aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Process Filtration

A guide to products and services

Parker | domnick hunter

ENGINEERING YOUR SUCCESS.

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Adding value to your business

Parker domnick hunter specializes in the manufacture and supply of high quality products for the clarification, stabilization and sterilization of liquids and gases, providing full scaleability from membrane flat stock to multi element filter systems. Each filter has been specifically developed to meet industry applications and requirements.

As a company it is our goal to deliver innovative quality products on time while responding to the needs of the end user with premier customer service. We know our success is only possible through increasing our customers' productivity and profitability.

Parker domnick hunter manufacture products in the most efficient, effective and environmentally conscious way building on a culture of continuous improvement.

With nearly 50 years filtration experience in markets such as pharmaceutical, beverage and water treatment we have developed innovative and cost-effective solutions that will add value to your manufacturing process, providing reliable products and services that meet or exceed your expectations.

Our worldwide assistance extends to on-site evaluations, design, manufacture, validation, quality control and ongoing support long after the filters are installed.

In 2005 domnick hunter became part of the Parker Hannifin Corporation. Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of commercial, mobile, industrial and aerospace markets. The company employs more than 50,000 people in more than 50 countries around the world.

- Continued investment in research & technology
- Application driven approach to new products
- Market specific experience leading to tailored solutions
- Global network providing technical, service and sales support
- Excellent reputation gained through working with some of the world's leading companies
- Highly skilled and trained employees

Quality & control

At the forefront of manufacturing excellence

Parker domnick hunter's commitment to leading quality standards in the filtration industry led to us being the first UK based filter company to achieve BS 5750 Pt 1 in 1984 and then BS EN ISO 14001 in 2001. The company is now certified to current version of ISO9001, ISO 13485 and is again leading the way through the implementation of a new application guide PS9100 in 2007.

In support of our on going commitment to quality, Parker domnick hunter has recently completed a £5 Million investment programme to upgrade and increase capacity at our Birtley, UK manufacturing facility. As well as investing in the latest clean room and custom manufacturing technologies, Parker domnick hunter has invested in key lean and six sigma initiatives.

Our focus on the selection of materials in accordance with current regulations such as FDA CFR's, cGMP guidelines and specifications from our Scientists, Engineers and validation experts, together with the use of validated manufacturing and test methodologies ensures high batch-to-batch reproducibility.

A controlled approach

- Both lot number and serial number are recorded for all products providing complete traceability back to base materials
- Products, processes and software are validated at regular intervals
- Integration of productivity, product quality and employee safety into the design and construction of facilities and equipment
- Clean room environment used for all manufacturing operations
- Extensive supplier quality assurance program in place
- Regular process audits conducted by trained auditors from across the business
- Extensive customer audits completed

Innovation

Putting your future needs at the forefront of product development

Parker domnick hunter understands the need to be innovative and deliver real solutions to customer problems. As a company we are always striving to create a culture that will achieve this goal, both through individual team creativity and measured risk taking.

Project teams with members from technical, marketing, manufacturing and procurement functions are necessary for the success of this process. Working closely with our customers has enabled us to design innovative products with value-added benefits.

People are vital to this process and Parker domnick hunter recognizes and supports the need for continuous learning to ensure that its employees have the skills to meet the demands of the changing world we live in.

Winovation

Parker Hannifin has developed an NPD system called Winovation, focusing on long term development of products that will grow our business together.

"Winovation, creates value by determining customer needs and developing products that meet those needs".

- Focus on value proposition
  - Unique customer benefits
- Provide a differentiated solution
- An effective discovery stage to generate great ideas
- Accountable and empowered cross functional teams
  - Dedicated resource
- Strong market and voice of the customer input
  - Products that are linked to customer goals and initiatives

Winovation

A forward thinking team provide:

- Introduction of new materials
- Sustained engineering
  - Rapid response team
  - Engineer existing products to meet demands of new applications
- Development to meet ever changing industry regulations
- Joint engineering projects, combining expertise
  - Cross fertilization of ideas with industry leaders
- Cost reduction exercises
  - Increased throughputs and lifetime as your business grows
- New products that can set new industry standards
- Helping to establish industry best practice
- Provide solutions to application driven problems
- Maximize value and user friendliness of products
- Joint projects with leading universities and institutions
- Access to Parker design and development global resource

Technical support

Dedicated team committed to improving the efficiency of your filtration process

Parker domnick hunter has a multi-disciplinary team of Scientists and Engineers committed to the technical support of our products around the world, providing pro-active practical support in all areas. The aim is to improve economy of filter use and to improve product yield and quality. We understand the practical needs within the process. If system performance is found to be out of specification, or showing deviation from the norm, you can count on active support on-site to identify and resolve problems.

A process audit is an excellent way of identifying and addressing the main risks that may compromize the quality of your production process. From utilities through to your aseptic filling line we can help identify improvements and advise on areas such as applicable products, system layouts, steam sterilization and integrity testing.

System design and implementation

A full operationally qualified filter system can be implemented using sample and used cartridge analysis from laboratory and pilot scale investigations. This can include the specification for a fully automated filter system design. This allows the filter user to have the difficult task of commissioning a filter system shared and facilitated through the Parker domnick hunter team of process experts.

- Filter system audits to optimize system performance
- Contract integrity testing
- Practical laboratory scale testing for continuous process improvements
- Sample and used cartridge analysis to aid in filter system design
- Process simulation
- Chemical compatibility
- Microbial analysis
- Customer specific validation strategy and protocol
- Remote monitoring of system performance

Existing system optimization

Where a process is altered through increased operational demand, e.g. through extension of a production campaign, higher production volumes, an increased number of product changes or a more rigorous sanitization / sterilization regime, Parker domnick hunter offer support to ensure the system remains appropriate for these changed process demands.

Training

Specialists from across our business can provide training at our state-of-the-art facilities or at your own site, which includes:

- Filtration theory and practice
- Integrity testing and validation
- SIP, CIP and compatibility testing

Fault diagnosis

Often filtration is a critical step or control point within a process. Therefore, when finished product quality is not achieved, the filter is often the first point of call. The Parker domnick hunter TSG group can provide a reactive service to enable rapid 'root cause' analysis and assist in minimizing the risk of recurrence where filtration, filtrate or integrity test values are found to be out of specification.

A scientific approach

Consistent performance put to the test

Parker domnick hunter employ a combination of Engineers and Scientists with advanced degrees in a wide range of fields including bioscience, biotechnology, microbiology and chemistry.

Using state-of-the-art equipment and facilities, the Parker Laboratory Services Group are equipped to become a valued partner in your validation process.

Providing step-by-step validation support to the customer by developing and executing process-specific protocols based on your application.

The Laboratory Services Group (LSG) at Parker domnick hunter provides documented evidence that gives the customer a high degree of assurance that our filters will consistently produce a level of performance that meets its predetermined specifications and quality attributes.

Quality control testing

- Water testing: TOC, endotoxin, bioburden, pH and conductivity
- Environmental monitoring, microbial assay
- Filter characteristics, visual bubble point, liquid and air flow rates, porometry analysis, water intrusion
- Quality control testing of incoming filter materials including bacterial challenge to ASTM 838-05 for sterilizing grade products
- Lot release of finished products and rinse water / effluent analysis

Customer validation

- A bespoke service offering a full validation package to support sterile filtration steps
- Includes protocol and experimental design, technical support and production of an audit reference of each filter and filtered product
- Establish integrity test parameters
- Develop customer specific validation strategies
- Examination of filter extractables
- Documented assurance

Scientific research

- Microbial assays standard and bespoke
- Protein binding analysis via SDS PAGE and gel imagery
- Process simulation and scale-up support
- New product design and optimization
- Process characterization and filtration analysis

Dedicated product range

Choice and flexibility to suit your application

Parker domnick hunter manufacture a range of microfiltration cartridges for liquid and gas applications that utilize the latest production techniques, combining the most suitable membranes and filtration media with the latest easy to use formats.

All of Parker domnick hunter's filters meet strict validation guidelines that provide a high degree of assurance that they will consistently achieve a high level of performance in a given application and meet the needs of the industry that they have been specifically designed for.

- Wide choice of filtration media and filter formats
- Technical and validation support
- Industry specific designed filters
- Fully retrofitable range of products
- Manufactured in state-of-the-art facilities

Scaleability provides flexibility

The ability to scale up from small area discs to process scale systems with minimal revalidation is paramount.

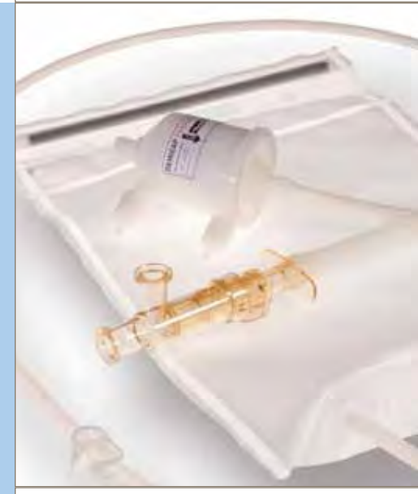
Parker domnick hunter provides a wide range of filter formats to ensure that the transition from pilot-scale through to full production is as smooth as possible.

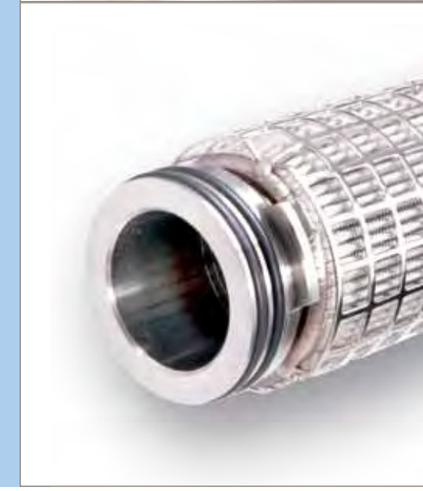
Single use systems

Disposable systems can eliminate cleaning validation, reduce capital costs, minimize health & safety risks and lower the chance of product contamination. Single use systems also provide a more convenient way of processing a product.

Close working relationships

Parker domnick hunter have partnered engineering companies on large-scale projects around the world that require filtration expertise and a capability to fabricate large-scale systems.





Understanding the principles of filtration

e-learning and training at your own speed

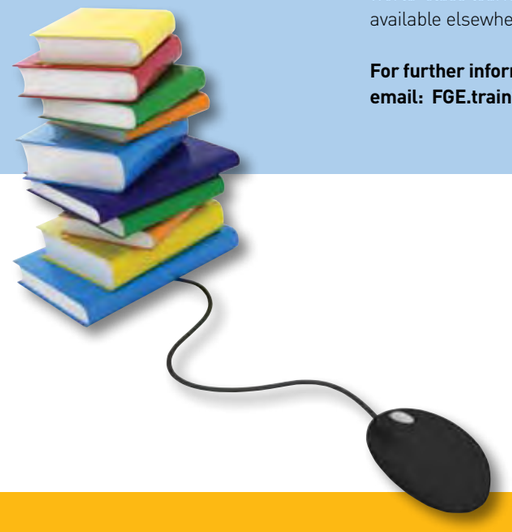
What is e-Learning ?
e-Learning is an effective learning process created by interaction with digitally-delivered content, learning support and services. It uses a combination of text, voice-over and moving images to explain ideas and concepts.

Why has Parker domnick hunter developed e-Learning ?
Parker operates in more than 50 countries and employs more than 50,000 people worldwide. e-Learning enables us to reach all the relevant people with a consistent and a clear message. e-Learning content has been developed in-house and we believe we have a unique and innovative package which provides world-class filtration training. We are now enabling our customers to access the same learning.

What courses are available ?
We can provide access to the Certificate in Filtration Technology course. This course consists of 9 modules of e-learning. It is intended as an introductory level course which looks mainly at the management of compressed air. Two further modules cover sterile air filtration and the filtration of liquids. Taken together they provide an excellent introduction to the world of filtration.

Each module has its own test and these test results are retained by the Learning Management System for later review.

Further Parker domnick hunter Certificate courses include a Certificate in Compressed Air Quality Management which consists of three modules covering ISO 8573.1 Air Quality standards, dryers and compressed air filter solutions.



How can I access e-learning ?
The e-Learning is held on a LMS (Learning Management System) at www.dhelearning.com.

To access the e-Learning you will need a user name and password, supplied by Parker domnick hunter.

How long will the course take to complete ?
Learners are able to complete the course at their own pace and can fit the course around the demands of a busy working day. The time taken to complete the course varies from person to person but for most people the Certificate in Filtration Technology represents 20 hours of study.

How do I find out more ?
It is possible to demonstrate the e-Learning package (and some of the other e-Learning materials) to you and your learning and development specialists. We firmly believe that in-house e-Learning represents world-class learning which is not available elsewhere.

For further information,
email: FGE.training@parker.com

Air / Gas filters

Filtration of air and gas

There is an increasing demand in the food & beverage industry for sterile air / gas which can be used in applications such as line clearing, storage tanks, machines and the venting of gas from storage tanks. It is essential that whenever gases come into contact with product or process equipment, any microbiological contamination is removed to guarantee product safety, uniform quality and extended shelf life. Parker domnick hunter provide a range of class-leading products with a proven track record.

Filters include:

- *PTFE impregnated glass microfibre (PTFE / GF)*
- *Polypropylene (PP)*
- *Glass microfibre (GF)*
- *Polytetrafluoroethylene (PTFE)*

TETPOR filters from Parker domnick hunter utilize a PTFE membrane to provide competitive performance and value in sterile air applications. Also available in high temperature formats.

HIGH FLOW BIO-X - High flow rates and high dirt holding capacity make HIGH FLOW BIO-X the filter of choice within the fermentation and beverage industries. A combination of PTFE and glass fibre media provides a product with high voids volume and added strength giving unrivalled performance in applications such as the provision of sterile gas to filling machines.

HIGH FLOW PREPOR GFA Filter Cartridges

- air / gas filters
- glass microfibre

HIGH FLOW PREPOR GFA is a high capacity glass fibre prefilter specifically designed for the removal of bulk particulate from compressed air and gases.

It is used extensively for prefiltration duties in dry compressed air systems and provides excellent protection for final sterile filters.

HIGH FLOW PREPOR GFA utilizes pleated glass fibre filter media encased within an upstream and downstream expanded polypropylene mesh filter support. The pleat pack is supported by an inner stainless steel core and outer heat stabilized polypropylene cage, heat bonded to heat stabilized polypropylene end caps.

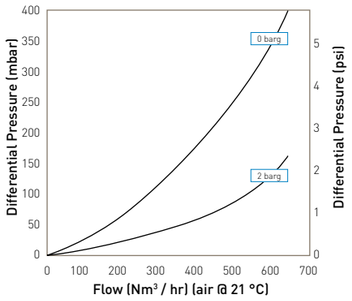
The combination of high voids volume filter media and pleated construction results in a filter cartridge with exceptional dirt holding capacity, able to operate at very low differential pressures.

Features and Benefits

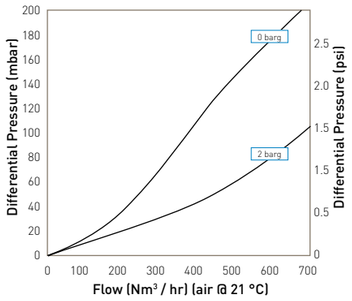
- High surface area and voids volume filter media
- Exceptionally high flow rates with low pressure drops
- Reliable efficient protection of final sterilization filters
- Heat stabilized componentry to allow operation at elevated temperatures

Note: PREPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



Cartridge flow rates
10¨ Size (250 mm)



Cartridge flow rates
20¨ Size (500 mm)

Specifications

Materials of Construction

Filtration Media:	Glass Microfibre
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	316L Stainless Steel
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert:	Stainless Steel
Standard o-rings/gaskets:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 3.5 barg (50.76 psig) at 20 °C (68 °F).

The maximum recommended continuous operating temperature is 70 °C (158 °F).

Note: For temperatures from 70 °C (158 °F) to 100 °C (212 °F) a special product with polyester supports is available.

Effective Filtration Area (EFA)

10¨ (250 mm) 0.48 m^2 (5.16 ft^2)

Ordering Information

ZCHP □ - □ □ - □

Code	Length (Nominal)
1	10¨ (250 mm)
2	20¨ (500 mm)
3	30¨ (750 mm)

Code	Micron
1.0	1.0 µm

Code	Endcap (10¨)
C	BF / 226 Bayonet
P	BIO-X Retrofit

Code	O-rings
E	EPDM
S	Silicone
V	Viton

Code	Variant*
S4*	High Temperature

** Only available with Silicone o-rings.*

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PEPLYN AIR Filter Cartridges

- air / gas filters
- meltblown polypropylene

PEPLYN AIR filter cartridges have been specifically designed to guarantee removal of particulate from gas streams.

They can be used to protect sterilizing grade filters in pressurized systems or in exhaust gas vent applications.

PEPLYN AIR is particularly suitable for:

- Inlet gas in the fermentation industry as protection to sterilizing grade filters where polypropylene media is preferred
- As protection to sterilizing grade filters in exhaust gas systems
- Vent applications
- Systems where high particulate loading is expected

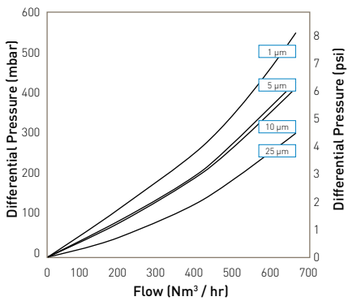
PEPLYN AIR has the ability to be steam sterilized and has a broad range of chemical compatibility

Features and Benefits

- Cost-effective prefiltration
- Absolute micron rating range from 1.0 - 25 micron
- High flow rates and long life
- Steam sterilizable
- Graded density for excellent particle retention
- No release of particles even during system pressure fluctuations

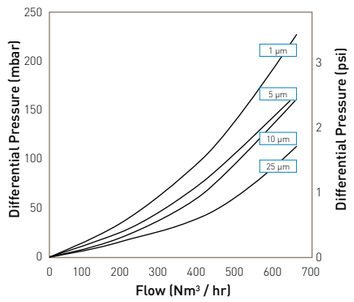
Note: PEPLYN is a registered trademark of Parker domnick hunter

Performance Characteristics



Flow rates for other sizes available upon request

Cartridge flow rates @ 0 barg 10¨ Size (250 mm)



Flow rates for other sizes available upon request

Cartridge flow rates @ 2 barg 10¨ Size (250 mm)

Specifications

Materials of Construction

Filtration Media:	Meltblown Polypropylene
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	316L Stainless Steel
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
Standard o-rings/gaskets:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 3.5 barg (50.76 psig) at 20 °C (68 °F).

The maximum recommended continuous operating temperature is 50 °C (122 °F).

Effective Filtration Area (EFA)*

10¨ (250 mm) 0.49 m² (5.27 ft²)

**Varies with micron rating*

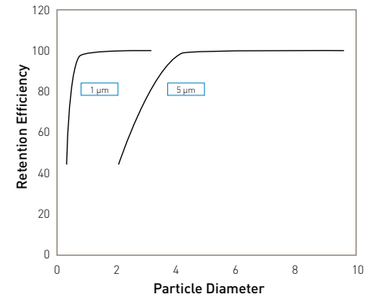
Cleaning and Sterilization

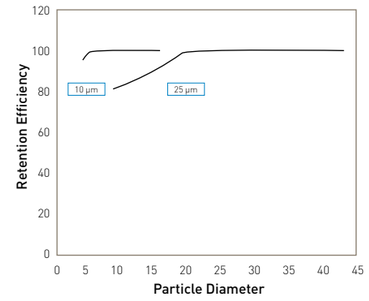
PEPLYN AIR cartridges can be repeatedly in situ steam sterilized or autoclaved up to 142 °C (287.6 °F).

Determination of Micron Ratings

Particle removal efficiencies of PEPLYN AIR cartridges have been determined independently by challenging with a cut silica test dust, generated by BUS1701 dust injector used in conjunction with laser particle counters.

Micron Efficiency Ratings





Ordering Information

ZCPH [ ] - [ ] [ ] - [ ]

Code	Length (Nominal)	
B*	2.5¨	(65 mm)
A*	5¨	(125 mm)
K	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)

** Supplied in Packs of 3.*

Code	Micron	
1.0	1.0	µm
005	5.0	µm
010	10.0	µm
025	25.0	µm

Code	Endcap (10¨)
C	BF / 226 Bayonet
H	UF Retrofit

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

Code	O-rings
E	EPDM
P	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

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BIO-X II Filter Cartridges

- air / gas filters
- borosilicate microfibre

BIO-X II air sterilization filter cartridges utilize a borosilicate microfibre media. This media has proven to be particularly effective in the removal of sub-micron particles as small as 0.01 micron, therefore ensuring the removal of all microorganisms, including bacteria and viruses.

The media is sandwiched between Nomex support materials to provide additional strength and prevent media migration. This is rigidly held between stainless steel support cylinders and finally encapsulated into stainless steel end caps. The result is a filter cartridge with the exceptional strength and efficiency necessary for absolute security in the most testing of applications.

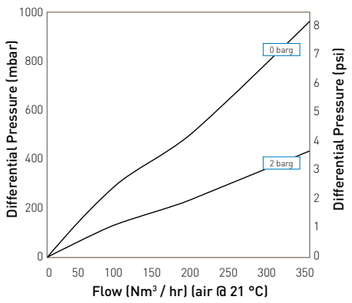
BIO-X II filter cartridges are particularly suitable for the increasing number of high temperature applications. They also fulfil the sterile compressed air and gas requirements of the dairy, brewery and food processing industries.

Note: BIO-X is a registered trademark of Parker domnick hunter

Features and Benefits

- Nomex support materials for high temperature operation
- Robust stainless steel construction
- High temperature operation 200 °C (392 °F)
- 100% integrity tested prior to despatch
- Unique serial number for full traceability
- Fully validated by aerosol bacterial challenge

Performance Characteristics



ME10AB7SRH Cartridge

Specifications

Materials of Construction

Filtration Media:	Borosilicate Microfibre
Upstream Support:	Nomex*
Downstream Support:	Nomex*
Inner Support Core:	Stainless Steel
Outer Protection Cage:	Stainless Steel
End Caps:	Stainless Steel
Encapsulant:	Epoxy Resin
Standard o-rings / gaskets:	Silicone

**Nomex is a registered trademark of E.I. du Pont de Nemours and Co. Inc.*

Recommended Operating Conditions

The maximum differential pressure is 700 mbar for economical element change.

Maximum Continuous Inlet Air Temperature

200 °C (392 °F) Intermittent
170 °C (388 °F) Continuous

Sterilization

BIO-X II filter elements can withstand a maximum of 100 in-line sterilization cycles with purified saturated steam. In-line sterilization 142 °C (287.6 °F), 2.8 barg (40.7 psig) for 30 minutes.

Integrity Test Data

All cartridges are integrity tested prior to despatch by the aerosol challenge test method using the Parker domnick hunter VALAIRDATA II.

Validation

The BIO-X II range of cartridges have been fully validated by bacterial challenge of aerosolized *Brevundimonas diminuta*.

Ordering Information

Cartridges

Element Code	Cartridge Length	Endcap Location
MER-BZ	2.5" (65 mm)	Demi A & B Std (Z)
MER-AZ	5" (125 mm)	Demi A & B Std (Z)
ME10-AB7SRH	10" (250 mm)	BS226 (C)
ME20.AB7-SRH	20" (500 mm)	BS226 (C)
ME30.AB7-SRH	30" (750 mm)	BS226 (C)

All BIO-X II cartridges are supplied as single units.

BIO-X II Retrofit Cartridge Part Numbers

Parker domnick hunter Cartridge	ME3/1	ME3/1.5	ME4/1.5	ME4/2.5	ME5/2.5	ME5/3	ME10/3	ME15/3	ME20/3	ME30/3	ME30/5	
Retrofit Cartridge	SRF3/1	SRF3/1.5	SRF4/1.5	SRF4/2.5	SRF5/2.5	SRF5/3	SRF10/3	SRF15/3	SRF20/3	SRF30/3	SRF30/5	
Parker domnick hunter Cartridge	MER2/10	MER3/10	MER4/20	MER5/20	MER5/25	MER7/25	MER7/30	MER10/30	MER15/30	MER20/30	MER30/30	MER30/50
Retrofit Cartridge	SRF02/10	SRF03/10	SRF04/20	SR05/20	SRF05/25	SRF07/25	SRF07/30	SRF10/30	SRF15/30	SRF20/30	SRF30/30	SRF30/50
Parker domnick hunter Cartridge	ME2/10	ME3/10	ME4/20	ME5/20	ME5/25	ME7/25	ME7/30	ME10/30	ME15/30	ME20/30	ME30/30	ME30/50
Retrofit Cartridge	P-SRF02/10	P-SRF03/10	P-SRF04/20	P-SRF05/20	P-SRF05/25	P-SRF07/25	P-SRF07/30	P-SRF10/30	P-SRF15/30	P-SRF20/30	P-SRF30/30	P-SRF30/50

HIGH FLOW BIO-X Filter Cartridges

- air / gas filters
- PTFE impregnated borosilicate microfibre

HIGH FLOW BIO-X combines proven depth filter technology and a pleated construction to provide retention down to 0.01 micron in gas.

Flow rates typically 2-3 times that of membrane filters make HIGH FLOW BIO-X the filter that can dramatically reduce cartridge usage and installation size within the fermentation, food and beverage industries.

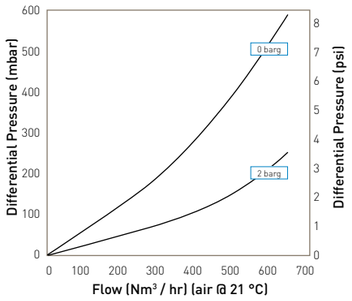
The specially developed PTFE impregnation process imparts greater strength and permanent hydrophobicity to the borosilicate microfibre media. This leads to excellent performance in applications such as the provision of sterile gas in filling machines.

Note: BIO-X is a registered trademark of Parker domnick hunter

Features and Benefits

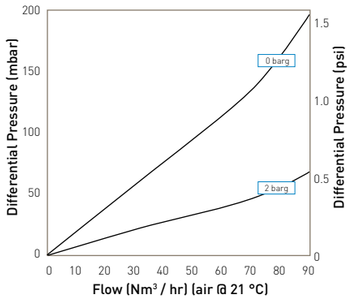
- 94% voids volume PTFE impregnated microfibre
- Wide bore cartridge construction to maximize flow rate
- Stainless steel inner core
- Exceptionally high flow rates with low pressure drops
- Fully validated by aerosolized bacterial and viral challenge

Performance Characteristics



Flow rates for other sizes available upon request

10¨ Size (250 mm) Cartridge



Flow rates for other sizes available upon request

A Size (125 mm) Cartridge

Specifications

Materials of Construction

Filtration Media:	PTFE Impregnated Borosilicate Microfibre
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	316L Stainless Steel
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert:	316L Stainless Steel
Standard o-rings/gaskets:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 3.5 barg (50.76 psig) at 70 °C (158 °F).

The maximum recommended continuous operating temperature is 70 °C (158 °F).

Effective Filtration Area (EFA)

10¨ (250 mm) 0.38 m^2 (4.09 ft^2)

Sterilization

HIGH FLOW BIO-X cartridges can be in situ steam sterilized or autoclaved up to 142 °C (287.6 °F) for a maximum of 150 steam cycles.

Retention Characteristics

The HIGH FLOW BIO-X range of cartridges has been fully validated by aerosol bacterial challenge levels of 10^{12} *Brevundimonas diminuta* per 10¨ (250 mm) filter cartridge. Independent test work also shows full retention to *MS-2 Coliphage*.

Integrity Test Data

All cartridges are integrity tested prior to despatch by the aerosol challenge test method using the Parker domnick hunter VALAIRDATA II.

Ordering Information

ZCHB - [ ] [ ] - [ ]

Code	Length (Nominal)	
B*	2.5¨	(65 mm)
A*	5¨	(125 mm)
K	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)

** Supplied in packs of 3.*

Code	Endcap (10¨)
C	P-7
P	BIO-X Retrofit
H	UF Retrofit

Code	Endcap (Demi)
H	UF Retrofit
T	TRUESEAL
Y	Demi MCY
Z	Demi A & B Std

Code	O-rings
E	EPDM
S*	Silicone
V	Viton

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

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HIGH FLOW BIO-X Vent Autoclave Filter Cartridges

- air / gas filters
- PTFE impregnated borosilicate glass microfibre

HIGH FLOW BIO-X Vent Autoclave filter cartridges are designed for critical applications where sterile air is required to break the vacuum formed by the condensation of steam inside the autoclave chamber.

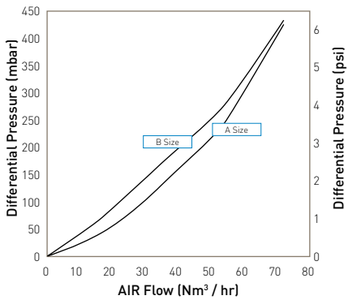
At the heart of the HIGH FLOW BIO-X Vent Autoclave filter cartridge is the latest inherently hydrophobic PTFE impregnated microfibre. With a voids volume of 94%, this media gives exceptional flow rates when compared to membranes. It will remove all particles down to 0.01 micron therefore ensuring the removal of microorganisms, including bacteria and viruses. The filter cartridges are manufactured using a heat sealed construction and no adhesives or resins are used in fabrication. The result, a product of not only exceptional quality, but also a very cost effective solution for the production of sterile air.

Note: BIO-X is a registered trademark of Parker domnick hunter

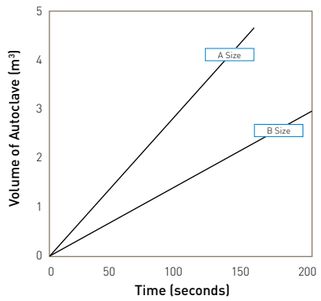
Features and Benefits

- High flow rates
- Hydrophobic filter medium
- Exceeds requirements of HTM10 and EN285
- Detachable prefilter layer
- Exceptional strength
- Repeatedly autoclavable

Performance Characteristics



Cartridge flow rates @ 0 barg



Vacuum break time against autoclave volume

Specifications

Materials of Construction

Filtration Media:	PTFE Impregnated Glass Microfibre
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
Prefilter Sock:	Polyurethane
End Caps:	Polypropylene
Standard gaskets:	EPDM

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 4.5 barg (65.26 psig) at 70 °C (158 °F).

The maximum recommended continuous operating temperature is 70 °C (158 °F).

Effective Filtration Area (EFA)

5" (125 mm) 0.2 m^2 (2.3 ft^2)

Sterilization

HIGH FLOW BIO-X Vent Autoclave filter cartridges can be repeatedly autoclaved up to 142 °C (288 °F) for a maximum of 150 cycles.

Note: Remove prefilter layer before steaming.

Retention Characteristics

The HIGH FLOW BIO-X Vent Autoclave range of cartridges has been fully validated by aerosol bacterial challenge levels of $>10^7$ *Brevundimonas diminuta* per cm^2. Independent test work also shows full retention to *MS-2 Coliphage*.

Integrity Test Data

All cartridges are integrity tested prior to despatch by the aerosol challenge test method using Parker domnick hunter's VALAIRDATA II.

Ordering Information

ZGP [ ] .01 [ ]

Code	Length (Nominal)	Code	Endcap
B	3.46" (88 mm)	V	1/4" BSPP
A	5.98" (152 mm)	X	1/2" NPTM

Supplied in packs of 3.

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TETPOR AIR Filter Cartridges

- air / gas filters
- expanded PTFE

TETPOR AIR sterilization filter cartridges offer exceptional filtration performance while providing the highest levels of biosecurity throughout the process industry.

Operating at ambient temperature conditions, TETPOR AIR filter cartridges provide a cost-effective filtration solution. A unique polypropylene prefilter layer extends service life in heavily contaminated environments.

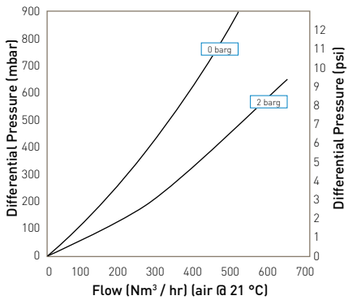
TETPOR AIR filter cartridges also utilize a well-proven inherently hydrophobic expanded PTFE membrane with an absolute removal rating of 0.01 micron for gas applications. This ensures the removal of all airborne bacteria, viruses and bacteriophage.

Note: TETPOR is a registered trademark of Parker domnick hunter

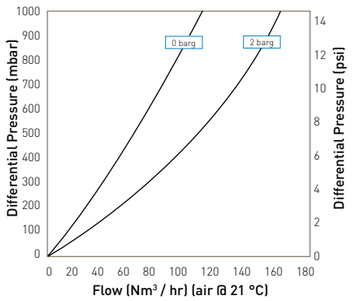
Features and Benefits

- Assured biosecurity with absolute rated filtration
- High flow rates with low pressure drops
- High voids volume PTFE membrane
- Steam sterilizable to 142 °C (287.6 °F)
- Unique prefilter layer

Performance Characteristics



10¨ Size (250 mm) Cartridge



B Size (65 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Expanded PTFE
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene

Filter Cartridges

Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Caps Insert:	316L Stainless Steel
Standard o-rings/gaskets:	Silicone

MURUS Disposable Filter Capsules

Core:	Polypropylene
Sleeve:	Polypropylene
Standard o-rings:	Viton
Capsule Body:	Polypropylene
Capsules Vent Seals:	Silicone

DEMICAP Filter Capsules

Core:	Polypropylene
Sleeve:	Polypropylene
End Caps:	Polypropylene
Capsule Body:	Polypropylene
Capsules Vent Seals:	Silicone
Filling Bell:	Polycarbonate

Syringe Filters

Body:	Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 60 °C (140 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.77	m^2	(8.28 ft^2)
K Size:	0.36	m^2	(3.87 ft^2)
A Size:	0.25	m^2	(2.69 ft^2)
B Size:	0.12	m^2	(1.29 ft^2)
E Size:	0.06	m^2	(0.64 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	120	142 °C (287.6 °F)	120	142 °C (287.6 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	100	135 °C (275 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) TETPOR AIR conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity).

Endotoxins
Aqueous extracts from the 10" (250 mm) TETPOR AIR contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
TETPOR AIR filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Integrity Test Data
All filters are integrity testable to the following limits when wet with 60 / 40 : IPA /water and using air as the test gas.

Cartridge	Test Pressure		Diffusional Flow	Water Intrusion Test Pressure		Water Intrusion	Water Flow
	(barg)	(psig)	(ml / min)	(barg)	(psig)	(ml / 10 min)	(µl / 10 min)
E	0.8	11.6	1.5	2.5	36.3	1.3	371
B	0.8	11.6	3.0	2.5	36.3	2.6	742
A	0.8	11.6	6.0	2.5	36.3	5.3	1514
K	0.8	11.6	8.5	2.5	36.3	7.5	2142
10"	0.8	11.6	18.0	2.5	36.3	16.0	4571

Retention Characteristics
TETPOR AIR filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) filter cartridge.

Ordering Information

Cartridges

ZCMT □ / □ □ - □ □

Code	Length (Nominal)		Code	Micron		Code	Endcap (10")	Code	Variant		Code	O-rings	
B*	2.5"	(65 mm)	020	0.2	µm	B*	dh DOE	A	Air / Gas		E	EPDM	
A*	5"	(125 mm)				C	BF / 226 Bayonet				P	PTFE Encapsulated Silicone	
K	5"	(125 mm)				D	Fin / 222				S*	Silicone	
1	10"	(250 mm)				E	Flat Top / 222				V	Viton	
2	20"	(500 mm)				F	BF / 216/218						
3	30"	(750 mm)				G	Recess / 222						
						H	UF Retrofit						
						R	BF / 222 Bayonet						

** Supplied in packs of 3.*

**EPDM gaskets supplied as standard.*

**Silicone o-ring supplied as standard without having to specify the 'S' code.*

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
X	116
Y	Demi Stub
Z	Demi A & B Std

MURUS Capsules

ZLMT □ - □ □ □ - □ □ □ □ - □

Code	Length (Nominal)		Code	Micron		Code	Inlet Connection	Code	Outlet Connection	Code	Variant		Code	Grade		Code	Design		Code	O-rings	
K	5"	(125 mm)	020	0.2	µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	A	Air / Gas		N	Non-sterile		L	In-Line		E	EPDM	
1	10"	(250 mm)				B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp							T*	T-Port		S*	Silicone	
2	20"	(500 mm)				D	1" Hosebarb	D	1" Hosebarb										V	Viton	
3	30"	(750 mm)				T	1" Tri-Clamp	T	1" Tri-Clamp												

**Only available with a 1" Tri-Clamp.*

**Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

ZEMT □ - □ □ □ - □ □ □ □

Code	Length (Nominal)		Code	Micron		Code	Inlet Connection	Code	Outlet Connection	Code	Variant		Code	Grade		Code	Pack N°	
E	4.4"	(113 mm)	020	0.2	µm	T	1" Tri-Clamp	T	1" Tri-Clamp	A	Air / Gas		N	Non-Sterile		3	Pack of 3	
B	5.5"	(140 mm)				N	1/2" NPT Male	N	1/2" NPT Male									
A	7.9"	(200 mm)				H	1/2" Hosebarb	H	1/2" Hosebarb									
						G	Stepped Hosebarb	G	Stepped Hosebarb									
						M	1/4" NPT Male	M	1/4" NPT Male									
						Q	Walther QC	Q	Walther QC									
						R	Grommel / QC	R	Grommel / QC									
						V	3/8" NPT Female	V	3/8" NPT Female									

Syringe Filters

ZSMT □ - □ □ □ - □ □ □ □ □

Code	Diameter		Code	Micron		Code	Inlet Connection	Code	Outlet Connection	Code	Variant		Code	Grade		Code	Options		Code	Pack N°	
050	50	mm	020	0.2	µm	G	Stepped Hosebarb	G	Stepped Hosebarb	P	Pharmaceutical		N	Non-sterile		S	Standard		025	25 per box	
						L	1/8" NPT Male	L	1/8" NPT Male												

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HIGH FLOW TETPOR II Filter Cartridges

- air / gas filters
- polytetrafluoroethylene PTFE

HIGH FLOW TETPOR II gas sterilization filters have been developed to benefit from technological advances within the manufacture of PTFE membranes. This new generation of filter sets the standard with an unrivalled combination of efficiency, flow rate and strength.

The HIGH FLOW TETPOR II is validated as a 0.2 micron sterilizing grade filter in liquids through ASTM 838-05 and 0.01 micron in gas through full retention to an aerosol challenge of MS2 phage. This ensures the filter will guarantee the sterility of your process in the worst-case scenario where the filter may be subjected to bulk liquid due to a process problem. Subtle changes to the structure of the PTFE have also resulted in the production of an extremely robust product now validated for 225 steam sterilization cycles @ 142 °C (287.6 °F). The combination of non-woven supports upstream of the membrane and an expanded net layer downstream has significant benefits. It provides increased protection and service life while guaranteeing zero fibre shedding into the process.

