Industrial Process

Product Catalogue

Parker domnick hunter

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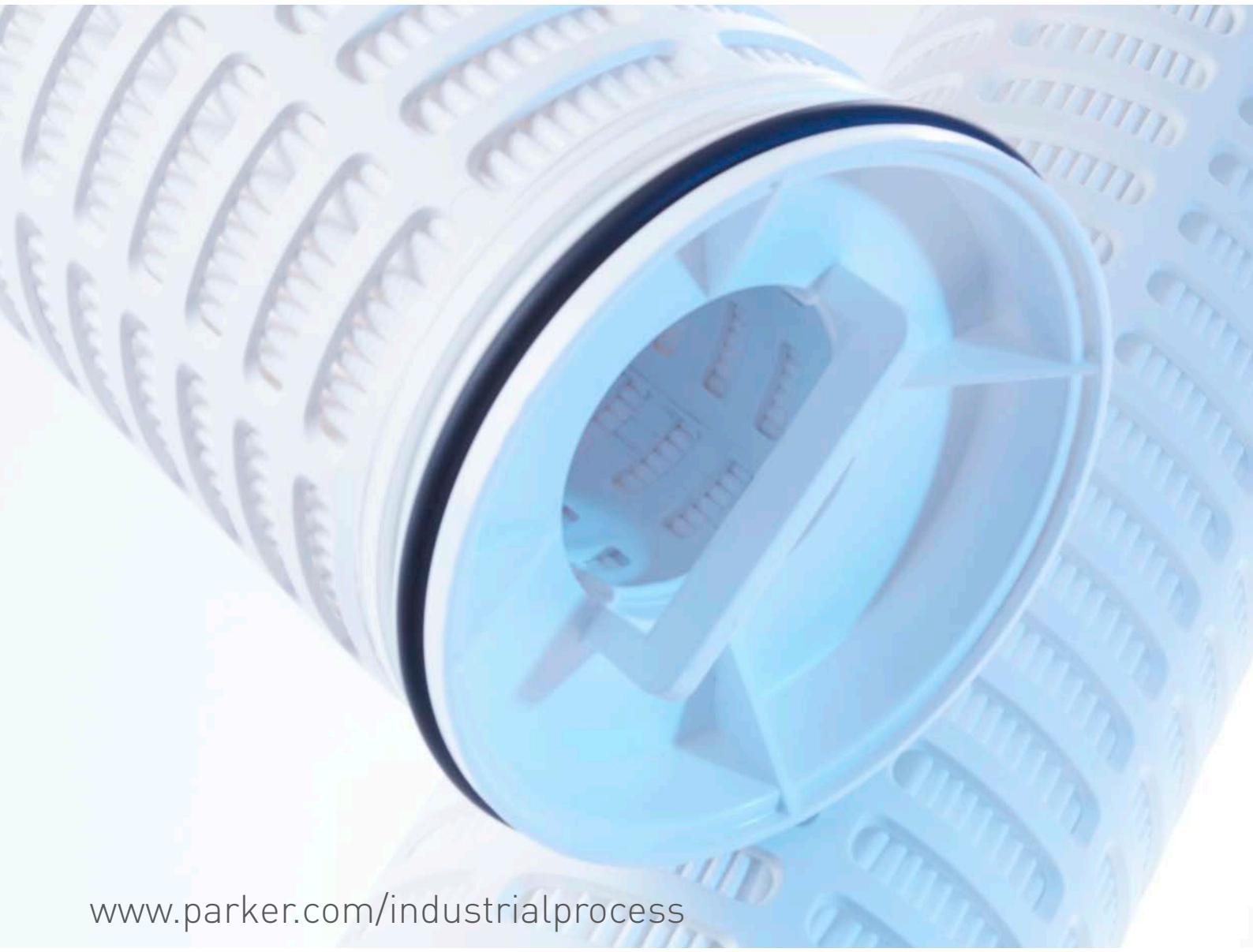
Contents



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Chemical Filtration

The chemical industry employs processes, reactions and refining to produce a wide variety of solid, liquid and gaseous products. Many are intermediates or precursors for input into plastics, textiles, agricultural, petroleum, pulp and paper industries. Filtration is critical to ensure the long term life of equipment used in the manufacturing process.

Filtration and separation in the fine and bulk chemicals industries often has to achieve fine filtration in very hazardous and aggressive environments. This may be in terms of the substances themselves or the prevailing operating temperatures and conditions.

No matter what filtration challenges you face, with a wide variety of filters and equipment that consistently deliver finished product to customer expectations and specifications, Parker domnick hunter are the perfect partner for your chemical filtration applications.

