)	-	99.99%	99.993%	**99.999%**	99.99996%

Materials of Construction

Filter Media
Glass Fibre

Core
Polypropylene

Support Media
Polypropylene

Cage
Polypropylene

End-cap
Polypropylene

Seal
Silicone

Configurations

Micron (µm)

CP+ = 0.45	CP = 1

Length (")

10	20	30	40

End-cap (refer to page 32)

CG	EG	EH	FG	FH	MG	MH

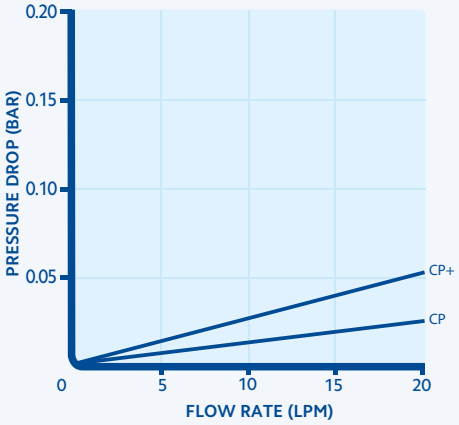
Specification

Efficiency
99.99 - >99.99996%

Max. Operating Temperature
82°C

Surface Area
0.41 m^2 per 10"

Max. Operating Pressure Differental
6 bar at 21°C



Water at 20°C. 10" cartridge.

Quality Assurance Certificate

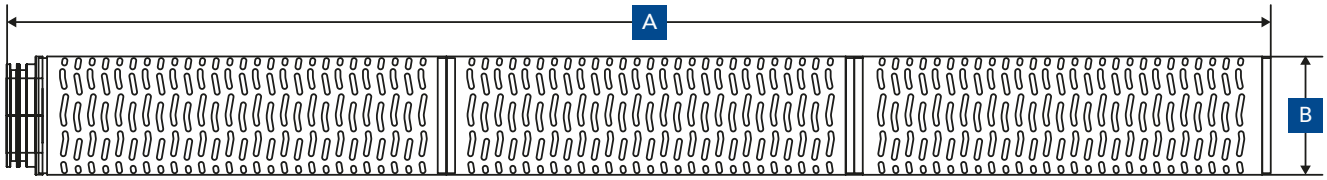
Crypto cartridges are shipped with a Quality Assurance Certificate, which provides the typical media properties and cartridge performance characteristics of the Glass Fibre media used in the construction of the cartridge. The certificate contains the following typical information:

- Materials of construction
- Challenge test criteria
- Cartridge performance characteristics

Compliance

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

Dimensions & Packaging



	A (mm)			B (mm)	Packaging	
Length	CG	EG/FG/MG	EH/FH/MH		Box Qty	Box Weight (kg)
10"	241	270	310	70	9	4
20"	506	520	560	70	9	7
30"	-	770	810	70	9	10
40"	-	1020	1060	70	9	14

Part Number

Code	Length	End-Cap
CP+	10, 20, 30, 40	CG, EG, EH, FG, FH, MG, MH
CP		

e.g. CP+40EH

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.