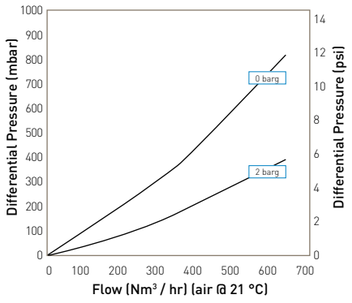
HIGH FLOW TETPOR II is suitable for all sterile gas applications including fermentation inlet and off gas streams, venting, lyophilisers, autoclave vacuum breaks and blow-fill-seal equipment as well as the provision of particle free air within the electronics industry.

Features and Benefits

- Optimum pleat configuration
- Steam sterilizable up to 225 cycles at 142 °C (287.6 °F)
- Unrivalled flow rates combined with low pressure drops
- Fully validated to ASTM 838-05 for liquid bacterial challenge
- Fully validated to aerosol and viral challenge
- Integrity testable by all methods including water intrusion test

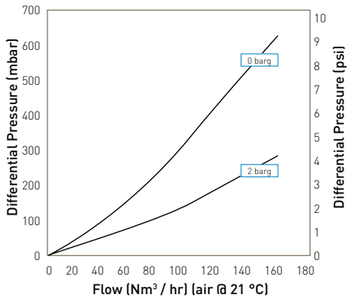
Note: TETPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



Flow rates for other sizes available upon request

10" Size (250 mm) Cartridge



Flow rates for other sizes available upon request

A Size (125 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Polytetrafluoroethylene PTFE
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	316L Stainless Steel
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert:	Polysulphone
Standard o-rings:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 3.5 barg (50.76 psig) at 60 °C (140 °F).

The maximum recommended continuous inlet air temperature is 60 °C (140 °F).

Note: HIGH FLOW TETPOR II cartridges can be used as WFI vents in heated housings if changed on a 4-6 monthly basis.

Sterilization

HIGH FLOW TETPOR II cartridges can be in situ steam sterilized for up to 225 cycles at 142 °C (287.6 °F).

Retention Characteristics

HIGH FLOW TETPOR II cartridges have been fully validated as 0.2 micron sterilizing grade filter cartridges, for compressed air and gas applications. They exceed liquid bacterial challenge levels as recommended by ASTM+. In addition, HIGH FLOW TETPOR II is also validated by aerosol bacterial and *MS-2 Coliphage* challenge testing.

+ASTM American Society for Testing and Materials

Integrity Test Data

All cartridges are integrity tested prior to despatch by the pressure decay and aerosol challenge test methods. Values are for cartridges wetted with 60 / 40 IPA / Water.

Cartridge	Test Pressure (bar)	Test Pressure (psi)	Diffusional Flow (ml / min)	Water Intrusion Test Pressure (barg)	Water Intrusion Test Pressure (psig)	Water Intrusion (ml / 10 min)	Water Flow (µl / 10 min)
D	0.8	11.6	0.6	2.5	36.2	N / A	N / A
C	0.8	11.6	1.1	2.5	36.2	N / A	N / A
B	0.8	11.6	2.8	2.5	36.2	2.3	657
A	0.8	11.6	5.6	2.5	36.2	4.6	1314
K	0.8	11.6	7.70	2.5	36.2	6.4	1828
10"	0.8	11.6	16.50	2.5	36.2	13.5	3857
20"	0.8	11.6	33.00	2.5	36.2	27.0	7714
30"	0.8	11.6	49.50	2.5	36.2	40.5	11571

Ordering Information

ZHFT / [ ] [ ] - [ ]

Code	Length (Nominal)	
D*	1.5"	(35 mm)
C*	2.5"	(65 mm)
B*	2.5"	(65 mm)
A*	5"	(125 mm)
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)

** Supplied in packs of 3.*

Code	Endcap (10")
C	P-7
P	BIO-X Retrofit
H	UF Retrofit

Code	Endcap (Demi)
H	UF Retrofit
T	TRUESEAL
W	HF Demi C & D
Y	Demi MCY
Z	Demi A & B Std

Code	O-rings
E	EPDM
P-	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

- Not available on C and D length variants.
**Silicone o-ring supplied as standard without having to specify the 'S' code.*

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HIGH FLOW TETPOR II Vent Autoclave Filter Cartridges

- air / gas filters
- polytetrafluoroethylene PTFE

HIGH FLOW TETPOR II Vent Autoclave filter cartridges are designed for critical applications where sterile air is required to break the vacuum formed by the condensation of steam inside the autoclave chamber.

At the heart of the HIGH FLOW TETPOR II Vent Autoclave filter cartridge is the latest inherently hydrophobic PTFE membrane. This absolute rated membrane will remove all particles down to 0.01 micron, thus removing airborne bacteria, viruses and bacteriophage.

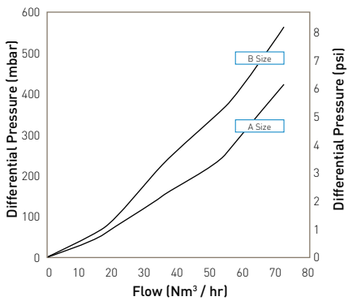
The filter cartridges are manufactured using a heat sealed construction, thus eliminating the need for adhesives or resins in fabrication. The result is a product of exceptional strength and quality.

Note: TETPOR is a registered trademark of Parker domnick hunter

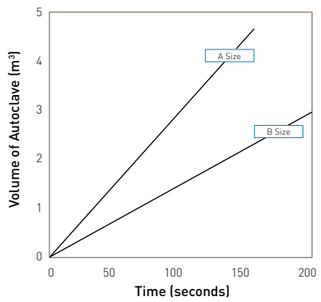
Features and Benefits

- Hydrophobic PTFE membrane
- Fully validated
- Detachable prefilter layer
- Exceptional strength
- Repeatedly autoclavable

Performance Characteristics



Cartridge flow rates @ 0 barg



Vacuum break time against autoclave volume

Specifications

Materials of Construction

Filtration Membrane:	Polytetrafluoroethylene PTFE
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
Prefilter Sock:	Polyurethane
End Caps:	Polypropylene
Standard gaskets:	EPDM

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 3.5 barg (50.76 psig) at 60 °C (140 °F).

The maximum recommended continuous operating temperature is 60 °C (140 °F).

Effective Filtration Area (EFA)

5" (125 mm) 0.3 m^2 (3.22 ft^2)

Sterilization

HIGH FLOW TETPOR II Vent Autoclave filter cartridges can be repeatedly autoclaved up to 142 °C (287.6 °F) for a maximum of 100 cycles.

Note: Remove prefilter layer before steaming.

Retention Characteristics

The HIGH FLOW TETPOR II Vent Autoclave range of cartridges has been fully validated by aerosol bacterial challenge levels of >10^7 *Brevundimonas diminuta* per cm^2. Independent test work also shows full retention to *MS-2 Coliphage*.

Integrity Test Data

All cartridges are integrity tested prior to despatch by the aerosol challenge test method using Parker domnick hunter's VALAIRDATA II.

Ordering Information

ZTA [ ] .01 [ ]

Code	Length (Nominal)		Code	Endcap
B	3.46"	(88 mm)	V	1/4" BSPP
A	5.98"	(152 mm)	X	1/2" NPTM

Supplied in packs of 3.

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HF TETPOR H.T. Filter Cartridges

- air / gas filters
- expanded PTFE

HIGH FLOW TETPOR H.T. gas sterilization filter cartridges provide unrivalled performance in process industry applications where continuous cartridge operation of up to 100 °C (212 °F) is a requirement.

Applications include specific biological fermentations which use high inlet air temperatures and heated vent filters on storage tanks whose contents are at elevated temperatures >80 °C (176 °F), e.g. WFI tanks.

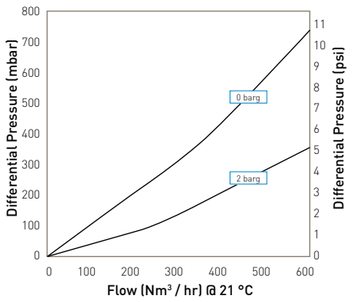
HIGH FLOW TETPOR H.T. cartridges utilize a proven inherently hydrophobic, expanded PTFE membrane with an absolute removal rating of 0.01 micron. This ensures the removal of all airborne bacteria, viruses and bacteriophage. Nomex membrane support layers facilitate continuous operation at temperatures up to 100 °C (212 °F).

Note: TETPOR is a registered trademark of Parker domnick hunter

Features and Benefits

- Long service life even at elevated temperatures 100 °C (212 °F)
- Assured biosecurity with absolute rated filtration
- Stainless steel inner core
- Steam sterilizable to 142 °C (287 °F)
- Exceptionally high flow rates with low pressure drops

Performance Characteristics



10¨ Size (250 mm) Cartridge

HIGH FLOW TETPOR H.T. Filter Cartridges

Specifications

Materials of Construction

Filtration Membrane:	Expanded PTFE
Upstream Support:	Nomex*
Downstream Support:	Nomex*
Inner Support Core:	316L Stainless Steel
Outer Protection Cage:	Heat Stabilized Polypropylene
End Caps:	Heat Stabilized Polypropylene
End Cap Insert:	Stainless Steel
Standard o-rings:	Silicone

**Nomex is a registered trademark of E.I. du Pont de Nemours and Co Inc*

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 3.5 barg (50.76 psig) at 100 °C (212 °F).

The maximum recommended continuous operating temperature is 100 °C (212 °F).

Effective Filtration Area (EFA)

10¨ (250 mm) 0.9 m^2 (9.8 ft^2)

Sterilization

HIGH FLOW TETPOR H.T. cartridges can be in situ steam sterilized for up to 120 cycles at 142 °C (287.6 °F).

Retention Characteristics

HIGH FLOW TETPOR H.T. cartridges have been fully validated as sterilizing grade filter cartridges, for compressed air and gas applications. They exceed liquid bacterial challenge levels as recommended by ASTM+. In addition, HIGH FLOW TETPOR H.T. is further validated by aerosol bacterial challenge testing.

+ASTM American Society for Testing and Materials

Integrity Test Data

All cartridges are integrity tested prior to despatch by the pressure decay and aerosol challenge test methods. Values are for cartridges wetted with 60 / 40 IPA / Water.

Micron Rating		0.2
Diffusional Flow Test Pressure	(barg)	0.80
	(psig)	11.6
Minimum Bubble Point	(barg)	1.00
	(psig)	14.5
Max. Diffusional Flow (10¨) (ml / min)		16.0

Ordering Information

ZCHT / [ ] [ ] - [ ] [ ]

Code	Length (Nominal)
1	10¨ (250 mm)
2	20¨ (500 mm)
3	30¨ (750 mm)

Code	Endcap (10¨)
C	BF / 226 Bayonet
P	BIO-X Retrofit

Code	Variant
N	Nomex

Code	O-rings
E	EPDM
P	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

**Silicone o-ring supplied as standard without having to specify the 'S' code.*

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Steam filters

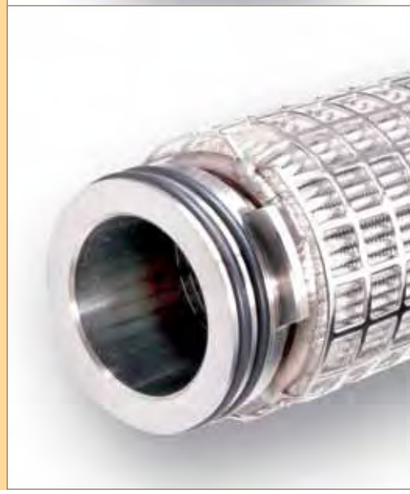
Filtration of steam

Steam is utilized in many areas of process manufacturing both directly and indirectly coming into contact with product, process lines and equipment. The quality of this steam varies considerably depending on methods of generation, additives, condition of supply pipelines and condensate management. If not treated, poor quality steam that is used to sterilize downstream process filters will lead to premature blockage.

Steam filters from Parker domnick hunter have been specifically designed to protect process equipment and pipework from particulate contamination, extending their overall life.

Pleated Steam filters from Parker domnick hunter are designed to provide a culinary grade steam coupled with exceptionally high flow rates. The 1 micron version guarantees steam to 3A.609-03 standard.

Sintered Steam filters from Parker domnick hunter are manufactured from a highly porous sintered stainless steel available in 1 and 25 micron. The 1 micron filter provides culinary grade steam that meets 3A standards. The general purpose 25 micron filter provides protection for membrane filters located downstream in the process.



STEAM Filter Cartridges

- steam filters
- 316L stainless steel

Steam is an often neglected part of a process, regarded as an add on to a customers liquid or gas filtration needs.

It has however, large specific applications in its own right and should be treated with the same level of importance as air, gas and liquid systems if long filter lifetimes and system cost effectiveness are to be achieved.

The quality of steam used within the food and dairy industries has been raised higher on the agenda in an ever increasing number of companies. Minimum acceptable standards are now being quoted on a more regular basis with particular reference to 'culinary grade' steam. Steam serves several purposes in the food & beverage industry. It is critical that this steam is of a high quality to ensure effective and continuous operation of the process.

Features and Benefits

- 316L stainless steel filter cartridges
- Exceptionally high flow rates
- Available in culinary grade 1 micron
- High dirt holding capacity
- 'JUMBO' filter configuration ensures maximum utilization of pipework capacity

Which Filter for Which Application ?

Process Steam

- Direct from boiler
- No direct contact with product being manufactured

Applications

- General heating
- Steam jackets
- Bio waste kill systems

Cartridges

Required if steam is used to sterilize liquid and gas cartridge filters

Sintered 25 µm
(Selection Criteria)

Use for relatively low flow rates

Pleated 5 µm
(Selection Criteria)

High flow rate and dirt holding capacity

Culinary Steam (3A Standard 609-03)

- 95% retention of >2 micron particles in the liquid phase
- Manufactured from 300 series stainless steel
- Any additives to the boiler feed should conform to CFR Title 21, Chapter 1, Part 173, Section 173.310

Applications

- Used in direct contact with food
- Direct contact with food processing equipment and HVAC systems

Cartridges

Selection dependant on flow parameters

Sintered 1 µm
(Selection Criteria)

Use for relatively low flow rates

Pleated 1 µm
(Selection Criteria)

Used to maximize steam capacity of pipe

JUMBO Filters
(Selection Criteria)

Highest available capacity

Clean Steam (HTM 2031:1997)*

- Condensate to WFI standards

Applications

- Pharmaceutical products
- Pharmaceutical plant HVAC systems

Cartridges

For removal of magnetite particles generated from stainless steel pipes due to corrosive purity of steam

HIGH FLOW TETPOR II
(Selection Criteria)

PTFE membrane 100% removal of magetite particles generated from stainless steel pipes

Culinary 1µm
(Selection Criteria)

To conform to HTM 2031 Point of Use filter rated at <5 µm

Specifications - PLEATED

Materials of Construction

- Filtration Media: 316L Stainless Steel
- Inner Support Core: 316L Stainless Steel
- Outer Support Cage: 316L Stainless Steel
- End Caps: 316L Stainless Steel
- Standard o-rings/gaskets: EPDM *(standard)*
  Silicone and Viton
  (options available)

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 10 barg (145.03 psig).

The maximum differential pressure in direction of flow (in to outside) is 2 barg (29.00 psig).

The maximum recommended continuous operating temperature range is -75 °C (-103 °F) to +200 °C (392 °F).

Note: Temperature dependant on o-ring compound

Effective Filtration Area (EFA)

10˝ (250 mm) 0.15 m^2 (1.61 ft^2)

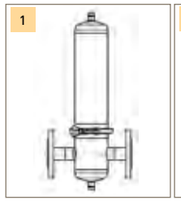
Housing Materials of Construction

- Material: 316L Stainless Steel
- Surface Finish
  - Single Internal: Electropolished Ra 0.8
  - Single External: Mechanical Polish (Commercial Bright)
  - Jumbo Internal: Upstream - Beadblast Outlet Assembly - Linished 180 grit
  - Jumbo External: Beadblast
- Vent / Drain
  - Single / Jumbo: $^1/_4$˝ BSPP Female Thread
- Seal Material: EPDM Aseptic Seal

Housing Design Pressure and Temperature

Single: 16 barg (232 psig) @ 200 °C (392 °F)

Jumbo: 7 barg (101 psig) @ 170 °C (338 °F)



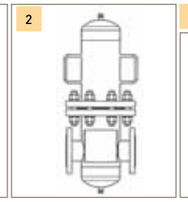


Figure	Housing Code	Connection Size	Capacity Kg / hr @ 1 barg	Overall Height	Replacement Filter Code
			<100 mbar or 40 m / sec		
1	HBAHP01KY	1.5˝ (38.1 mm)	150	14.8˝ (376 mm)	ZCHS-K-...C
1	HBAHP011C	2˝ (50.8 mm)	280	20.7˝ (526 mm)	ZCHS-1-....C
2	VISCE-01J-D	3˝ (50.8 mm)	750	30.0˝ (763 mm)	ZCHS-J-...3
2	VISCE-01J-E	4˝ (101.6 mm)	1300	35.2˝ (895 mm)	ZCHS-J-...4
2	VISCE-03J-G	6˝ (152.4 mm)	2300	41.2˝ (1049 mm)	3 x ZCHS-J...3
2	VISCE-03J-H	8˝ (203.2 mm)	3750	48.7˝ (1237 mm)	3 x ZCHS-J-...4

Note: For efficient steam distribution it is recommended that steam velocities are restricted to 25 m / sec^{-1}. For more information on the HBA range, please contact Parker domnick hunter.

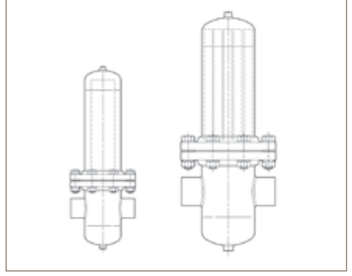
Correction Factors

To use the table above, the steam flow rates must be at 1 barg (14.50 psig). For system flows at different line pressures, divide the system flow by the correction factor below to find the equivalent flow @ 1 barg (14.50 psig).

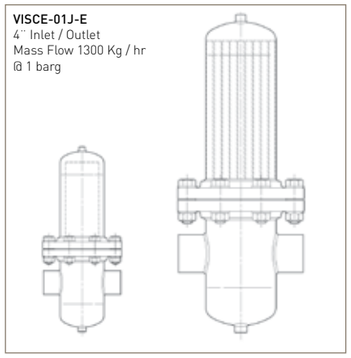
Steam Pressure	0	1	2	3	4	5	6	7	8	9	10
Correction Factor	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5

Table showing the relative system size difference between pleated cartridges left and sintered cartridges right.

VISCE-01J-D
3˝ Inlet / Outlet
Mass Flow 780 Kg / hr
@ 1 barg



VISCE-01J-E
4˝ Inlet / Outlet
Mass Flow 1300 Kg / hr
@ 1 barg



Specifications - SINTERED

Materials of Construction

- Filtration Media: Sintered Stainless Steel (316L)
- End Caps: Stainless Steel (316L)
- Standard o-rings/gaskets: EPDM *(standard)*
  Silicone and Viton
  (options available)

Recommended Operating Conditions

The maximum differential pressure in direction of flow (outside to in) is 10 barg (145.03 psig).

The maximum differential pressure in direction of flow (in to outside) is 5 barg (72.51 psig).

The maximum recommended continuous operating temperature range is -75 °C (-103 °F) to +200 °C (392 °F).

Note: Temperature dependant on o-ring compound

Housing Materials of Construction

- Material: 316L Stainless Steel
- Surface Finish
  - Internal: Electropolished Ra 0.8
  - External: Mechanical Polish (Commercial Bright)
- Vent / Drain: $^1/_4$˝ BSPP Female Thread (Supplied with Plug)
- Seal Material: EPDM Aseptic Seal

Housing Design Pressure and Temperature

16 barg (232 psig) @ 200 °C (392 °F)

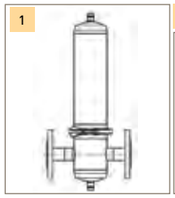


Figure	Housing Code	Connection Size	Capacity Kg / hr @ 1 barg		Overall Height	Replacement Filter Code
			<100 mbar or 40 m / sec 1 µm	25 µm		
1	HBAHP01KY	1.5˝ (38.1 mm)	21	45	14.8˝ (376 mm)	ZCSSK-...C
1	HBAHP011C	2˝ (50.8 mm)	40	160	20.7˝ (526 mm)	ZCSS1-....C
1	HBAHP012C	2˝ (50.8 mm)	82	280	30.5˝ (776 mm)	ZCSS2-....C

Note: For efficient steam distribution it is recommended that steam velocities are restricted to 25 m / sec^{-1}. For more information on the HBA range, please contact Parker domnick hunter.

Correction Factors

To use the table above, the steam flow rates must be at 1 barg (14.50 psig). For system flows at different line pressures, divide the system flow by the correction factor below to find the equivalent flow @ 1 barg (14.50 psig).

Steam Pressure	0	1	2	3	4	5	6	7	8	9	10
Correction Factor	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5

Ordering Information

SINTERED

ZCSS ☐ - ☐ ☐

Code | Length (Nominal)			Code | Nominal Micron Rating (Steam)		Code | Endcap (10˝)	
B	2.5˝	(65 mm)	001	1.0 µm (Culinary)	B	dh DOE
A	5˝	(125 mm)	025	25.0 µm	C	BF / 226 Bayonet
K	5˝	(125 mm)				
1	10˝	(250 mm)			Code | Endcap (Demi)	
2	20˝	(500 mm)			T	TRUESEAL
3	30˝	(750 mm)			Z	Demi A & B Std

All cartridges supplied as single items.

PLEATED

ZCHS - ☐ - ☐ ☐

Code | Length (Nominal)			Code | Nominal Micron Rating (Steam)		Code | Endcap (10˝)	
B	2.5˝	(65 mm)	001	1.0 µm (Culinary)	B	dh DOE
A	5˝	(125 mm)	005	5.0 µm	C	BF / 226 Bayonet
K	5˝	(125 mm)			3	3˝ JUMBO
1	10˝	(250 mm)			4	4˝ JUMBO
2	20˝	(500 mm)				
3	30˝	(750 mm)			Code | Endcap (Demi)	
					T	TRUESEAL
					Z	Demi A & B Std

All cartridges supplied as single items.

SINTERED Stainless Steel Retrofit Cartridge Part Numbers - 1.0 µm & 25 µm

Parker domnick hunter Cartridge	DS-R 3/1	DS-R 3/1.4	DS-R 4/1.5	DS-R 4/2.5	DS-R 5/2.5	DS-R 5/3	DS-R 10/3	DS-R 15/3	DS-R 20/3	DS-R 30/3	DS-R 30/5
Retrofit Cartridge	GS3/1 SS3/1	GS3/1.5 SS3/1.5	GS4/1.5 SS4/1.5	GS4/2.5 SS4/2.5	GS5/2.5 SS5/2.5	GS5/3 SS5/3	GS10/3 SS10/3	GS15/3 SS15/3	GS20/3 SS20/3	GS30/3 SS30/3	GS30/5 SS30/5

Parker domnick hunter Cartridge	DS-R 02/05	DS-R 02/10	DS-R 03/05	DS-R 03/10	DS-R 04/10	DS-R 04/20	DS-R 05/20	DS-R 05/25	DS-R 07/25	DS-R 07/30	DS-R 10/30	DS-R 15/30	DS-R 20/30	DS-R 30/30	DS-R 30/50
Retrofit Cartridge	GS02/05 SS02/05	GS02/10 SS02/10	GS03/05 SS03/05	GS03/10 SS03/10	GS04/10 SS04/10	GS04/20 SS04/20	GS05/20 SS05/20	GS05/25 SS05/25	GS07/25 SS07/25	GS07/30 SS07/30	GS10/30 SS10/30	GS15/30 SS15/30	GS20/30 SS20/30	GS30/30 SS30/30	GS30/50 SS30/50

Parker domnick hunter Cartridge	PDS-R 02/05	PDS-R 02/10	PDS-R 03/05	PDS-R 03/10	PDS-R 04/10	PDS-R 04/20	PDS-R 05/20	PDS-R 05/25	PDS-R 07/25	PDS-R 07/30	PDS-R 10/30	PDS-R 15/30	PDS-R 20/30	PDS-R 30/30	PDS-R 30/50
Retrofit Cartridge	P-GS02/05 P-SS02/05	P-GS02/10 P-SS02/10	P-GS03/05 P-SS03/05	P-GS03/10 P-SS03/10	P-GS04/10 P-SS04/10	P-GS04/20 P-SS04/20	P-GS05/20 P-SS05/20	P-GS05/25 P-SS05/25	P-GS07/25 P-SS07/25	P-GS07/30 P-SS07/30	P-GS10/30 P-SS10/30	P-GS15/30 P-SS15/30	P-GS20/30 P-SS20/30	P-GS30/30 P-SS30/30	P-GS30/50 P-SS30/50

Liquid filters

Filtration of liquids

Covering a wide range of process applications, Parker domnick hunter manufacture a range of filters that exceed industry requirements, providing high flow rates and long life in often demanding environments. With the ability to withstand aggressive chemicals and high temperature operations, Parker domnick hunter has a liquid filter that will match your requirements.

As an industry focussed manufacturer, Parker domnick hunter understand that every process or application can be different, which is why we have a Sustaining Engineering Group whose purpose is to tailor our product range to meet your exacting needs, making our filters truly fit for purpose.

Filters include:

- *Polypropylene (PP)*
- *Glass microfibre (GF)*
- *Polyethersulphone (PES)*
- *Polytetrafluoroethylene (PTFE)*

PEPLYN filters from Parker domnick hunter are used for clarification and prefiltration in a wide range of applications. The polypropylene construction makes them the ideal choice for aggressive and viscous chemicals and solvents.

PROSPUN Filter Cartridges

- liquid filters
- polypropylene

PROSPUN C is the most economical solution for delivering general liquid clarification and particle retention. It can be used as a guard filter to protect the process against high variable levels of particulate.

- Economical general clarification
- High strength bonded fibre construction
- Ideal for primary stage filtration
- Nominal retention efficiency for general clarification duties

PROSPUN T offers consistent retention characteristics and a high level of security that is enhanced by the option to incorporate plug-in o-ring seal adapters on the cartridge. The service life of PROSPUN T is maximized through the use of closely controlled density and diameter fibre technology.

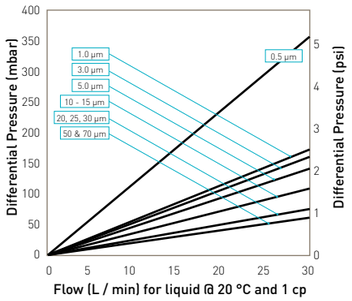
- High dirt holding capacity
- Range of end cap adapters and seals
- Excellent protection of downstream process
- >90% efficiency at given rating

PROSPUN A - Closely controlled fibre diameter and density in a multiple layered construction serve to maximize service life of PROSPUN A whilst delivering absolute particle retention.

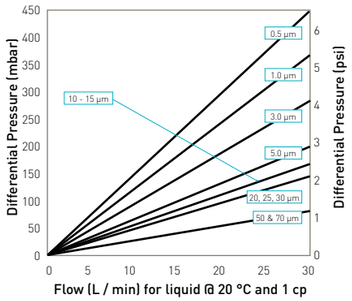
- High dirt holding capacity
- Range of end cap adapters, seals and additional support for backwash applications
- Consistent absolute retention under a wide range of operating conditions

Note: PROSPUN is a registered trademark of Parker domnick hunter

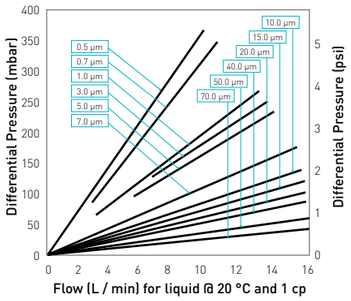
Performance Characteristics



PROSPUN C



PROSPUN T



PROSPUN A

Specifications

Materials of Construction

Filtration Media:	Polypropylene
End Caps:	Polypropylene
Seals:	As Required

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 60 °C (140 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Cleaning and Sterilization

PROSPUN cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 121 °C (249.8 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Dimensions

Nominal outside diameter: 2.4" (62 mm)
Nominal inside diameter: 1.1" (29 mm)

Length	Connection Configuration B Seal-Seal	Connection Configuration L and O Seal-Seal Single Open Ended Shoulder-Shoulder
1	9.87" (251 mm)	10" (254 mm)
2	19.50" (498 mm)	20" (508 mm)
3	29.37" (746 mm)	30" (762 mm)
4	39.12" (994 mm)	40" (1016 mm)

Optional reinforcing cage available for PROSPUN A, contact Parker domnick hunter for details.

Minimum Box Quantities

Cartridge Size	Quantity
10" (254 mm)	40
20" (508 mm)	20
30" (762 mm)	20
40" (1016 mm)	20

Recommended Rinse Volume

Prior to use - 10 litres per 10" (250 mm) filter cartridge.

Ordering Information

PR [ ] [ ] - [ ] [ ] - [ ] [ ] [ ]

Code	Type
SC*	PROSPUN C
ST	PROSPUN T
SA	PROSPUN A

*Only available with plain cut ends or with polyethylene foam seal

Code	Length (Nominal)
1	10" (250 mm)
2	20" (500 mm)
3	30" (750 mm)
4	40" (1000 mm)

Code	Micron PROSPUN C
.5	0.5 µm
01	1.0 µm
03	3.0 µm
05	5.0 µm
10	10.0 µm
15	15.0 µm
20	20.0 µm
25	25.0 µm
30	30.0 µm
50	50.0 µm
75	75.0 µm

Code	Micron PROSPUN T
.5	0.5 µm
01	1.0 µm
03	3.0 µm
05	5.0 µm
10	10.0 µm
15	15.0 µm
20	20.0 µm
25	25.0 µm
30	30.0 µm
50	50.0 µm
75	75.0 µm

Code	Micron PROSPUN A
.5	0.5 µm
.7	0.7 µm
01	1.0 µm
03	3.0 µm
05	5.0 µm
10	10.0 µm
15	15.0 µm
20	20.0 µm
40	40.0 µm
50	50.0 µm
70	70.0 µm

Code	Endcap (10")
B	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat / 222
L	DOE
O	Plain Cut End

Code	Seal
Blank	None
E	EPDM
F	Polyethylene Foam
S	Silicone
V	Viton*

PROSPUN A only

Code	Cage
S	Standard No Cage
L	Lightweight Reinforcing Cage*
H	Heavyweight Reinforcing Cage*

PROSPUN A only

For non-standard lengths, insert seal-seal (O,B,L configurations) or shoulder-shoulder (single open end configurations) in millimeters.

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PROPLEAT PP Filter Cartridges

- liquid filters
- polypropylene

PROPLEAT PP cartridges have been developed to bridge the gap between meltblown depth filters and absolute rated pleated media filters.

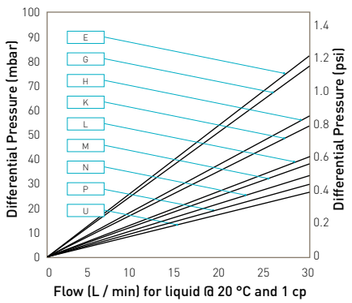
Their continuous length and all-polypropylene construction results in a robust yet economical design that maximizes the effective filtration area and provides wide chemical compatibility, coupled with low extractable levels.

All PROPLEAT PP cartridges exhibit 99% efficiency at their given retention rating, providing consistent and economical clarification in a diverse range of applications.

Features and Benefits

- Continuous length rigid sleeve and core provide high strength during normal and reverse flow operations
- Retention ratings to suit a wide range of clarification applications
- Excellent chemical compatibility
- Elevated temperature option available for hot water sanitization and steam sterilization

Performance Characteristics



Cartridge flow rates

Specifications

Materials of Construction

- Filtration Media: Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Cap Insert (if specified): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 60 °C (140 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Effective Filtration Area (EFA)

40" (1000 mm) 2.2 m^2 (23.2 ft^2)

Cleaning and Sterilization

PROPLEAT PP cartridges can be repeatedly in situ steam sterilized or autoclaved at up to 121 °C (250 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Retention Characteristics

The retention characteristics of PROPLEAT PP have been determined by a single-pass technique using suspension of ISO 12103 Part 1 A2 Fine and A4 Coarse test dust in water.

Media Code ß ratio	99% & approximate ratings at lower efficiencies 99% 100	95% 20	90% 10
E	0.8	0.7	0.6
G	1.0	0.9	0.7
H	3.5	2.3	1.0
K	4.8	3.8	2.8
L	7.2	6.0	4.5
M	10.0	8.0	6.0
N	12.0	9.0	7.0
P	18.0	13.0	10.0
U	40.0	30.0	25.0

Recommended Rinse Volume

Prior to use - 10 litres per 10" (250 mm) cartridge.

Minimum Box Quantities

All cartridges supplied in boxes of 6.

Dimensions

- Nominal Outside Diameter:
  2.8" (70 mm) C,D,E,R Style
  2.5" (64 mm) B,L Style
- Nominal Inside Diameter:
  1.1" (28 mm)

Standard Lengths (DOE seal to seal) - mm (inch)

Length	B Style	L Style
1	9 7/8" (250 mm)	9 7/8" (250 mm)
2	19 1/2" (498 mm)	20" (508 mm)
3	29 3/8" (746 mm)	30 1/8" (766 mm)
4	39 1/8" (994 mm)	40" (1014 mm)

Ordering Information

PRPP [ ] - [ ] N [ ] - [ ] [ ]

Code | Length (Nominal)	Retention Rating	Code | Endcap (10")	Code | Seal	Code | Option
1 10" (250 mm)	E	B dh DOE	E EPDM	S Hot Water / Steam Option
2 20" (500 mm)	G	C BF / 226 Bayonet	S Silicone	
3 30" (750 mm)	H	D Fin / 222		
4 40" (1000 mm)	K	E Flat / 222		
	L	L Extended DOE		
	M	R Fin / 222 Bayonet		
	N			
	P			
	U			

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PROSTEEL A Filter Cartridges

- liquid filters
- 316L stainless steel

PROSTEEL A filters provide the ideal solution in applications where traditional polymer based filters are limited by compatibility, exposure time or a combination of high temperature and viscosity.

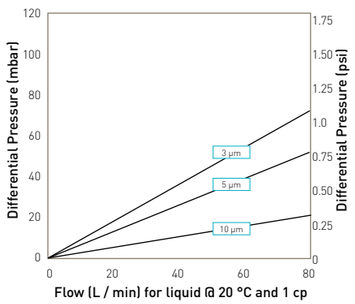
They are ideally suited to filtration of the solvents used in a wide range of process industries from pharmaceuticals, food & beverage and electronics through to paints and inks. The Parker domnick hunter range of stainless steel filters provides a solution to compatibility issues while maintaining absolute retention ratings down to 3.0 micron. 316L stainless steel fibres are sintered together into a graded pore structure.

The efficiency of the media increases through the filtration bed resulting in excellent dirt holding capacity while maintaining high relative flow rates compared to alternative technology such as sintered powder tubes and metal membranes. The filters are available in two formats both using the same filtration media but one manufactured in a pleated construction and one in a cylindrical wrap. This allows a cost-effective selection depending on flow rate and dirt holding requirements.

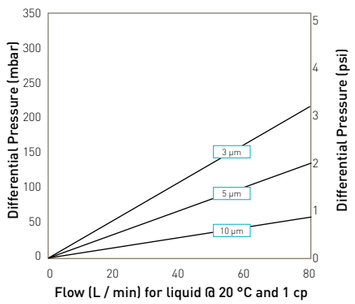
Features and Benefits

- Absolute rated stainless steel liquid filters
- Ideal for aggressive solvents, viscous and hot solutions
- Removal rating 3, 5 and 10 microns
- Compatible with most solvents
- Graded density metal fibre technology provides exceptional dirt holding capacity while retaining excellent flow rates
- Available in two formats; pleated and wrapped, for complete system optimization

Performance Characteristics



Pleated cartridge flow rates
10¨ Size (250 mm) Cartridge



Cylindrically wrapped cartridge flow rates
10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Media: 316L Stainless Steel
- Inner Support Core: 316L Stainless Steel
- Outer Protection Cage: 316L Stainless Steel
- End Caps: 316L Stainless Steel
- Standard o-rings/gaskets*:EPDM
- Assembly Method: TIG Welded

**All o-rings are manufactured from FDA approved compounds.*

Recommended Operating Conditions

Operating Temperature °C	°F	Maximum Forward DP (bar)	(psi)	Maximum Reverse DP (bar)	(psi)
200	392	25	364	3	44

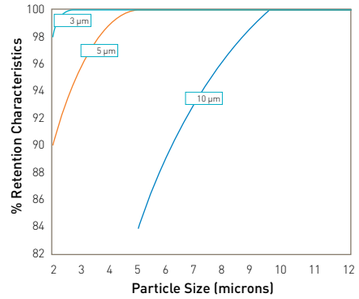
Note: The maximum operating temperature is dependant on o-ring selection and properties of the liquid being filtered.

Effective Filtration Area (EFA)

- ZCCF Cylindrical Wrap
  10¨ (250 mm) 0.05 m^2 (0.53 ft^2)
- ZCMF Pleated
  10¨ (250 mm) 0.13 m^2 (1.39 ft^2)

Retention Characteristics

The retention characteristics of the stainless steel filters are determined using ACFTD in accordance with the single pass test ASTM 795-88.



Dirt Holding Capacity

The table below gives an indication of dirt holding capacity in grams when tested in accordance with the Multipass method ISO 168892.

Type	Micron Rating 3.0	5.0	10.0
ZCCF	3.0	3.5	4.0
ZCMF	7.0	7.6	8.4

Integrity Test Data

The general condition of the cartridge can be tested via the bubble point method. Typical values are detailed in the table below.

Micron Rating		3.0	5.0	10.0
Bubble Point	(mbarg)	125.0	76.0	37.0
in Water	(psig)	1.78	1.1	0.54

Ordering Information

ZC □ □ - □ □ - □

Code | Type	
CF	Wrapped
MF	Pleated

All cartridges are supplied as single items.

Code | Length (Nominal)		
B	2.5¨	(65 mm)
A	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)

Code | Micron		
003	3.0	µm
005	5.0	µm
010	10.0	µm

Code | Endcap (10¨)	
B	dh DOE
C	226 Bayonet

Code | Endcap (Demi)	
T	TRUESEAL
Z	Demi A & B Std

Code | O-rings	
E*	EPDM
P	PTFE Encapsulated Silicone
S	Silicone
V	Viton

**EPDM o-ring supplied as standard without having to specify the 'E' code.*

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PROSTEEL N Filter Cartridges

- liquid filters
- 316L stainless steel

PROSTEEL N filters provide the ideal solution in applications where traditional polymer based filters are limited by compatibility, exposure time or a combination of high temperature and viscosity.

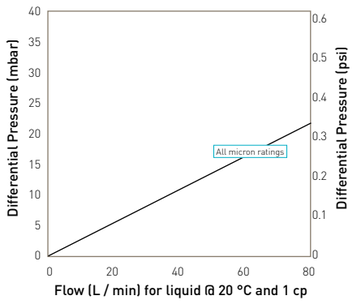
They are ideally suited to filtration of solvents used in a wide range of processes in pharmaceuticals, food & beverage and electronics through to paints and inks.