Applications

Chemical

- Aromatic derivatives
- Bulk chemical filtration
- Dyes and pigments
- Hydrogen peroxide
- Catalyst recovery
- DI water filtration
- Final product clarification
- Quench water
- Reactants

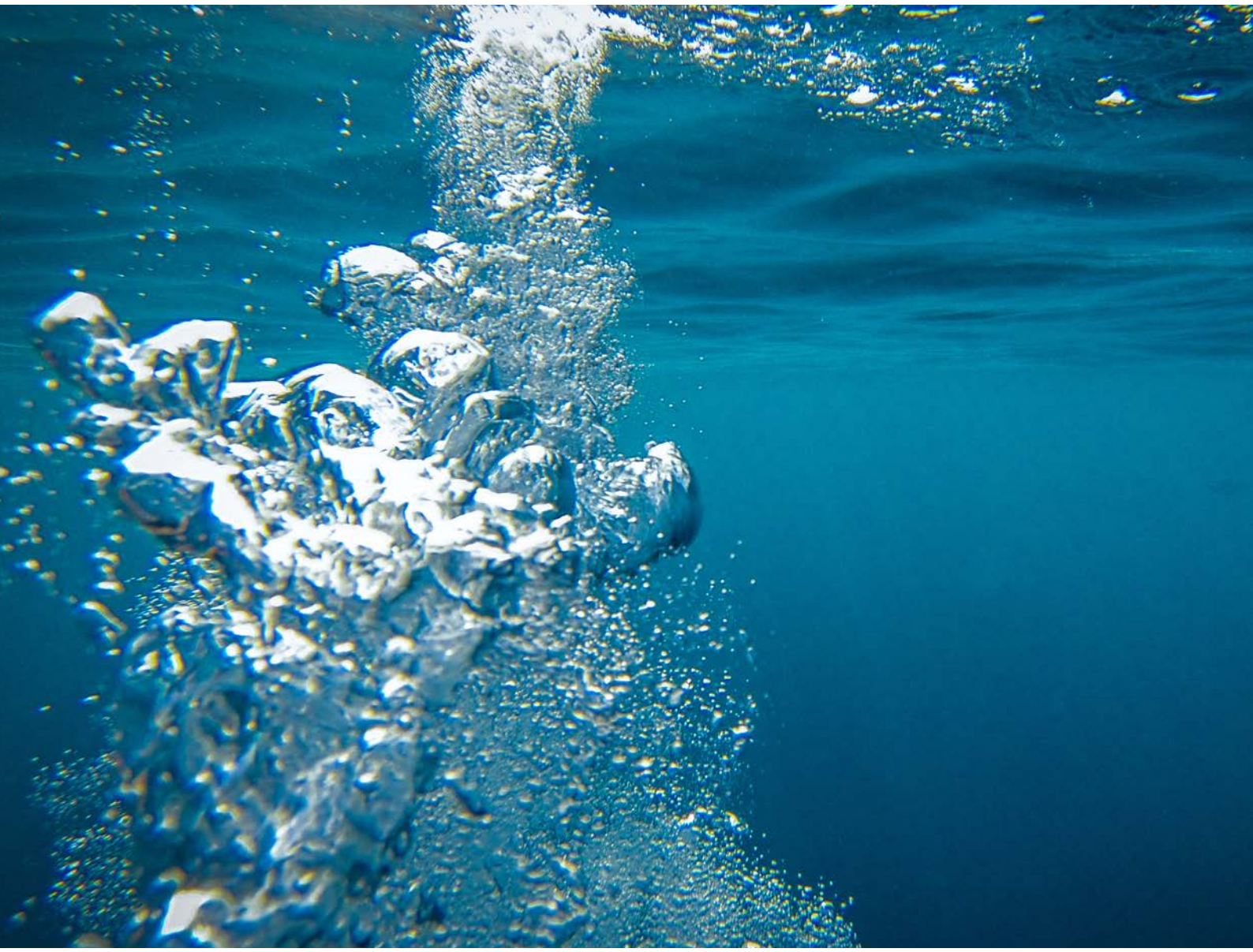
Olefins and polyolefins

- Ethylene glycol
- Ethylene oxide
- Polyols
- Feedstock filtration
- Guard filtration
- Process water

Polymer

- Acrylics
- Polyester
- Polyethylene
- Melt polymer filtration
- Solvents
- Feedstocks
- Pigment slurries
- Intermediates
- Spin pack protection

Water Filtration



In industrial applications water treatment is employed to optimise processes such as heating, cooling, processing, cleaning and rinsing. Consumers expect stringent standards in their water treatment in order to meet regulations, optimise production, preserve equipment and conserve this valuable resource.

Treatment of incoming water can employ a number of filtration steps before acceptable standards are achieved for the application. The correct choice of filtration is necessary to protect equipment such as reverse osmosis membranes, heat exchangers and nozzles, preventing unwanted down time, repairs and equipment replacement.

Parker domnick hunter's range of affordable filtration solutions for water treatment help producers minimise downtime and reduce cleaning, replacement and energy costs.

Applications

Water cutting
Desalination
RO membrane protection
Scale and rust removal
Boiler feed water
Post turbine water

Resins and Coatings

Resin and paint manufacturing processes present a number of challenges. Filtration solutions have to classify pigments, whilst removing gels and oversized particles from typically viscous fluids, this must be achieved without introducing further contamination or introducing silicones.

Parker domnick hunter's range of filtration products have been designed to overcome common processing problems. With filters which consistently classify pigments and filter viscous fluids, producers can improve final product quality whilst reducing costs associated with re-work or contamination issues.