The Parker domnick hunter range of stainless steel filters provides the solution to compatibility issues while maintaining excellent flow rates for clarifying duties. The filters are available in two formats both using the same filtration media but one manufactured in a pleated construction and one in a cylindrical wrap. This allows a cost-effective selection depending on flow rate and dirt holding requirements.

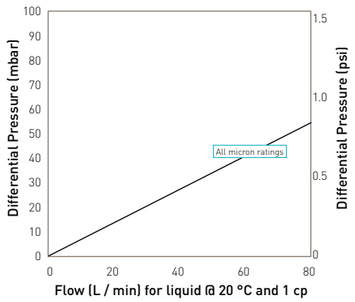
Features and Benefits

- Nominally rated stainless steel liquid filters
- Ideal for aggressive solvents, viscous and hot solutions
- Removal rating from 5 to 100 microns
- Compatible with most solvents
- Stainless steel mesh ensures excellent regeneration characteristics for extended service life
- Available in two formats; pleated and wrapped, for complete system optimisation

Performance Characteristics



Pleated cartridge flow rates
10¨ Size (250 mm) Cartridge



Cylindrically wrapped cartridge flow rates
10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Media: 316L Stainless Steel
- Inner Support Core: 316L Stainless Steel
- Outer Protection Cage: 316L Stainless Steel
- End Caps: 316L Stainless Steel
- Standard o-rings/gaskets*: EPDM
- Assembly Method: TIG Welded

**All o-rings are manufactured from FDA approved compounds.*

Recommended Operating Conditions

Operating Temperature °C	Operating Temperature °F	Maximum Forward DP (bar)	Maximum Forward DP (psi)	Maximum Reverse DP (bar)	Maximum Reverse DP (psi)
200	392	25	364	3	44

Note: The maximum operating temperature is dependant on o-ring selection and properties of the liquid being filtered.

Effective Filtration Area (EFA)

- ZCCM Cylindrical Wrap
  10¨ (250 mm) 0.05 m^2 (0.53 ft^2)
- ZCPM Pleated
  10¨ (250 mm) 0.13 m^2 (1.39 ft^2)

Ordering Information

ZC [ ] [ ] - [ ] [ ] - [ ]

Code	Type
CM	Wrapped
PM	Pleated

All cartridges are supplied as single items.

Code	Length (Nominal)		
B	2.5¨	(65 mm)
A	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)

Code	Micron	
005	5.0	µm
010	10.0	µm
020	20.0	µm
040	40.0	µm
100	100.0	µm

Code	Endcap (10¨)
B	dh DOE
C	226 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Z	Demi A & B Std

Code	O-rings
E*	EPDM
P	PTFE Encapsulated Silicone
S	Silicone
V	Viton

**EPDM o-ring supplied as standard without having to specify the 'E' code.*

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PEPLYN NE Filter Cartridges

- liquid filters
- polypropylene

PEPLYN NE liquid filter cartridges are designed for use in the microelectronics industry for filtration of water, process chemicals, photochemicals, solvents and etchants.

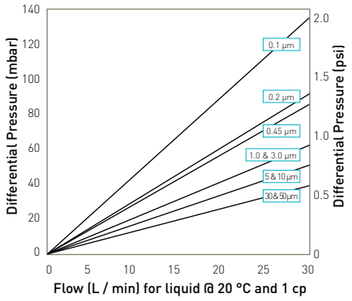
PEPLYN NE filters resist hydrolysis in aggressive solutions which would otherwise result in the contamination of the process fluid. The filter media has graded fibre diameter and density, resulting in progressively finer retention through the depth of the media. This graded density depth mechanism, combined with optimized pleated pack configuration and high surface area, affords high flow capability and exceptional dirt holding capacity when compared with competitive pleated cartridges and meltblown depth filters. PEPLYN NE provides consistant retention and stability over a wide range of operating conditions.

Features and Benefits

- Nominal micron ratings ranging from 0.1 to 50 micron
- Graded density for excellent particle retention
- Pleated media for high flow rates and long life
- All polypropylene construction
- Wide range of end caps to provide retrofitting of existing systems

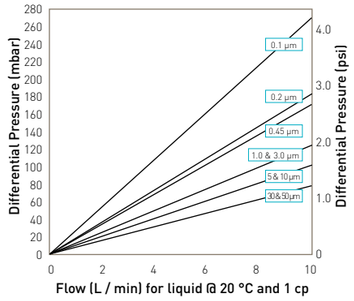
Note: PEPLYN is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B Size (65 mm) Cartridge

Specifications

Materials of Construction

- Filtration Media: Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Cap Insert (if applicable): 316L Stainless Steel*
  **Not available in B & L endcap variants*
- Standard o-rings/gaskets: EPDM
- Capsule Body: Polypropylene
- Capsule Vent Seals: EPDM

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules can be operated at a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.79 m² (8.50 ft²)

Ordering Information

Cartridges

ZCNE □ - □ □ - / □

Code	Length (Nominal)		
B*	2.5˝	(65 mm)	
A*	5˝	(125 mm)	
K	5˝	(125 mm)	
1	10˝	(250 mm)	
2	20˝	(500 mm)	
3	30˝	(750 mm)	
4	40˝	(1000 mm)	

** Supplied in packs of 3.*

Code	Micron	
.10	0.1	µm
.20	0.2	µm
.45	0.45	µm
1.0	1.0	µm
003	3.0	µm
005	5.0	µm
010	10.0	µm
030	30.0	µm
050	50.0	µm

Code	Endcap (10˝)
B	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

Code	O-rings
E*	EPDM
P	PTFE Encapsulated Silicone
S	Silicone
V	Viton

**EPDM o-ring supplied as standard without having to specify the 'E' code.*

Capsules

ZENE □ - □ □ □ - □ □ □

Code	Length (Nominal)		
E	4.4˝	(113 mm)	
B	5.5˝	(140 mm)	
A	7.9˝	(200 mm)	

Code	Micron	
.10	0.1	µm
.20	0.2	µm
.45	0.45	µm
1.0	1.0	µm
003	3.0	µm
005	5.0	µm
010	10.0	µm
030	30.0	µm
050	50.0	µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
V	3/8˝ NPT Female

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
V	3/8˝ NPT Female

Code	Variant	
E	Electronics	
P	Pharmaceutical	

Code	Grade	
N	Non Sterile	

Code	Pack N°	
3	Pack of 3	

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PEPLYN PLUS Filter Cartridges

- liquid filters
- polypropylene

PEPLYN PLUS liquid filter cartridges are utilized for the clarification and prefiltration of a wide range of products in the pharmaceutical, beverage, ultrapure water and fine chemical industries.

The all polypropylene construction ensures a broad range of chemical compatibility making PEPLYN PLUS cartridges particularly suitable for the filtration of aggressive and viscous chemicals and solvents. They do not suffer from hydrolysis in aggressive solutions which would result in the contamination of the process fluid.

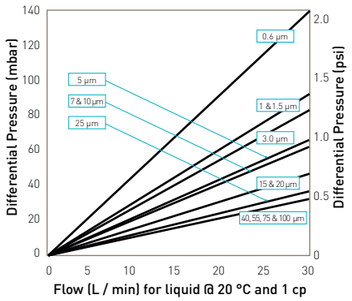
Extensive research has resulted in filter media with continuously graded fibre density giving progressively finer particulate retention through the depth of the media. This combined with optimized media pleating density gives PEPLYN PLUS cartridges exceptional lifetime performance.

Note: PEPLYN is a registered trademark of Parker domnick hunter

Features and Benefits

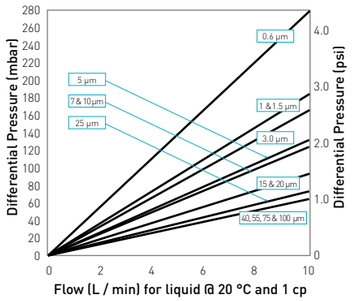
- Micron rating range from 0.6 to 100 micron
- Pleated media for high flow rates and long life
- Graded density for excellent particle retention
- Wide range of end caps to provide retrofitting of existing systems
- All polypropylene construction

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B Size (65 mm) Cartridge

Specifications

Materials of Construction

Filtration Media:	Polypropylene
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*
Not available in B & L endcap variants	
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone
Filling Bell:	Polycarbonate
Syringe Filter Body:	Polypropylene

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.79 m^2 (8.50 ft^2)

Cleaning and Sterilization

PEPLYN PLUS cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 135 °C (275 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 135 °C (275 °F).

Retention Characteristics

The retention characteristics of PEPLYN PLUS have been determined by a single-pass technique using suspensions of ISO 12103 Part 1 A2 Fine and A4 Coarse test dust in water.

Media Code	Micron Rating at Various Efficiencies >99.99% 10000	>99.98% 5000	>99.90% 1000	>99% 100	>90% 10
.60	0.60	0.57	0.54	0.32	0.20
1.0	1.00	0.95	0.90	0.70	0.50
1.5	1.50	1.40	1.10	0.80	0.60
003	3.00	2.80	1.80	1.00	0.70
005	5.00	4.70	4.50	3.50	1.00
007	7.00	6.70	6.30	4.50	2.50
010	10.00	8.00	7.00	4.80	2.80
015	15.00	12.00	10.00	7.20	4.50
020	20.00	16.00	14.00	10.00	6.00
025	25.00	20.00	17.00	12.00	7.00

Pharmaceutical Validation

A full validation guide is available upon request from Laboratory Services Group (LSG).

Ordering Information

Cartridges

ZCPP [ ] - [ ] [ ] [ ] [ ] [ ]

Code	Length (Nominal)
B*	2.5˝ (65 mm)
A*	5˝ (125 mm)
K	5˝ (125 mm)
1	10˝ (250 mm)
2	20˝ (500 mm)
3	30˝ (750 mm)
4	40˝ (1000 mm)

* Supplied in packs of 3.

Code	Micron
.60	0.6 µm
1.0	1.0 µm
1.5	1.5 µm
003	3.0 µm
005	5.0 µm
007	7.0 µm
010	10.0 µm

Code	Micron
015	15.0 µm
020	20.0 µm
025	25.0 µm
040	40.0 µm
055	55.0 µm
075	75.0 µm
100*	100.0 µm

* Not available in B and A lengths.

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

* EPDM gaskets supplied as standard

Code	Variant
E	Electronics
P	Pharmaceutical
S	Steam Sterilizable
/	None

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
P	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

*Silicone o-ring supplied as standard without having to specify the 'S' code.

Capsules

ZEPP [ ] - [ ] [ ] [ ] - [ ] [ ] [ ] [ ] - [ ]

Code	Length (Nominal)
E	4.4˝ (113 mm)
B	5.5˝ (140 mm)
A	7.9˝ (200 mm)

Code	Micron
.60	0.6 µm
1.0	1.0 µm
1.5	1.5 µm
003	3.0 µm
005	5.0 µm
007	7.0 µm
010	10.0 µm

Code	Micron
015	15.0 µm
020	20.0 µm
025	25.0 µm
040	40.0 µm
055	55.0 µm
075	75.0 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8˝ NPT Female

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8˝ NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-Sterile

Code	Pack N°
3	Pack of 3

Code	Accessory
FB	Filling Bell

G & H connections only

Syringe Filters

ZSPP [ ] - [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ] [ ]

Code	Diameter
025	25 mm
050	50 mm

Code	Micron
.60	0.6 µm
1.0	1.0 µm

Code	Inlet / Outlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Inlet / Outlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-sterile

Code	Options
S	Standard

Code	Pack N°
025	25 per box

PREPOR GF Filter Cartridges

- liquid filters
- glass microfibre

PREPOR GF liquid filter cartridges are utilized for the clarification, stabilization and bioburden reduction of aqueous solutions, media and biologicals.

These filters have a high dirt holding capacity and exhibit exceptional flow performance compared to polypropylene filters. The hydrophilic nature of PREPOR GF filter cartridges also makes them more suitable for gravity fed systems.

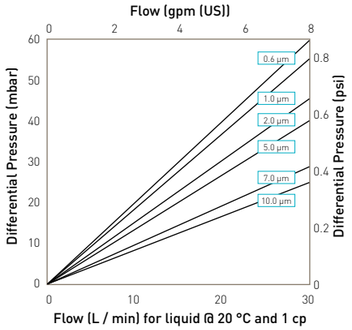
PREPOR GF utilizes a glass microfibre filter medium encased within an upstream polypropylene mesh and a downstream non-woven filter support material. PREPOR GF filter cartridges are dimensionally stable with no media migration. The pleat pack is supported by an inner polypropylene core and outer polypropylene cage, heat bonded to polypropylene end caps.

Note: PREPOR is a registered trademark of Parker domnick hunter

Features and Benefits

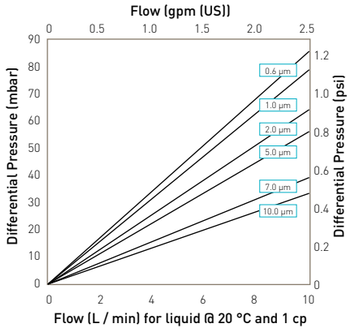
- Micron rating range from 0.6 to 10 micron
- Wide range of end caps to allow retrofitting of existing systems
- High filtration area
- High capacity filter media giving microbial retention
- Heat bonded construction

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B Size (65 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Glass Microfibre
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*
Not available in B & L endcap variants	
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone
Filling Bell:	Polycarbonate
Syringe Filter Body:	Polypropylene

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.6 m² (6.3 ft²)

Cleaning and Sterilization

PREPOR GF cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 121 °C (249.8 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 121 °C (249.8 °F).

Retention Characteristics

The retention characteristics of PREPOR GF have been determined through controlled laboratory tests challenging with a standard aqueous suspension of ACFTD (AC Fine Test Dust) using on-line laser particle counters.

	Micron Rating at Various Efficiencies					
Efficiency ß Ratio	>99.99% 10000	99.98% 5000	99.90% 1000	99% 100	95% 20	90% 10
0.6 & 0.8 µm	0.60	0.50	0.46	0.33	0.25	0.22
1.0 & 1.5 µm	1.0	0.80	0.60	0.52	0.42	0.35
2.0 µm	1.5	1.2	0.93	0.77	0.63	0.47
5.0 µm	2.0	1.6	1.5	1.2	0.82	0.73
7.0 µm	5.0	4.3	3.6	2.9	2.3	2.0
10.0 µm	10.0	9.2	7.9	5.9	4.4	4.0

Pharmaceutical Validation

A full validation guide is available upon request from Laboratory Services Group (LSG).

Ordering Information

Cartridges

ZCGF □ - □ □ - □ □

Code	Length (Nominal)
B*	2.5˝ (65 mm)
A*	5˝ (125 mm)
K	5˝ (125 mm)
1	10˝ (250 mm)
2	20˝ (500 mm)
3	30˝ (750 mm)
4	40˝ (1000 mm)

*Supplied in packs of 3.

Code	Micron
.60	0.6 µm
.80	0.8 µm
1.0	1.0 µm
1.5	1.5 µm
002	2.0 µm
005	5.0 µm
007	7.0 µm
010	10.0 µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

* EPDM gaskets supplied as standard

Code	Variant
P	Pharmaceutical
S*	Steam Sterilizable
/	None

*For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
P	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

*Silicone o-ring supplied as standard without having to specify the 'S' code.

Capsules

ZEGF □ - □ □ - □ □ - □ □

Code	Length (Nominal)
E	4.4˝ (113 mm)
B	5.5˝ (140 mm)
A	7.9˝ (200 mm)

Code	Micron
.60	0.6 µm
.80	0.8 µm
1.0	1.0 µm
1.5	1.5 µm
002	2.0 µm
005	5.0 µm
007	7.0 µm
010	10.0 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8˝ NPT Female

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8˝ NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-Sterile

Code	Pack N°
3	Pack of 3

Code	Accessory
FB	Filling Bell

G & H connections only

Syringe Filters

ZSGF □ - □ □ □ □ - □ □ □ □

Code	Diameter
025	25 mm
050	50 mm

Code	Micron
.60	0.6 µm
.80	0.8 µm
1.0	1.0 µm
1.5	1.5 µm

Code	Micron
002	2.0 µm
005	5.0 µm
007	7.0 µm
010	10.0 µm

Code	Inlet / Outlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Inlet / Outlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-sterile

Code	Options
S	Standard

Code	Pack N°
025	25 per box

PREPOR GP Filter Cartridges

- liquid filters
- glass microfibre / polypropylene

PREPOR GP is a new prefilter that combines the strength of polypropylene with the microbial retention of glass fibre for demanding applications such as long term exposure to steam, high differential pressures or aggressive chemicals.

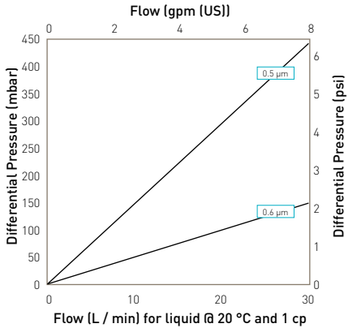
The combined media will also provide a significant microbial reduction that makes PREPOR GP equally suitable for bioburden reductions in pharmaceutical liquids as well as offering excellent protection to sterilizing grade membrane cartridges. By using graded density media, PREPOR GP has a higher voids volume (95%) and greater dirt holding capacity than surface filtration membranes which means that filtration costs are reduced without affecting the product quality. PREPOR GP can also provide excellent prefiltration to membrane filters in proteinaceous and high contamination applications by extending the life of the membrane cartridge and hence reducing filtration costs.

Features and Benefits

- Combined media for microbial retention and mechanical strength
- Graded density media gives increased dirt holding capacity
- Suitable for bioburden reduction and fine prefiltration
- Pleated construction with rigid core and sleeve

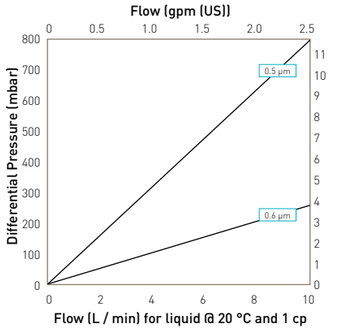
Note: PREPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ size (250 mm) filters



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B size (125 mm) filters

Specifications

Materials of Construction

- Filtration Media: Glass Microfibre / Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Cap Insert (if applicable): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Polypropylene
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.37 m^2 (3.9 ft^2)

Cleaning and Sterilization

PREPOR GP cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 121 °C (249.8 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of PREPOR GP have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size (µm)*	Typical Titre Reduction 0.5	0.6	1.0	1.5
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0	10^4	10^3	-	-
Oenococcus oenos	0.5 - 0.7 x 0.7 - 1.2	10^4	10^3	-	-
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0	10^4	10^3	-	-
Saccharomyces cerevisiae	1.0 (spherical buds)	10^7	10^6	10^4	10^3

Ordering Information

Cartridges

ZCGP □ - □ □ - □ □

Code	Length (Nominal)	
B*	2.5˝	(65 mm)
A*	5˝	(125 mm)
K	5˝	(125 mm)
1	10˝	(250 mm)
2	20˝	(500 mm)
3	30˝	(750 mm)
4	40˝	(1000 mm)

** Supplied in packs of 3.*

Code	Micron	
.50	0.5	µm
.60	0.6	µm
.80	0.8	µm
1.0	1.0	µm
1.5	1.5	µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Variant
E	Electronics
S*	Steam Sterilizable

**For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.*

Code	O-rings
E	EPDM
P	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

**Silicone o-ring supplied as standard without having to specify the 'S' code.*

Capsules

ZEGP □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)	
E	4.4˝	(113 mm)
B	5.5˝	(140 mm)
A	7.9˝	(200 mm)

Code	Micron	
.50	0.5	µm
.60	0.6	µm
.80	0.8	µm
1.0	1.0	µm
1.5	1.5	µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
V	3/8˝ NPT Female

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male
V	3/8˝ NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-Sterile

Code	Pack N°
3	Pack of 3

Code	Accessory
FB	Filling Bell

G & H connections only

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*

PREPOR PES Filter Cartridges

- liquid filters
- polyethersulphone

PREPOR PES is an innovative particulate grade membrane prefilter cartridge designed to work in harmony with final sterilizing filters, to guarantee the highest levels of performance and security.

PREPOR PES combines high flow rate characteristics with good microbial reduction and minimum product adsorption by using the latest hydrophilic polyethersulphone membrane technology.

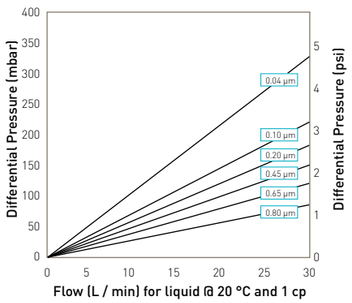
PREPOR PES uses all polypropylene hardware to offer good chemical compatibility and low extractables and is suitable for use in many pharmaceutical applications including terminal and aseptic filtration, ophthalmics, biologicals, serum, SVPs, LVPs and other complex liquids.

Note: PREPOR is a registered trademark of Parker domnick hunter

Features and Benefits

- Micron rating from 0.04 to 0.8 micron
- Versatile particulate grade membrane filter for bioburden reduction and prefiltration duties
- High filtration area with asymmetrical membrane giving long life and high flow rates
- Available in a comprehensive range of end cap configurations for retrofitting existing applications

Performance Characteristics



For K size for a given flow rate multiply 10" size differential pressure by 2

10" Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Polyethersulphone
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*

**Not available in B & L endcap variants*

Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone
Filling Bell:	Polycarbonate

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10" (250 mm) Up to 0.69 m^2 (7.42 ft^2)

Cleaning and Sterilization

PREPOR PES cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

To maximize the life of the cartridge, the differential pressure across the cartridge should not exceed 0.3 barg (4.35 psig) at 130 °C (266 °F).

Retention Characteristics

While the PREPOR PES product is rated for particulate retention, the performance of PREPOR PES products has been assessed to bacterial titre reduction using a challenge methodology based on the ASTM F838-05 methodology applied to sterilizing grade filters. Typical levels are given below:

Organism	Approx. Cell* Size (µm)	Typical Titre Reduction 0.2	0.45	0.65	0.8	1.2
Brevundimonas diminuta	0.5 - 1.0 x 1.5 - 5.0	$>10^{10}$	10^{5}	10^{2}	-	-
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0	$>10^{12}$	10^{10}	10^{7}	10^{4}	10^{2}
Oenococcus oenos	0.5 - 0.7 x 0.7 - 1.2	$>10^{12}$	10^{12}	10^{8}	10^{5}	10^{3}

Ordering Information

Cartridges

ZCPS □ - □ □ □ □

Code	Length (Nominal)	
B*	2.5"	(65 mm)
A*	5"	(125 mm)
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)
4	40"	(1000 mm)

** Supplied in packs of 3.*

Code	Micron
004	0.04 µm
010	0.10 µm
020	0.20 µm
045	0.45 µm
065	0.65 µm
080	0.80 µm

Code	Endcap (10")
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Variant
E	Electronics
P	Pharmaceutical

Code	O-rings
E	EPDM
P	PTFE Encapsulated Silicone
S*	Silicone
V	Viton

**Silicone o-ring supplied as standard without having to specify the 'S' code.*

Capsules

ZEPS □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)	
E	4.4"	(113 mm)
B	5.5"	(140 mm)
A	7.9"	(200 mm)

Code	Micron
004	0.04 µm
010	0.10 µm
020	0.20 µm
045	0.45 µm
065	0.65 µm
080	0.80 µm

Code	Inlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8" NPT Female

Code	Outlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8" NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade
N	Supplied Non-Sterile
S	Supplied Gamma Pre-sterilized

Code	Pack N°
3	Pack of 3

Code	Accessory
FB	Filling Bell

G & H connections only

** Approx. values as in "Holt, J.G., Kreg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*

TETPOR PLUS Filter Cartridges

- liquid filters
- polytetrafluoroethylene

TETPOR PLUS filters are manufactured entirely from fluoropolymers making them extremely resistant to a wide range of aggressive chemicals.

TETPOR PLUS filter cartridges have been specifically designed for the filtration of liquids and gases in the bulk pharmaceutical, chemical and biopharmaceutical industry where particulate removal, bioburden reduction and guaranteed sterility is required.

The increasing use of ozonation for the treatment of WFI systems has highlighted compatibility issues with vent filters based on standard polypropylene components. The introduction of a fully validated 0.2 micron sterilizing grade TETPOR PLUS filter cartridge provides guaranteed long term performance in these applications with the additional benefit that the filters integrity can be validated by the water intrusion test method.

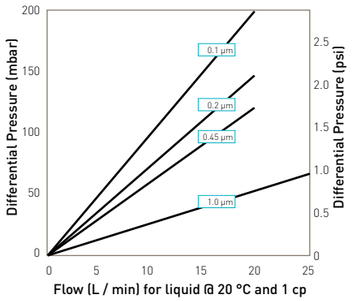
The high voids volume single layer PTFE membrane ensures an excellent combination of flow rate and retention.

Features and Benefits

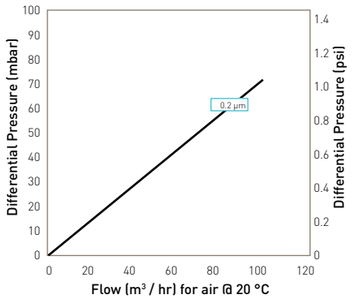
- Sterile filtration of oxygen / oxygen enriched feeds in cell culture
- Exceptional resistance to solvents and oxidative environments
- Ideal for sterile venting on ozonated water systems
- Fully validated to ASTM F838-05 for sterilizing grade filters
- PTFE membrane
- Available in a wide range of micron ratings to suit all applications

Note: TETPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



10¨ Size (250 mm) Cartridge



10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Polytetrafluoroethylene
Upstream Support:	Polytetrafluoroethylene
Downstream Support:	Polytetrafluoroethylene
Inner Support Core:	PFA
Outer Protection Cage:	PFA
End Caps:	PFA

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 125 °C (257 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.5	80.0
75	167	3.8	55.0
125	257	2.0	30.0

Effective Filtration Area (EFA)

10¨ (250 mm)	Up to 0.63 m^2 (6.78 ft^2)
K Size (125 mm)	Up to 0.32 m^2 (3.44 ft^2)

Cleaning and Sterilization

TETPOR PLUS cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 142 °C (287.6 °F) for a maximum of 30 cycles.

Retention Characteristics

TETPOR PLUS filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10¨ (250 mm) module.

Integrity Test Data

The following is the integrity test information for the micron ratings available within the TETPOR PLUS product range. Diffusional flow and bubble point values are given for cartridges wetted in 60:40 v/v IPA:Water solution.

Micron Rating		0.1	0.2	0.45	1.0
Diffusional Flow	(barg)	1.45	1.0	0.45	3.0
Test Pressure	(psig)	19.0	15.0	0.5	0.2
Max. Diffusional Flow (10¨)		35.0	16.5	50.0	-
(ml / min)	(K)	16.3	7.7	23.3	-
Min. Bubble Point	(barg)	1.45	1.0	0.48	3.0
	(psig)	19.0	15.0	0.5	0.2
Water Intrusion	(barg)	-	2.5	-	-
Test Pressure	(psig)	-	36.3	-	-
Max. Water Intrusion	(10¨)	-	13.5	-	-
(ml / 10 min)	(K)	-	6.4	-	-

Pharmaceutical Validation

A full validation guide is available upon request from Laboratory Services Group (LSG).

Ordering Information

ZCTP □ - □ □ - □ - □ □

Code	Length (Nominal)		Code	Micron		Code	Endcap (10¨)		Code	Insert Option		Code	Variant		Code	O-rings	
K	5¨	(125 mm)	010	0.1	µm	CF	Flat Top / 226		N*	No Insert		P	Pharmaceutical		P	FEP Encapsulated Viton	
1	10¨	(250 mm)	020	0.2	µm	C	BF / 226 Bayonet								K	Kalrez	
2	20¨	(500 mm)	045	0.45	µm	E	Flat Top / 222								C	Chemraz	
3	30¨	(750 mm)	100	1.0	µm	D	Fin / 222								S	Silicone	
4	40¨	(1000 mm)															

*Omit if 316L stainless steel insert required

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CARBOFLOW MX Filter Cartridges

- carbon activated filters
- carbon

CARBOFLOW MX cartridges are offered in both high efficiency and general grades. They consist of bituminous coal sourced carbon, extruded together with an FDA listed thermoplastic binder, to produce an extremely porous yet rigid structure.

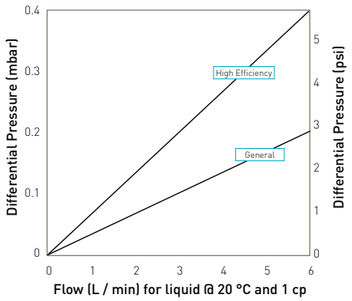
The result is a filter offering unsurpassed adsorptive capacity, up to 20 times that of traditional granular carbon or carbon impregnated filters, and high particle removal efficiency.

The rigid structure of CARBOFLOW MX not only minimizes any possibility of channelling, bypass or fluidizing, but also the release of carbon fines during start up and operation. Such problems are common with more traditional carbon filters. CARBOFLOW MX is available in lengths up to 40¨ (1016 mm) together with end fittings to suit most industry standard housings.

Features and Benefits

- Available in lengths 5¨ to 40¨
- Ideal for chlorine and chloroform reduction
- Available in 2 grades
- FDA approved materials

Performance Characteristics



10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

Carbon:	Bituminous Coal
Carbon Type:	Steam Activated, Acid Wash
Carbon Weight (per 10¨):	350 g
End Caps:	Polypropylene

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Maximum Operating Temperature

60 °C (158 °F)

Maximum Differential Pressure

7 bar (101.52 psi)

Recommended Changeout Differential Pressure

2 bar (29.00 psi)

Retention Characteristics

	1 High Efficiency	2 General
Particle Removal	99.9% @ 2 mic	98% @ 10 mic
Chlorine Reduction**	76 cu.m @ 4 l / min	22.7 cu.m @ 4 l / min
Chloroform Reduction*	3 cu.m @ 2 l / min	n / a

** Per 10¨ element, for longer lengths multiply pro-rata for details of test conditions contact Parker domnick hunter for details.*

***Based on an inlet concentration of 2 ppm chlorine.*

Applications

- Pre and post R.O. filtration
- Domestic drinking water
- De-chlorination
- Process water
- Product rinse waters
- Plating solutions
- De-colourization

Ordering Information

Code | Flow Path	Code | Length (Nominal)	Code | Type	Code | Grade	Code | End Fitting	Code | Seal Material
C Carbon	05 4.75¨ (124 mm) 09 9.75¨ (247 mm) 10 9.875¨ (251 mm) 11 10¨ (254 mm) 19 19.50¨ (500 mm) 20 20¨ (508 mm) 29 29.50¨ (750 mm) 30 30¨ (762 mm) 39 39.25¨ (1000 mm) 40 40¨ (1016 mm)	M Extruded	1 High Efficiency 2 General	0 DOE 2 Flat / 226 3 Flat / 222 7 Fin / 226 8 Fin / 222 9 213 S SOE	E EPDM N Nitrile P PE Foam S Silicone V Viton

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Beverage filters

Beverage liquids

Parker domnick hunter has supplied the beverage industry with high quality filter products since 1963. During this time the company has worked hand in hand with leading beverage manufacturers to develop an industry specific range of filter products.

Experience in local markets, supported by a dedicated team of Engineers and Scientists allows Parker domnick hunter to maximize your manufacturing process and support your future development plans.

PREPOR - Prefiltration liquid filters from Parker domnick hunter provide high efficiency removal of spoilage organisms and yeast removal, providing economic stabilization of your product.

BEVPOR - PES membrane range of filters from Parker domnick hunter have been specifically designed for the beverage industry to provide microbial stabilization that extends shelf-life, while maintaining colour and flavour of the final product.

PEPLYN HD Filter Cartridges

- liquid filters
- polypropylene

The two ways to increase the lifetime of a filter are to increase the amount of contamination it can handle, or to improve the effectiveness of cleaning procedures.

PEPLYN HD combines both of these capabilities in an advanced pleated construction. PEPLYN HD utilizes high depth pleated polypropylene media that balances high contaminant loading capacity with efficient cleaning.

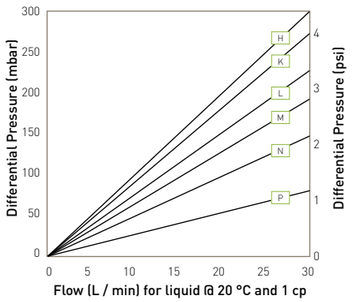
Capture of particles is throughout the depth of the media, larger particles being retained in the outer prefiltration layers, while the inner graded density PEPLYN media provides accurately defined retention under wide extremes of operating conditions. The lifetime of PEPLYN HD is enhanced by its ability to withstand frequent backwash cleaning.

Note: PEPLYN is a registered trademark of Parker domnick hunter

Features and Benefits

- Raw water filtration for the protection of downstream process such as RO membranes
- Trap filtration removing pre-coat and body fed particles that have been released from powder filters
- Removal of carbon and resin fines downstream from treatment processes

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Media: Polypropylene
- Prefilter Media: Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Cap Insert (if applicable): 316L Stainless Steel*

  **Not available in B & L endcap variants*
- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Polypropylene
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.3 m^2 (3.22 ft^2)

Cleaning and Sterilization

PEPLYN HD cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 135 °C (275 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 135 °C (275 °F).

Retention Characteristics

The retention characteristics of PEPLYN HD filter cartridges have been determined by a single-pass technique using suspensions of ISO 12103 Pt. 1 A2 Fine and A4 Course test dust in water.

Micron Rating at Various Efficiencies						
Efficiency	>99.99%	99.98%	99.90%	99%	95%	90%
Beta Ratio	10000	5000	1000	100	20	10
G	3.00	2.80	1.80	1.00	0.85	0.70
H	4.80	4.00	3.20	2.60	1.90	1.60
K	9.00	8.20	6.90	5.00	3.70	3.40
L	12.00	10.00	7.80	5.90	4.60	4.00
M	14.00	10.00	9.20	6.90	6.10	5.00
N	17.00	14.00	12.00	9.00	7.00	6.00
P	22.00	18.00	15.00	12.00	9.40	6.80

Ordering Information

Cartridges

PHD - [ ] [ ] [ ] - [ ] [ ] [ ]

Code | Length (Nominal)		
B*	2.5¨	(65 mm)
A*	5¨	(125 mm)
K	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)
4	40¨	(1000 mm)

** Supplied in packs of 3.*

Retention Rating
G
H
K
L
M
N
P

Code | Flush	
N	None

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code | Endcap (10¨)	
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code | Endcap (Demi)	
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code | Format	
A	10¨ Modular
D	Demi

Code | O-rings	
E	EPDM
S	Silicone

Capsules

PHD - [ ] [ ] [ ] - [ ] [ ] [ ]

Code | Length (Nominal)		
E	4.4¨	(113 mm)
B	5.5¨	(140 mm)
A	7.9¨	(200 mm)

Supplied in packs of 3.

Retention Rating
G
H
K
L
M
N
P

Code | Flush	
N	None

Code | Inlet Connection	
T	1¨ Tri-Clamp
N	$^1/_2$¨ NPT Male
H	$^1/_2$¨ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$¨ NPT Male
V	$^3/_8$¨ NPT Female

Code | Outlet Connection	
T	1¨ Tri-Clamp
N	$^1/_2$¨ NPT Male
H	$^1/_2$¨ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$¨ NPT Male
V	$^3/_8$¨ NPT Female

Code | Vent / Drain Seals	
S	Silicone

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PEPLYN HA Filter Cartridges

- liquid filters
- polypropylene

Two ways to increase the lifetime of a filter are to increase the amount of contamination it can handle or to improve the effectiveness of cleaning procedures. PEPLYN HA combines both of these features in its advanced pleated construction.

PEPLYN HA utilizes polypropylene filter media and support materials, which balance a high surface area and closely controlled porosity, in a configuration that maximizes the cleaning efficiency of the cartridge.

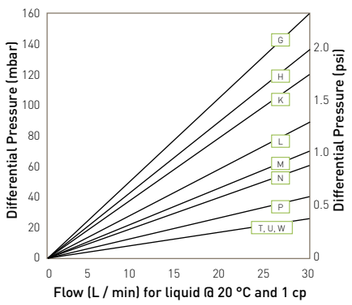
Capture of larger particles is predominantly on the surface of the media, where the rigid, open pleat structure ensures that backwash cleaning provides effective removal. Smaller particles are retained throughout the depth of the graded density PEPLYN media, providing accurately defined retention under wide extremes of operating conditions.

Features and Benefits

- Ideally suited for raw water filtration where the longevity of the filter can be enhanced by repetitive backwashing
- Trap filtration (also known as police or guard filtration) removing precoat and body fed particles that have been released from powder filters, for example, in a brewing process
- Removal of carbon and resin fines downstream from treatment processes
- Clarification of CIP solutions prior to their use with fine prefilter cartridges and microporous membranes

Note: PEPLYN is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Media:	Polypropylene
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone

**Not available in B & L endcap variants*

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.7 m^2 (7.53 ft^2)

Cleaning and Sterilization

PEPLYN HA cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 135 °C (275 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 135 °C (275 °F).

Retention Characteristics

The retention characteristics of PEPLYN HA filter cartridges have been determined by a single-pass technique using suspensions of ISO 12103 Pt. 1 A2 Fine and A4 Course test dust in water.

Efficiency / Beta Ratio	>99.99% 10000	99.98% 5000	99.90% 1000	99% 100	95% 20	90% 10
	Micron Rating at Various Efficiencies					
D	1.00	0.95	0.90	0.70	0.60	0.50
E	1.50	1.40	1.10	0.80	0.70	0.60
G	3.00	2.80	1.80	1.00	0.90	0.70
H	5.00	4.70	4.50	3.50	2.30	1.00
K	10.00	8.00	7.00	4.80	3.80	2.80
L	15.00	12.00	10.00	7.20	6.00	4.50
M	20.00	16.00	14.00	10.00	8.00	6.00
N	25.00	20.00	17.00	12.00	9.00	7.00
P	32.00	27.00	24.00	18.00	13.00	10.00
T	50.00	40.00	34.00	28.00	20.00	17.00
U	70.00	55.00	50.00	40.00	30.00	25.00
W	125.00	100.00	80.00	70.00	50.00	40.00

Ordering Information

Cartridges

PHA - [ ] [ ] [ ] - [ ] [ ] [ ]

Code | Length (Nominal)		
B*	2.5¨	(65 mm)
A*	5¨	(125 mm)
K	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)
4	40¨	(1000 mm)

** Supplied in packs of 3.*

Retention Rating
D
E
G
H
K
L
M
N
P
T
U
W*

** Not available in A and B lengths.*

Code | Flush	
N	None

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code | Endcap (10¨)	
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code | Endcap (Demi)	
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code | Format	
A	10¨ Modular
D	Demi

Code | O-rings	
E	EPDM
S	Silicone

Capsules

PHA - [ ] [ ] [ ] - [ ] [ ] [ ]

Code | Length (Nominal)		
E	4.4¨	(113 mm)
B	5.5¨	(140 mm)
A	7.9¨	(200 mm)

Supplied in packs of 3.

Retention Rating
D
E
G
H
K
L
M
N
P
T
U

Code | Flush	
N	None

Code | Inlet Connection	
T	1¨ Tri-Clamp
N	1/2¨ NPT Male
H	1/2¨ Hosebarb
G	Stepped Hosebarb
M	1/4¨ NPT Male
V	3/8¨ NPT Female

Code | Outlet Connection	
T	1¨ Tri-Clamp
N	1/2¨ NPT Male
H	1/2¨ Hosebarb
G	Stepped Hosebarb
M	1/4¨ NPT Male
V	3/8¨ NPT Female

Code | Vent / Drain Seals	
S	Silicone

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PREPOR GF Filter Cartridges

- liquid filters
- glass microfibre

PREPOR GF filter cartridges have been specifically developed for fine clarification of water, products and ancillary liquids.

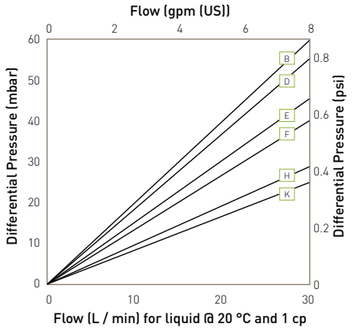
The higher efficiency grades also provide excellent bioburden reduction and protection to microporous membranes.

The high porosity of the microfibre filter media means that the filters have high dirt holding capacity and exhibit exceptional flow performance compared to similarly rated polypropylene filters. Coupled with the hydrophilic nature of the media, this makes them more suitable for low pressure and gravity fed systems, viscous liquids and an option for all systems where long-term elevated temperature and chemical cleaning are not required.

Features and Benefits

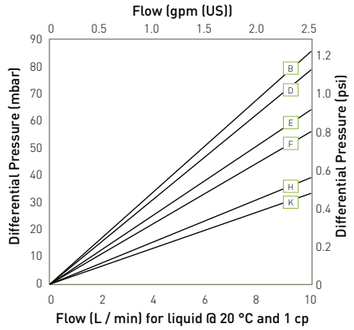
- Clarification of products for the purpose of visual aesthetics
- Fine clarification of products and ancillary liquids to extend the lifetime of microporous membrane filters
- Removal of low levels of bioburden, such as natural yeasts, from incoming liquids
- Clarification of viscous liquids such as syrups, especially where low transfer pressures are used

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B size (125 mm) Cartridge and Capsule

Specifications

Materials of Construction

Filtration Membrane:	Glass Microfibre
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone

**Not available in B & L endcap variants*

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.6 m² (6.3 ft²)

Cleaning and Sterilisation

PREPOR GF cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 121 °C (249.8 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of PREPOR GF have been determined through controlled laboratory tests challenging with a standard aqueous suspension of ACFTD (AC Fine Test Dust) using on-line laser particle counters.

Micron Rating at Various Efficiencies						
Efficiency	>99.99%	99.98%	99.90%	99%	95%	90%
Beta Ratio	10000	5000	1000	100	20	10
B	0.60	0.50	0.46	0.33	0.25	0.22
D	1.0	0.80	0.60	0.52	0.42	0.35
E	1.5	1.2	0.93	0.77	0.63	0.47
F	2.0	1.6	1.5	1.2	0.82	0.73
H	5.0	4.3	3.6	2.9	2.3	2.0
K	10.0	9.2	7.9	5.9	4.4	4.0

Ordering Information

Cartridges

PGF - [ ] [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)		Retention Rating
B*	2.5¨	(65 mm)	B
A*	5¨	(125 mm)	D
K	5¨	(125 mm)	E
1	10¨	(250 mm)	F
2	20¨	(500 mm)	H
3	30¨	(750 mm)	K
4	40¨	(1000 mm)	

** Supplied in packs of 3.*

Code	Flush
N	None

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	Endcap (10¨)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format	
A	10¨	Modular
D	Demi	

Code	O-rings	
E	EPDM	
S	Silicone	

Capsules

PGF - [ ] [ ] [ ] - [ ] [ ] [ ] [ ]

Code	Length (Nominal)		Retention Rating
E	4.4¨	(113 mm)	B
B	5.5¨	(140 mm)	D
A	7.9¨	(200 mm)	E
			F
			H
			K

Supplied in packs of 3.

Code	Flush
N	None

Code	Inlet Connection	
T	1¨	Tri-Clamp
N	$^1/_2$¨	NPT Male
H	$^1/_2$¨	Hosebarb
G	Stepped Hosebarb	
M	$^1/_4$¨	NPT Male
V	$^3/_8$¨	NPT Female

Code	Outlet Connection	
T	1¨	Tri-Clamp
N	$^1/_2$¨	NPT Male
H	$^1/_2$¨	Hosebarb
G	Stepped Hosebarb	
M	$^1/_4$¨	NPT Male
V	$^3/_8$¨	NPT Female

Code	Vent / Drain Seals	
S	Silicone	

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PREPOR GP Filter Cartridges

- liquid filters
- glass microfibre / polypropylene

PREPOR GP filter cartridges will significantly reduce numbers of yeast and spoilage organisms in beverage products to provide extremely cost-effective microbiological stabilization.

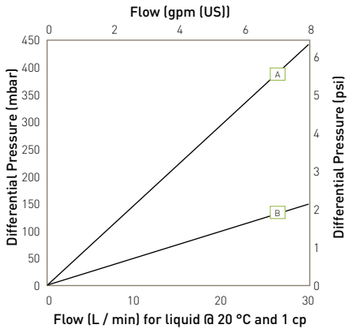
The cartridges will also 'condition' liquids and can be used to improve the filterability of products prior to terminal stabilization by thermal or filtrative methods.

The filters utilize a unique combination of graded density glass microfibre and polypropylene media. Combined together in a pleated construction, this configuration provides a high surface area and couples the advantages of glass microfibre with the inherent strength and durability of polypropylene.

Features and Benefits

- Microbial reduction in beverage applications
- Ideally suited for yeast removal and bacterial reduction to provide short-term microbiological stability
- Fine clarification to provide bright finished product
- Adjustment of filterability of bulk liquids after tank storage transport
- Prefiltration duty to extend the lifetime of downstream microporous membrane filters

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Glass Microfibre / Polypropylene
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*
Not available in B & L endcap variants	
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.37 m^2 (3.9 ft^2)

Cleaning and Sterilization

PREPOR GP cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 121 °C (249.8 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of PREPOR GP have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size (µm)*	Typical Titre Reduction A	B	D	E
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0	10^6	10^3	-	-
Oenococcus oenos	0.5 - 0.7 x 0.7 - 1.2	10^6	10^3	-	-
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0	10^6	10^3	-	-
Saccharomyces cerevisiae	1.0 (spherical buds)	10^7	10^6	10^6	10^3

Ordering Information

Cartridges

PGP - [ ] [ ] [ ] - [ ] [ ] [ ]

Code | Length (Nominal)		
B*	2.5¨	(65 mm)
A*	5¨	(125 mm)
K	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)
4	40¨	(1000 mm)

* Supplied in packs of 3.

Retention Rating
A
B
D
E

Code | Flush	
N	None (standard)

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code | Endcap (10¨)	
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code | Endcap (Demi)	
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

* EPDM gaskets supplied as standard

Code | Format	
A	10¨ Modular
D	Demi

Code | O-rings	
E	EPDM
S	Silicone

Capsules

PGP - [ ] [ ] [ ] - [ ] [ ] [ ]

Code | Length (Nominal)		
E	4.4¨	(113 mm)
B	5.5¨	(140 mm)
A	7.9¨	(200 mm)

Supplied in packs of 3.

Retention Rating
A
B
D
E

Code | Flush	
N	None

Code | Inlet Connection	
T	1¨ Tri-Clamp
N	$^1/_2$¨ NPT Male
H	$^1/_2$¨ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$¨ NPT Male
V	$^3/_8$¨ NPT Female

Code | Outlet Connection	
T	1¨ Tri-Clamp
N	$^1/_2$¨ NPT Male
H	$^1/_2$¨ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$¨ NPT Male
V	$^3/_8$¨ NPT Female

Code | Vent / Drain Seals	
S	Silicone

* *Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*

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PREPOR PP Filter Cartridges

- liquid filters
- polypropylene

PREPOR PP filter cartridges will significantly reduce numbers of yeast and spoilage organisms from beverage products, to provide extremely cost effective microbial stabilization.

The cartridges will also 'condition' liquids and can be used to improve the filterability of products prior to terminal stabilization by thermal or filtrative methods.

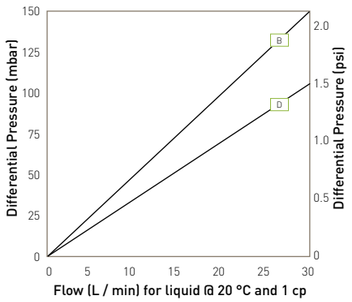
The filters will withstand harsh operational conditions and repeated cleaning, making them ideal for extended use in the bulk conditioning of products prior to membrane 'sterilization' and pasteurization. Their mechanical strength and wide chemical resistance also make them suitable for long-term contact with strong cleaning agents and detergents.

Features and Benefits

- Yeast and bacterial reduction to provide short term microbial stability
- Adjustment of filterability of bulk liquids after tank storage or transport
- Fine clarification to provide bright finished product
- Prolonged contact with hot water, steam and chemicals
- Prefiltration duty to extend the lifetime of downstream microporous filters

Note: PREPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Media:	Polypropylene
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*

**Not available in B & L endcap variants*

Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.5 m^2 (5.38 ft^2)

Cleaning and Sterilization

PREPOR PP cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 135 °C (275 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 135 °C (275 °F).

Retention Characteristics

The retention characteristics of PREPOR PP have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size (µm)*	Typical Titre Reduction B	Typical Titre Reduction D
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0	10^2	-
Oenococcus oenos	0.5 - 0.7 x 0.7 - 1.2	10^2	-
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0	10^2	-
Saccharomyces cerevisiae	1.0 (spherical buds)	10^4	10^7

Ordering Information

Cartridges

PPP - ☐ ☐ ☐ - ☐ ☐ ☐

Code	Length (Nominal)		Retention Rating
B*	2.5¨	(65 mm)	B
A*	5¨	(125 mm)	D
K	5¨	(125 mm)	
1	10¨	(250 mm)	
2	20¨	(500 mm)	
3	30¨	(750 mm)	
4	40¨	(1000 mm)	

** Supplied in packs of 3.*

Code	Flush
N	None

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	Endcap (10¨)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10¨ Modular
D	Demi

Code	O-rings
E	EPDM
S	Silicone

Capsules

PPP - ☐ ☐ ☐ - ☐ ☐ ☐

Code	Length (Nominal)		Retention Rating
E	4.4¨	(113 mm)	B
B	5.5¨	(140 mm)	D
A	7.9¨	(200 mm)	

Supplied in packs of 3.

Code	Flush
N	None

Code	Inlet Connection
T	1¨ Tri-Clamp
N	$^1/_2$¨ NPT Male
H	$^1/_2$¨ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$¨ NPT Male
V	$^3/_8$¨ NPT Female

Code	Outlet Connection
T	1¨ Tri-Clamp
N	$^1/_2$¨ NPT Male
H	$^1/_2$¨ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$¨ NPT Male
V	$^3/_8$¨ NPT Female

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*

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CRYPTOCLEAR PLUS Filter Cartridges

- liquid filters
- polypropylene

CRYPTOCLEAR PLUS pleated filter cartridges have been designed specifically for the removal of *Cryptosporidium parvum* and *Giadia intestinalis* from water in the food, beverage and healthcare industries.

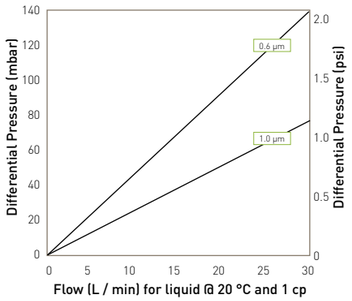
Extensive research, including live oocyst challenge has resulted in a graded density filtration medium that maximizes loading capacity of the filters whilst accurately defining particle and oocyst retention under a variety of operating conditions.

CRYPTOCLEAR PLUS cartridges can be repeatedly sanitized using hot water, steam and a wide range of chemicals.

Features and Benefits

- Specifically designed for the reduction of *Cryptosporidium parvum* oocysts
- 0.6 and 1.0 micron retention ratings
- All polypropylene construction
- Graded density pleated media optimized dirt capacity and oocyst retention
- Independently tested with viable *Cryptosporidium parvum* oocysts

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Media:	Polypropylene
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Cap Insert (if applicable):	316L Stainless Steel*
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Polypropylene
Capsule Vent Seals:	Silicone

**Not available in B & L endcap variants*

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents. CRYPTOCLEAR PLUS is listed as a WRAS Approved Product.

WRAS - Water Regulations Advisory Scheme BS6920 Test of Effect on Water Quality

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.57 m^2 (6.13 ft^2)

Cleaning and Sterilization

CRYPTOCLEAR PLUS cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 142 °C (287.6 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 135 °C (275 °F).

Retention Characteristics

The removal efficiencies of CRYPTOCLEAR PLUS cartridges have been determined from tests conducted by Thames Water Utilities Limited on live *Cryptosporidium* oocysts.

Product	Micron	Retention
CRYPTOCLEAR PLUS	0.6	>99.997%
CRYPTOCLEAR PLUS	1.0	>99.3%

Ordering Information

Cartridges

ZCCP [ ] - [ ] [ ]

Code	Length (Nominal)	
B*	2.5¨	(65 mm)
A*	5¨	(125 mm)
K	5¨	(125 mm)
1	10¨	(250 mm)
2	20¨	(500 mm)
3	30¨	(750 mm)
4	40¨	(1000 mm)

** Supplied in packs of 3.*

Code	Micron	
.60	0.6	µm
1.0	1.0	µm

Code	Endcap (10¨)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Capsules

ZECP [ ] - [ ] [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
E	4.4¨	(113 mm)
B	5.5¨	(140 mm)
A	7.9¨	(200 mm)

Code	Micron	
.60	0.6	µm
1.0	1.0	µm

Code	Inlet Connection
T	1¨ Tri-Clamp
N	1/2¨ NPT Male
H	1/2¨ Hosebarb
G	Stepped Hosebarb
M	1/4¨ NPT Male
V	3/8¨ NPT Female

Code	Outlet Connection
T	1¨ Tri-Clamp
N	1/2¨ NPT Male
H	1/2¨ Hosebarb
G	Stepped Hosebarb
M	1/4¨ NPT Male
V	3/8¨ NPT Female

Code	Variant	
B	Beverage	

Code	Grade	
N	Non-Sterile	

Code	Pack N°	
3	Pack of 3	

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CRYPTOCLEAR PES Filter Cartridges

- liquid filters
- polyethersulphone

CRYPTOCLEAR PES utilizes the unique properties of a microbially retentive polyethersulphone membrane that provides absolute retention of *Cryptosporidium parvum* oocysts to meet the specific needs of the food, beverage and potable water industries.

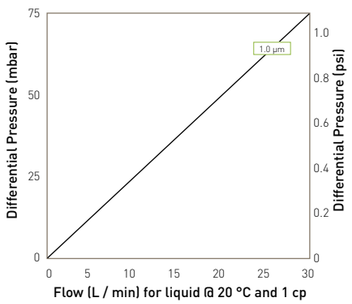
CRYPTOCLEAR PES membrane has an asymmetrical pore structure with a high voids volume which offers unrivalled retention capacity resulting in higher throughputs and higher flow rates than symmetrical membranes.

The microporous membrane is inherently hydrophilic and can be integrity tested repeatedly, providing a valuable quality assurance tool that fits well into a HACCP framework.

Features and Benefits

- Specifically developed for the removal of *Cryptosporidium parvum* oocysts
- 1.0 micron absolute rated polyethersulphone membrane
- High throughputs and flow rates
- Can be repeatedly steam sterilized or chemically sanitized
- Repeatedly integrity testable
- 100% retention of oocysts

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Polyethersulphone
Prefilter Layer:	Polyester
Upstream Support:	Polyester
Downstream Support:	Polyester
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Nylon
End Cap Insert (if applicable):	316L Stainless Steel*
**Not available in B & L endcap variants*	
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Nylon
Capsule Vent Seals:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents. CRYPTOCLEAR PES is listed as a WRAS Approved Product.

WRAS - Water Regulations Advisory Scheme BS6920 Test of Effect on Water Quality

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.8 m^2 (8.61 ft^2)

Cleaning and Sterilization

CRYPTOCLEAR PES cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The removal efficiencies of CRYPTOCLEAR PES cartridges have been determined from tests conducted by Thames Water Utilities Limited on live *Cryptosporidium* oocysts.

Product	Micron	Retention
CRYPTOCLEAR PES	1.0	100%

Integrity Test Data

All filters are flushed with purified water prior to despatch. They are integrity testable to the following limits:

Micron Rating		1.0
Diffusional Flow	(barg)	0.6
Test Pressure	(psig)	9.0
Max. Diffusional Flow (10˝)		21.0
(ml / min)	(K)	9.8
	(A)	8.0
	(B)	3.9
	(E)	1.8

Ordering Information

Cartridges

ZCCS □ - □ □

Code | Length (Nominal)		
B*	2.5˝	(65 mm)
A*	5˝	(125 mm)
K	5˝	(125 mm)
1	10˝	(250 mm)
2	20˝	(500 mm)
3	30˝	(750 mm)
4	40˝	(1000 mm)

** Supplied in packs of 3.*

Code | Micron			
100	1.0	µm	

Code | Endcap (10˝)	
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
N	Internal 213
R	BF / 222 Bayonet

Code | Endcap (Demi)	
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Capsules

ZECS □ - □ □ □ - □ □ □

Code | Length (Nominal)		
E	4.4˝	(113 mm)
B	5.5˝	(140 mm)
A	7.9˝	(200 mm)

Code | Micron		
100	1.0	µm

Code | Inlet Connection	
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code | Outlet Connection	
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code | Variant	
B	Beverage

Code | Grade	
N	Non-Sterile

Code | Pack N°	
3	Pack of 3

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BEVPOR PS Filter Cartridges

- liquid filters
- polyethersulphone

Minimizing the cost of microbiological stabilization per unit volume while maintaining quality and product characteristics is a key requirement within beverage production.

BEVPOR PS is an advanced membrane filter cartridge designed for the beverage industry to meet and surpass these criteria.

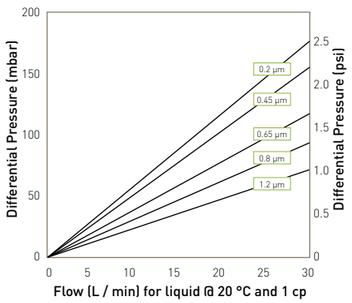
Specifically developed as a beverage grade cartridge, BEVPOR PS utilizes an advanced polyethersulphone membrane configured to provide high flow and cost-effective performance. The membrane has an asymmetric pore structure which provides graded filtration throughout its depth, resulting in increased capacity to hold contaminants. Componentry has been selected to maximize mechanical strength and chemical compatibility enabling the filter to withstand repeated chemical cleaning and sterilization.

Features and Benefits

- Removal ratings from 0.2 to 1.2 micron
- Repeatedly integrity testable
- Cartridge can be regenerated and sanitized for extended service life
- Low adsorption of protein, colour and flavour components
- Asymmetrical pore structure provides high capacity contaminant loading

Note: BEVPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Cap Insert (if applicable): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10¨ (250 mm) Up to 0.6 m^2 (6.45 ft^2)

Cleaning and Sterilization

BEVPOR PS cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR PS have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
Brettanomyces^	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	0.45	0.65	0.8	1.2
Brevundimonas diminuta	6	-	-	-	-
Serratia marcescens	9	8	6*	-	-
Escherichia coli	>9	>9	6	2	1
Lactobacillus brevis	>9	>9	5	-	-
Saccharomyces cerevisiae	>7	>7	-	-	-
Brettanomyces	>6	>6	4	2	1

** Results based on BEVPOR PT*

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65	0.8	1.2
Diffusional Flow	(barg)	1.7	1.4	1.0	0.8	0.6
Test Pressure	(psig)	25.0	20.0	15.0	12.0	9.0
Max. Diffusional Flow (10¨)		16.0	16.0	16.0	16.0	16.0
(ml / min)	(K)	7.5	7.5	7.5	7.5	7.5
	(A)	6.1	6.1	6.1	6.1	6.1
	(B)	3.0	3.0	3.0	3.0	3.0
	(E)	1.4	1.4	1.4	1.4	1.4

Ordering Information

Cartridges

BPS - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
B*	2.5¨ (65 mm)
A*	5¨ (125 mm)
K	5¨ (125 mm)
1	10¨ (250 mm)
2	20¨ (500 mm)
3	30¨ (750 mm)
4	40¨ (1000 mm)

** Supplied in packs of 3.*

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Endcap (10¨)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10¨ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BPS - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
E	4.4¨ (113 mm)
B	5.5¨ (140 mm)
A	7.9¨ (200 mm)

Supplied in packs of 3.

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Inlet Connection
T	1¨ Tri-Clamp
N	1/2¨ NPT Male
H	1/2¨ Hosebarb
G	Stepped Hosebarb
M	1/4¨ NPT Male

Code	Outlet Connection
T	1¨ Tri-Clamp
N	1/2¨ NPT Male
H	1/2¨ Hosebarb
G	Stepped Hosebarb
M	1/4¨ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*
^ Kurzmann, C.P., Fell, J.W., 1998 The Yeasts. A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
° PDA Technical Report 26, Sterilizing Filtration of Liquids

BEVPOR PH Filter Cartridges

- liquid filters
- polyethersulphone

Minimizing the cost of microbiological stabilization per unit volume while maintaining quality and product characteristics is a key requirement within beverage production.

BEVPOR PH is an advanced membrane filter cartridge designed for the beverage industry to meet and surpass these criteria.

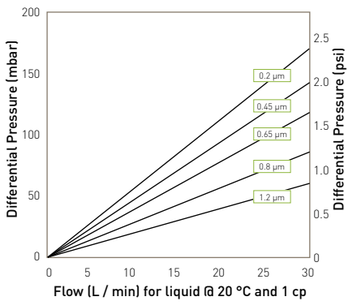
Specifically developed as a beverage grade cartridge, BEVPOR PH utilizes an advanced polyethersulphone membrane and an integral prefilter layer to give high flow rates, long life and improved throughput. The combination of prefilter and the asymmetrical pore structure of the membrane provides graded filtration through the depth of the media, resulting in increased capacity to hold contaminants. Componentry has been selected to withstand repeated chemical cleaning and steam sterilization.

Note: BEVPOR is a registered trademark of Parker domnick hunter

Features and Benefits

- Removal ratings from 0.2 to 1.2 micron
- Integral prefilter layer and high surface area combine to maximize service life
- Repeatedly integrity testable
- Cartridge can be regenerated and sanitized for extended service life
- Low adsorption of protein, colour and flavour components
- Asymmetrical membrane pore structure provides high contaminant loading capacity

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Prefilter Layer: Polyester
- Upstream Support: Polyester
- Downstream Support: Polyester
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Cap Insert (if applicable): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.8 m^2 (8.61 ft^2)

Cleaning and Sterilization

BEVPOR PH cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR PH have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
*Brettanomyces*ˆ	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	0.45	0.65	0.8	1.2
Brevundimonas diminuta	6	-	-	-	-
Serratia marcescens	9	8	6*	-	-
Escherichia coli	>9	>9	6	2	1
Lactobacillus brevis	>9	>9	5	-	-
Saccharomyces cerevisiae	>7	>7	-	-	-
Brettanomyces	>6	>6	4	2	1

** Results based on BEVPOR PT*

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65	0.8	1.2
Diffusional Flow	(barg)	1.7	1.4	1.0	0.8	0.6
Test Pressure	(psig)	25.0	20.0	15.0	12.0	9.0
Max. Diffusional Flow (10˝)		21.0	21.0	21.0	21.0	21.0
(ml / min)	(K)	9.8	9.8	9.8	9.8	9.8
	(A)	8.0	8.0	8.0	8.0	8.0
	(B)	3.9	3.9	3.9	3.9	3.9
	(E)	1.8	1.8	1.8	1.8	1.8

Ordering Information

Cartridges

BPH - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
B*	2.5˝ (65 mm)
A*	5˝ (125 mm)
K	5˝ (125 mm)
1	10˝ (250 mm)
2	20˝ (500 mm)
3	30˝ (750 mm)
4	40˝ (1000 mm)

** Supplied in packs of 3.*

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10˝ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BPH - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
E	4.4˝ (113 mm)
B	5.5˝ (140 mm)
A	7.9˝ (200 mm)

Supplied in packs of 3.

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in ˝Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins˝.*
ˆ Kurzmann, C.P., Fell, J.W., 1998 The Yeasts. A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
° PDA Technical Report 26, Sterilizing Filtration of Liquids

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BEVPOR PT Filter Cartridges

- liquid filters
- polyethersulphone

Minimizing the cost of microbiological stabilization per unit volume while maintaining quality and product characteristics is a key requirement within beverage production.

BEVPOR PT is an advanced membrane filter cartridge designed for the beverage industry to meet and surpass these criteria.

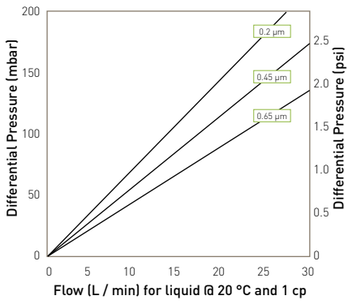
Specifically developed as a beverage grade cartridge, BEVPOR PT utilizes an advanced polyethersulphone membrane and an integral membrane prefilter layer to give high flow rates, long life and improved throughputs. Both prefilter and final membrane layers have an asymmetrical pore structure, providing graded filtration throughout their depth and resulting in increased capacity to hold contaminants. BEVPOR PT is especially suited to filtration of products that contain submicron colloidal species that may block unprotected sterilising-grade membranes.

Features and Benefits

- Removal ratings from 0.2 to 0.65 micron
- Prefilter layer selected to provide removal of colloidal species providing long service life
- Repeatedly integrity testable
- Cartridge can be regenerated and sanitized for extended service life
- Low adsorption of protein, colour and flavour components
- Asymmetrical membrane pore structure provides high contaminant loading capacity

Note: BEVPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Media:	Polyethersulphone
Prefilter Layer:	Polyethersulphone
Upstream Support:	Polyester
Downstream Support:	Polyester
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Nylon
End Cap Insert (if applicable):	316L Stainless Steel*
**Not available in B & L endcap variants*	
Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Nylon
Capsule Vent Seals:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.6 m^2 (6.45 ft^2)

Cleaning and Sterilization

BEVPOR PT cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR PT have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
Brettanomyces^	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	LRV 0.45	LRV 0.65
Brevundimonas diminuta	6	-	-
Serratia marcescens	9	8	6
Escherichia coli	>9	>9	6
Lactobacillus brevis	>9	>9	5
Saccharomyces cerevisiae	>7	>7	-
Brettanomyces	>6	>6	4

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65
Diffusional Flow	(barg)	1.7	1.4	1.0
Test Pressure	(psig)	25.0	20.0	15.0
Max. Diffusional Flow (10˝)		16.0	16.0	16.0
(ml / min)	(K)	7.5	7.5	7.5
	(A)	6.1	6.1	6.1
	(B)	3.0	3.0	3.0
	(E)	1.4	1.4	1.4

Ordering Information

Cartridges

BPT - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
B*	2.5˝ (65 mm)
A*	5˝ (125 mm)
K	5˝ (125 mm)
1	10˝ (250 mm)
2	20˝ (500 mm)
3	30˝ (750 mm)
4	40˝ (1000 mm)

** Supplied in packs of 3.*

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10˝ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BPT - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
E	4.4˝ (113 mm)
B	5.5˝ (140 mm)
A	7.9˝ (200 mm)

Supplied in packs of 3.

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	$^1/_4$˝ NPT Male
H	$^1/_2$˝ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$˝ NPT Male

Code	Outlet Connection
T	1˝ Tri-Clamp
N	$^1/_4$˝ NPT Male
H	$^1/_2$˝ Hosebarb
G	Stepped Hosebarb
M	$^1/_4$˝ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*
^ Kurzmann, C.P., Fell, J.W., 1998 The Yeasts. A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
° PDA Technical Report 26, Sterilizing Filtration of Liquids

BEVPOR PW Filter Cartridges

- liquid filters
- polyethersulphone

Minimizing the cost of microbiological stabilization per unit volume while maintaining quality and product characteristics is a key requirement within beverage production.

BEVPOR PW is an advanced membrane filter cartridge designed to meet and surpass these criteria.

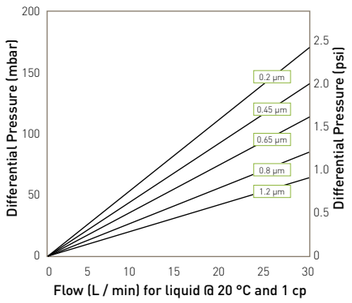
Specifically developed for the microbiological stabilization of bottled water, BEVPOR PW utilizes an advanced polyethersulphone membrane and integral prefilter layer to give high flow rates, long life and improved throughput. The combination of prefilter and the asymmetrical pore structure of the membrane provides graded filtration through the depth of the media, resulting in increased capacity to hold contaminants. Componentry has been selected to withstand repeated chemical cleaning and steam sterilization.

Features and Benefits

- Optimized for the microbiological stabilization of bottled water
- Removal ratings from 0.2 to 1.2 micron
- Integral prefilter layer and high surface area combine to maximize service life
- Repeatedly integrity testable
- Cartridge can be regenerated and sanitized for extended service life
- Asymmetrical membrane pore structure provides high contaminant loading capacity

Note: BEVPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Prefilter Layer: Polyester
- Upstream Support: Polyester
- Downstream Support: Polyester
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Cap Insert (if applicable): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.6 m^2 (6.45 ft^2)

Cleaning and Sterilization

BEVPOR PW cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR PW have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
Brettanomyces‘	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	0.45	0.65	0.8	1.2
Brevundimonas diminuta	6	-	-	-	-
Serratia marcescens	9	8	6*	-	-
Escherichia coli	>9	>9	6	2	1
Lactobacillus brevis	>9	>9	5	-	-
Saccharomyces cerevisiae	>7	>7	-	-	-
Brettanomyces	>6	>6	4	2	1

** Results based on BEVPOR PT*

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65	0.8	1.2
Diffusional Flow	(barg)	1.7	1.4	1.0	0.8	0.6
Test Pressure	(psig)	25.0	20.0	15.0	12.0	9.0
Max. Diffusional Flow (10˝)		16.0	16.0	16.0	16.0	16.0
(ml / min)	(K)	7.5	7.5	7.5	7.5	7.5
	(A)	6.1	6.1	6.1	6.1	6.1
	(B)	3.0	3.0	3.0	3.0	3.0
	(E)	1.4	1.4	1.4	1.4	1.4

Ordering Information

Cartridges

BPW - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
B*	2.5˝	(65 mm)
A*	5˝	(125 mm)
K	5˝	(125 mm)
1	10˝	(250 mm)
2	20˝	(500 mm)
3	30˝	(750 mm)
4	40˝	(1000 mm)

** Supplied in packs of 3.*

Code	Micron	
02	0.2	µm
04	0.45	µm
06	0.65	µm
08	0.8	µm
12	1.2	µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10˝ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BPW - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
E	4.4˝	(113 mm)
B	5.5˝	(140 mm)
A	7.9˝	(200 mm)

Supplied in packs of 3.

Code	Micron	
02	0.2	µm
04	0.45	µm
06	0.65	µm
08	0.8	µm
12	1.2	µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in ˝Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins˝.*
‘ Kurzmann, C.P., Fell, J.W., 1998 The Yeasts. A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
° PDA Technical Report 26, Sterilizing Filtration of Liquids

BEVPOR MS Filter Cartridges

- liquid filters
- polyethersulphone

The BEVPOR range of membrane cartridge filters is available in a selection of retention ratings to provide protection of beverages from the effects of common spoilage organisms or to enable them to meet regulatory requirements.

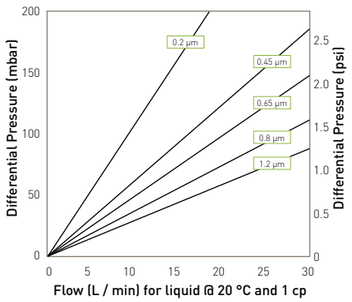
However, it is possible that other smaller microorganisms may be present that, while not affecting microbiological stability, may nonetheless be undesirable from a quality viewpoint. BEVPOR MS provides higher removal efficiency than BEVPOR PS, the basis of which is the recognized standard in the pharmaceutical industry for a 0.2 micron sterilizing grade membrane[1]. Specifically developed as a beverage grade cartridge, BEVPOR MS utilizes an advanced polyethersulphone membrane configured to provide high flow and cost-effective performance. The membrane has an asymmetric pore structure which provides graded filtration throughout its depth, resulting in increased capacity to hold contaminants. Componentry has been selected to maximize mechanical strength and chemical compatibility enabling the filter to withstand repeated chemical cleaning and sterilization. *[1]ASTM F838-05*

Features and Benefits

- Enhanced microbial retention based on pharmaceutical industry specifications
- Repeatedly integrity testable
- Cartridges can be regenerated and sanitized for extended service life
- Low adsorption of protein, colour and flavour components
- Asymmetrical membrane pore structure provides high contaminant loading capacity

Note: BEVPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Cap Insert (if applicable): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Whilst BEVPOR MS can withstand reverse pressure, poor control of backwash procedures can result in damage to the product. Consult Parker domnick hunter before using reverse flow or pressurisation techniques.

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.6 m^2 (6.45 ft^2)

Cleaning and Sterilization

BEVPOR MS cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR MS have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
Brettanomyces°	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	0.45	0.65	0.8	1.2
Brevundimonas diminuta	>10	6	-	-	-
Serratia marcescens	>9	9	8	6*	-
Escherichia coli	>9	>9	>9	6	2
Lactobacillus brevis	>9	>9	>9	5	-
Saccharomyces cerevisiae	>7	>7	>7	-	-
Brettanomyces	>6	>6	>6	4	2

** Results based on BEVPOR PT*

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65	0.8	1.2
Diffusional Flow	(barg)	2.4	1.7	1.4	1.0	0.8
Test Pressure	(psig)	35.0	25.0	20.0	15.0	12.0
Max. Diffusional Flow (10˝)		16.0	16.0	16.0	16.0	16.0
(ml / min)	(K)	7.5	7.5	7.5	7.5	7.5
	(A)	6.1	6.1	6.1	6.1	6.1
	(B)	3.0	3.0	3.0	3.0	3.0
	(E)	1.4	1.4	1.4	1.4	1.4

Ordering Information

Cartridges

BMS - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
B*	2.5˝ (65 mm)
A*	5˝ (125 mm)
K	5˝ (125 mm)
1	10˝ (250 mm)
2	20˝ (500 mm)
3	30˝ (750 mm)
4	40˝ (1000 mm)

** Supplied in packs of 3.*

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10˝ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BMS - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)
E	4.4˝ (113 mm)
B	5.5˝ (140 mm)
A	7.9˝ (200 mm)

Supplied in packs of 3.

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/4˝ NPT Male
H	1/4˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*
° Kurzmann, C.P., Fell, J.W., 1998 The Yeasts, A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
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BEVPOR MT Filter Cartridges

- liquid filters
- polyethersulphone

The BEVPOR range of membrane cartridge filters is available in a selection of retention ratings to provide protection of beverages from the effects of common spoilage organisms or to enable them to meet regulatory requirements.

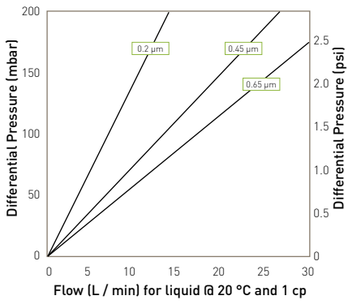
However, it is possible that other smaller microorganisms may be present that, while not affecting microbiological stability, may nonetheless be undesirable from a quality viewpoint. BEVPOR MT provides higher removal efficiency than BEVPOR PT, the basis of which is the recognized standard in the pharmaceutical industry for a 0.2 micron sterilizing grade membrane[1]. Specifically developed as a beverage grade cartridge, BEVPOR MT utilizes an advanced polyethersulphone membrane configured to provide high flow and cost-effective performance. The membrane has an asymmetric pore structure which provides graded filtration throughout its depth, resulting in increased capacity to hold contaminants. Componentry has been selected to maximize mechanical strength and chemical compatibility enabling the filter to withstand repeated chemical cleaning and sterilization. *[1]ASTM F838-05*

Features and Benefits

- Enhanced microbial retention based on pharmaceutical industry specifications
- Prefilter layer selected to provide removal of colloidal species providing long service life
- Repeatedly integrity testable
- Cartridge can be regenerated and sanitized for extended service life
- Low adsorption of protein, colour and flavour components
- Asymmetrical membrane pore structure provides high contaminant loading capacity

Note: BEVPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

Filtration Membrane:	Polyethersulphone
Prefilter Layer:	Polyethersulphone
Upstream Support:	Polyester
Downstream Support:	Polyester
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Nylon
End Cap Insert (if applicable):	316L Stainless Steel*

**Not available in B & L endcap variants*

Standard o-rings/gaskets:	Silicone / EPDM
Capsule Body:	Nylon
Capsule Vent Seals:	Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Whilst BEVPOR MT can withstand reverse pressure, poor control of backwash procedures can result in damage to the product. Consult Parker domnick hunter before using reverse flow or pressurisation techniques.

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.6 m^2 (6.45 ft^2)

Cleaning and Sterilization

BEVPOR MT cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR MT have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
*Brettanomyces*ˢ	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	LRV 0.45	LRV 0.65
Brevundimonas diminuta	>10	6	-
Serratia marcescens	>9	9	8
Escherichia coli	>9	>9	>9
Lactobacillus brevis	>9	>9	>9
Saccharomyces cerevisiae	>7	>7	>7
Brettanomyces	>6	>6	>6

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65
Diffusional Flow	(barg)	2.4	1.7	1.4
Test Pressure	(psig)	35.0	25.0	20.0
Max. Diffusional Flow (10^{-3})		16.0	16.0	16.0
(ml / min)	(K)	7.5	7.5	7.5
	(A)	6.1	6.1	6.1
	(B)	3.0	3.0	3.0
	(E)	1.4	1.4	1.4

Ordering Information

Cartridges

BMT - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
B*	2.5˝	(65 mm)
A*	5˝	(125 mm)
K	5˝	(125 mm)
1	10˝	(250 mm)
2	20˝	(500 mm)
3	30˝	(750 mm)
4	40˝	(1000 mm)

** Supplied in packs of 3.*

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10˝ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BMT - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
E	4.4˝	(113 mm)
B	5.5˝	(140 mm)
A	7.9˝	(200 mm)

Supplied in packs of 3.

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*
ˢ Kurzmann, C.P., Fell, J.W., 1998 The Yeasts. A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
° PDA Technical Report 26, Sterilizing Filtration of Liquids

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BEVPOR MH Filter Cartridges

- liquid filters
- polyethersulphone

The BEVPOR range of membrane cartridge filters is available in a selection of retention ratings to provide protection of beverages from the effects of common spoilage organisms or to enable them to meet regulatory requirements.