Applications

Coatings

- Adhesives
- Resins
- Electrical wire coating
- Reflective and anti-reflective optical coatings
- Digital storage media

Paints

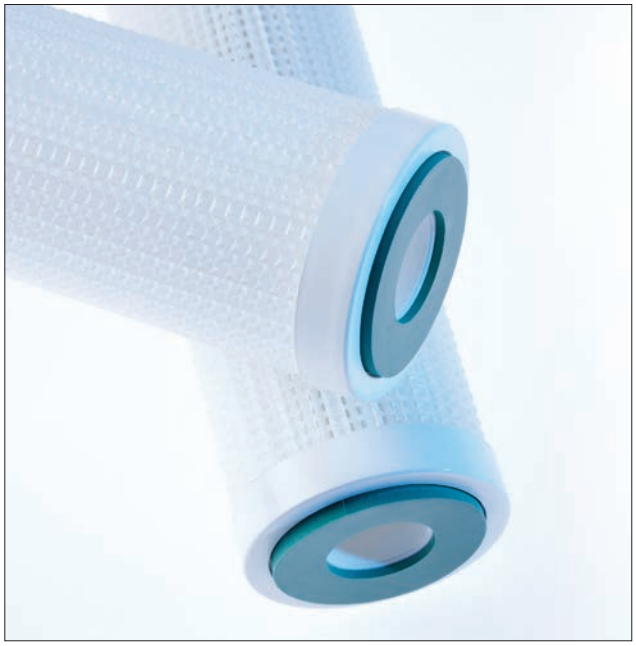
- Primers
- Resins
- Base coats
- Clear coats
- Solvents
- Anti-corrosion
- Electrodeposition

Inks

- Bulk inks
- Tints and dye
- Inkjet labelling
- Newspaper inks

PLEATFLOW

Liquid filter cartridges



The Pleatflow range of filter cartridges offer ideal solutions for the pre and final filtration of a wide variety of process liquids, providing long service life at minimal cost.

The 100% polypropylene hardware construction of the filter ensures minimum extractable levels with a range of industrial solvents and optimal integrity when used in physically demanding applications.

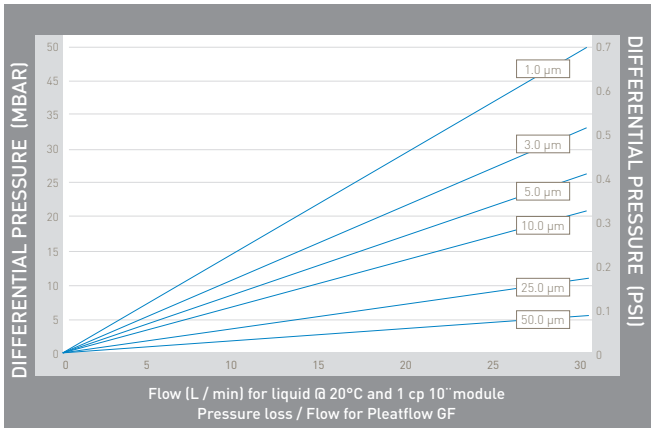
Pleatflow filter cartridge manufacturing utilises graded density medias in both glass fibre and polypropylene. The filter design provides broad chemical compatibility, consistent efficiency and superior service life.

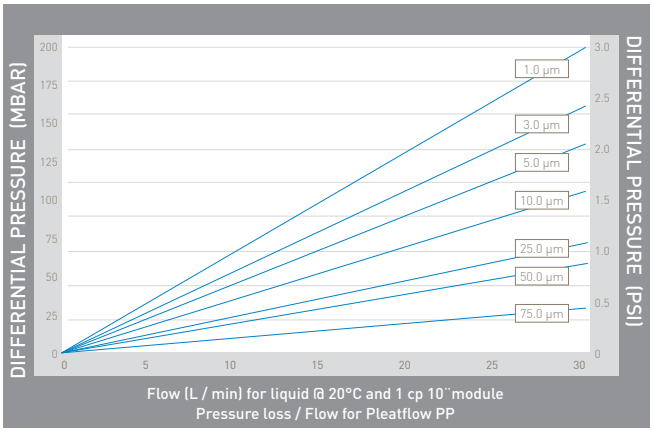
With absolute rated filtration efficiency and high surface area, Pleatflow filter cartridges are a cost effective solution for both pre and final filtration.

Features	Benefits
Absolute rated efficiency 99.98% from 1 to 75 micron.	Consistent absolute retention suitable for a wide range of clarification applications.
Available in a comprehensive range of end cap configurations and continuous lengths up to 40".	Simple retrofitting to existing systems and housings.
Continuous length with rigid cage and core.	Provides high strength during operation.
High pleated surface area available in both PP and GF.	High flow rates and low initial pressure losses.

APPLICATIONS

- ✓ Catalyst recovery
- ✓ Reagent grade chemicals
- ✓ Make-up and wash waters
- ✓ Membrane prefiltration





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PLEATFLOW

Liquid filter cartridges

Specifications

Materials of Construction

Filtration media:	Polyester
	Glass fibre / polyester
	Polypropylene
Inner support core:	Polypropylene / stainless steel
Outer protection cage:	
Rigid outer:	Polypropylene
Net:	Polyethylene
End caps:	Polypropylene / nylon
Standard o-rings / gasket:	Nitrile
	EPDM
	Silicone

Effective Filtration Area

Polypropylene up to 0.55m² (5.9ft²) per 250mm (10¨module).

Glass fibre up to 0.48m² (5.2ft²) per 250mm (10¨module).