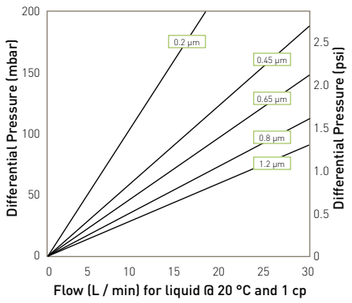
However, it is possible that other smaller microorganisms may be present that, while not affecting microbiological stability, may nonetheless be undesirable from a quality viewpoint. BEVPOR MH provides higher removal efficiency than BEVPOR PH, the basis of which is the recognized standard in the pharmaceutical industry for a 0.2 micron sterilizing grade membrane[1]. Specifically developed as a beverage grade cartridge, BEVPOR MH utilizes an advanced polyethersulphone membrane and integral prefilter layer to give high flow rates, long life and improved throughput. The combination of prefilter and the asymmetrical pore structure of the membrane provides graded filtration through the depth of the media, resulting in increased capacity to hold contaminants. Componentry has been selected to withstand repeated chemical cleaning and steam sterilization. *[1]ASTM F838-05*

Features and Benefits

- Enhanced microbial retention based on pharmaceutical industry specifications
- Integral prefilter layer and high surface area combine to maximize service life
- Repeatedly integrity testable
- Cartridge can be regenerated and sanitized for extended service life
- Low adsorption of protein, colour and flavour components
- Asymmetrical membrane pore structure provides high contaminant loading capacity

Note: BEVPOR is a registered trademark of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10˝ size differential pressure by 2

10˝ Size (250 mm) Cartridge

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Prefilter Layer: Polyester
- Upstream Support: Polyester
- Downstream Support: Polyester
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Cap Insert (if applicable): 316L Stainless Steel*

**Not available in B & L endcap variants*

- Standard o-rings/gaskets: Silicone / EPDM
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177, EC1935 / 2004 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.0	14.5
>100 (steam)	>212 (steam)	0.3	4.0

Whilst BEVPOR MH can withstand reverse pressure, poor control of backwash procedures can result in damage to the product. Consult Parker domnick hunter before using reverse flow or pressurisation techniques.

Capsules may be operated up to a temperature of 40 °C (104 °F) at line pressures up to 5.0 barg (72.51 psig) for liquids.

Effective Filtration Area (EFA)

10˝ (250 mm) Up to 0.8 m^2 (8.61 ft^2)

Cleaning and Sterilization

BEVPOR MH cartridges can be repeatedly steam sterilized in situ or autoclaved at up to 130 °C (266 °F). They can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals. Capsules can be repeatedly autoclaved up to 130 °C (266 °F).

Retention Characteristics

The retention characteristics of BEVPOR MH have been determined by a combination of controlled laboratory tests and in-use monitoring for a number of organisms. Bacterial challenge testing is carried out to methods specified in ASTM F838-05.

Organism	Approx. Cell Size* (diameter x length µm)
Brevundimonas diminuta°	0.3 x 0.6 - 0.8
Serratia marcescens	0.5 - 0.8 x 0.9 - 2.0
Escherichia coli	1.1 - 1.5 x 2.0 - 6.0
Lactobacillus brevis	0.5 - 1.2 x 1.0 - 10.0
Saccharomyces cerevisiae	1.0 (Spherical Buds)
*Brettanomyces*ˆ	1.5 - 3.5 x 2.0 - 19.0

Organism	LRV 0.2	0.45	0.65	0.8	1.2
Brevundimonas diminuta	>10	6	-	-	-
Serratia marcescens	>9	9	8	6*	-
Escherichia coli	>9	>9	>9	6	2
Lactobacillus brevis	>9	>9	>9	5	-
Saccharomyces cerevisiae	>7	>7	>7	-	-
Brettanomyces	>6	>6	>6	4	2

** Results based on BEVPOR PT*

Integrity Test Data

All filters are flushed with pharmaceutical grade purified water prior to despatch. They are integrity tested to the following limits:

Micron Rating		0.2	0.45	0.65	0.8	1.2
Diffusional Flow	(barg)	2.4	1.7	1.4	1.0	0.8
Test Pressure	(psig)	35.0	25.0	20.0	15.0	12.0
Max. Diffusional Flow (10˝)		21.0	21.0	21.0	21.0	21.0
(ml / min)	(K)	9.8	9.8	9.8	9.8	9.8
	(A)	8.0	8.0	8.0	8.0	8.0
	(B)	3.9	3.9	3.9	3.9	3.9
	(E)	1.8	1.8	1.8	1.8	1.8

Ordering Information

Cartridges

BMH - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
B*	2.5˝	(65 mm)
A*	5˝	(125 mm)
K	5˝	(125 mm)
1	10˝	(250 mm)
2	20˝	(500 mm)
3	30˝	(750 mm)
4	40˝	(1000 mm)

** Supplied in packs of 3.*

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Endcap (10˝)
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Format
A	10˝ Modular
D	Demi

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Code	O-rings
E	EPDM
S	Silicone

Capsules

BMH - [ ] [ ] - [ ] [ ] [ ]

Code	Length (Nominal)	
E	4.4˝	(113 mm)
B	5.5˝	(140 mm)
A	7.9˝	(200 mm)

Supplied in packs of 3.

Code	Micron
02	0.2 µm
04	0.45 µm
06	0.65 µm
08	0.8 µm
12	1.2 µm

Code	Inlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Outlet Connection
T	1˝ Tri-Clamp
N	1/2˝ NPT Male
H	1/2˝ Hosebarb
G	Stepped Hosebarb
M	1/4˝ NPT Male

Code	Vent / Drain Seals
S	Silicone

** Approx. values as in "Holt, J.G., Krieg, N.R., Sneath, P.H.A., Staley, J.T., Williams, S.T., 1994. Bergey's Manual of Determinative Bacteriology, Ninth Edition, Williams & Wilkins".*
ˆ Kurzmann, C.P., Fell, J.W., 1998 The Yeasts. A Taxonomic Study. Elsevier Science Publisher BV, Amsterdam, The Netherlands.
° PDA Technical Report 26, Sterilizing Filtration of Liquids

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Pharmaceutical filters

Pharmaceutical filtration

Parker domnick hunter manufacture innovative filtration solutions for critical areas of pharmaceutical production such as bulk chemicals / API, fermentation and aseptic final fill. Our validated product range is fully supported by our global network of technical support Scientists and Engineers.

The ability to scale up from small area discs to process scale systems with minimal revalidation is paramount. Parker domnick hunter provides a wide range of filter formats to ensure that the transition from pilot-scale through to production is as smooth as possible.

Disposable single use systems can eliminate cleaning validation, reduce capital costs, minimize health and safety risks and lower the risk of product contamination, as well as providing a more convenient way of processing a product.

PROCLEAR filters from Parker domnick hunter represent a range of prefiltration and clarification media for particulate removal and bioburden reduction. Designed to maximize throughput in the most demanding applications.

PROPOR multi-format sterile liquid filters from Parker domnick hunter offer a PES membrane which demonstrates low preservative binding and retention of diminutive organisms, coupled with high flow and high capacity performance in critical applications.

PROCLEAR GF Filter Cartridges

- liquid filters
- glass microfibre

PROCLEAR GF filters are designed for reliable and economical removal of particulate and microorganisms from pharmaceutical fluids.

The non-fibre releasing glass microfibre filter media gives excellent dirt holding capacity and high flow rates for long service life and efficient and cost-effective filter system design.

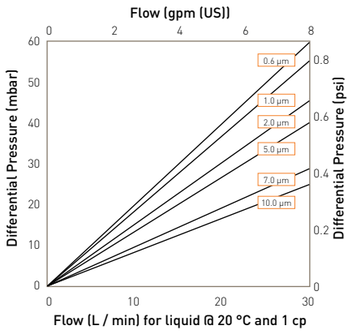
PROCLEAR GF filters have low extractable levels making them ideal for general clarification and prefiltration duties in pharmaceutical processing.

Note: PROCLEAR and DEMICAP are registered trademarks of Parker domnick hunter

Features and Benefits

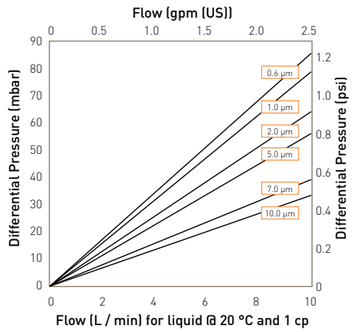
- Excellent dirt holding capacity
- Non-fibre releasing glass microfibre media
- Long service life for maximum throughput
- MURUS and DEMICAP's can be gamma-irradiated and autoclaved

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B size (65 mm) Cartridge and Capsule

Specifications

Materials of Construction

- Filtration Media: Glass Microfibre
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene

Filter Cartridges

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Caps Insert: 316L Stainless Steel

**Not available in B & L endcap variants*

MURUS Disposable Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

DEMICAP Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate

Syringe Filters

- Body: Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.5	21.7

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.56 m^2	(6.0 ft^2)
K Size:	0.27 m^2	(2.9 ft^2)
A Size:	0.20 m^2	(2.2 ft^2)
B Size:	0.10 m^2	(1.1 ft^2)
E Size:	0.05 m^2	(0.6 ft^2)
Syringe ø50 mm:	14.50 cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	10	121 °C (249.8 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

PROCLEAR GF filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water.

Gamma-Irradiation

PROCLEAR GF MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROCLEAR GF conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROCLEAR GF contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROCLEAR GF filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Ordering Information

Cartridges

PCGF □ - □ □ - □ □

Code	Length (Nominal)		
B*	2.5"	(65 mm)
A*	5"	(125 mm)
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)
4	40"	(1000 mm)

** Supplied in packs of 3.*

Code	Micron	
96	0.6	µm
01	1.0	µm
02	2.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Endcap (10")
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Variant
P	Pharmaceutical

Code	O-rings
E	EPDM
S	Silicone
V	Viton

MURUS Capsules

PLGF □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)		
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)

Code	Micron	
96	0.6	µm
01	1.0	µm
02	2.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Inlet Connection
A	3/4" Tri-Clamp
B	1 1/2" Tri-Clamp
D	1" Hosebarb
T	1" Tri-Clamp

Code	Outlet Connection
A	3/4" Tri-Clamp
B	1 1/2" Tri-Clamp
D	1" Hosebarb
T	1" Tri-Clamp

Code	Variant
P	Pharmaceutical

Code	Grade	
N	Non-sterile	
S	Pre-sterilised	γ (>25 kGy)

Code	Design	
L	In-Line	
T*	T-Port	

**Only available with a 1" Tri-Clamp*

Code	O-rings	
E	EPDM	
S*	Silicone	
V	Viton	

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

PEGF □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)		
E	4.4"	(113 mm)
B	5.5"	(140 mm)
A	7.9"	(200 mm)

Code	Micron	
96	0.6	µm
01	1.0	µm
02	2.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Inlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8" NPT Female

Code	Outlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8" NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade	
N	Non-sterile	
S	Pre-sterilised	γ (>25 kGy)

Code	Pack N°	
3	Pack of 3	

Code	Accessory	
FB	Filling Bell	

G & H connections only

Syringe Filters

PSGF □ - □ □ □ - □ □ □ □

Code	Diameter	
050	50 mm	

Code	Micron	
96	0.6	µm
01	1.0	µm
02	2.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Inlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Outlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Variant
P	Pharmaceutical

Code	Grade	
N	Non-sterile	

Code	Options	
S	Standard	

Code	Pack N°	
025	25 per box	

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PROCLEAR GP Filter Cartridges

- liquid filters
- glass microfibre / polypropylene

PROCLEAR GP filters combine glass microfibre and polypropylene media to provide maximum protection to downstream filter membranes and equipment.

Dirt holding capacity is maximized through use of a graded density media making PROCLEAR GP cartridge filters an economical and reliable choice for prefiltration.

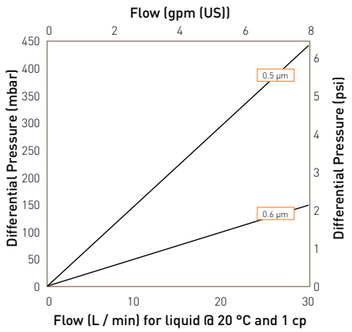
PROCLEAR GP filters have low extractable levels and are suitable for bioburden reduction and fine prefiltration of pharmaceutical fluids and are ideal for high contamination applications.

Note: PROCLEAR and DEMICAP are registered trademarks of Parker domnick hunter

Features and Benefits

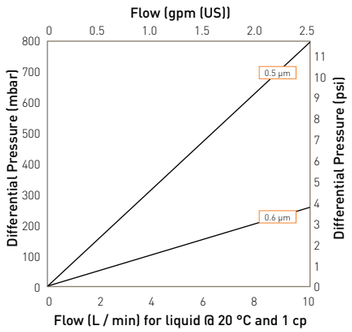
- Dual layer media or increased capacity and assurance
- Maximizes retention for protection of downstream membranes
- Ideal for difficult to filter solutions
- MURUS and DEMICAP's can be gamma-irradiated and autoclaved

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B size (65 mm) Cartridge and Capsule

Specifications

Materials of Construction

- Filtration Media: Glass Microfibre / Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene

Filter Cartridges
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Caps Insert: 316L Stainless Steel

**Not available in B & L endcap variants*

MURUS Disposable Filter Capsules
- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

DEMICAP Filter Capsules
- Core: Polypropylene
- Sleeve: Polypropylene
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

Syringe Filters
- Body: Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.5	21.7

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.34	m^2	(3.7 ft^2)
K Size:	0.16	m^2	(1.7 ft^2)
A Size:	0.12	m^2	(1.3 ft^2)
B Size:	0.06	m^2	(0.6 ft^2)
E Size:	0.03	m^2	(0.3 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	10	121 °C (249.8 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

PROCLEAR GP filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water.

Gamma-Irradiation

PROCLEAR GP MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROCLEAR GP conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROCLEAR GP contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROCLEAR GP filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Ordering Information

Cartridges

PCGP □ - □ □ - □ □

Code	Length (Nominal)		
B*	2.5"	(65 mm)
A*	5"	(125 mm)
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)
4	40"	(1000 mm)

* Supplied in packs of 3.

Code	Micron	
95	0.5	µm
96	0.6	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Endcap (10")
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

* EPDM gaskets supplied as standard

Code	Variant
P	Pharmaceutical

Code	O-rings
E	EPDM
S	Silicone
V	Viton

MURUS Capsules

PLGP □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)		
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)

Code	Micron	
95	0.5	µm
96	0.6	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Inlet Connection
A	3/4" Tri-Clamp
B	1 1/2" Tri-Clamp
D	1" Hosebarb
T	1" Tri-Clamp

Code	Outlet Connection
A	3/4" Tri-Clamp
B	1 1/2" Tri-Clamp
D	1" Hosebarb
T	1" Tri-Clamp

Code	Variant
P	Pharmaceutical

Code	Grade	
N	Non-sterile	
S	Pre-sterilized	γ (>25 kGy)

Code	Design
L	In-Line
T*	T-Port

*Only available with a 1" Tri-Clamp

Code	O-rings
E	EPDM
S*	Silicone
V	Viton

* Silicone o-ring supplied as standard without having to specify the 'S' code.

DEMICAP Capsules

PEGP □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)		
E	4.4"	(113 mm)
B	5.5"	(140 mm)
A	7.9"	(200 mm)

Code	Micron	
95	0.5	µm
96	0.6	µm

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Inlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
V	3/8" NPT Female

Code	Outlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
V	3/8" NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade	
N	Non-sterile	
S	Pre-sterilised	γ (>25 kGy)

Code	Pack N°	
3	Pack of 3	

Code	Accessory	
FB	Filling Bell	

G & H connections only

Syringe Filters

PSGP □ - □ □ □ - □ □ □ □

Code	Diameter	
050	50 mm	

Code	Micron	
95	0.5	µm
96	0.6	µm

Code	Inlet Connection	
F	Female Luer Lock	
G	Stepped Hosebarb	

Code	Outlet Connection	
F	Female Luer Lock	
G	Stepped Hosebarb	

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-sterile

Code	Options
S	Standard

Code	Pack N°	
025	25 per box	

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PROCLEAR PP Filter Cartridges

- liquid filters
- polypropylene

PROCLEAR PP filters are designed for a wide range of prefiltration duties within the production of pharmaceuticals and are particularly suited to applications where chemical compatibility is an issue.

The optimum pleat configuration and graded density polypropylene media used in PROCLEAR PP filters ensure the filters have the highest possible throughput to blockage resulting in long service life.

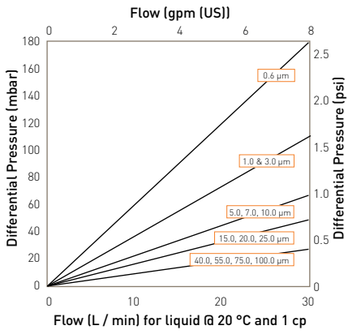
The PROCLEAR PP range of filters are fully supported by a comprehensive validation guide to simplify its specification into new and existing processes.

Features and Benefits

- Graded density polypropylene media for high capacity
- Extremely robust to withstand aggressive conditions
- All polypropylene construction
- MURUS and DEMICAP's can be gamma-irradiated and autoclaved

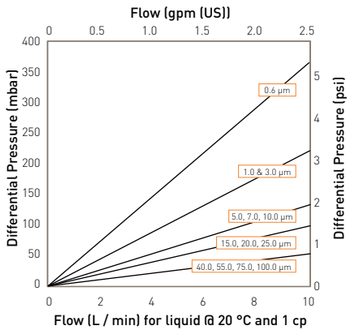
Note: PROCLEAR and DEMICAP are registered trademarks of Parker domnick hunter

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

B size (65 mm) Cartridge and Capsule

Specifications

Materials of Construction

- Filtration Membrane: Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene

Filter Cartridges

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Caps Insert: 316L Stainless Steel

**Not available in B & L endcap variants*

MURUS Disposable Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

DEMICAP Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate

Syringe Filters

- Body: Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.5	21.7

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm) up to 0.79m² (8.5 ft²)

Sterilization

PROCLEAR PP filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	30	135 °C (275 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water.

Gamma-Irradiation

PROCLEAR PP MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROCLEAR PP conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROCLEAR PP contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROCLEAR PP filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Ordering Information

Cartridges

PCPP □ - □ □ - □ □

Code	Length (Nominal)		
B*	2.5"	(65 mm)
A*	5"	(125 mm)
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)
4	40"	(1000 mm)

** Supplied in packs of 3.*

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Micron	
96	0.6	µm
01	1.0	µm
03	3.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm
15	15.0	µm
20	20.0	µm
25	25.0	µm
40	40.0	µm
55	55.0	µm
75	75.0	µm
100*	100.0	µm

**Not available with A and B Size formats*

Code	Endcap (10")
B*	dh DOE
C	BF / 226 Bayonet
D	Fin / 222
E	Flat Top / 222
G	Recess / 222
H	UF Retrofit
J	SOE (no o-ring)
L*	dh DOE
N	Internal 213
R	BF / 222 Bayonet

Code	Endcap (Demi)
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard*

Code	Variant
P	Pharmaceutical

Code	O-rings
E	EPDM
S	Silicone
V	Viton

MURUS Capsules

PLPP □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)		
K	5"	(125 mm)
1	10"	(250 mm)
2	20"	(500 mm)
3	30"	(750 mm)

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Micron	
96	0.6	µm
01	1.0	µm
03	3.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm
15	15.0	µm
20	20.0	µm
25	25.0	µm
40	40.0	µm
55	55.0	µm
75	75.0	µm
100	100.0	µm

Code	Inlet Connection
A	3/4" Tri-Clamp
B	1 1/2" Tri-Clamp
D	1" Hosebarb
T	1" Tri-Clamp

Code	Outlet Connection
A	3/4" Tri-Clamp
B	1 1/2" Tri-Clamp
D	1" Hosebarb
T	1" Tri-Clamp

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-sterile
S	Pre-sterilized γ (>25 kGy)

Code	Design
L	In-Line
T*	T-Port

**Only available with a 1" Tri-Clamp*

Code	O-rings
E	EPDM
S*	Silicone
V	Viton

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

PEPP □ - □ □ □ - □ □ □ - □

Code	Length (Nominal)		
E	4.4"	(113 mm)
B	5.5"	(140 mm)
A	7.9"	(200 mm)

Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Code	Micron	
96	0.6	µm
01	1.0	µm
03	3.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm
15	15.0	µm
20	20.0	µm
25	25.0	µm
40	40.0	µm
55	55.0	µm
75	75.0	µm

Code	Inlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8" NPT Female

Code	Outlet Connection
T	1" Tri-Clamp
N	1/2" NPT Male
H	1/2" Hosebarb
G	Stepped Hosebarb
M	1/4" NPT Male
Q	Walther QC
R	Grommel / QC
V	3/8" NPT Female

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-sterile
S	Pre-sterilized γ (>25 kGy)

Code	Pack N°	
3	Pack of 3

Code	Accessory	
FB	Filling Bell

G & H connections only

Syringe Filters

PSPP □ - □ □ □ - □ □ □ □

Code	Diameter	
050	50 mm

Code	Micron	
96	0.6	µm
01	1.0	µm
03	3.0	µm
05	5.0	µm
07	7.0	µm
10	10.0	µm
15	15.0	µm
20	20.0	µm
25	25.0	µm
40	40.0	µm
55	55.0	µm
75	75.0	µm

Code	Inlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Outlet Connection
F	Female Luer Lock
G	Stepped Hosebarb

Code	Variant
P	Pharmaceutical

Code	Grade
N	Non-sterile

Code	Options
S	Standard

Code	Pack N°	
025	25 per box

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PROPOR BR Filter Cartridges

- liquid filters
- polyethersulphone

PROPOR BR filters have been specifically designed for the fast and cost-effective bioburden reduction of pharmaceutical solutions.

PROPOR BR filters feature an integral meltblown prefilter layer to maximize dirt holding capacity whilst the polyethersulphone membrane guarantees a bioburden log reduction of greater than 5 giving excellent microbial protection. This makes PROPOR BR filters ideal for bioburden reduction of LVPs prior to terminal sterilization.

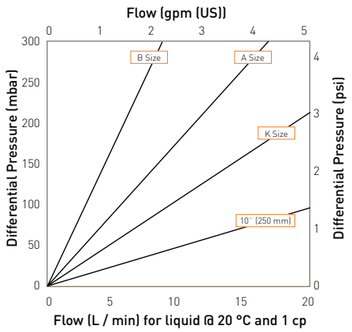
PROPOR BR filters are also ideally suited to prefiltration and bioburden reduction prior to sterilizing grade membrane filters. The robust construction of PROPOR BR filters guarantees consistent performance on multiple batches.

Features and Benefits

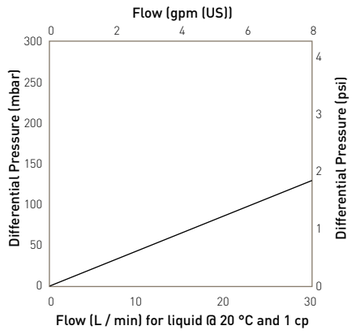
- *Brevundimonas diminuta* retention of LRV >5 for efficient bioburden reduction
- Additional prefilter layer gives excellent throughput to blockage
- Low binding for minimal product loss
- MURUS and DEMICAP's can be gamma-irradiated and autoclaved

Note: PROPOR and DEMICAP are registered trademarks of Parker domnick hunter

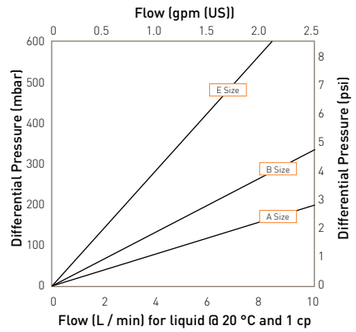
Performance Characteristics



Cartridge flow rates



MURUS flow rates (10¨ Size (250 mm))



DEMICAP flow rates

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Prefilter Layer: Polyester
- Upstream Support: Polyester
- Downstream Support: Polyester

Filter Cartridges

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Caps Insert: 316L Stainless Steel

MURUS Disposable Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

DEMICAP Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps: Nylon
- Capsule Body: Nylon
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate

Syringe Filters

- Body: Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.55	m^2	(5.92 ft^2)
K Size:	0.26	m^2	(2.79 ft^2)
A Size:	0.20	m^2	(2.15 ft^2)
B Size:	0.10	m^2	(1.07 ft^2)
E Size:	0.05	m^2	(0.53 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	30	130 °C (266 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

PROPOR BR filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Gamma-Irradiation

PROPOR BR MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROPOR BR conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROPOR BR contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

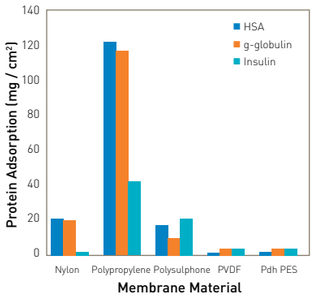
Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROPOR BR filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

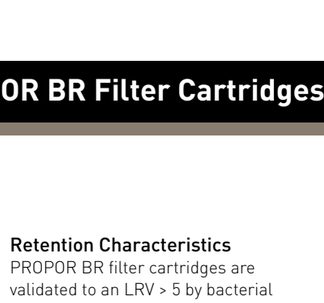
Integrity Test Data
All filters are integrity testable to the following limits when wet with water and using air as the test gas.

Micron Rating		0.2
Filter Cartridges / MURUS / DEMICAP		
Min. Bubble Point	(barg)	2.5
	(psig)	36.0
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Diffusional Flow	(barg)	1.7
Test Pressure	(psig)	24.7
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Max. Diffusional Flow (10")		16.0
(ml / min)	(K)	7.5
	(A)	6.0
	(B)	2.9
	(E)	1.2

Retention Characteristics
PROPOR BR filter cartridges are validated to an LRV > 5 by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) module.



Protein binding on membrane materials



Flow rate comparison for bioburden reduction filters

Ordering Information

Cartridges

ZCBR □ - □ □ - □ □

Code | Length (Nominal)			Code | Micron		Code | Endcap (10")		Code | Variant		Code | O-rings	
B*	2.5"	(65 mm)	020	0.20 µm	C	BF / 226 Bayonet	P	Pharmaceutical	E	EPDM
A*	5"	(125 mm)			D	Fin / 222			S	Silicone
K	5"	(125 mm)			E	Flat Top / 222			V	Viton
1	10"	(250 mm)			G	Recess / 222				
2	20"	(500 mm)			R	BF / 222 Bayonet				
3	30"	(750 mm)								
4	40"	(1000 mm)								

Code | Endcap (Demi)	
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** Supplied in packs of 3.*

MURUS Capsules

ZLBR □ - □ □ □ - □ □ □ - □

Code | Length (Nominal)			Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Design		Code | O-rings	
K	5"	(125 mm)	020	0.2 µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	L	In-Line	E	EPDM
1	10"	(250 mm)			B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp			S	Pre-sterilized γ (>25 kGy)	T*	T-Port	S*	Silicone
2	20"	(500 mm)			D	1" Hosebarb	D	1" Hosebarb							V	Viton
3	30"	(750 mm)			T	1" Tri-Clamp	T	1" Tri-Clamp								

**Only available with a 1" Tri-Clamp*

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

ZEBR □ - □ □ □ - □ □ □ - □

Code | Length (Nominal)			Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Pack N°		Code | Accessory	
E	4.4"	(113 mm)	020	0.2 µm	T	1" Tri-Clamp	T	1" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	3	Pack of 3	FB	Filling Bell
B	5.5"	(140 mm)			N	1/2" NPT Male	N	1/2" NPT Male			S	Pre-sterilized γ (>25 kGy)				
A	7.9"	(200 mm)			H	1/2" Hosebarb	H	1/2" Hosebarb								
					G	Stepped Hosebarb	G	Stepped Hosebarb								
					M	1/4" NPT Male	M	1/4" NPT Male								
					Q	Walther QC	Q	Walther QC								
					R	Grommel / QC	R	Grommel / QC								

G & H connections only

Syringe Filters

ZSBR □ - □ □ □ - □ □ □ □

Code | Diameter		Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Options		Code | Pack N°	
050	50 mm	020	0.2 µm	F	Female Luer Lock	F	Female Luer Lock	P	Pharmaceutical	N	Non-sterile	S	Standard	025	25 per box
				G	Stepped Hosebarb	G	Stepped Hosebarb								

PROPOR SG Filter Cartridges

- liquid filters
- polyethersulphone

PROPOR SG sterilizing grade filters feature a patented, microbially retentive polyethersulphone membrane for fast, reliable and cost-effective sterile filtration of pharmaceutical fluids.

The asymmetric pore structure and high voids volume of the PROPOR SG membrane allow high throughputs and exceptionally high flow rates compared with competitive PES and alternative membranes. Low protein and preservative binding properties minimize product loss due to adsorption.

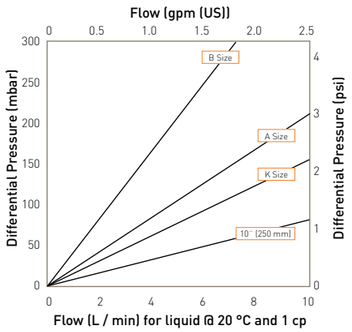
PROPOR SG filters are optimized for pharmaceutical processing. They have low extractable levels and broad chemical compatibility across the full pH range including organic solvents.

Features and Benefits

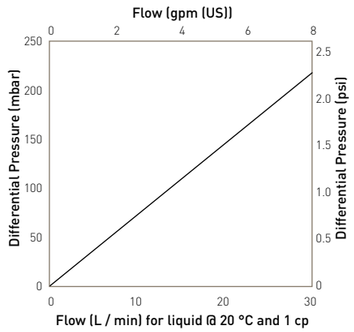
- Up to 3.5 times higher flow rates than competitive sterilizing grade filters
- Fully validated and integrity testable membrane for assurance of sterility
- Low binding for minimal product loss
- MURUS and DEMICAP's can be gamma-irradiated and autoclaved

Note: PROPOR and DEMICAP are registered trademarks of Parker domnick hunter

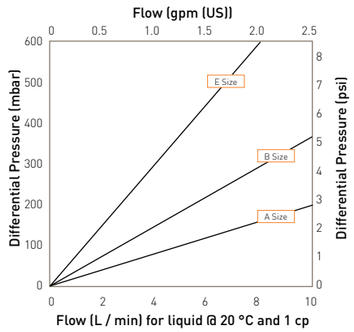
Performance Characteristics



Cartridge flow rates
0.2 µm Cartridge



MURUS flow rates (10¨ Size (250 mm))
0.2 µm Capsule



DEMICAP flow rates
0.2 µm Capsule

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester

Filter Cartridges
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Caps Insert: 316L Stainless Steel

MURUS Disposable Filter Capsules
- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

DEMICAP Filter Capsules
- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps: Nylon
- Capsule Body: Nylon
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate

Syringe Filters
- Body: Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.55	m^2	(5.92 ft^2)
K Size:	0.26	m^2	(2.79 ft^2)
A Size:	0.20	m^2	(2.15 ft^2)
B Size:	0.10	m^2	(1.07 ft^2)
E Size:	0.05	m^2	(0.53 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	30	130 °C (266 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

PROPOR SG filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Gamma-Irradiation

PROPOR SG MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROPOR SG conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROPOR SG contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

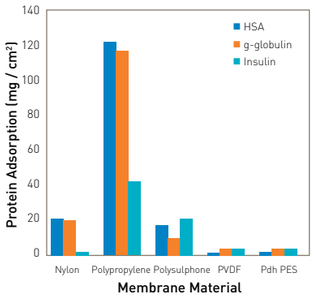
Oxidizable Substances
PROPOR SG filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Integrity Test Data
All filters are integrity testable to the following limits when wet with water and using air as the test gas.

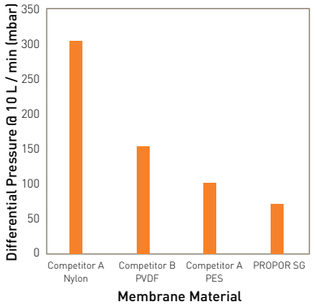
Micron Rating		0.1	0.2	0.45
Filter Cartridges / MURUS / DEMICAP / Syringe FIlters				
Min. Bubble Point*	(barg)	2.36	3.38	2.48
	(psig)	34.2	49.0	36.0
Filter Cartridges / MURUS / DEMICAP / Syringe Filters				
Diffusional Flow	(barg)	4.8	2.8	1.7
Test Pressure	(psig)	69.6	40.6	24.9
Filter Cartridges / MURUS / DEMICAP / Syringe Filters				
Max. Diffusional Flow (10")		27.0	16.0	16.0
(ml / min)	(K)	12.6	7.5	7.5
	(A)	10.1	6.0	6.0
	(B)	4.9	2.9	2.9
	(E)	2.1	1.2	1.2

**Bubble point for 0.1 µm product is in 60/40 v/v IPA/Water .*

Retention Characteristics
PROPOR SG filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) filter cartridge.



Protein binding on membrane materials



Differential pressure comparison of 10" (250 mm) sterilising grade filters

Ordering Information

Cartridges

ZCSG □ - □ □ - □ □ □

Code | Length (Nominal)			Code | Micron		Code | Endcap (10")		Code | Variant		Code | O-rings		Code | Componentry	
B*	2.5"	(65 mm)	010	0.10 µm	C	BF / 226 Bayonet	P	Pharmaceutical	E	EPDM	X	All polypropylene componentry
A*	5"	(125 mm)	020	0.20 µm	D	Fin / 222			S	Silicone		
K	5"	(125 mm)	045	0.45 µm	E	Flat Top / 222			V	Viton		
1	10"	(250 mm)			G	Recess / 222						
2	20"	(500 mm)			R	BF / 222 Bayonet						
3	30"	(750 mm)										
4	40"	(1000 mm)										

** Supplied in packs of 3.*

Code | Endcap (Demi)

SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

MURUS Capsules

ZLSG □ - □ □ □ - □ □ - □ □

Code | Length (Nominal)			Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Design		Code | O-rings	
K	5"	(125 mm)	010	0.10 µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	L	In-Line	E	EPDM
1	10"	(250 mm)	020	0.20 µm	B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp			S	Pre-sterilized γ (>25 kGy)	T*	T-Port	S*	Silicone
2	20"	(500 mm)	045	0.45 µm	D	1" Hosebarb	D	1" Hosebarb							V	Viton
3	30"	(750 mm)			T	1" Tri-Clamp	T	1" Tri-Clamp								

**Only available with a 1" Tri-Clamp*

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

ZESG □ - □ □ □ - □ □ - □ □

Code | Length (Nominal)			Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Pack N°		Code | Accessory	
E	4.4"	(113 mm)	010	0.10 µm	T	1" Tri-Clamp	T	1" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	3	Pack of 3	FB	Filling Bell
B	5.5"	(140 mm)	020	0.20 µm	N	1/2" NPT Male	N	1/2" NPT Male			S	Pre-sterilized γ (>25 kGy)	X*	All polypropylene componentry		
A	7.9"	(200 mm)	045	0.45 µm	H	1/2" Hosebarb	H	1/2" Hosebarb								
					G	Stepped Hosebarb	G	Stepped Hosebarb								
					M	1/4" NPT Male	M	1/4" NPT Male								
					Q	Walther QC	Q	Walther QC								
					R	Grommel / QC	R	Grommel / QC								

** Note: Supplied in Packs of 3.*

G & H connections only

Syringe Filters

ZSSG □ - □ □ □ - □ □ □ □

Code | Diameter		Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Options		Code | Pack N°	
050	50 mm	010	0.10 µm	F	Female Luer Lock	F	Female Luer Lock	P	Pharmaceutical	N	Non-sterile	S	Standard	025	25 per box
		020	0.20 µm	G	Stepped Hosebarb	G	Stepped Hosebarb								
		045	0.45 µm												

PROPOR HC Filter Cartridges

- liquid filters
- polyethersulphone

PROPOR HC sterilizing grade filters have been specifically designed for the effective and economical processing of difficult to filter solutions.

The optimised PROPOR HC PES membrane configuration features a highly asymmetric membrane prefilter layer, which significantly extends throughput and prevents the problems associated with premature filter blockage with complex solutions.

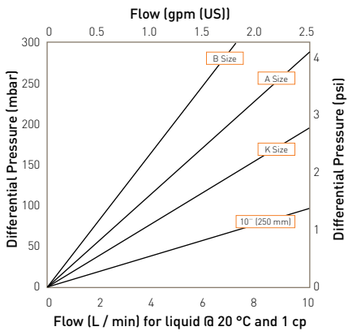
PROPOR HC filters are high capacity and fast flowing. The PES membrane is inherently low binding, which minimizes product loss due to protein or preservative adsorption. The filters have low extractable levels and broad chemical compatibility.

Note: PROPOR and DEMICAP are registered trademarks of Parker domnick hunter

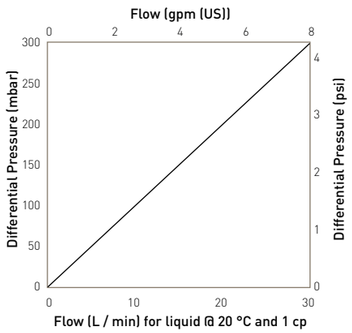
Features and Benefits

- Optimized membrane configuration allows up to ten times the throughput compared to single layer membrane products
- Integral prefilter layer can condense filter trains for greater processing economy
- Incorporates a fully validated and integrity testable 0.2 micron membrane for assurance of sterility
- Low binding for minimal product loss

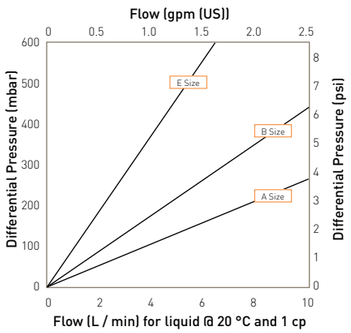
Performance Characteristics



Cartridge flow rates



MURUS flow rates (10¨ Size (250 mm))



DEMICAP flow rates

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Prefilter Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester

Filter Cartridges

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Caps Insert: 316L Stainless Steel

MURUS Disposable Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone

DEMICAP Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps: Nylon
- Capsule Body: Nylon
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate

Syringe Filters

- Body: Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.55	m^2	(5.92 ft^2)
K Size:	0.26	m^2	(2.79 ft^2)
A Size:	0.20	m^2	(2.15 ft^2)
B Size:	0.10	m^2	(1.07 ft^2)
E Size:	0.05	m^2	(0.53 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	30	130 °C (266 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

PROPOR HC filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Gamma-Irradiation

PROPOR HC MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROPOR HC conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROPOR HC contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

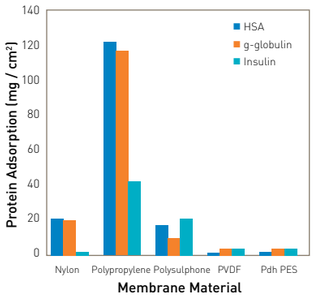
Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROPOR HC filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

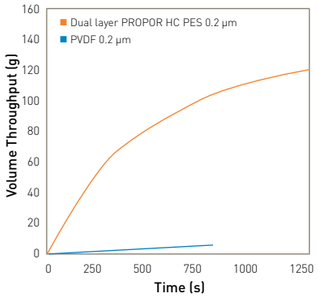
Integrity Test Data
All filters are integrity testable to the following limits when wet with water and using air as the test gas.

Micron Rating		0.2
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Min. Bubble Point	(barg)	3.4
	(psig)	49.0
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Diffusional Flow	(barg)	2.8
Test Pressure	(psig)	40.6
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Max. Diffusional Flow (10")		18.0
(ml / min)	(K)	8.4
	(A)	6.7
	(B)	3.2
	(E)	1.4

Retention Characteristics
PROPOR HC filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) filter cartridge.



Protein binding on membrane materials



Total volume throughput (g) vs time (s) for an insulin intermediate solution

Ordering Information

Cartridges

ZCHC □ - □ □ - □ □

Code | Length (Nominal)			Code | Micron		Code | Endcap (10")		Code | Variant		Code | O-rings	
B*	2.5"	(65 mm)	620	0.20 µm	C	BF / 226 Bayonet	P	Pharmaceutical	E	EPDM
A*	5"	(125 mm)			D	Fin / 222			S	Silicone
K	5"	(125 mm)			E	Flat Top / 222			V	Viton
1	10"	(250 mm)			G	Recess / 222				
2	20"	(500 mm)			R	BF / 222 Bayonet				
3	30"	(750 mm)								
4	40"	(1000 mm)								

Code | Endcap (Demi)	
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** Supplied in packs of 3.*

MURUS Capsules

ZLHC □ - □ □ □ - □ □ □ - □

Code | Length (Nominal)			Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Design		Code | O-rings	
K	5"	(125 mm)	620	0.2 µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	L	In-Line	E	EPDM
1	10"	(250 mm)			B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp			S	Pre-sterilized γ (>25 kGy)	T*	T-Port	S*	Silicone
2	20"	(500 mm)			D	1" Hosebarb	D	1" Hosebarb							V	Viton
3	30"	(750 mm)			T	1" Tri-Clamp	T	1" Tri-Clamp								

**Only available with a 1" Tri-Clamp*

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

ZEHC □ - □ □ □ - □ □ □ - □ □

Code | Length (Nominal)			Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Pack N°		Code | Accessory	
E	4.4"	(113 mm)	620	0.2 µm	T	1" Tri-Clamp	T	1" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	3	Pack of 3	FB	Filling Bell
B	5.5"	(140 mm)			N	1/2" NPT Male	N	1/2" NPT Male			S	Pre-sterilized γ (>25 kGy)				
A	7.9"	(200 mm)			H	1/2" Hosebarb	H	1/2" Hosebarb								
					G	Stepped Hosebarb	G	Stepped Hosebarb								
					M	1/4" NPT Male	M	1/4" NPT Male								
					Q	Walther QC	Q	Walther QC								
					R	Grommel / QC	R	Grommel / QC								

G & H connections only

Syringe Filters

ZSHC □ - □ □ □ - □ □ □ □

Code | Diameter		Code | Micron		Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Options		Code | Pack N°	
050	50 mm	620	0.2 µm	F	Female Luer Lock	F	Female Luer Lock	P	Pharmaceutical	N	Non-sterile	S	Standard	025	25 per box
				G	Stepped Hosebarb	G	Stepped Hosebarb								

PROPOR LR Filter Cartridges

- liquid filters
- polyethersulphone

PROPOR LR filters have been specifically designed for high flow and effective removal of *Ralstonia pickettii* and other diminutive organisms.

A number of studies have concluded that not all microorganisms are removed by 0.2 micron rated membranes under all conditions. PROPOR LR filters use a 0.1 micron rated membrane, which can remove diminutive organisms, while maintaining flow rates typical of a 0.2 micron filtration system.

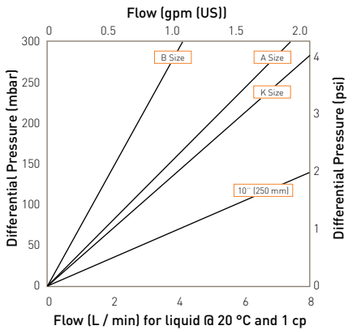
Ralstonia pickettii is one organism that has frequently been shown to penetrate a 0.2 micron rated membrane and is a common contaminant in purified water systems. PROPOR LR filters have been validated directly against the removal of *Ralstonia pickettii*.

Features and Benefits

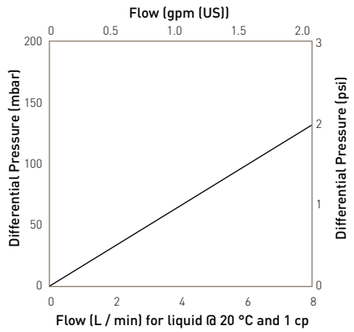
- Fully correlated against *Ralstonia pickettii* and integrity testable
- Increases retention efficiency whilst maintaining existing 0.2 micron rated system size
- Up to 2.5 times higher flow rate than competitive 0.1 micron rated filters
- MURUS and DEMICAP's can be gamma-irradiated and autoclaved

Note: PROPOR and DEMICAP are registered trademarks of Parker domnick hunter

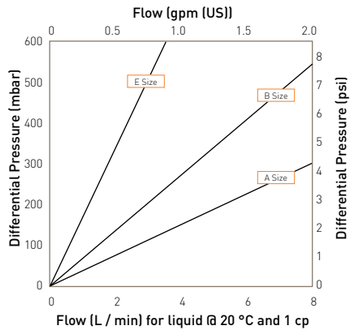
Performance Characteristics



Cartridge flow rates



MURUS flow rates (10¨ Size (250 mm))



DEMICAP flow rates

Specifications

Materials of Construction

Filtration Membrane:	Polyethersulphone
Upstream Support:	Polyester
Downstream Support:	Polyester

Filter Cartridges

Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Nylon
End Caps Insert:	316L Stainless Steel

MURUS Disposable Filter Capsules

Core:	Polypropylene
Sleeve:	Polypropylene
End Caps Insert:	316L Stainless Steel
Standard o-rings/gaskets:	Silicone
Capsule Body:	Polypropylene
Capsules Vent Seals:	Silicone

DEMICAP Filter Capsules

Core:	Polypropylene
Sleeve:	Polypropylene
End Caps:	Nylon
Capsule Body:	Nylon
Capsules Vent Seals:	Silicone
Filling Bell:	Polycarbonate

Syringe Filters

Body:	Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.55	m^2	(5.92 ft^2)
K Size:	0.26	m^2	(2.79 ft^2)
A Size:	0.20	m^2	(2.15 ft^2)
B Size:	0.10	m^2	(1.07 ft^2)
E Size:	0.05	m^2	(0.53 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	10	130 °C (266 °F)	30	130 °C (266 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	130 °C (266 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

PROPOR LR filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Gamma-Irradiation

PROPOR LR MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROPOR LR conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROPOR LR contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

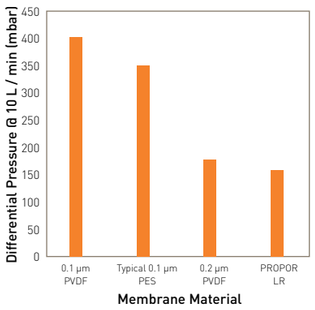
Oxidizable Substances
PROPOR LR filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Integrity Test Data
All filters are integrity testable to the following limits when wet with water (diffusional flow) and 60 / 40 : IPA / Water (bubble point) using air as the test gas.

Micron Rating		0.1
Filter Cartridges / MURUS / DEMICAP		
Min. Bubble Point	(barg)	2.1
	(psig)	30.0
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Diffusional Flow	(barg)	4.2
Test Pressure	(psig)	61.0
Filter Cartridges / MURUS / DEMICAP / Syringe Filters		
Max. Diffusional Flow (10")		27.0
(ml / min)	(K)	12.6
	(A)	10.1
	(B)	4.9
	(E)	2.1

(Maximum allowable diffusional flows are directly correlated to full retention of *Ralstonia pickettii*.)

Retention Characteristics
PROPOR LR filters are validated by bacterial challenge testing with *Ralstonia pickettii* and *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) filter cartridge.



Differential pressure comparison of 10" (250 mm) sterilising grade filters

Ordering Information

Cartridges

ZCLR □ - □ □ - □ □

Code | Length (Nominal)			Code | Micron			Code | Endcap (10")		Code | Variant		Code | O-rings	
B*	2.5"	(65 mm)	010	0.1	µm	C	BF / 226 Bayonet	P	Pharmaceutical	E	EPDM
A*	5"	(125 mm)				D	Fin / 222			S	Silicone
K	5"	(125 mm)				E	Flat Top / 222			V	Viton
1	10"	(250 mm)				G	Recess / 222				
2	20"	(500 mm)				R	BF / 222 Bayonet				
3	30"	(750 mm)									
4	40"	(1000 mm)									

** Supplied in packs of 3.*

Code | Endcap (Demi)	
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

MURUS Capsules

ZLLR □ - □ □ □ - □ □ □ - □

Code | Length (Nominal)			Code | Micron			Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Design		Code | O-rings	
K	5"	(125 mm)	010	0.1	µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	L	In-Line	E	EPDM
1	10"	(250 mm)				B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp			S	Pre-sterilized γ (>25 kGy)	T*	T-Port	S*	Silicone
2	20"	(500 mm)				D	1" Hosebarb	D	1" Hosebarb							V	Viton
3	30"	(750 mm)				T	1" Tri-Clamp	T	1" Tri-Clamp								

**Only available with a 1" Tri-Clamp*

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

ZELR □ - □ □ □ - □ □ □ - □

Code | Length (Nominal)			Code | Micron			Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Pack N°		Code | Accessory	
E	4.4"	(113 mm)	010	0.1	µm	T	1" Tri-Clamp	T	1" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	3	Pack of 3	FB	Filling Bell
B	5.5"	(140 mm)				N	1/2" NPT Male	N	1/2" NPT Male			S	Pre-sterilized γ (>25 kGy)				
A	7.9"	(200 mm)				H	1/2" Hosebarb	H	1/2" Hosebarb								
						G	Stepped Hosebarb	G	Stepped Hosebarb								
						M	1/4" NPT Male	M	1/4" NPT Male								
						Q	Walther QC	Q	Walther QC								
						R	Grommel / QC	R	Grommel / QC								

G & H connections only

Syringe Filters

ZSLR □ - □ □ □ - □ □ □ □ □

Code | Diameter		Code | Micron			Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Options		Code | Pack N°	
050	50 mm	010	0.1	µm	F	Female Luer Lock	F	Female Luer Lock	P	Pharmaceutical	N	Non-sterile	S	Standard	025	25 per box
					G	Stepped Hosebarb	G	Stepped Hosebarb								

✆ +44 (0)191 4105121 dhprocess@parker.com www.parker.com/processfiltration

TETPOR HP Filter Cartridges

- liquid filters
- hydrophilic PTFE

TETPOR HP filter cartridges have been specially designed to minimize protein and preservative binding in the sterilization of pharmaceutical and multi-dose ophthalmic solutions.

Adsorption of proteins or preservatives from a pharmaceutical preparation onto the filter membrane can complicate the manufacturing process and lead to costly product wastage. The unique hydrophilic PTFE membrane featured in the TETPOR HP exhibits lower levels of binding than other commonly used filtration membranes such as PES and PVDF which can prevent product loss during processing.

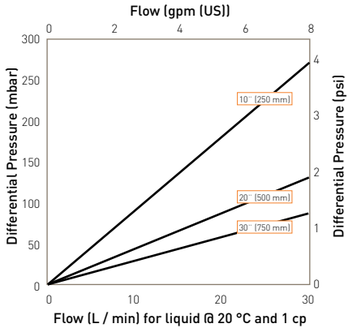
The TETPOR HP exhibits low extractable levels and the sterilizing grade membrane has comparative flow rates to PES and PVDF products. Its hydrophilicity is stable to both chemicals and heat. The product also offers an exceptionally broad range of chemical compatibility making it well suited to the processing of aggressive aqueous liquids.

Features and Benefits

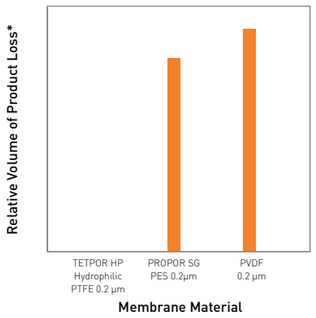
- Exceptionally low binding membrane to prevent costly product loss and process down time
- Incorporates a fully validated and integrity testable 0.2 micron membrane for assurance of sterility
- Fast flowing membrane for increased process efficiency

Note: TETPOR is a registered trademark of Parker domnick hunter

Performance Characteristics

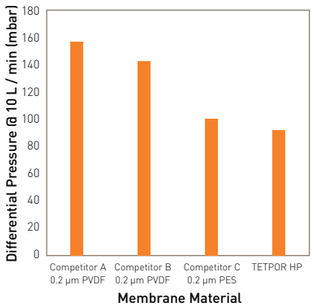


Cartridge flow rates



Comparison of product loss due to preservative binding on different filter membranes for a 0.001 % solution of benzalkonium chloride (BAK)

* *The relative volume of product loss represents the volume at which the concentration of BAK in the filtrate recovers back to 95 % of the original concentration, which is typically the point at which the filling operation can begin.*



Comparison of differential pressure of 10" (250 mm) sterilising grade cartridges filtering water

Specifications

Materials of Construction

Filtration Membrane:	Hydrophilic PTFE
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene
Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
Standard o-rings:	Silicone

Recommended Operating Conditions

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	179	2.0	29.0
90	194	1.7	24.6

Effective Filtration Area (EFA)

10" (250 mm)	0.88 m^2 (9.47 ft^2)
20" (500 mm)	1.76 m^2 (18.94 ft^2)
30" (750 mm)	2.64 m^2 (28.42 ft^2)

Sterilization

TETPOR HP filter cartridges are validated to withstand 10 steam-in-place cycles at 135 °C (275 °F).

TETPOR HP filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100 % flushed with pharmaceutical purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

TOC / Conductivity

The filtrate quality from a 10" (250 mm) TETPOR HP conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins

Aqueous extracts from the 10" (250 mm) TETPOR HP contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)

The quantity of NVE's obtained from a TETPOR HP cartridge during a 24 hour static soak was undetectable compared to a control sample.

Oxidizable Substances

TETPOR HP filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Integrity Test Data

All filters are integrity testable to the following limits when wet with water and using air as the test gas (a minimum 20 minute purified water flush is recommended prior to integrity testing in water).

Micron Rating		0.2
Min. Bubble Point	(barg)	1.5
(60 / 40 IPA / Water (v/ v))	(psig)	21.0
Diffusional Flow	(barg)	2.2
Test Pressure	(psig)	31.9
Max. Diffusional Flow*(10") [ml / min]		37.0

**Note: It is also possible to integrity test the TETPOR HP in 60 / 40 IPA / Water (v / v). Maximum allowable diffusional flow for a 10" (250 mm) TETPOR HP in 60 / 40 IPA / Water is 16.8 ml / min.*

Retention Characteristics

TETPOR HP filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) module.

Pharmaceutical Validation

A full validation guide is available upon request from Laboratory Services Group (LSG).

Ordering Information

ZCMT [ ] - [ ] [ ] - [ ] - [ ]

Code | Length (Nominal)			Code | Micron		Code | Endcap (10")		Code | Variant		Code | O-rings	
1	10"	(250 mm)	020	0.2 µm	C	P-7	HP	Hydrophilic PTFE	E	EPDM
2	20"	(500 mm)							P	PTFE Encapsulated Silicone
3	30"	(750 mm)							S	Silicone
									V	Viton

TETPOR LIQUID Filter Cartridges

- liquid filters
- PTFE

TETPOR LIQUID filters are particularly suitable for sterilization and particulate removal from aggressive chemicals (including acids, bases and solvents) within a wide range of critical processing industries.

The superior performance, strength and durability of TETPOR LIQUID filters stems from the use of a single layer, high security PTFE membrane, which has a high dirt holding capacity due to its high voids volume. This results in low pressure drops and long service life.

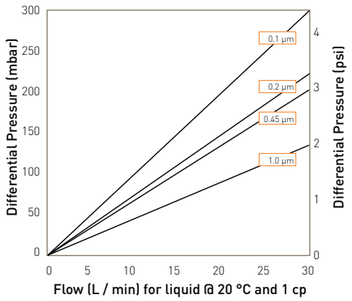
High flow rates are achieved due to the optimized pleat pack density and the superior design construction of TETPOR LIQUID filters.

Note: TETPOR is a registered trademark of Parker domnick hunter

Features and Benefits

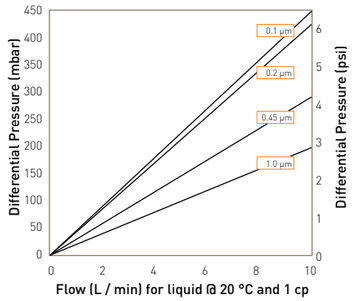
- Superior chemical resistance of PTFE membrane combined with polypropylene hardware
- Integrity tested prior to despatch
- Validated to ASTM F838-05 methodology
- Comprehensive range of end cap configurations for retrofitting

Performance Characteristics



For K size for a given flow rate multiply 10¨ size differential pressure by 2

10¨ Size (250 mm) Cartridge



For A size for a given flow rate divide B size differential pressure by 2
For E sie for a given flow rate multiply B size differential pressure by 2

B Size (65 mm) Cartridge and Capsule

Specifications

Materials of Construction

Filtration Membrane:	PTFE
Upstream Support:	Polypropylene
Downstream Support:	Polypropylene

Filter Cartridges

Inner Support Core:	Polypropylene
Outer Protection Cage:	Polypropylene
End Caps:	Polypropylene
End Caps Insert:	316L Stainless Steel

**Not available in B endcap variant*

Standard o-rings/gaskets:	Viton

MURUS Disposable Filter Capsules

Core:	Polypropylene
Sleeve:	Polypropylene
End Caps Insert:	316L Stainless Steel
Standard o-rings/gaskets:	Silicone
Capsule Body:	Polypropylene
Capsules Vent Seals:	Silicone

DEMICAP Filter Capsules

Core:	Polypropylene
Sleeve:	Polypropylene
End Caps:	Polypropylene
Capsule Body:	Polypropylene
Capsules Vent Seals:	Silicone
Filling Bell:	Polycarbonate

Syringe Filters

Body:	Polypropylene

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

Temperature °C	Temperature °F	Max. Forward dP (bar)	Max. Forward dP (psi)
20	68	5.0	72.5
40	104	4.0	58.0
60	140	3.0	43.5
80	176	2.0	29.0
90	194	1.7	24.6

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/ EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document : In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Effective Filtration Area (EFA)

10¨ (250 mm):	0.77	m^2	(8.28 ft^2)
K Size:	0.36	m^2	(3.87 ft^2)
A Size:	0.25	m^2	(2.69 ft^2)
B Size:	0.12	m^2	(1.29 ft^2)
E Size:	0.06	m^2	(0.64 ft^2)
Syringe ø50 mm:	14.50	cm^2	(2.25 in^2)

Sterilization

	Autoclave Cycles	Autoclave Temp	Steam-in-Place Cycles (30 min.)	Steam-in-Place Temp
Cartridges	120	142 °C (287.6 °F)	120	142 °C (287.6 °F)
MURUS	5	130 °C (266 °F)	-	-
DEMICAP	10	135 °C (275 °F)	-	-
Syringe	1	130 °C (266 °F)	-	-

TETPOR LIQUID filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) TETPOR LIQUID conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity).

Endotoxins
Aqueous extracts from the 10" (250 mm) TETPOR LIQUID contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
TETPOR LIQUID filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Integrity Test Data
All filters are integrity testable to the following limits when wet with 60 / 40 IPA / Water and using air as the test gas.

Micron Rating		0.1	0.2	0.45	1.0
Filter Cartridges / MURUS / DEMICAP / Syringe Filters					
Min. Bubble Point	(barg)	1.3	1.0	0.7	-
	(psig)	18.8	14.5	10.1	-
Filter Cartridges / MURUS / DEMICAP / Syringe Filters					
Diffusional Flow	(barg)	1.0	0.8	0.4	-
Test Pressure	(psig)	14.5	11.6	5.8	-
Filter Cartridges / MURUS / DEMICAP / Syringe Filters					
Max. Diffusional Flow (10")		27.0	18.0	18.0	-
(ml / min)	(K)	12.7	8.5	8.5	-
	(A)	9.0	6.0	6.0	-
	(B)	4.5	3.0	3.0	-
	(E)	2.3	1.5	1.5	-

Retention Characteristics
TETPOR LIQUID filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^{11} organisms per 10" (250 mm) filter cartridge.

Ordering Information

Cartridges

ZCMT □ - □ □ □ □

Code | Length (Nominal)			Code | Micron			Code | Endcap (10")		Code | Variant		Code | O-rings	
B*	2.5"	(65 mm)	010	0.1	µm	B*	dh DOE	L	Liquid	E	EPDM
A*	5"	(125 mm)	020	0.2	µm	C	BF / 226 Bayonet	P	Pharmaceutical	P	PTFE Encapsulated Silicone
K	5"	(125 mm)	045	0.45	µm	D	Fin / 222	S	Steam Sterilizable	S	Silicone
1	10"	(250 mm)	100	1.0	µm	E	Flat Top / 222			V*	Viton
2	20"	(500 mm)				G	Recess / 222				
3	30"	(750 mm)				R	BF / 222 Bayonet				
4	40"	(1000 mm)									

** Supplied in packs of 3.*

** Viton o-ring supplied as standard without having to specify the 'V' code.*

Code | Endcap (Demi)	
SK	Retrofit
T	TRUESEAL
Y	Demi Stub
Z	Demi A & B Std

** EPDM gaskets supplied as standard Note: Viton supplied as standard on all other endcap options.*

MURUS Capsules

ZLMT □ - □ □ □ □ - □ □ □ - □

Code | Length (Nominal)			Code | Micron			Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Design		Code | O-rings	
K	5"	(125 mm)	010	0.1	µm	A	3/4" Tri-Clamp	A	3/4" Tri-Clamp	P	Pharmaceutical	N	Non-sterile	L	In-Line	E	EPDM
1	10"	(250 mm)	020	0.2	µm	B	1 1/2" Tri-Clamp	B	1 1/2" Tri-Clamp					T*	T-Port	S*	Silicone
2	20"	(500 mm)	045	0.45	µm	D	1" Hosebarb	D	1" Hosebarb							V	Viton
3	30"	(750 mm)	100	1.0	µm	T	1" Tri-Clamp	T	1" Tri-Clamp								

**Only available with a 1" Tri-Clamp*

** Silicone o-ring supplied as standard without having to specify the 'S' code.*

DEMICAP Capsules

ZEMT □ - □ □ □ - □ □ □ □

Code | Length (Nominal)			Code | Micron			Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Pack N°		Code | Accessory	
E	4.4"	(113 mm)	010	0.1	µm	T	1" Tri-Clamp	T	1" Tri-Clamp	P	Pharmaceutical	N	Non-Sterile	3	Pack of 3	FB	Filling Bell
B	5.5"	(140 mm)	020	0.2	µm	N	1/2" NPT Male	N	1/2" NPT Male								
A	7.9"	(200 mm)	045	0.45	µm	H	1/2" Hosebarb	H	1/2" Hosebarb								
			100	1.0	µm	G	Stepped Hosebarb	G	Stepped Hosebarb								
						M	1/4" NPT Male	M	1/4" NPT Male								
						Q	Walther QC	Q	Walther QC								
						R	Grommel / QC	R	Grommel / QC								
						V	3/8" NPT Female	V	3/8" NPT Female								

G & H connections only

Syringe Filters

ZSMT □ - □ □ □ - □ □ □ □ □

Code | Diameter		Code | Micron			Code | Inlet Connection		Code | Outlet Connection		Code | Variant		Code | Grade		Code | Options		Code | Pack N°	
050	50 mm	020	0.2	µm	F	Female Luer Lock	F	Female Luer Lock	P	Pharmaceutical	N	Non-sterile	S	Standard	025	25 per box
					G	Stepped Hosebarb	G	Stepped Hosebarb								

✆ +44 (0)191 4105121 dhprocess@parker.com www.parker.com/processfiltration

A dedicated housing range

That can be customized to meet the demands of your application

Parker domnick hunter manufacture stainless and carbon steel pressure vessels that are designed to meet International industry standards as well as specific customer application requirements.

A combination of highly skilled employees, dedicated manufacturing facility and nearly 50 years experience of supplying process industries around the world, Parker domnick hunter provide solutions that match your requirements for performance, quality and value.

Our fabrication facility manufactures a standard range of stainless steel housings to support our range of filters, which can be modified and adapted to meet any process requirements. Our strength is in providing a range of products that meet industry requirements and a flexibility to meet your own requirements.

Manufacturing best practice
- ISO9001
- ISO13485
- ISO14001

Vessels built to industry standards
- PED (CE)
- EN / B445
- EN / 286
- EN / 1210
- ATEX
- PD5500
- ASMEU
- ASME BPE

Stamp of approval
- Certificate of Authorization (U stamp)
- National Board Certificate of Authorization
- American Society of Mechanical Engineers

- Air, gas and liquid housings
- Single and multi rounds
- Multi housing skid systems
- Dedicated industry specific range
- Custom options to meet application needs
- Silicone rubber heating jackets
- Single cartridge polypropylene / nylon housings

A dedicated housing range

HSA

- Flow efficient higher specification 316L sanitary air and gas housing for applications such as in the Pharmaceutical industry.
- Sanitary tri-clamp connections, gauge port, drain and body closure as standard. Many other options in the PLUS range.
- Sanitary 'C' style or demi TRUESEAL filter cartridge locations.

HSA PLUS 'Z' STYLE

- Flow efficient sanitary 316L demi air and gas housing for smaller scale applications in the Food & Beverage and Pharmaceutical industry.
- Sanitary tri-clamp connections, gauge port, drain and body closure as standard. Many other options in the PLUS range.
- 'Z' style single internal o-ring filter cartridge locations.

HBA

- Flow efficient 316L air and gas housing for applications such as in the Food & Beverage industry.
- Screwed (G¨) BSP or NPT connections, vent and drain as standard. Many other options available in the PLUS range, including higher specification sanitary design features.
- Sanitary 'C' style or demi TRUESEAL filter cartridge locations.

HSV

- Flow efficient 316L sanitary open air housing typically for tank venting applications.
- Sanitary tri-clamp connections and body closure as standard. Many other options, including higher specification surface finishes in the PLUS range.
- Sanitary 'C' style or demi TRUESEAL filter cartridge locations.

HSVLP

- Flow efficient 316L sanitary 'L' Port (side and base) air housing typically for tank venting applications.
- Sanitary tri-clamp connections and body closure as standard. Other options available in the PLUS range, including electro-polished finish and integrity test sockets.
- Sanitary 'C' style or demi TRUESEAL filter cartridge locations.

HSL

- Flow efficient 316L sanitary liquid housing for applications in the Food & Beverage and Pharmaceutical industry.
- Sanitary tri-clamp connections, gauge port and body closure as standard. Many other options in the PLUS range.
- Sanitary 'C' style or demi TRUESEAL filter cartridge locations.

HSI

- Flow efficient 316L sanitary in-line housing for air, gas and liquid for applications in the Food & Beverage and Pharmaceutical industry.
- Sanitary tri-clamp connections, gauge port and body closure as standard. Many other options in the PLUS range.
- Sanitary 'C' style or demi TRUESEAL filter cartridge locations.

HIL

- Liquid 316L housing for prefiltration and industrial applications.
- Screwed (G¨) BSP or NPT connections, vent and drain as standard. Many other options available in the PLUS range.
- B (DOE) or D (222) style filter cartridge locations.

HIF

- Liquid Demi 316L housing for small scale applications.
- Screwed (G¨) BSP or NPT connections, vent and drain as standard. Many other options available in the PLUS range.
- 'Z' style single internal o-ring filter cartridge locations.

ZVP (PLASTIC)

- Liquid polypropylene, polycarbonate or nylon housing.
- Screwed (G¨) BSP connections, vent and drain as standard.
- B (DOE) and N or J style single internal o-ring filter cartridge locations.

HCA

- Enhanced PLUS flow efficient Alloy 22 (none wetted parts 316) air and gas housing for aggressive applications such as chemical synthesis in the Pharmaceutical industry.
- Flanged connections with screwed (G), BSP or NPT vent and drain and tri-clamp body closure as standard. Other options available.
- Sanitary 'C' style filter cartridge locations.

HCL

- Enhanced PLUS flow efficient Alloy 22 (none wetted parts 316) liquid housing for aggressive applications such as chemical synthesis in the Pharmaceutical industry.
- Flanged connections with screwed (G), BSP or NPT vent and drain and tri-clamp body closure as standard. Other options available.
- Sanitary 'C' style filter cartridge locations.

HPG

- Enhanced PLUS higher pressure 316L air and gas housing for applications such as in the Food & Beverage industry. 25 barg (363 psig) and 40 barg (580 psig) variants available.
- ANSI, ISO, (G¨)BSP or NPT connections, vent and drain as standard. Other options available.
- Sanitary 'C' style filter cartridge locations.

ZVACE (MULTI)

- Multi-round flow efficient 316L air and gas housing for applications such as in the Industrial Biotech and Food & Beverage industry.
- Weld end or flanged connection, screwed (G¨) BSP or NPT, vent and drain as standard. Many other options available.
- Sanitary 'C' style filter cartridge locations.

VISCE

- Single and 3 round flow efficient 316L steam housing for applications such as in the Industrial Biotech and Food & Beverage industry.
- Weld end or flanged connection, screwed (G¨) BSP or NPT, vent and drain as standard. Many other options available.
- Sanitary J (Jumbo) style filter cartridge locations.

VSHCE (MULTI)

- Multi-round flow efficient 316L sanitary liquid housing for applications in the Food & Beverage industry.
- Many connection options as standard. Sanitary tri-clamp gauge port and drain connections (or no drains). Many other options available.
- Sanitary 'C' style filter cartridge locations.

VSLCE (MULTI)

- Multi round flow efficient 316L sanitary liquid housing for applications in the Pharmaceutical industry.
- Sanitary tri-clamp connections, gauge port and body closure as standard.
- Sanitary screwed integrity test / sample and drain connections. Many other options available.
- Sanitary 'C' style filter cartridge locations.

VILCE (MULTI)

- Multi liquid 316L housing for prefiltration and industrial applications.
- Screwed (G¨) BSP or NPT connections, vent and drain as standard. Many other options available in the PLUS range.
- B (DOE) or D (222) style filter cartridge locations.

SKIDS

- Custom design - Parker domnick hunter offers a specialist design and fabrication service allowing individual customer system specifications to be met.

HEATING EQUIPMENT

- Housing heating jacket system mainly for vent applications.
- Silicone or PTFE Glass Silk heating jacket with integrated control unit and inter-connection wiring.
- Accurate temperature control using PT100 temperature sensor with additional thermal cut out at 150 °C (302 °F).

For more information on Parker domnick hunter's complete housing range, please contact your local Parker domnick hunter representative for a copy of the latest technical literature.

Integrity testing equipment

Whatever your industry, integrity testing plays a vital role in ensuring the performance and sterility of your process filters. The ability to integrity test a filter provides a valuable tool to gauge, not only performance of your process, but also the quality and safety of your final product. A properly conducted integrity test provides assurances that the filter will fulfil the role it was designed for ensuring your production process runs to its maximum potential.

Integrity testing of sterile grade filters is a fundamental requirement of critical process applications. FDA guidelines require integrity testing of filters used in the processing of sterile solutions. It is vital producers ensure the quality and biological safety of the product that reaches the customer. Increased shelf-life, reputation and customer well being are of paramount importance

Parker domnick hunter, have a range of instruments that have been specifically designed to meet the demands of your industry. All instrumentation is supported by our global team of dedicated instrument service Engineers on hand to provide validation, installation and performance guarantees.

Aerosol challenge

This methodology uses a high concentration of aerosol in the most penetrating particle size (MPPS) of 0.2 - 0.3 µm. The MPPS is a function of the particle challenge for air filters.

During the test the filter system is challenged with 10^9 aerosol particles. The latest in laser particle detection technology measures the percentage penetration through the test system. The test is directly correlated to aersol challenges with live *Brevundimonas diminuta* and *E-coli* phage. A positive result shows that the test filter is providing bacterial and viral removal when used in gas. The integrity test method of VALAIRDATA II is unique to Parker domnick hunter and is the only integrity test method for gas filters to simulate actual filter use.

Bubble point testing

The bubble point test measures the pressure that is required to expel a wetting fluid from the largest pore in a wetted membrane. Historically this was a visual assessment indicated by bubbling on the downstream side of the membrane, hence the term 'bubble point'. The test is typically applied to smaller filters and to remove subjectivity is now conducted using automated integrity testers.

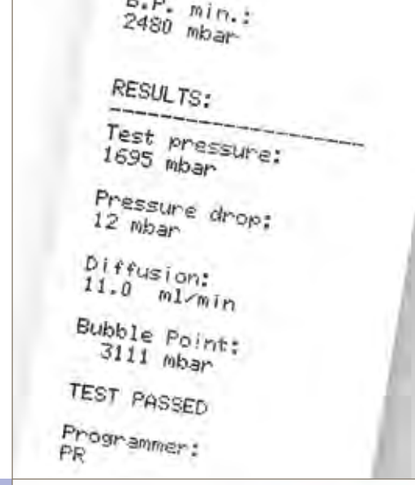
Water intrusion

Water intrusion testing is based on the measure of the intrusion or flow of water into the pore structure of a hydrophobic filter membrane, under an applied test pressure. The flow is measured, with the test result / limit being directly correlated to the ASTM standard for a sterilizing grade filter.

Diffusional flow

The diffusional flow test measures the volume of a diffusive gas flow across a wetted membrane, under an applied test pressure. This method can be utilized to test both hydrophilic and hydrophobic membrane filters.

Diffusional flow test results are directly correlated to live bacterial challenges using industry standard organisms. For a 0.2 micron sterilizing grade filter this challenge procedure is defined in ASTM F838-05.



VALAIRDATA II

The most efficient test for sterile gas filters

Since 1990 and the launch of the unique VALAIRDATA aerosol integrity test system, the aerosol test method has become widely accepted in a variety of applications and industries as a routine method for integrity testing air filtration systems. The VALAIRDATA II integrity test instrument is a second generation design offering further practicality in air filter testing.

The VALAIRDATA II combines the sound principles of aerosol testing, as recommended in the 'PDA's Sterilizing Filtration of Air - Technical Report #40', with a compact, portable and ergonomic design reducing test times and improving multi cartridge system sensitivity.

The VALAIRDATA II aerosol test is correlated to an aerosolised *Brevundimonas diminuta* and bacteriophage (such as *Enterobacteria phage MS2*) challenge.

Aerosol methods are rapid, can identify filter non-integrity on very large systems, allow immediate use of filter systems after testing as drying is not required and provides direct measurement of filter performance for gas filters.

- **30 second test time for a single 10¨ (250 mm) cartridge challenge**
- **Results correlated to aerosol bacterial and viral challenge**
- **Increased sensitivity compared to liquid based tests especially on multi-cartridge systems**
- **Built-in test instrument system integrity check**
- **Well established with over 200 current VALAIRDATA II users**
- **Fully validated secure option design to GAMP 4 Guidelines and meets the FDA's 21CFR11 requirements**
- **Stores up to 200 test results and supported with software for PC download**
- **PDA recommended for use where filtered gas not in direct contact with exposed sterile product or surfaces**

Physical Parameters

Instrument Material	Moulded Robust Polyurethane Case & Non-Slip Feet
Instrument Size	363 mm x 155 mm x 308 mm : 14.3¨ x 6.1¨ x 12.1¨
Weight	8 Kg : 18 lb
Ingress Protection Class	IP45
Power Supply	Re-chargeable Battery (12V / 3.8 Ah) & Mains (90 - 230 VAC : 50 / 60 Hz)
Keyboard	16 Tactile Keys with Alphanumeric Input
Inlet Pressure Required	3.5 - 7.0 barg (50 - 100 psig) (60 Al / min)
Operating Temperature	5 - 37 °C (40 - 95.6 °F)
Pneumatic Connectors	Rectus 21 KA Series
Ambient Humidity	10 - 95% RH (non-condensing)
Languages	English, French, German, Spanish, Italian, Danish, Portugese & Swedish
Programmed Tests	Up to 100
Storable Test Programmes	200

Instrument Options

	Standard	Secure Environment	Electronic Signature
PC Manager Software	ST - Standard	SE - Secure Environment	ES - Electronic Signature
PC Operating Platforms	Microsoft Windows 7, 98, 2000, NT & XP	Microsoft Windows 7, 98, 2000, NT & XP	Microsoft Windows XP
Design Environment Approvals	Hardware & Software Development to GAMP Guidelines	GAMP Hardware & Software Development 21CFR11 Compliant (PC data is users responsibility)	GAMP Hardware & Software Development 21CFR11 Compliant
Operator (max. 40)	Open Access	Access Password & PIN	Access Password & PIN
Access ADMINISTRATOR	Open Access	Access Password & PIN	Access Password & PIN
Record Output	RS232 Transfer	RS232 Transfer	RS232 Transfer
Audit Trail Record	No	Yes	Yes

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PORECHECK IV

The perfect choice for the pharmaceutical industry

Parker domnick hunter, in conjunction with the pharmaceutical industry has reviewed the limitations and benefits of current integrity test equipment. This review has led to the development of the PORECHECK IV integrity test system which has been specifically designed with the needs of routine production users in mind.

The PORECHECK IV is configured for water intrusion testing, pressure decay and bubble point testing.

The PORECHECK IV comes in two versions:

'P' Pharmaceutical (CFR)
- allows traceability and audit tracking capability

'C' Certified
- comes with password level protection

This market leading system incorporates a range of design features unique to the PORECHECK IV bringing true portability, enhanced ease of use, flexibility and reliability in challenging environments. All this within an instrument fully compliant with 21 CFR Part 11.