Recommended Operating Conditions

Maximum Temperature:
65°C (149°F)

Maximum Differential Pressure:
4 barg (58 psid)

Recommended Change Out Pressure:
2.5 barg (36 psid)

Micron Rating	Liquid Service	
	90% Efficiency (micron)	Absolute Efficiency (micron)
1	0.25	1.0
2	0.5	2.0
5	1.0	5.0
10	3.0	10.0
25	10.0	25.0
50	25.0	50.0

NOTE: PLEATFLOW GF and PP cartridges are designed to operate at a maximum working temperature of 65°C (149°F) and maximum differential pressure of 4 barg. If applications require temperatures and pressures beyond these limits Parker domnick hunter can offer elements with stainless steel cores and end caps.

Ordering information

CARTRIDGES

G □ □ □ □ □ □ □ □

Code	Length (Nominal)	
05	5¨	(125mm)
09	9.75¨	(247mm)
10	9.875¨	(251mm)
11	10¨	(254mm)
19	19.75¨	(500mm)
20	20¨	(508mm)
29	29.50¨	(750mm)
30	30¨	(762mm)
39	39.25¨	(1000mm)
40	40¨	(1016mm)

Code	Micron
01	1
02	2
05	5
10	10
25	25
50	50
75	75*
99	100**

** Polypropylene only*
*** Polyester only*

Code	Media
01	Polyester
02	Glass fibre / Polyester
T5	Polypropylene

Code	Core / End Cap
2	Polypropylene
3	Stainless steel / nylon
4*	All stainless steel
5	Stainless steel / Polypropylene

**DOE only*

Code	Outer Cage
1	Black net
2	Blue net
3	Green net
4	Natural net
5	Red net
7	Rigid net
0	No outer cage
S	Stainless steel

Code	End Fitting
0	Double open end
2	Flat / 226
3	Flat / 222
7	Fin / 226
8	Fin / 222
9	Flat / 213

Code	Seal Material
E	EPDM
N	Nitrile
S	Silicone
V	Viton
0	No gasket

Cartridge lengths are measured over end cap shoulders. For DOE type cartridge lengths are measured over gaskets. Standard elements have diameter 2.7¨ (68mm). In nominal lengths of 10, 20, 30, 40 inches. (250, 500, 750, 100mm).

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POLYFLOW II G

Liquid filter cartridges

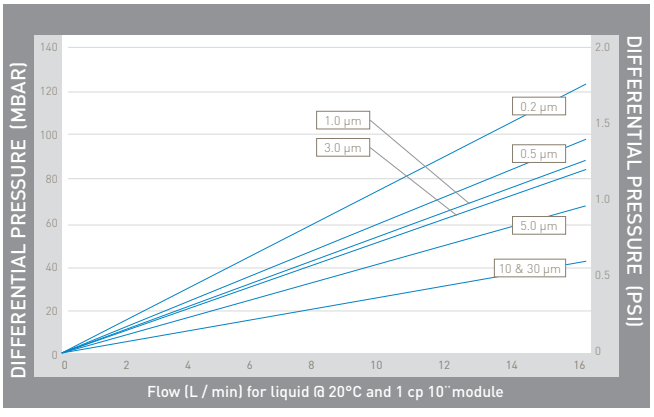
Polyflow II G depth media has been developed for a wide variety of general process applications from fluid clarification to general prefiltration. Its high dirt-loading, random-fibre polypropylene depth media provides consistent particle retention.

Polyflow II G is thermally bonded from 100% polypropylene to ensure clean filtrates and excellent chemical and thermal compatibility in the most stringent of processing conditions. Polyflow II G leads in overall reduction of filtration costs when compared to spunbonded, stringwound, and nominally-rated pleated prefilter cartridges. Its longer filtration life reduces downtime due to change-outs.

Features	Benefits
Nominally rated efficiency 80%.	Provides excellent protection for downstream filters.
All polypropylene media, supports and hardware, thermally welded.	Broad range of chemical compatibility with low extractables.
Available in a comprehensive range of end cap configurations.	Simple retrofitting to existing systems and housings.
High surface area graded density pleated configuration.	Low clean differential pressure and excellent dirt holding capacity.

APPLICATIONS

- ✓ Solvent filtration
- ✓ Feedstock filtration
- ✓ Final product clarification
- ✓ Reagent-grade chemicals



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POLYFLOW II G

Liquid filter cartridges

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)	Stainless steel
Standard o-rings / gasket:	Nitrile

Recommended Operating Conditions

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

Temperature		Max Forward dP	
°C	°F	(bar)	(psid)
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

Maximum Operating Temperature

71°C (160°F)

Effective Filtration Area (EFA)

10" (250mm) 0.33m² (3.22ft²).

Ordering information

CARTRIDGES

P2 G □ 0 □ □ – □ – □ □

Code	Insert Style
1	None (std)
5	Stainless steel

Code	End Fitting
1	DOE
2	Flat / 226
3	Flat / 222
7	Fin / 226
8	Fin / 222
G	213 / Internal / o-ring DOE
H	213 / Internal / o-ring recessed blank
R	222 / Recessed blank

Code	Length (Nominal)
10	10" (250mm)
20	20" (500mm)
30	30" (750mm)
40	40" (1000mm)

Code	Micron
002	0.2
005	0.5
010	10
030	3.0
050	5.0
100	10.0
300	30.0

Code	Seal
0	Buna N
1	EPDM
2	Silicone
4	Viton
5*	FEP Viton
6*	FEP Silicone
N	None

* o-rings only

Code	Gasket o-rings
1	5mm (0.200")
2	3mm (0.125")
4	(1) 5mm (0.200") and (1) 3mm (0.125")
N	No gaskets

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POLYFLOW II

Liquid filter cartridges

Polyflow II's random fibre polypropylene depth media provides long on-stream life and high retention efficiencies. While many polypropylene depth media are nominally rated and cannot meet their actual claimed retention efficiency, Polyflow II has been engineered to meet exacting performance claims.

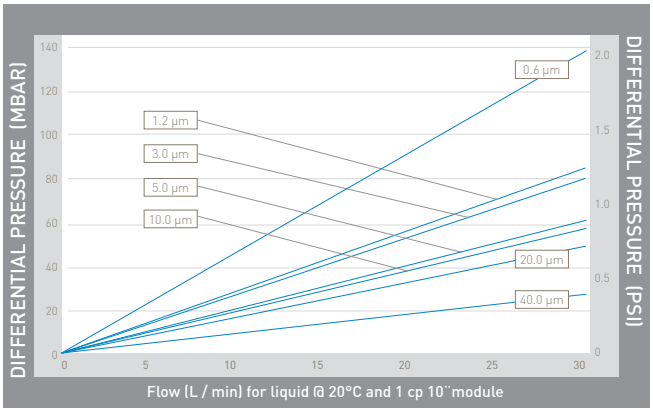
The all polypropylene construction ensures a broad range of chemical compatibility making Polyflow II cartridges particularly suitable for the filtration of aggressive and viscous chemicals and solvents. They do not suffer from hydrolysis in aggressive solutions which would result in the contamination 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 optimised media pleating density gives Polyflow II cartridges exceptional lifetime performance.

Features	Benefits
Absolute rated efficiency 99.98% (ß5000).	Provides excellent protection for downstream filters.
All polypropylene media, supports and hardware, thermally welded.	Broad range of chemical compatibility with low extractables.
Available in a comprehensive range of end cap configurations.	Simple retrofitting to existing systems and housings.
High surface area graded density pleated configuration.	Low clean differential pressure and excellent dirt holding capacity.

APPLICATIONS

- ✓ Solvent filtration
- ✓ Feedstock filtration
- ✓ Final product clarification
- ✓ Reagent-grade chemicals



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POLYFLOW II

Liquid filter cartridges

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)*	Stainless steel

Recommended Operating Conditions

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

Temperature		Max Forward dP	
°C	°F	(bar)	(psid)
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

Steam Sterilisation

Polyflow II cartridges can be repeatedly steam sterilised in situ or autoclaved at up to 130°C (266°F). They can be sanitised with hot water at up to 80°C (176°F). Cartridges and capsules can be autoclaved for up to 25 cycles (30 minutes) at 135°C (275°F). They are all compatible with most sanitising agents.

Recommended Rinse Volume:

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

Effective Filtration Area:

10¨(250mm) 0.5m² (5.38ft²).

Retention Characteristics

The retention characteristics of Polyflow II 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	>99.99% 10000	>99.98% 5000	99.90% 1000	99% 100	90% 10
006	0.60	0.57	0.54	0.32	0.20
012	1.20	0.95	0.90	0.70	0.50
030	3.00	2.80	1.80	1.00	0.70
050	5.00	4.70	4.50	3.50	1.00
100	10.0	8.00	7.00	4.80	2.80
200	20.00	16.00	14.00	10.00	6.00
400	40.00	32.00	28.00	20.00	12.00

Ordering information

CARTRIDGES

P2 – □ 0 □ □ – □ – □ □

Code	Insert Style
1	None (std)
5	Stainless steel

Code	End Fitting
1	DOE
2	Flat / 226
3	Flat / 222
7	Fin / 226
8	Fin / 222
G	213 / Internal / o-ring DOE
H	213 / Internal / o-ring recessed blank
R	222 / Recessed blank

Code	Length (Nominal)
10	10¨ (250mm)
20	20¨ (500mm)
30	30¨ (750mm)
40	40¨ (1000mm)

Code	Micron
006	0.6
012	1.2
030	3.0
050	5.0
100	10.0
200	20.0
400	40.0

Code	Seal
0	Buna N
1	EPDM
2	Silicone
4	Viton
5*	FEP Viton
6*	FEP Silicone
N	None

Code	Gasket Thickness
1	5mm (0.200¨)
2	3mm (0.125¨)
4	(1) 5mm (0.200¨) and (1) 3mm (0.125¨)
N	No gasket

CAPSULES

22 – C □ B □ □ – □ – □ □

Code	Size
H	Half
S	Standard
D	Double

Code	Inlet Connection
B	1/4¨Hose barb
H	1/2¨Hose bard
S	1 1/2¨ Sanitary flange
D	Quick disconnect
P	1/4¨NPT (Male)
J	1/2¨NPT (Male)
K	3/8¨NPT (Female)
G	Swagelok

Code	Outlet Connection
B	1/4¨Hose barb
H	1/2¨Hose bard
S	1 1/2¨ Sanitary flange
D	Quick disconnect
P	1/4¨NPT (Male)
J	1/2¨NPT (Male)
K	3/8¨NPT (Female)
G	Swagelok

Code	Micron
006	0.6
012	1.2
030	3.0
050	5.0

Code	Seal
0	Nitrile
1	EPDM
2	Silicone
4	Viton
N	None
Z	No vents

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CLARIFLOW WG

Cost-effective hydrophilic polyethersulphone membrane filter cartridge

Clariflow water service grade cartridges are cost-effective alternatives to Clariflow general grade cartridges for the filtration of a variety of aqueous liquids.