- **Designed to 21 CFR Part II and Annex II compliant environments**
- **Automatic compensation when used on housings located 10 metres above instrument**
- **Maintains resolution and accuracy regardless of filter system size 0.1 to 150 litres**
- **Highly portable and mains independent**
- **Configurable to automatically flush and drain filters**
- **Robust waterproof stainless steel casing**
- **Direct attachment to test disposable capsules**
- **100 storable test programs defined in blocks**

Physical Parameters

Instrument Material	Stainless Steel 1.4301 (AISI 304)
Instrument Size	200 mm x 300 mm x 155 mm : 7.9" x 11.8" x 6.1"
Weight	8.6 Kg : 20 lb
Ingress Protection Class	IP54
Power Supply	Re-chargeable Battery (12V / 3.8 Ah) & Mains (90 - 230 VAC : 50 / 60 Hz)
Keyboard	Remote Infrared - Alpha Numeric & Instrument Keypad - Numeric
Inlet Pressure Required	6.5 - 8.0 barg (94 - 116 psig)
Test Pressure Range	350 mbar to 6 barg (87 psig)
Pneumatic Connectors	Stäubli RBE 0.3 Style : Stainless Steel 1.4404 (AISI 316L)
Storage Temperature	2 - 50 °C (35.5 - 122 °F)
Ambient Humidity	1 - 80% RH
Display	LCD - 20 Character x 4 Lines - Back Lit
Printer	Internally Housed Impact Dot Matrix , 24 Characters per Line
Languages	English, French, German, Spanish, Italian & Danish
Software Protection	Stored in Flash - EPROM
Storable Test Programs	Up to 100 (in Flash - EPROM) Stored in 10 Blocks of 10 Programs

Test Accuracy

	Standard		High Pressure
Water Intrusion Measurement Range (ul / t)		100 - 99999	
Resolution (µl)		5	
Accuracy (for a 10" cartridge @ 4000 µl / min)	3%		6%
Test Pressure (mbar)		350 - 4000	
Stabilisation Time		60 - 999 secs	
Test Time (t)		30 - 999 secs	
Hardware Volume (ml)		1 - 32000	
Diffusional Flow Measurement (ml / min)		1 - 999	
Resolution (ml / min)		0.1	
Accuracy (for a 10" cartridge @ 16 ml / min)	3%		6%
Test Pressure (mbar)	350 - 4000		350 - 7000
Stabilisation Time		60 - 999 secs	
Test Time (t)		30 - 999 secs	
Upstream System Volume (ml)		1 - 32000	
Bubble Point Measurement Range (mbar)	450 - 3900	(min. 100 mbar above DF test pressure)	450 - 7900
Resolution (mbar)	1		2
Accuracy		1& FS	

Instrument Options

	'P' Pharmaceutical	'C' Certified	Documentation
Storable Test Records	40	No	Installation, Operating & Maintenance Manual
USER Accounts	25	Unlimited	Checklist of Supplied Components
Access USER	Access Password & PIN	Open Access	Calibration & Pressure Vessel Certification
Access PROGRAMMER	Access Password & PIN	Access Password	CE Declaration of Conformity
Access ADMINISTRATOR	Access Password & PIN	Access Password	Operational Qualification Support Documentation
Record Output	Printed Records & RS232 Transfer	Printed Record Test Result Only	Laboratory Qualification Results
Audit Trail Record	256 Event Audit Trail	No	Suggested OQ Test Protocol

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BEVCHECK & BEVCHECK PLUS

Monitoring performance and product quality

BEVCHECK
Simple routine integrity testing for the beverage industry BEVCHECK is an easy to use, portable unit that allows you to test the integrity of your membrane filters using the pressure decay method. Test data can be reported as pressure decay or diffusional flow.

BEVCHECK is a small hand held unit, or is light enough to be mounted directly on to a connection on the filter housing. Software included with the unit enables it to be connected to a pc for enhanced programming and data handling flexibility.

BEVCHECK PLUS
Provides an automated method for testing membrane filter cartridges used in beverage applications. Using the pressure decay method, the unit controls the whole test from increase of pressure, through stabilization and pressure decay measurement, to release of pressure.

Test data can be reported as pressure decay or diffusional flow and is provided in a printed summary. The unit is small enough to be portable around the production facility, or can be positioned centrally for remote connection to the filter housings.

- Large memory stores up to 19 programs and 100 test reports
- Flexible - suitable for use with compressed air or nitrogen
- Accommodates a wide range of filter retention ratings and housing sizes
- Clear liquid crystal display and wipe clean keypad
- Self test function automatically checks the function of the unit
- PC interface and software provides additional programming and data handling flexibility
- IP53 protection class
- Hand held portability with rechargeable battery operation
- Convenient built-in printer provides printed test report (PLUS)

Physical Parameters

	BEVCHECK	BEVCHECK PLUS
Housing Material	ABS	Polystyrol
Instrument Size	(WxDxH) 105 mm x 210 mm x 45 mm (4¨ x 8.25¨ x 1.75¨)	(WxDxH) 315 mm x 280 mm x 150 mm (12.5¨x 11¨ x 6¨)
Weight	0.5 Kg (1.1 lbs)	3.9 Kg (8.6 lbs)
Ingress Protection Class	IP53	IP53
Power Supply	Re-Chargeable HiMH Battery (4.8 V / 1.5 Ah) & External Charger (100- 230V AC / 47 - 63 Hz / 7.5V 1.33A)	HiMH Battery (4.8 V / 1.5 Ah) & External Charger / Mains (230V AC:18V DC, 1.7A / 230V AC:15V AC, 15VA)
Battery Life (From Full Charge)	7 hours Typ.	2 hours Typ.
Keyboard	16 Key - Polycarbonate Keypad	16 Key - Polycarbonate Keypad
Inlet Pressure Required	0 - 4000 mbar	0 - 4500 mbar
Operation Temperature	3 - 33 °C (37.4 - 91.4 °F)	3 - 30 °C (37.4 - 95 °F)
Pneumatic Connectors	Compressed Air / Filter : Rectus 21 Male	Compressed Air / Filter : Festo 4 mm Stäubi RBE03 Male Vent : Festo 4 mm
Storage Temperature	3 - 35 °C (37.4 - 95 °F)	3 - 35 °C (37.4 - 86 °F)
Ambient Humidity	5 - 95% Rel.	5 - 95% Rel.
Display	LCD - 16 Character x 2 Lines	LCD - 20 Character x 4 Lines
Printer	None	Built in Thermal Printer - 57 mm Printer
Language	English, German, Italian, French, Spanish & Portugese	English, German, Italian, French, Spanish & Portugese
Storable Test Programs	19	19
Storable Test Records	100	100
Test Pressure Control	Manual (Additional Accessory Kit Required)	Fully Automatic
Test Pressure Range	0 - 4000 mbar	0 - 3900 mbar
Housing Volume Range	10 - 999999 ml	10 - 999999 ml
Diffusional Flow Range	1 - 99.9 ml / min	1 - 999.9 ml / min
Stabilisation Time Range	1 - 1800 secs	1 - 1800 secs
Test Time Range	1 - 1800 secs	1 - 1800 secs
Interfaces	PC Data / Remote Operation : RS232 4-Pole Jack	D-Sub 25 Pole PC Data / Remote Operation : RS232 9-Digit Male
Documentation / Ancillaries	CE Declaration of Conformity Calibration Certificate Winfilter PC Software Power Supply / Charger with Country Specific Mains Adaptor PC Comms Cable (RS232 - 4 Pole Jack to 9 Pin Male) Installation, Operation & Maintenance Instructions (IOMI) Foam Lined Carry Case	CE Declaration of Conformity Calibration Certificate Winfilter PC Software Power Supply / Charger with Country Specific Mains Adaptor PC Comms Cable (RS232 - 4 Pole Jack to 9 Pin Male) Installation, Operation & Maintenance Instructions (IOMI) Foam Lined Carry Case

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Filter Discs

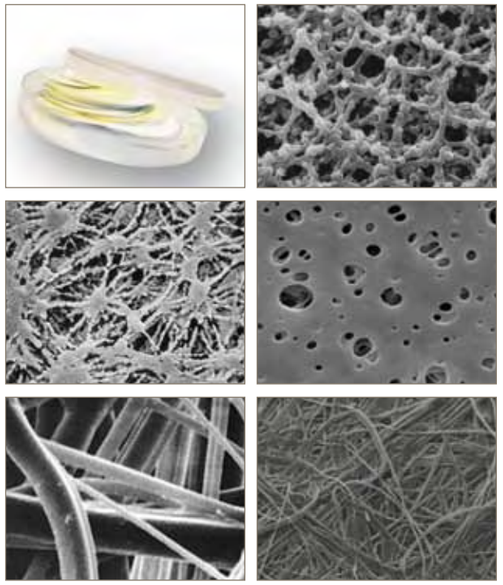
- liquid filters
- various membrane / media

Process and analytical filter discs from Parker domnick hunter are available in a range of pore size and a choice of five materials.

Membrane discs:
- Cellulose mixed esters
- Polyethersulphone
- Nylon

Fibrous media discs:
- Glass microfibre
- Polypropylene

The discs are supplied interleaved between two protecting layers with the feed surface oriented upwards in the box.



Features and Benefits

- High throughput rates
- Superior flow characteristics
- Easy to handle
- Reduced filtration time
- Low protein binding

Liquid Filters

ZD [ ] [ ] - [ ] A [ ]

Code	Product	Code	Diameter	Product	Code	Micron	Code	Quantity
PP	PEPLYN PLUS	047	ø47	PEPLYN PLUS	.60	0.6 µm	Y	50
GF	PREPOR GF				1.0	1.0 µm		
GP	PREPOR GP				1.5	1.5 µm		
PS	PREPOR PES				003	3.0 µm		
					005	5.0 µm		
					007	7.0 µm		
					010	10.0 µm		
					015	15.0 µm		
					020	20.0 µm		
					025	25.0 µm		
					040	40.0 µm		
					055	55.0 µm		
					075	75.0 µm		
				PREPOR GF	.60	0.6 µm	Y	50
					.80	0.8 µm		
					1.0	1.0 µm		
					1.5	1.5 µm		
					002	2.0 µm		
					005	5.0 µm		
					007	7.0 µm		
					010	10.0 µm		
				PREPOR GP	.50	0.5 µm	X	25
					.60	0.6 µm		
					.80	0.8 µm		
					1.0	1.0 µm		
					1.5	1.5 µm		
				PREPOR PES	004	0.04 µm	Z	100
					010	0.10 µm		
					020	0.20 µm		
					045	0.45 µm		
					065	0.65 µm		
					080	0.80 µm		

Ordering Information

Beverage Prefilters

[ ] [ ] - [ ] NA [ ]

Code	Product	Product	Code	Code	Quantity
PHD	PEPLYN HD	PEPLYN HD	G, H, K, L, M, N, P	W*	10
PHA	PEPLYN HA			X°	25
PGF	PREPOR GF	PEPLYN HA	D, E, G, H, K, L, M, N, P, T, U, W	Y	50
PGP	PREPOR GP	PREPOR GF	B, C, D, E, F, H, K	Y	50
PPP	PREPOR PP	PREPOR GP	A, B, D, E	X	25
		PREPOR PP	B, D	Y	50

*G, H, K, L, M ratings only
°N & P ratings only

Beverage Final Filters

[ ] [ ] - [ ] A [ ]

Code	Product	Code	Diameter	Product	Code	Micron	Code	Quantity
BPS	BEVPOR PS	047	ø47	BEVPOR PS	02	0.2 µm	Z	100
BPH	BEVPOR PH				04	0.45 µm		
BPT	BEVPOR PT				06	0.65 µm		
BMS	BEVPOR MS				08	0.80 µm		
BMT	BEVPOR MT				12	1.2 µm		
BMH	BEVPOR MH			BEVPOR PH	02	0.2 µm	Y	50
					04	0.45 µm		
					06	0.65 µm		
					08	0.80 µm		
					12	1.2 µm		
				BEVPOR PT	02	0.2 µm	Z	100
					04	0.45 µm		
					06	0.65 µm		
				BEVPOR MS	02	0.2 µm	Z	100
					04	0.45 µm		
					06	0.65 µm		
					08	0.80 µm		
					12	1.2 µm		
				BEVPOR MT	02	0.2 µm	Z	100
					04	0.45 µm		
					06	0.65 µm		
				BEVPOR MH	02	0.2 µm	Y	50
					04	0.45 µm		
					06	0.65 µm		
					08	0.80 µm		
					12	1.2 µm		

Pharmaceutical Filters

ZD - [ ] [ ] [ ] [ ]

Code	Product	Code	Diameter	Product	Code	Micron	Code	Quantity
BR	PROPOR BR	047	ø47	PROPOR BR	020	0.20 µm	Y	50
SG	PROPOR SG			PROPOR SG	010	0.10 µm	Z	100
HC	PROPOR HC				020	0.20 µm		
LR	PROPOR LR				045	0.45 µm		
MT	TETPOR LIQUID			PROPOR HC	620	0.20 µm	Y	50
				PROPOR LR	010	0.1 µm	Z	100
				TETPOR LIQUID	010	0.1 µm	Z	100
					020	0.2 µm		
					045	0.45 µm		
					100	1.0 µm		

Standard diameters 047 mm.
Diameters 025mm, 090 mm & 142 mm are also available.
For full ordering information, variants, quantities and availability, please contact Parker domnick hunter.

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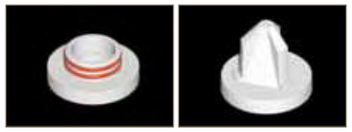
Endcap styles

Cartridge endcaps

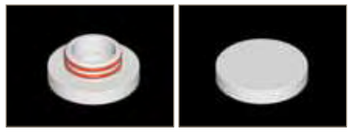
A Style 223 o-rings

B, L Style Flat Gaskets

C Style 226 o-rings



D Style 222 o-rings



E Style 222 o-rings

F Style 216 / 218 o-rings

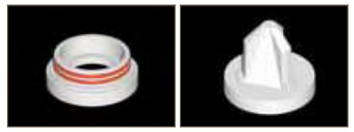
G Style 222 o-rings

H Style 54 mm ID
x 4 mm o-rings

J Style S.O.E.

K Style 214 o-rings
(internal)

N Style 213 o-rings
(internal)



P Style 227 o-rings

R Style 222 o-rings

S Style Flat Gaskets

SK Style
(demi only)

T Style 126 o-rings
(demi only)

U Style 222 o-rings

W Style 111 o-rings
(demi only)

X Style 116 o-rings
(demi only)

Y Style 116 o-rings
(internal) (demi only)

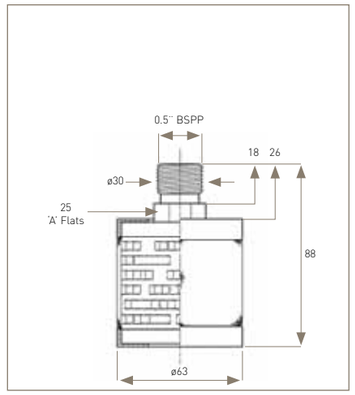
Z Style 116 o-rings
(internal) (demi only)

Demi H Style 217 o-rings
(demi only)

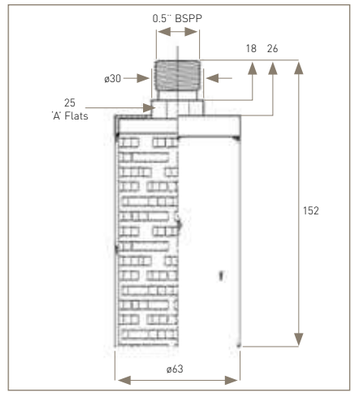
Vent autoclave filter endcaps and dimensions

X Style $^{1}/_{2}$" NPTM
Thread & Gasket

V Style BSPP
Thread & Gasket



'B' Size

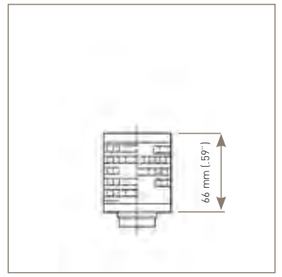


'A' Size

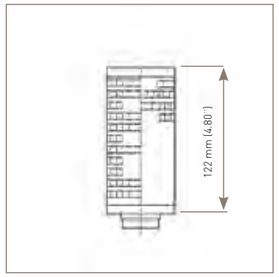
Endcap cross reference chart

Parker domnick hunter	PA	MI	SA
B	MCY 10"	F	23
C (10" Size)	7	7	25
C (K Size)	2		
D	8	5	26
E / G	E = 3 / G = 25	0	27
F	MYS	8	24
L	MCY 20" and above	F	23
R			28
X			
Y	MCY2230		
Z	MCY2230 / 4463		

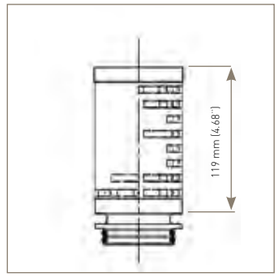
Cartridge dimensions



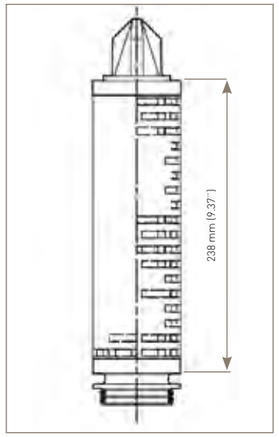
'B' Size



'A' Size



'K' Size



10" Size

DEMICAP styles

Stepped Hosebarb (Code G)

1/2¨ Hosebarb (Code H)

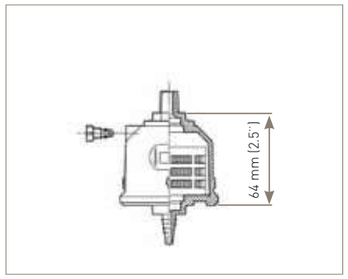
1/4¨ NPT (Code N)

1/2¨ NPT (Code M)

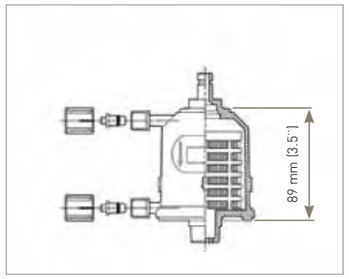
Walther Male (Code Q)

Gromelle (Code R)

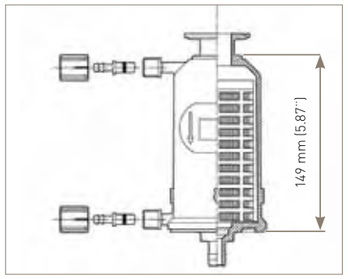
1¨ Tri-clamp (Code T)



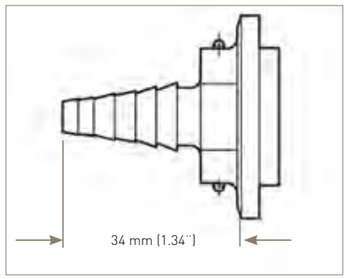
'E' Size



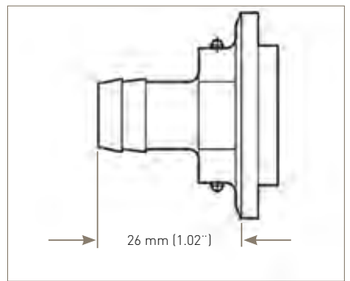
'B' Size



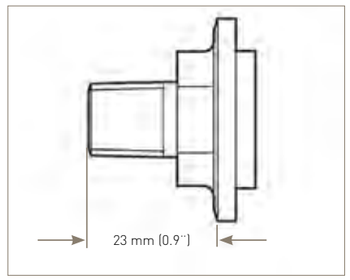
'A' Size



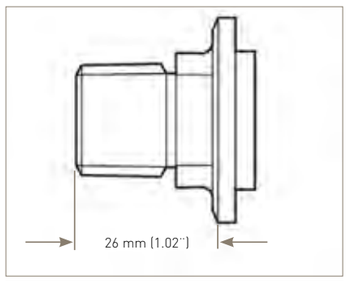
Stepped Hosebarb (Code G)



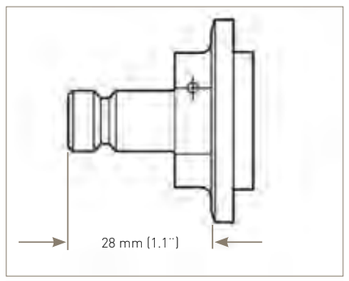
1/2¨ Hosebarb (Code H)



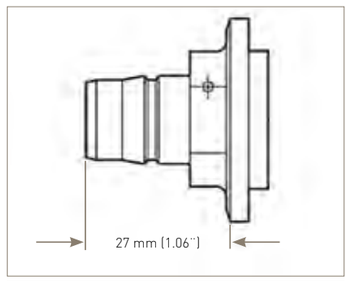
1/2¨ NPT (Code N)



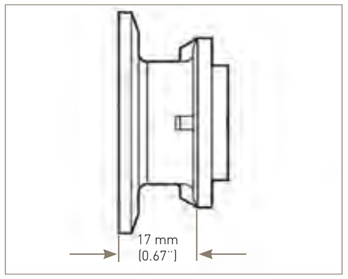
1/4¨ NPT (Code M)



Walther Male (Code Q)



Gromelle (Code R)



1¨ Tri-clamp (Code T)

MURUS and syringe styles

Large scale disposable inlet / outlet connection styles

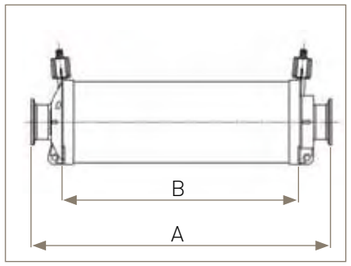
1¨ Hosebarb

$^{3}/_{4}$¨ Tri-clamp

1¨ Tri-clamp

$1^{1}/_{2}$¨ Tri-clamp

T-Port
(1¨ Tri-Clamp only)



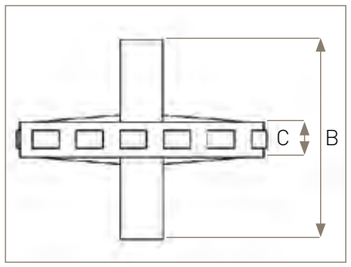
Cartridge Type	'A'	'B'
10¨ 250 mm	13.07¨ 332 mm	10.30¨ 262 mm
20¨ 500 mm	22.79¨ 579 mm	20.04¨ 509 mm
30¨ 750 mm	32.56¨ 827 mm	29.80¨ 757 mm

Syringe filters

Stepped Hosebarb
Suitable for tubing with 6 mm ($^{1}/_{4}$¨)
12 mm ($^{1}/_{2}$¨) internal diameter

Luer Slip Male

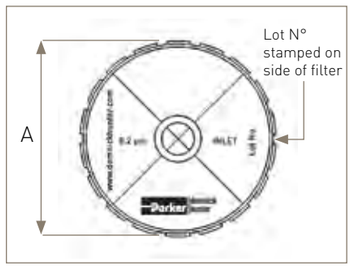
Luer Loc Female



'A'	'B'	'C'
0.98¨ 25 mm	1.12¨ 28.5 mm	0.31¨ 8.0 mm
1.96¨ 50 mm	2.12¨ 54.0 mm	0.31¨ 8.0 mm

$^{5}/_{16}$¨ Hosebarb

$^{1}/_{8}$¨ BSPM Thread



Example of Syringe filter marking

Installation and operating guidelines

For liquid and gas filter cartridges

Introduction

These guidelines give the correct methods for using liquid and gas filter cartridges manufactured by Parker domnick hunter. If you have any queries, our process filtration specialists will be pleased to discuss your particular filtration requirements or answer any questions you may have. We may also be contacted at any of the addresses given on the reverse of this document or through our worldwide network of subsidiary companies and distributors.

1. Storage

1.1 Store cartridges in a clean and dry environment and avoid placing heavy objects on the top of the cartridge tube or packaging. The cartridges should not be exposed to temperatures below 5 °C (41 °F) or above 40 °C (104 °F) or to direct sunlight.

1.2 Keep the cartridge in it's sealed polyethylene bag until it is time to install it.

1.3 The shelf-life for cartridge filters is as follows:-

ASYPOR membrane variants	- 2 years
Liquid membrane cartridges	- 3 years
Liquid depth cartridges	- 5 years
TETPOR membrane variants	- 5 years
Gas membrane cartridges	- 5 years
Gas depth cartridges	- 5 years
Gamma irradiated cartridges	- Consult Certificate of Conformance

2. Installation

The various cartridge formats and end caps are shown on the end of this sheet, please refer to this if you are unsure which cartridge format you have.

2.1 New housings should be flushed out with clean water / air (dependant on the application) prior to installation of the cartridge to remove any debris. Ensure tie-rods / support plates are removed prior to flushing as vibration (especially in air) can cause components to loosen.

2.2 Before changing or installing a liquid or gas cartridge filter ensure that the filter vessel is depressurized and any liquid has been drained off. (Most vent filter cartridges are open to atmosphere but if the filter is connected to a pressurized line then ensure that the filter vessel is depressurized before removing the filter bowl).

2.3 Remove the filter bowl. For plastic housings the bowl is unscrewed and for stainless steel housings the bowl is held in place using a band clamp or a bolted flange.

2.4 Cut open the polyethylene bag at the cartridge open end and check that the o-ring seals or gaskets are clean, intact, correctly located in their grooves and not damaged.

2.5 Lubricate o-ring seals with a lubricant that is compatible with the process fluid (e.g. clean water) or use process liquid itself. Note: No lubricant should be used for oxygen applications.

2.6 Using the bag as protection and holding the cartridge as near as possible to the open end as opposed to the main body of the cartridge or the top end cap, press the cartridge firmly into or onto the housing locations. Keep the cartridge vertical to prevent damage to the o-rings.

a) If the vessel has a bayonet type cartridge location (A,C & R), slightly turn the cartridge clock-wise to locate the retaining lugs.

b) For double open ended cartridges (B), take care to ensure that the cartridge gaskets on both the housing and cartridge are centred over the housing knife edge seals at both ends before closing the vessel.

c) Cartridges with a threaded end cap (V) should be screwed in until the gasket is compressed.

d) Threaded vent filters should be screwed into position until the flat gasket is compressed (BSPP) or the thread locks (NPT).

2.7 Remove the polyethylene bag from the cartridge(s) before the vessel is closed.

2.8 Some filter housings take more than one cartridge (multi-round) and they will have a support plate that locates on top of the cartridges and prevents movement and damage. Refer to the vessel instructions for the way that this plate is secured and ensure that it is always installed before the vessel bowl is located.

3. Operation (liquid cartridges)

Filter cartridges should not be subjected to excessive hydraulic shock and should never be reverse pressurized from the downstream to the upstream side (inside to out).

3.1 Slowly open the upstream valve and allow liquid into the filter vessel.

3.2 The vent valve located at the top of the vessel should be cracked open to allow air to escape and to ensure that the filter vessel is full of liquid. The vent valve should be closed when liquid starts to exit the valve.
N.B. If hazardous liquids are being filtered, please ensure that vent and drain valves are connected to a suitable drain line.

3.3 Slowly open the downstream valve and allow the filtered liquid to flow. It is recommended that newly installed cartridges are briefly flushed to drain and remove an debris that may have been inadvertently generated during cartridge installation or to remove trace levels of surfactant that may be present in some filter media. Liquid cartridges are shown to be blocked when the differential pressure across the filter has significantly increased and / or the flow of liquid through them is reduced to an unacceptable level. If you do not have pressure gauges that indicate the differential pressure then please contact Parker domnick hunter or their representative.

4. Operation (gas / vent cartridges)

Vent / Gas filter cartridges are hydrophobic and they will not operate effectively if they are covered in water or steam condensate. This can lead to tank collapse or cartridge deformation so please ensure that if vent filters do come into contact with water they are replaced.

Gas cartridges are blocked when the differential pressure across the filter is high and/or the flow of gas through them is significantly reduced. In normal operation they should be changed at least annually.

5. Integrity testing

Some liquid and gas cartridges may be integrity tested by a number of manual or automatic methods. Please contact Parker domnick hunter or it's representative for further information on which method is most suitable for your application or refer to the appropriate product datasheet.

6. Hot water sanitization (Liquid hydrophilic cartridges)

Recirculate prefiltered water through the filter for 1 hour at 80 °C (176 °F), the maximum differential pressure across the filter should be no more than 0.3 bar (5 psi). Open all system outlet valves to sanitize the system thoroughly.

7. Steam sterilization

Please refer to the datasheets to find out if your cartridge filter and housing can be autoclaved or steamed in place (SIP) and the allowed maximum temperature. To minimize the risk of contamination to a sterile system the filter should be autoclaved or SIP'd immediately prior to use.
N.B. Plastic housings cannot be steam sterilized or autoclaved.

Steam-in-place (SIP)

It is important that both liquid and gas filter cartridges do not have bulk steam flowed through them during SIP because excessive differential presure can cause damage to the cartridge at high temperatures. It is also usual to filter the steam so that any dirt it carries does not block or damage the filter.

Vacuum autoclave sterilization

The cartridge should be installed in the housing, the vent / drain valves left open and the housing bowl left slightly open. Do not allow the cartridge to support the vessel base or allow the bowl to rest on the cartridge during autoclaving. The assembly should be autoclaved on a cycle with a slow exhaust. Where possible liquid cartridges should be flushed with clean water prior to autoclaving.

Parker domnick hunter has detailed guidelines for the sanitization and steam sterilization of liquid and gas filters so if you are unsure of the procedures please contact Parker domnick hunter or it's representative.

Disposal

All cartridge filters should be disposed of in a safe manner and in line with Health & Safety Guidelines.

Conversion tables

Volume rate of flow

CONVERT FROM ↓ TO →	Multiplying Factors									
	litre / sec	litre / hr	m^3 / sec	m^3 / hr	ft^3 / min	ft^3 / hr	UK gal / min	UK gal / hr	US gal / min	US gal / hr
litre / sec	1.	3600.	0.001	3.6	2.118882	127.133	13.19814	791.8884	15.85032	951.019
litre / hr	0.000278	1.	0.00000028	0.001	0.000588	0.035315	0.003666	0.219969	0.004403	0.264172
m^3 / sec	1000.	3 600 000.	1.	3600.	2118.88	127 133.	13 198.1	791 889.	15 850.3	951 019.
m^3 / hr	0.27778	1000.	0.000278	1.	0.588578	35.3415	3.66615	219.969	4.402863	264.1718
ft^3 / min	0.471947	1699.017	0.000472	1.699017	1.	60.	6.228833	373.730	7.480517	448.8310
ft^3 / hr	0.007866	28.3168	-	0.028317	0.01667	1.	0.103814	6.228833	0.124675	7.480517
UK gal / min	0.0757	272.766	0.0000758	0.272766	0.160544	9.63262	1.	60.	1.20095	72.05700
UK gal / hr	0.001263	4.54609	-	0.004546	0.002676	0.160544	0.016667	1.	0.020016	1.20095
US gal /min	0.063090	226.8	0.0000631	0.227125	7.4805	448.8	0.832674	49.96045	1.	60.
US gal / hr	0.001052	3.785411	-	0.003785	0.133681	0.133681	0.013878	0.832674	0.016667	1.

Pressure (liquid column, atmospheric, etc.)

CONVERT FROM ↓ TO →	Multiplying Factors									
	lb / in^2	inH_2O	ftH_2O	inHg	atmos.	mmHg	mbar	kgf / cm^2	N / m^2	N / mm^2
lb / in^2	1.	27.6799	2.30667	2.03602	0.068046	51.7149	68.9476	0.070307	6894.76	0.0068948
inH_2O	0.036127	1.	0.083333	0.073556	0.0024583	1.86832	2.49089	0.002540	249.089	0.0002491
ftH_2O	0.433528	12.	1.	0.882671	0.029500	22.4198	29.8907	0.03048	2989.07	0.0029891
inHg	0.491154	13.5951	1.13292	1.	0.033421	25.4	33.8639	0.034532	3386.39	0.003386
atmos.	14.6959	406.781	33.8984	29.9213	1.	760.000	1013.25	1.03323	101 235.	0.101325
mmHg	0.019337	0.535240	0.044603	0.03937	0.0013158	1.	1.33322	0.0013591	133.322	0.0001333
mbar	0.014504	0.401463	0.033455	0.029530	0.0009869	0.750062	1.	0.0010197	100.	0.0001
kgf / cm^2	14.2233	393.700	32.8084	28.959	0.967841	735.559	980.655	1.	98 066.5	0.98066
N / m^2	0.000145	0.004015	0.0003345	0.0002953	0.000099	0.007501	0.01	0.0000102	1.	0.000001
N / mm^2	145.038	4014.63	334.553	295.300	9.86923	7500.62	10 000.	10.1972	1 000 000.	1.

Mass

CONVERT FROM ↓ TO →	Multiplying Factors						
	grain	metric carat	gram	dram	drachm (apoth)	oz	oz tr or oz apoth
grain	1.	0.323995	0.064799	0.36571	0.016667	0.002286	0.002083
metric carat	3.08647	1.	0.2	0.112877	0.51441	0.007055	0.006430
gram	15.4324	5.	1.	0.564383	0.257206	0.035274	0.032151
dram	27.34375	8.85923	1.77185	1.	0.455729	0.0625	0.056966
drachm (apoth)	60.	19.4397	3.88793	2.19429	1.	0.137143	0.125
oz	437.5	141.748	28.3495	16.	7.29167	1.	0.911458
oz tr or oz path	480.	155.517	31.1035	17.5543	8.	1.09714	1.

Conversion tables

Mass

CONVERT FROM ↓ TO →	Multiplying Factors							
	lb	kg	slug	US cwt	UK cwt	oz / US ton	tonne	UK ton
lb	1.	0.453592	0.031081	0.01	0.008929	0.0005	0.000454	0.000446
kg	2.20462	1.	0.068522	0.022046	0.019684	0.001102	0.001	0.000984
slug	32.1740	14.5939	1.	0.32174	0.287268	0.016087	0.014594	0.014363
US cwt	100.	45.3592	3.10810	1.	0.892857	0.05	0.045359	0.044643
UK cwt	112.	50.8023	3.481072	1.12	1.	0.056	0.050802	0.05
oz / US ton	2000.	907.185	62.1620	20.	17.8571	1.	0.907185	0.892857
tonne	2204.62	1000.	68.5218	22.0462	19.6841	1.10231	1.	0.984207
UK ton	2240.	1016.05	69.62143	22.4	20.	1.12	1.01605	1.

Volume and capacity

CONVERT FROM ↓ TO →	Multiplying Factors									
	cm^3	in^3	ft^3	yd^3	m^3	litre	UK pint	UK gallon	US pint	US gallon
cm^3	1.	0.061024	0.0000353	-	0.000001	0.001	0.001760	0.000220	0.002113	0.000264
in^3	16.3871	1.	0.0005787	0.0000214	0.0000164	0.016387	0.028837	0.003605	0.034632	0.004329
ft^3	28 316.8	1728.	1.	0.037037	0.028317	28.3168	49.8307	6.22883	59.8442	7.48052
yd^3	764 555.	46 656	27.	1.	0.764555	764.555	1345.429	168.1784	1615.793	201.9740
m^3	1 000 000.	61 023.7	35.3145	1.30795	1.	1000.	1759.75	219.969	2113.38	264.172
litre	1000.	61.0237	0.035315	0.001308	0.001	1.	1.75975	0.219969	2.11338	0.264172
UK pint	568.261	34.6774	0.020068	0.000743	0.0005683	0.568261	1.	0.125	1.20095	0.150119
UK gallon	4 546.09	277.420	0.160544	0.005946	0.0045461	4.54609	8.	1.	9.60760	1.20095
US pint	473.176	28.875	0.016710	0.000619	0.0004732	0.473176	0.832674	0.104084	1.	0.125
US gallon	3 785.41	231.	0.133681	0.004951	0.0037854	3.785411	6.661392	0.832674	8.	1.

Volume and capacity

CONVERT FROM ↓ TO →	Multiplying Factors								
	UK minim	US minim	cm^3	UK fl drachm	US fl drachm	UK fl ounce	US fl ounce	litre	in^3
UK minim	1.	0.960760	0.059194	0.016667	0.016013	0.002083	0.002002	0.0000592	0.0036122
US minim	1.04084	1.	0.061611	0.17348	0.01667	0.002168	0.002084	0.0000616	0.0037597
cm^3	16.8936	16.2307	1.	0.281561	0.270519	0.035195	0.033814	0.001	0.061024
UK fl drachm	60.	57.64560	3.55163	1.	0.960760	0.125	0.120095	0.003552	0.216734
US fl drachm	62.45040	60.	3.696678	1.04084	1.	0.130105	0.125	0.003697	0.225585
UK fl ounce	480.	461.1648	28.4131	8.	7.68608	1.	0.960760	0.028413	1.73387
US fl ounce	499.604	480.	29.5735	8.32674	8.	1.04084	1.	0.029573	1.80469
litre	16 893.6	16 230.7	1000.	281.561	270.5125	35.1951	33.8140	1.	61.0237
in^3	276.837	265.9739	16.3871	4.61395	4.432899	0.576744	0.554113	0.016387	1.