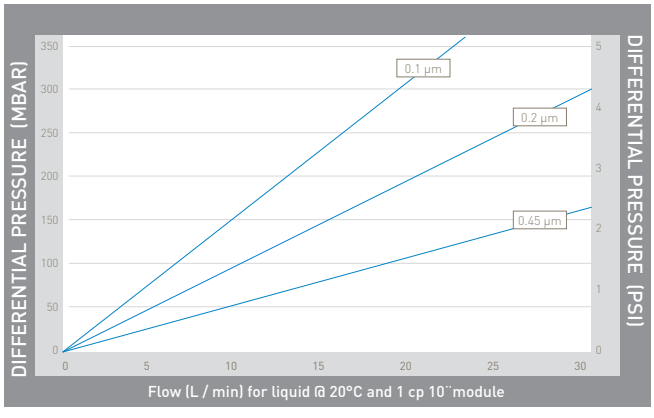
The water service cartridge is built around a unique polyethersulfone (PES) membrane that is inherently hydrophilic, and contains no added surfactants or wetting agents. It delivers clean filtrates, high flow rates, extended service life and excellent resistance to hydrolysis.

Water service cartridges are fabricated under cleanroom conditions.

Features	Benefits
Removal of sub-micron particles in high purity applications.	Protection of critical equipment.
Polypropylene supports and hardware.	Broad range of chemical compatibility.
Available in a comprehensive range of end cap configurations.	Simple retrofitting to existing systems and housings.
High filtration area with asymmetrical membrane.	Provides long life and high flow rates.

APPLICATIONS

- ✓ Deionized water filtration
- ✓ Recirculating liquid
- ✓ Process water
- ✓ Chemical filtration



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CLARIFLOW WG

Cost-effective hydrophilic polyethersulphone membrane filter cartridge

Specifications

Materials of Construction

Membrane:	Polyethersulfone
Support layers:	Polypropylene
Structure:	Polypropylene

All components are thermally bonded to assure integrity, purity and reduce extractables.

Maximum Differential Pressure

Forward:
5.5 bar (80 psid) @ 24°C (75°C)
2.8 bar (40 psid) @ 82°C (180°F)

Effective Filtration Area (EFA)

10" (250mm) 0.50m² (5.4ft²).

Bulk Packaging

Bulk packaged in case quantities to reduce material disposal

10" 28 per carton
20" 12 per carton
30" 12 per carton
40" 9 per carton

Performance Attributes

Typical water flow rates		
Micron:	lpm/100mbar	gpm/psid
0.1	7.14	1.3
0.2	14.27	2.6
0.45	20.86	3.8

Per 10 inch (250mm) cartridge equivalent and for fluids with viscosity of 1cP.

Ordering information

CARTRIDGES

25 - □ 0 □ □ – □ □ – □ – WG

Code	Insert Style
1	No insert (standard)
5	Encapsulated 316 SS insert
6	Encapsulated polysulfone insert
A	1/2" shortened filter (222 only)

Code	End Fitting
1	DOE
2	Flat / 226
3	Flat / 222
6	020 / Internal / Flat
7	Fin / 222
8	Fin / 222
G	120 / Internal / Recessed
H	213 / Internal / Recessed end cap
R	213 / Internal / Recessed end cap (Ametek) 222 / Recessed end cap

Code	Length (Nominal)
10	10" (250mm)
20	20" (500mm)
30	30" (750mm)
40	40" (1000mm)

All cartridges are 2.75" (69mm) in diameter.

Code	Micron
001	0.1
002	0.2
004	0.45

Code	Gasket / o-rings
0	Buna N
1	EPDM
2	Silicone
4	Viton
5*	Encapsulated Viton
6*	Encapsulated Silicone
N	None

* o-rings only

Code	Thickness (gaskets only)
1	5mm (0.200")
2	3mm (0.125")
4	(1) 5mm (0.200") and (1) 3mm (0.125")
N	No gaskets

Each cartridge is identified with a product number, pore size, and lot number for traceability.

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CLARIFLOW G

Hydrophilic polyethersulfone membrane filter cartridge

Clariflow general grade cartridges are designed for general-purpose use in the filtration of high-purity liquids and aqueous chemicals.

The mirrored-anisotropic polyethersulfone (PES) membrane is inherently hydrophilic and has a pore morphology that delivers exceptionally high flow rates.

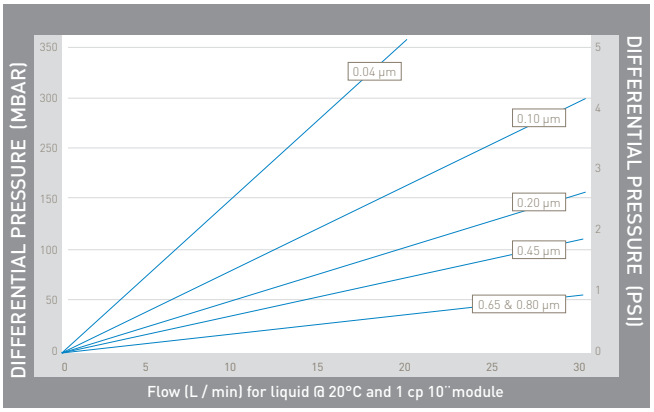
As there are no added surfactants or wetting agents and the support layers and structure are all-polypropylene, the filter exhibits low extractables, broad chemical compatibility and good resistance to hydrolysis.

The Clariflow general grade cartridge is available in absolute ratings of 0.04, 0.1, 0.2, 0.45, 0.65 and 0.8µm pore sizes.

Features	Benefits
Removal of sub-micron particles in high purity applications.	Protection of critical equipment.
Polypropylene supports and hardware.	Broad range of chemical compatibility.
Available in a comprehensive range of end cap configurations.	Simple retrofitting to existing systems and housings.
High filtration area with asymmetrical membrane.	Provides long life and high flow rates.

APPLICATIONS

- ✓ Deionized water filtration
- ✓ Recirculating liquid
- ✓ Process water
- ✓ Chemical filtration



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CLARIFLOW G

Hydrophilic polyethersulfone membrane filter cartridge

Specifications

Materials of Construction

Membrane:	Polyethersulfone
Support layers:	Polypropylene
Structure:	Polypropylene

All components are thermally bonded to assure integrity purity and to reduce extractables.

Maximum Differential Pressure

Forward:
5.5 bar (80 psid) @ 24°C (75°F)
2.8 bar (40 psid) @ 82°C (180°F)

Reverse:
3.4 bar (50 psid) @ 24°C (75°F)

Effective Filtration Area (EFA)

10˝ (250mm) 0.63m² (6.8ft²).

Maximum Operating Temperature

71°C (160°F)

Performance Attributes

Typical water flow rates

Micron:	lpm/100mbar	gpm/psid
0.04	5.29	1.0
0.10	9.88	1.8
0.20	20	3.7
0.45	26	4.8
0.65	51	9.2
0.80	52	9.5

Per 10 inch (250mm) cartridge equivalent and for fluids with viscosity of 1cP.

Ordering information

CARTRIDGES

25 -10 □ □ – □ – □ □ – G

Code	Description
1	DOE
2	226/Flat
3	222/Flat
6	020/Internal/Flat
7	226/Fin
8	222/Fin

Code	Length (Nominal)
10	10˝ (250mm)
20	20˝ (500mm)
30	30˝ (750mm)
40	40˝ (1000mm)

All cartridges are 2.75˝ (69mm) in diameter.

Code	Micron
924	0.04
001	0.10
002	0.20
004	0.45
006	0.65
008	0.85

Code	Gasket / o-rings
0	Buna N
1	EPDM
2	Silicone
4	Viton
5*	FEP-Encapsulated Viton
6*	FEP-Encapsulated Silicone
N	None

* o-rings only

Code	Thickness (gaskets only)
1	5mm (0.200˝)
2	3mm (0.125˝)
4	(1) 5mm (0.200˝) and (1) 3mm (0.125˝)
N	No gaskets

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PARMAX-R

High flow absolute rigid cage filter cartridge

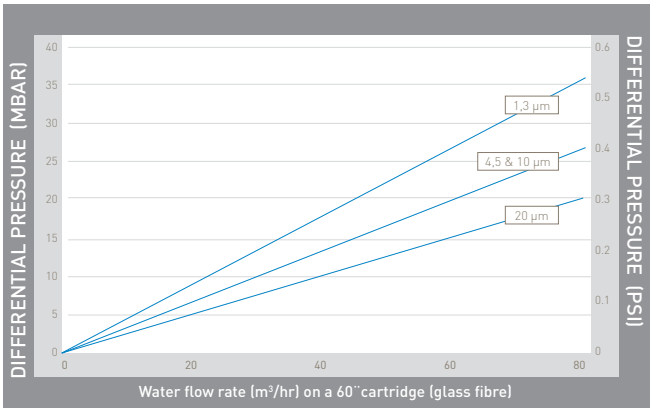
Parmax-R filter cartridges combine the best of pleated and large diameter technologies. They are manufactured from polypropylene and glass fibre media in absolute (99.98%) ratings from 1 to 40 micron.

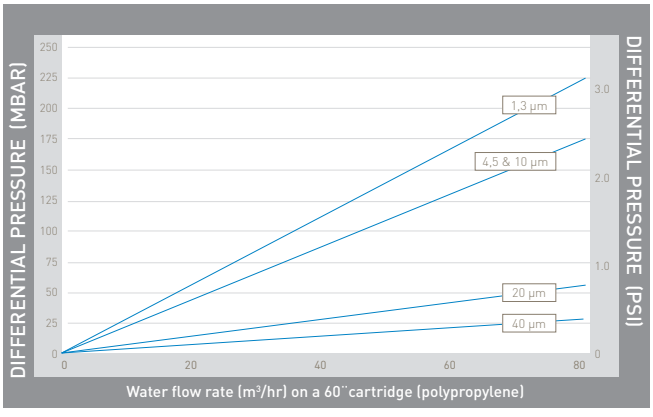
The unique layered construction provides excellent retention across a wide range of flux rates and the rigid cage construction provides greater security in demanding applications. One six inch diameter cartridge can handle up to 80m³/hr (503 bbl/hr) flow / 40" length, with added lifetime on 60" version. The inside-to-outside flow allows for a high contaminant holding capacity. High flow and long filter life make the Parmax-R an ideal choice for a wide variety of critical industrial and oil and gas process applications.