Chemical compatibility

NC = Not Compatible
LC = Limited Compatibility
C = Compatible
- = No Data

	Acetic acid 3.5N	Acetic acid 8.75N	Acetic acid conc. 17.5N	Acetone	Acetonitrile	Acidbrite 4 (Diversey) 3.0% v/v	Ammonium Hydroxide 8N	Ammonium Oxalate 0.07N	Amyl Acetate	Aqueous Ammonia 15.5N	Benzyl Alcohol	Benzylkonium Chloride 0.1%	Boric acid, saturated	Butan-1-ol	Butan-2-ol	Carbon Tetrachloride	Chloroform
BEVPOR MH / MS / MT / PH / PS / PT	C	-	-	NC	-	-	LC	-	LC	LC	-	-	-	C	C	-	NC
BIO-X II	C	C	C	C	C	-	C	C	C	C	C	C	C	C	C	C	C
CRYPTOCLEAR PES	C	-	-	NC	-	-	LC	-	LC	LC	-	-	-	C	C	-	NC
CRYTOCLEAR PLUS	C	C	C	C	C	C	C	C	C	C	NC	C	C	C	C	NC	NC
HIGH FLOW BIO-X	C	C	C	C	C	-	C	C	C	C	C	C	C	C	C	C	C
HIGH FLOW BIO-X VENT AUTOCLAVE	C	-	-	-	-	-	C	C	C	C	C	C	C	C	C	C	C
HIGH FLOW PREPOR GFA	C	C	C	C	LC	C	C	C	LC	LC	NC	C	C	C	C	NC	NC
HIGH FLOW TETPOR II	C	C	C	C	C	-	C	C	C	C	C	C	C	LC	C	C	C
HIGH FLOW TETPOR H.T.	C	C	C	C	C	-	C	C	C	LC	C	C	C	LC	C	C	C
HIGH FLOW TETPOR VENT AUTOCLAVE	C	C	C	C	C	-	C	C	C	C	C	C	C	LC	C	C	C
PEPLYN AIR / NE / PLUS / HA / HD / PREPOR PP	C	C	C	C	C	C	C	C	C	C	NC	C	C	C	C	NC	NC
PREPOR GF / GP	-	C	C	C	LC	C	C	C	LC	LC	NC	C	C	C	C	NC	NC
PREPOR PES	C	-	-	NC	-	-	C	-	LC	C	-	-	-	C	C	-	NC
PROCLEAR PP	C	C	C	C	C	C	C	C	C	C	NC	C	C	C	C	NC	NC
PROCLEAR GF	C	C	C	C	LC	C	C	C	LC	LC	NC	C	C	C	C	NC	NC
PROPLEAT	C	C	C	C	C	C	C	C	C	C	NC	C	C	C	C	NC	NC
PROPOR BR / HC / LR	C	-	-	NC	-	-	LC	-	LC	LC	-	-	-	C	C	-	NC
PROPOR SG	C	-	-	NC	-	-	C	-	LC	C	-	-	-	C	C	-	NC
PROSPUN	C	C	C	C	C	C	C	C	C	C	NC	C	C	C	C	NC	NC
PROSTEEL A / N	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
STEAM FILTERS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
TETPOR AIR / LIQUID	C	C	C	C	C	-	C	C	C	C	C	C	C	NC	C	NC	NC
TETPOR PLUS	C	C	C	C	C	-	C	C	C	C	C	C	C	NC	C	NC	NC
EPDM	C	LC	LC	C	NC	C	C	C	NC	C	C	C	C	C	LC	NC	NC
VITON	C	LC	NC	NC	NC	C	C	C	NC	C	C	C	C	C	C	C	LC
SILICONE	C	NC	NC	NC	NC	C	C	C	LC	C	C	C	C	C	C	NC	NC

	Cyclohexane	1,4 - Dioxane	Diverflow (Diversey) 3% v/v	Diversey 212G 0.6% v/v	Divosan Forte 0.5% v/v	Divosan XT 1% v/v	Ethanol	Ethanol 45%	Ethyl Acetate	Formaldehyde 0.3%	Formaldehyde 37%	Formic acid conc.	Glycerol	Hexane	Hydrochloric acid 1N	Hydrochloric acid 10%	Hydrochloric acid conc.	Hydrochloric acid conc. 13%	Hydrogen Peroxide	Hydrogen Peroxide 10 Vol	Hydrogen Peroxide 100 Vol	Methanol	Methyl-Iso-Butylketone	Methylene Chloride @ 40 °C (104 °F)	Nitric Acid 2N 14.4%
BEVPOR MH / MS / MT / PH / PS / PT	-	-	C	-	C	-	C	C	NC	C	-	-	C	-	C	-	-	-	-	C	-	C	NC	-	C
BIO-X II	C	C	-	-	-	-	C	-	LC	C	C	C	C	C	-		-	C	C	-	-	C	C	-	C
CRYPTOCLEAR PES	-	-	C	-	C	-	C	C	NC	C	-	-	C	-	C	-	-	-	-	C	-	C	NC	-	C
CRYTOCLEAR PLUS	NC	C	C	C	C	C	C	C	LC	C	C	C	C	NC	C	-	C	-	C	C	C	C	C	LC	C
HIGH FLOW BIO-X	C	C	-	-	-	-	C	-	LC	C	C	C	C	C	-		-	C	C	-	-	C	C	-	C
HIGH FLOW BIO-X VENT AUTOCLAVE	C	C	-	-	-	-	C	-	LC	C	C	C	C	C	-		-	C	C	-	-	C	C	-	C
HIGH FLOW PREPOR GFA	NC	LC	NC	C	C	C	C	C	LC	C	C	NC	C	-	C		NC	-	-	C	C	C	C	LC	C
HIGH FLOW TETPOR II	-	C	-	-	-	-	C	-	LC	C	C	C	C	C	-		-	C	-	-	C	C	C	-	C
HIGH FLOW TETPOR H.T.	-	C	-	-	-	-	-	-	LC	C	C	C	C	C	-		-	C	-	-	C	C	C	-	C
HIGH FLOW TETPOR VENT AUTOCLAVE	-	C	-	-	-	-	C	-	LC	C	C	C	C	C	-		-	C	-	-	C	C	C	-	C
PEPLYN AIR / NE / PLUS / HA / HD / PREPOR PP	NC	C	C	C	C	C	C	C	LC	C	C	C	C	NC	C	-	C	-	C	C	C	C	C	LC	C
PREPOR GF / GP	NC	LC	NC	C	C	C	C	C	LC	C	C	NC	C	-	C	-	NC	-	-	C	C	C	C	LC	NC
PREPOR PES	-	-	C	-	C	-	C	C	NC	C	-	-	C	-	C	-	-	-	-	C	-	C	NC	-	C
PROCLEAR PP	NC	C	C	C	C	C	C	C	LC	C	C	C	C	NC	C		C	-	C	C	C	C	C	LC	C
PROCLEAR GF	NC	LC	NC	C	C	C	C	C	LC	C	C	NC	C	-	C		NC	-	-	C	C	C	C	LC	C
PROPLEAT	NC	C	C	C	C	C	C	C	LC	C	C	C	C	NC	C	-	C	-	C	C	C	C	C	LC	C
PROPOR BR / HC / LR	-	-	C	-	C	-	C	C	NC	C	-	-	C	-	C		-	-	-	C	-	C	NC	-	C
PROPOR SG	-	-	C	-	C	-	C	C	NC	C	-	-	C	-	C		-	-	-	C	-	C	NC	-	C
PROSPUN	NC	C	C	C	C	C	C	C	LC	C	C	C	C	NC	C	-	C	-	C	C	C	C	C	LC	C
PROSTEEL A / N	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
STEAM FILTERS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
TETPOR AIR / LIQUID	LC	C	-	-	-	-	C	C	LC	C	C	C	C	-	C		C	-	-	C	C	C	C	-	C
TETPOR PLUS	LC	C	-	-	-	-	C	C	LC	C	C	C	C	C	C		C	C	C	C	C	C	C	C	C
EPDM	NC	NC	C	C	C	C	C	C	C	C	C	C	C	NC	C		NC	NC	C	C	C	C	NC	-	LC
VITON	NC	NC	C	C	C	C	C	C	NC	C	C	NC	C	NC	C		NC	NC	C	C	C	NC	NC	-	C
SILICONE	NC	NC	LC	C	C	C	LC	C	LC	C	C	NC	C	NC	C		NC	NC	C	C	C	C	LC	-	C

Chemical compatibility

NC = Not Compatible
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	Nitric acid 15.8N	Ozone	Paraffin yellow	Pentane	Peracetic acid 0.5% (10 week test)	Peracetic acid 4%	Perchloroethylene	Petroleum spirits	Phenol (aq) (0.5N)	Phenol 5%	Phenol 0.25%	Polyethylene Glycol 600	Polyglycol 2000-E	Potassium Dichromate 0.1N	Potassium Iodine 0.6N	Potassium Hydroxide 10N	Potassium Permanganate 0.1N
BEVPOR MH / MS / MT / PH / PS / PT	-	NC	-	-	-	C	NC	-	-	-	-	NC	-	-	-	LC	C
BIO-X II	C	-	LC	C	-	C	-	-	C	-	-	LC	-	C	C	C	C
CRYPTOCLEAR PES	-	NC	-	-	-	C	NC	-	-	-	-	NC	-	-	-	LC	C
CRYPTOCLEAR PLUS	C	-	C	LC	-	C	-	NC	-	C	C	C	-	C	C	C	C
HIGH FLOW BIO-X	C	-	LC	C	-	C	-	-	C	-	-	LC	-	C	C	C	C
HIGH FLOW BIO-X VENT AUTOCLAVE	C	-	LC	C	-	C	-	-	C	-	-	LC	-	C	C	C	C
HIGH FLOW PREPOR GFA	NC	-	LC	LC	-	C	-	NC	-	C	C	NC	-	C	C	NC	NC
HIGH FLOW TETPOR II	C	-	C	-	C	C	-	C	NC	-	-	C	-	C	C	C	C
HIGH FLOW TETPOR H.T.	NC	-	C	-	C	C	-	C	-	-	-	C	-	C	C	C	LC
HIGH FLOW TETPOR VENT AUTOCLAVE	C	-	C	-	C	C	-	C	NC	-	-	C	-	C	C	C	C
PEPLYN AIR / NE / PLUS / HA / HD / PREPOR PP	C	-	C	LC	-	C	-	NC	-	C	C	C	-	C	C	C	C
PREPOR GF / GP	-	NC	-	-	-	C	NC	-	-	-	-	NC	-	-	-	C	C
PREPOR PES	C	-	-	NC	-	-	C	-	LC	C	-	-	-	C	C	-	NC
PROCLEAR PP	C	-	C	LC	-	C	-	NC	-	C	C	LC	-	C	C	C	C
PROCLEAR GF	NC	-	LC	LC	-	C	-	NC	-	C	C	NC	-	C	C	NC	NC
PROPLEAT	C	-	C	LC	-	C	-	NC	-	C	C	C	-	C	C	C	C
PROPOR BR / HC / LR	-	NC	-	-	-	-	NC	-	-	-	-	NC	-	-	-	LC	C
PROPOR SG	-	NC	-	-	-	C	NC	-	-	-	-	NC	-	-	-	C	C
PROSPUN	C	-	C	LC	-	C	-	NC	-	C	C	C	-	C	C	C	C
PROSTEEL A / N	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
STEAM FILTERS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
TETPOR AIR / LIQUID	C	-	C	LC	-	C	-	LC	-	C	C	-	-	C	C	C	C
TETPOR PLUS	C	C	C	LC	-	C	-	LC	-	C	C	-	-	C	C	C	C
EPDM	NC	-	NC	NC	C	C	-	NC	-	C	C	-	C	C	C	C	C
VITON	NC	-	C	C	C	C	-	C	-	C	C	-	C	C	C	C	C
SILICONE	NC	-	NC	NC	C	C	-	NC	-	C	C	-	C	C	C	C	C

	Propan-1-ol	Propan-2-ol	Propan-2-ol, 60:40 H_2O	Pyridine	Sodium Chloride 0.5N	Saline Lactose Broth	Sodium Hydroxide 1N,4%	Sodium Hydroxide 7N,28%	Sodium Hypochlorite	Sodium Hypochlorite (14% Free CL_2)	Sodium salts	Sodium thiosulphate 0.1N	Sulphuric acid 1N	Sulphuric acid conc.	Sulphurous acid	Toluene	1,1,1 Trichloroethane	1,1,2 Trichloroethane	Trichloroacetic Acid 80%	Trichloroacetic Acid 5N	Toluene	Xylene
BEVPOR MH / MS / MT / PH / PS / PT	C	C	C	NC	C	C	C	NC	C	C	C	-	C	NC	NC	NC	-	NC	-	-	-	LC
BIO-X II	C	C	C	C	C	C	NC	NC		C		C	C	NC	-	NC	-	C	-	C	-	LC
CRYPTOCLEAR PES	C	C	C	NC	C	C	C	NC	C	C	C	-	C	NC	NC	NC	-	NC	-	-	-	LC
CRYPTOCLEAR PLUS	C	C	C	C	C	C	C	C	-	C	-	C	C	LC	-	NC	-	LC	C	-	-	NC
HIGH FLOW BIO-X	C	C	C	C	C	C	NC	NC		C		C	C	NC	-	NC	-	C	-	C	-	LC
HIGH FLOW BIO-X VENT AUTOCLAVE	C	C	C	C	C	C	NC	NC		C		C	C	NC	-	NC	-	C	-	C	-	LC
HIGH FLOW PREPOR GFA	NC	NC	NC	NC	C	C	C	NC		C		C	LC	LC	-	-	-	LC	LC	-	NC	NC
HIGH FLOW TETPOR II	C	C	C	C	C	C	C	C		C		C	C	LC	-	NC	-	C	-	C	-	LC
HIGH FLOW TETPOR H.T.	C	C	C	C	C	C	C	C		C		C	C	NC	-	NC	-	LC	-	C	-	LC
HIGH FLOW TETPOR VENT AUTOCLAVE	C	C	C	C	C	C	C	C		C		C	C	LC	-	NC	-	C	-	C	-	LC
PEPLYN AIR / NE / PLUS / HA / HD / PREPOR PP	C	C	C	C	C	C	C	C	-	C	-	C	C	LC	-	NC	-	LC	C	-	-	NC
PREPOR GF / GP	C	C	C	NC	C	C	C	NC	C	C	C	-	C	NC	NC	NC	-	NC	-	-	-	LC
PREPOR PES	-	-	C	-	C	-	C	C	NC	C	-	-	C	-	C	-	-	-	-	-	C	-
PROCLEAR PP	C	C	C	C	C	C	C	C		C		C	C	LC	-	NC	-	LC	C	-	-	NC
PROCLEAR GF	NC	NC	NC	NC	C	C	C	NC		C		C	LC	LC	-	-	-	LC	LC	-	NC	NC
PROPLEAT	C	C	C	C	C	C	C	C	-	C	-	C	C	LC	-	NC	-	LC	C	-	-	NC
PROPOR BR / HC / LR	C	C	C	NC	C	C	C	NC		C		-	C	NC	NC	NC	-	NC	-	-	-	LC
PROPOR SG	C	C	C	NC	C	C	C	NC		C		-	C	NC	NC	NC	-	NC	-	-	-	LC
PROSPUN	C	C	C	C	C	C	C	C	-	C	-	C	C	LC	-	NC	-	LC	C	-	-	NC
PROSTEEL A / N	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
STEAM FILTERS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
TETPOR AIR / LIQUID	C	C	C	C	C	C	C	C		C		C	-	LC	-	-	-	LC	C	-	-	NC
TETPOR PLUS	C	C	C	C	C	C	C	C		C		C	-	LC	-	C	-	LC	C	-	-	NC
EPDM	C	C	C	C	C	C	C	C		C		C	C	-	-	NC	-	NC	NC	-	NC	C
VITON	C	C	C	NC	C	C	C	C		C		C	C	-	-	LC	-	LC	LC	-	LC	LC
SILICONE	LC	LC	C	C	C	C	C	LC		C		C	C	-	-	NC	-	LC	NC	-	NC	NC

The chemicals are arranged in alphabetical order using their most common or trade names. If the chemical in question does not appear to be listed, it may be found elsewhere in the table under a pseudonym, in particular its IUPAC[1] name.
With regard to compatibility:

- Any product that has Limited Compatibility (LC) at ambient temperatures should not be used at a higher temperature.
- The list of compatibilities does not take into account any synergistic effects of more than one chemical present in the solution to be filtered.
- Test Conditions - 72 hours at ambient temperature and pressure, unless otherwise stated.
- Contact Parker domnick hunter for confirmation of compatibility with specific operating conditions.

Glossary of terms used in filtration

A

Absolute pressure
Associated with gas systems. The absolute pressure is the total pressure exerted on a system equal to atmospheric pressure plus gauge pressure, for example 2 barg = 3 bar absolute.

Absolute rating
A definitive value given to a filter that represents the smallest particle size capable of being captured by the filter. Typically it refers to 100% retention at a particular micron rating. The assigning of micron ratings is however dependant on the test methodology used. e.g.: a sterile grade absolute rated liquid filter is assigned a 0.2 micron rating if it retains all microorganisms of a predetermined size it does not mean that the filter has 0.2 micron pores. When selecting a filter for a particular application always refer to the methods and assumptions made for assigning the micron rating.

Air flow
A measure of the amount of air that flows through a filter at a certain system pressure and pressure drop. This is typically expressed in normalized units i.e.: the relative flow rate at atmospheric pressure and is quoted for a clean unused filter. Always quote system pressures when sizing gas filters.

Aerosol integrity testing
A method specifically designed for sterile gas filters whereby aerosol in the most penetrating particle size (MPPS: 0.2–0.3 micron) is used as a non-destructive challenge to the filter to determine whether it is providing sterile gas. The test can be performed using an automated test instrument such as the Parker domnick hunter VALAIRDATA II.

Autoclave
A closed pressure vessel into which steam is introduced (typically at a temperature of 121 - 134 °C (250 - 273 °F)) to sterilise the contents.

B

Backwash
A reverse flow of liquid through a filter in order to flush out trapped solids.

Bacterial challenge
This refers to a live bacterial challenge of a filter in either the liquid or gas phase. The type of organism used for the test depends on the assigned micron rating of the filter. For example a 0.2 micron sterile grade liquid filter is challenged with the organism *Brevundimonas diminuta* (test method ASTM 838-05) while a 0.45 micron absolute rated liquid filter is challenged with a suspension of *Serratia marcesens*. In some cases for critical performance validation requirements it will be necessary to challenge the filter with bacteria in the actual process fluid being filtered.

Beta rating
A measure of a filter's efficiency based on the number of particles present in the influent (upstream) to those in the effluent (downstream). Efficiency is expressed as a BETA ratio and is calculated as follows:

$$\text{Beta Ratio} = \frac{\text{Number of particles in the influent}}{\text{Number of particles in the effluent}}$$

Generally a Beta Ratio at 5000 is accepted by the industry as being an 'absolute' rating for media prefilters.

C

Cartridge or filter cartridge
A filtration or separation device usually supplied in a cylindrical format which locates easily and quickly into a filter housing.

Chemical compatibility
When selecting filter materials attention needs to be given to their compatibility to the fluid which is to be filtered. A filter (depending on application) needs to be assessed for reduction in performance in terms of material degradation, integrity, etc. as well as quantifying any extractables levels. It should be noted that the compatibility of a filter is dependent on the process conditions. General material compatibility databases assume limited temperature and exposure time. They also refer to just one chemical. In an actual process there could be a combination of chemicals, high differential pressure and high temperature which all could influence filter performance. General guidance on filter performance can be given from experience and in-house data but normally it is recommended that filter compatibility is tested in the process conditions.

Clarification
This is the selective removal of particulate from a process fluid usually achieved through depth filtration. The degree of clarification is dependant on customer specification.

Colony forming unit (CFU)
The minimum number of cells on an agar plate which will give rise to a visible colony. This term is most commonly seen in the validation of sterile filters to a live bacterial challenge where the challenge and the number of organisms recovered is stated in CFU.

Coalescing
When small droplets of aerosolized liquid merge together to form larger droplets. This normally occurs in a depth filter as the process gas carrying the entrained liquid droplets passes through the filtration media. A coalescing filter such as the Parker domnick hunter OIL-X also flows from the inside of the cartridge to the outside so any coalesced liquid drains to the base of the filter and subsequently into the bottom of the filter housing.

Colloid
Colloids are molecules that have not coagulated together to form a precipitate but remain in liquid suspension. These molecules are very small in size and have a molecular charge that affects their affinity for other molecules and materials. The choice of filter type and design is of paramount importance for a colloidal system if premature blockage is to be avoided.

Compaction
This can occur to a filtration medium when it is subjected to high differential pressures. The high forces on the filtration media (especially depth type) can lead to compression of the structure and subsequent changes in filtration characteristics.

Concentrate
The retained non filtered stream from a crossflow filter system.

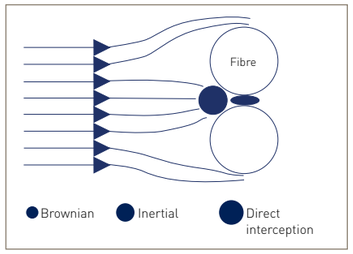
Cross flow filtration
A filter characterized by the feed stream travelling parallel to instead of directly through the filtration medium. This has the advantage of minimizing the blockage of the membrane as the system is to some extent 'self cleaning'.

D

Dead leg
An area of pipework where there is potentially no flow and therefore stagnant conditions exists. It is extremely important to eliminate these if contamination issues are to be minimized.

Depth filter
A depth filter is characterised by the thickness of the filtration media as well as its structure. A depth filter is normally fibrous in nature and contaminant is retained through the depth of the filtration media rather than just the surface.

Diffusional interception



This is the dominant removal mechanism for the smallest particles captured by a filter in the gas phase. Particles as small as 0.01 µm exhibit great diffusional movement (Brownian Motion) which has the effect of increasing its nominal mean diameter to the filter. The efficiency of this capture mechanism decreases as the particle size increases.

Diffusional flow
A non-destructive integrity test method for membrane based filters. It involves wetting out every pore in the membrane structure with water or the process fluid or a low surface tension liquid in case of hydrophobic membrane. Compressed air is applied to the upstream side of the filter and gas diffuses through the wetted pores. This flow rate is either measured directly by mass flow meters or indirectly via measuring the drop in pressure on the upstream side of the filter.

Differential pressure
Differential pressure (dP) is the difference in the pressure measured upstream (influent) and downstream (effluent) of a filter. Particularly in liquid applications differential pressure will increase to a point where either filter damage or insufficient flow will result. The higher the differential pressure the higher the energy cost so it is important to balance the pressure drop requirements with the installation size and required lifetime to blockage. Units of measurement are bar and psi as opposed to barg and psig.

Glossary of terms used in filtration

E

Effective filtration area (EFA)
This is the area of filtration material available for filtration.

Effluent
The fluid which has passed through a filter.

Extractables
When a filter is in contact with the process fluid, chemical components may leach from the materials of construction and deposited in the filtrate. The levels of non-volatile extractables for a limited number of fluids are quoted in the filter validation guide. The level of extractables is dependent on the process conditions. Filtration of solvents, high temperature fluids and steam sterilization are three areas where extractables can increase.

F

Filter (noun) / filter cartridge / cartridge
An apparatus which performs filtration.

Filter (verb)
To pass a fluid or gas through a porous medium in order to remove solid particles.

Filter efficiency
Filter efficiency is a measure of the percentage of particles that are removed from the fluid by the filter. Typically these are given in terms of the % removal for a certain size of particle. A filter efficiency may also be given across a range of particle sizes . For a number of gas applications the efficiency of a filter may be quoted in relation to the filters ability to remove particles at the most penetrating particle size (MPPS) of 0.2-0.3 micron. Always ensure filter efficiency is matched to the requirements of the process.

Filterability indices (FI) and Vmax
This is an indication of a filters capacity to process certain fluids. It generally gives a measure of the rate of blockage of a filter as well as the theoretical maximum throughput. The time required to flow two consecutive 200 ml fluid samples is recorded and the filterability indices are calculated from the results. The two formulae used are as follows:

$$(\text{Vmax}) = \frac{400 + 400T_1}{(T_2 - 2T_1)}$$

$$\text{FI} = (T_2 - 2T_1)$$

T_1 = Time to filter first 200 ml
T_2 = Time to filter second 200 ml

It should be noted that these methods give a general indication of performance and are often more useful in comparative performance measurement between different filter types.

Filtrate
Another name for effluent.

Filter sterilization
Sterilization is the act of making an organism barren or infertile (unable to reproduce). The sterilization of a filter can be achieved by a number of methods including dry heat, steam, ethylene oxide, hydrogen peroxide or irradiation. The method chosen depends on the process and the materials of construction of the filter but by far the most widely used is that of steam, either in an autoclave or via steam-in-place (SIP).

Flux
The rate of fluid flow (gas or liquid) when expressed in terms of flow per unit area of the filter that removes the contaminants from the fluid stream. It can apply to both depth and membrane media.

G

Gauge pressure
The pressure of a system measured by a gauge, which excludes atmospheric pressure, for example 1 bar atmosphere (or 1 bar absolute) = 0 barg.

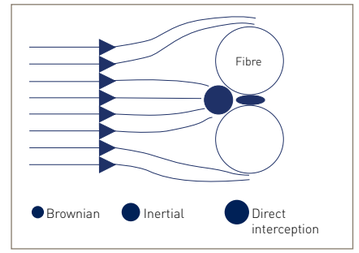
H

Housing
An enclosure for a filter element, typically rated for pressure, that directs the fluid through the filter.

Hydrophilic
Hydrophilicity is the ability of a filtration media to 'wet out', that is, for the porous structure to be completed filled with the liquid being filtered. This is an important characteristic as incomplete wetting of the structure can lead to a reduction in flow capacity and problems with integrity testing. All liquid filters are 'hydrophilic' apart from those that may have been selected for use with aggressive solvents. These filters are typically based on a fluoropolymer and their structure needs to be wetted with a low surface tension liquid such as isopropyl alcohol. Once the structure has been wet, the filter will process aqueous solutions without a problem.

I

Inertial impaction
This is a removal mechanism for particles captured by a filter in the gas phase. The particles follow the streamlines of gas between the filter fibres and membrane pores. Due to their mass the inertia of the particle will cause it to move out of the streamline and attach itself to a fibre or pore wall. The effect of this capture mechanism increases with particle size / mass.



Influent
The fluid entering the filter system.

In vitro
In an unnatural position e.g. outside the body " In vitro" is Latin for "in glass" an experiment performed without the involvement of a whole, living organism.

In vivo
The testing of a substance or experimentation in or using a living, whole organism.

L

Log reduction value (LRV)
This is a measurement of a filters removal efficiency for a specific contaminant. It is normally associated with the bacterial retention of a filter. The LRV is :

$$\text{Log}_{10} \frac{\text{Number of bacteria in the influent}}{\text{Number of bacteria in the effluent}}$$

e.g. $\left(\text{Log}_{10} \frac{1 \times 10^{10}}{1}\right)$ = LRV of >10

It is always expressed as > (greater than) as 1 has to be used for the effluent even if there are no organisms present. This can also be expressed as a 10 log reduction or a titre reduction of 10^{10}.

M

Medium (Media)
This is the component of the filter that removes the contaminants from the fluid stream. Also commonly referring to depth - type materials, in its more generic sense a filter medium / media can refer to either depth or membrane filter materials.

Microfiltration
Microfiltration is the process of removing particles from a liquid or gas by passing it through a porous medium. It generally involves removing particles between the sizes of 10 and 0.04 micron in liquids, and down to 0.01 micron in gases.

Micron (micrometer)
Designated by the Greek letter µ a micron is 10^{-3}mm (millimeters) or 10^4 (Angstroms) or 0.00003937 inch. For a perspective on this size a human hair is approximately 70 microns thick and the limit of resolution of the naked eye is around 40 microns.

Membrane
A membrane is a thin, porous film typically between 30 and 150 micron in thickness. It has of tens of millions of pores / cm^2 through which the process fluid runs. The nature of the pore structure is determined by the manufacturing method. Solvent cast membranes such as Polyethersulphone (PES) and Mixed Esters of Cellulose (MEC) have a defined pore structure which can be asymmetric whilst membrane such as Polytetrafluoroethylene (PTFE) which is manufactured by 'stretching' have a fibrous appearance and a less defined pore structure.

N

Nanofiltration
Filtration that removes both particles and small dissolved molecules and ions. Finer than ultrafiltration, not as fine as Reverse Osmosis.

Nanometer
A nanometer is 10^{-9} meters

Nominal filter rating
This rating is often quoted within the filtration industry but great care should be taken in ensuring the efficiency and test methodologies are completely understood. A 5 micron nominal filter could be 99% retentive at 5 micron, another could be 80%. It can be very misleading to compare the performance of filters on nominal ratings. When selecting a filter the duty required should be

Glossary of terms used in filtration

compared to the individual performance characteristics of filter. Parker domnick hunter has the experience to help select the most appropriate filter for the application.

O

Oleophobic
Oleophobic membranes and depth media have the capability to repel fluids such as oil and lubricants. This phenomena is used in some of the new generation oil coalescing filters.

Oxidation
This refers to the degradation of materials in the presence of oxygen and high temperature. It is normally associated with high temperature gas systems where the combination of steam sterilization can lead to the onset of oxidation of polypropylene filtration components in as little as 3 months. For applications where continuous (1 year and above) exposure to high temperature is required the use of a special product with oxidation resistant filtration support materials such as the HIGH FLOW TETPOR H.T. is recommended.

Oxidation can also occur on filters used in ozonated water systems. In these instances careful selection of filter components is required.

P

Pleating
Filtration media can be pleated or corregated to maximize the filtration area. By pleating filtration media it is possible to fit a large EFA in a relatively small cartridge volume.

Voids volume (porosity)
This is a measurement of the free space in a filtration media. The more free space the less the resistance to flow. Typical values for a membrane are in the region of 50 – 80% and for depth type media between 60 - 95%.

Pressure decay
A non-destructive integrity test method for membrane based filters. It involves wetting out every pore in the membrane structure with water or the process fluid or a low surface tension liquid in case of hydrophobic membrane. Compressed air is applied to the upstream side of the filter and gas diffuses through the wetted pores. This causes a pressure drop in the upstream side of the filter known as the pressure decay. The maximum allowable pressure decay for a filter is dependant on the upstream volume and therefore must be known.

Pressure Decay (mbar /min) =

$$\frac{\text{Diffusional Flow (ml / min)}}{\text{Upstream Vol (l)}}$$

Pyrogenicity
Pyrogenicity is the tendency of a substance to raise body temperature when injected into the body. Filtration materials that come in contact with injectable liquids must meet pyrogenicity standards and be classified as non-pyrogenic. Pyrogenicity can be determined by such standard tests as the Limulus Amoebocyte Lysate (LAL) test.

Permeate
Synonymous with filtrate.

R

Regeneration
When a filter becomes blocked with protein based material it may be possible to regenerate, or clean the filter, so improving overall lifetime.

Reverse jetting
The application of high pressure compressed gas to the inside of a filter to release powder collected on its surface.

Reverse osmosis
Forcing a liquid through a non-porous membrane, removing particles, along with dissolved molecules and ions. Reverse osmosis is the finest form of membrane separation and is used to desalinate water for drinking, and in the preparation of ultrapure water for various industries.

S

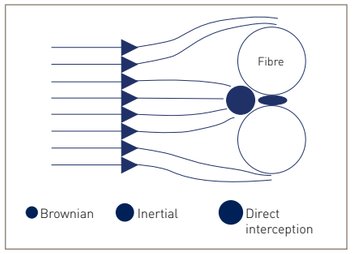
Sanitization
Reduction not elimination of a microbial population to render a fluid/system free from spoilage organisms and increase shelf-life of products.

Sedimentation
The process by which suspended solid particles in a liquid phase gravitate downwards. Eventually they will settle on the bottom of the holding tank, pipework etc. The rate of sedimentation is governed by particle mass and fluid velocity.

Separation
Separation is the process of dividing a fluid stream (either liquid or gas) into separate components. This can include separation of two phases (liquid from gas), separation of soluble impurities (known as purification) or solids from a fluid (filtration). The products of a separation can themselves be separated further in many cases.

Silt density index (SDI)
This is another measure of the rate of blockage and is typically used when the system is relatively clean and the difference between T_{400} and T_{200} (see Filterability Indices) is so small that large inaccuracies can occur. The SDI uses the time taken for two 500 ml samples of fluid to pass though a 47 mm diameter 0.45 µm disc. There is typically a 15 minute gap between the two samples being taken.

Size exclusion
This is a removal mechanism for particles captured by a filter in either the liquid or gas phase. It applies to particles that are physically too large to pass through the filter structure. The mechanism is not affected by flow rate unless pressure drops cause deformation of the particle.



Solute
A solid which is dissolved in a solvent. For instance, the salt in salt water is a solute.

Solvent
A liquid substance capable of dissolving other substances. The solvent does not change its state in forming a solution.

Stabilization
This is the reduction in microbial loading in a fluid system and is generally associated with the beverage industry where partial rather than complete removal of spoilage organisms may be required to extend shelf-life.

Sterilization
In terms of filtration this means the elimination of all living microorganisms from the influent stream.

Surfactant
Acronym for a surface active agent. In filtration it is also sometimes called a wetting agent. If a filter is being used to filter aqueous solutions and incomplete wetting of the membrane pore structure is encountered a 'wetting agent' may be added to the membrane surface by flowing a quantity of surfactant through the filter. However, the use of a wetting agent is not desirable, especially in a pharmaceutical environment, as there is also the possibility of the surfactant leaching from the filter into the filtrate during processing or steam sterilization, etc.

T

Thermal stability
This is most important during sterilization of the filter. The majority of cartridge and disposable type filters are manufactured from polymers such as polypropylene and nylon. During sterilization the components of the filter expand and contract putting great strain on the device. The filter performance with respect to steam sterilization should be matched closely to the requirements of the process. It should be noted that some filter configurations cannot be in-situ steam sterilized but can only be autoclaved.

Titre reduction
See LRV.

Turbidity
This is a measurement of the amount of suspended particles in a fluid and is effectively a clarity index. It is measured in NTU (Nephelometric Turbidity Units).

Glossary of terms used in filtration

U

Unloading
The release of contaminants which had initially been captured by a filter. This is most likely to occur in filtration systems with are subjected to high pressure pulses such as high capacity filling lines.

Ultrafiltration
Filtration of a liquid that separates suspended or dissolved substances based on their molecular weight or size. Ultrafiltration generally refers to separating everything larger than a large molecule. Compare to microfiltration, nanofiltration, reverse osmosis.

V

Viscosity
Viscosity is a measurement of the resistance to flow of a fluid. The more viscous the fluid, the greater the time required to filter. Viscosity will in general reduce with an increase in temperature. This is why very viscous solutions such as glucose are heated prior to filtration.

Vmax
See Filterability Indices.

W

Water flow
Measure of the amount of water that flows through a filter. Related to the degree of contamination, differential pressure, total porosity, and filter area (ASTM:F317-72). Expressed in the membrane industry in units of millilitres / minute / square centimetre.

Water Intrusion
A non-destructive integrity test method specifically designed for hydrophobic filters. It involves filling the upstream volume of a filter housing with water and applying a pressure, typically in the order 2.5 barg. As the membrane is hydrophobic the bulk water will not pass through. However, due to the difference in pressure between the upstream and downstream side of the filter there is a net loss of water from the upstream side due to evaporation and the slight penetration of water into the pore structure. This loss of water results in a pressure drop which is displayed as either a water intrusion value or a water flow value. The water intrusion is the measure of the increase in compressible gas volume expressed at atmospheric pressure and the water flow equates to the volume of water lost from the system.

Water flow = Water Intrusion / Absolute test pressure.

Industrial products

Parker domnick hunter, Industrial Division, is a well established global business capable of meeting the compressed air treatment product needs of all industries. Our commitment to customer satisfaction goes beyond initial supply and installation. Comprehensive aftersales support includes servicing, spare parts, quality testing and technical advice.

Bespoke design services are also available for customized projects to ensure customer specifications are met. Services are delivered locally by our global network of qualified service engineers.

Parker domnick hunter

LAB GAS GENERATORS
Hydrogen, nitrogen & zero air

The range of analytical gas generators from Parker domnick hunter includes UHP hydrogen, nitrogen and zero air and enables users to produce a cost-effective, continuous supply of premium quality gas from a compact, on-site source.

- Increases safety with the elimination of high pressure gas storage or cylinder handling
- Cost-effective due to low life-cycle ownership
- UHP hydrogen generators facilitate optimized analysis
- Convenient, on-demand gas supply

MAXIGAS
Nitrogen gas generators

Produces on-site nitrogen gas from compressed air and is the cost-effective alternative to traditional nitrogen sources for multiple applications. Excellent energy efficiency and a low life-cycle ownership cost facilitate considerable cost savings of up to 90%.

- Low life-cycle ownership cost and elimination of costs associated with a cylinder supply
- On-demand functionality limits waste
- Energy efficient; operates from a small compressor

MIXED GAS DISPENSERS
CO_2 & nitrogen

Designed to provide bar owners with the ideal supply of mixed gas blends of CO_2 and nitrogen for beer dispensing. The system uses a nitrogen generator which, when connected to CO_2 cylinders, can produce mixed blends of CO_2 and nitrogen in a number of predetermined ratios.

- Improved quality and economy
- Nitrogen purity of 99.8%
- A more efficient operation
- Improved shelf-life

WS WATER SEPARATORS
Bulk liquid removal

Providing efficient bulk liquid removal at all flow conditions, OIL-X EVOLUTION WS Water Separators also minimize energy consumption and help reduce your carbon footprint.

- Tested in accordance with ISO8573.9
- Performance independently verified
- Low pressure loss / low operational cost

OIL-X EVOLUTION
Compressed air filters

Providing air quality that meets or exceeds the requirements of ISO8573-1, the international standard for compressed air quality, OIL-X EVOLUTION is also the most energy efficient compressed air filter in the world, helping to reduce your carbon footprint.

- The most energy efficient filters available
- High quality ISO8573.1:2001 compressed air
- Running costs that start low and stay low

CRD
Refrigeration dryers

Avoid corrosion, machinery failure and product spoilage by removing water from any compressed system at affordable prices. The CRD range provides the very latest in drying technology and is suitable for all compressor types.

- Clean, dry compressed air, stops damage and corrosion
- Environmentally friendly R407C refrigerant
- Energy efficient, low running costs

PNEUDRI
Desiccant dryers

Providing water vapour removal in accordance with Classes 1, 2 & 3 of ISO8573-1 the international standard for compressed air quality, PNEUDRI modular compressed air dryers offer unrivalled performance, flexibility and expandability in a unique space saving design. Low operational costs and integrated energy management systems also ensure energy consumption is kept to a minimum.

- Highest quality air
- Totally stops corrosion / damage
- Low installation costs
- Energy efficient

ES2000 SERIES
Oil / water separators

Providing a legal and responsible way to dispose of oil contaminated compressor condensate, ES2000 series oil water separators are a cost effective alternative to expensive waste disposable companies.

- Help to protect and maintain the environment
- Efficiently separate oil and water on-site and return up to 99.9% of the condensate to foul sewers
- Meet trade effluent discharge regulations
- Rapid payback over conventional disposal methods

BREATHING AIR PURIFIERS
Breathable air

Providing breathable quality compressed air in compliance with international standards, breathing air purifiers supply effective protection from harmful substances, maintaining employee health.

- High efficiency coalescing filter, for removal of oil / water
- Adsorption bed of activated carbon, for removal of oil vapour and odours
- Catalytic element, for removal of carbon monoxide

NBC FILTRATION
Biological & chemical protection

The need to protect key personnel from attacks by chemical and biological weapons has never been greater. Given the escalation of this type of threat from terrorist groups and unstable nations, the development of the NBC filtration system provides effective protection.

- Fully regenerative
- Increased capacity
- Compact modular design

HYPERCHILL
Precision chilled water

Hyperchill maximizes productivity and minimizes costs, as well as easy conformity to regulations on water quality. Hyperchill is the perfect solution to industrial chilled water needs.

- Increases productivity, reduces costs
- Adaptable to individual customer needs

PCO_2
Carbon dioxide polishing filter

Providing quality incident protection for beverage grade carbon dioxide, PCO_2 offers protection against carbon dioxide contamination and impurities of up to 10 times the allowable levels.

- Ensures compliance with quality guidelines published by the International Society for Beverage Technologies (ISBT)
- Protects drinks manufacturing processes from vapour impurities

For further information on the full range of Industrial and Gas Generation products available, please contact Parker domnick hunter Industrial Division

tel: +44 (0)191 402 9000
fax: +44 (0)191 482 6296
email: dhindsales@parker.com

Parker's motion & control technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion or control technology need, Parker has the experience, breadth of product and global reach to consistently delivery. No company knows more about motion and control technology than Parker. For further information call 00800 27 27 5374

AEROSPACE
Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes

CLIMATE CONTROL
Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

Key Products

- CO^2 controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves

ELECTROMECHANICAL
Key Markets

- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery & converting
- Primary metals
- Semiconductor & electronics
- Textile
- Wire & cable

Key Products

- AC / DC drives & systems
- Electric actuators, gantry robots & slides
- Electrohydrostatic actuation systems
- Electromechanical actuation systems
- Human machines interface
- Linear motors
- Stepper motors, servo motors, drives & controls
- Structural extrusions

FILTRATION
Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine, air, fuel & oil filtration & systems
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators

FLUID & GAS HANDLING
Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects

HYDRAULICS
Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects

PNEUMATICS
Key Markets

- Aerospace
- Conveyor & material handling
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

Key Products

- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors

PROCESS CONTROL
Key Markets

- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

Key Products

- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds

SEALING & SHIELDING
Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

Key Products

- Analytical sample conditioning products & systems
- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management

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