Features	Benefits
High strength rigid polypropylene cage.	Ideal for harsh conditions and demanding applications.
Large diameter yields higher flow rates and long on stream life.	Permits use of fewer elements and cuts capital expenditure.
Integrated handle for easy and quick change outs.	Simple and less frequent change outs reduces downtime.
Absolute rated efficiency 99.98% (ß5000).	Consistent absolute retention suitable for critical applications.
Inside-to-outside flow pattern.	Ensures positive capture of contaminants.

APPLICATIONS

- ✓ Completion, work-over and gravel pack fluids
- ✓ RO pre-filtration
- ✓ Process water
- ✓ Solvents
- ✓ Acids





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PARMAX-R

High flow absolute rigid cage filter cartridge

Specifications

Materials of Construction

Type:	100% thermally welded, pleated media supported by all polypropylene construction.
Filter media:	Glass fibre
	Polypropylene
Support core:	Moulded polypropylene
Rigid outer cage and thermally welded end caps:	Moulded polypropylene
Seal materials:	Buna-N
	EPDM
	Silicone
	Viton

Dimensions:
Cartridge outside diameter:
6.26¨ (159mm).

Cartridge inside diameter:
2.91¨ (74mm).

Cartridge length:
20¨ (533mm)
40¨ (1026mm)
60¨ (1540mm)

Connection:
Type 435 o-ring

Filtration area:
4.5-5.5m^2 per 40¨ cartridge

Maximum Recommended Operating Conditions:
Temperature:
65°C (149°F) @ 30 psi (2.1 bar)

Maximum allowable ΔP:
30 psi (2.1 bar) @ 80°C (176°F)
70 psi (4.8 bar) @ 25°C (77°F)

Flow rates:
40m^3/hr (250 bbl/hr) per 20¨ length @ 20°C (68°F)
80m^3/hr (503 bbl/hr) per 40¨ length @ 20°C (68°F)
80m^3/hr (503 bbl/hr) per 60¨ length @ 20°C (68°F)

Ordering information

CARTRIDGES

□ □ – □ □ □ – R

Code	Filter Media
RCP	Polypropylene
RMG	Glass fibre

Code	Micron
010	1
020	2*
030	3**
045	4.5
100	10
200	20
400	40**

*GF only
** PP only

Code	Length (Nominal)
20	20¨ (533mm)
40	40¨ (1026mm)
60	60¨ (1540mm)

Code	Seal Material
N	Buna-N
E	EPDM
S	Silicone
V	Viton

Code	End Cap Configuration
PP	435-o-ring / closed

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HOUSING RANGE AVAILABLE

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MAXGUARD GF and HF+

Highflow absolute rated glass fibre filter cartridge

The absolute rated high flow Maxguard filter cartridge has been designed for ease-of-use whilst increasing productivity when compared to conventional filter formats.

The Maxguard HF+ can operate at flow rates up to 79.5m³/hr and the Maxguard up to 25m³/hr resulting in reduced cartridge usage and fewer change outs when measured against systems using standard diameter elements.

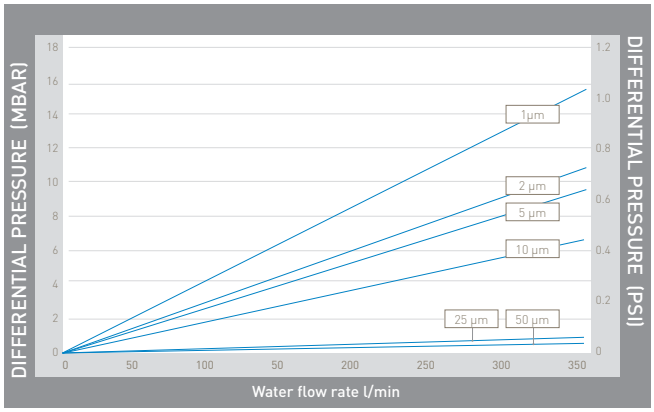
The Maxguard cartridges are available in glass fibre media and in two end cap configurations: industry standard 226 positive double o-ring seal with an easy-to-grasp integrated handle, or large diameter 338 fitting with bayonet for added security.

Cartridges are constructed using thermally welded polypropylene end caps, outer sleeves and inner support cores. This robust design protects the absolute rated filter media in harsh, high flow applications whilst improving operational efficiency.

Features	Benefits
High strength rigid polypropylene cage.	Ideal for harsh conditions and demanding applications.
Large diameter yields higher flow rates and long on-stream life.	Permits use of fewer elements and cuts capital expenditure.
Integrated handle for easy and quick change outs.	Simple and less frequent change outs reduces downtime.
Absolute rated efficiency 99.98% (ß5000).	Consistent absolute retention suitable for critical applications.
Inside-to-outside flow pattern.	Ensures positive capture of contaminants.

APPLICATIONS

- ✓ Completion, work-over and gravel pack fluids
- ✓ RO prefiltration
- ✓ Process water
- ✓ Solvents
- ✓ Acids



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ENGINEERING YOUR SUCCESS.

MAXGUARD GF and HF+

Highflow absolute rated glass fibre filter cartridge

Specifications

Materials of Construction

Type:	100% thermally welded, pleated media supported by all polypropylene construction.
Filter media:	Glass fibre
Media support core:	Moulded polypropylene
Media netting:	Polypropylene
End caps:	Moulded polypropylene
Seal materials:	Buna-N
	Silicone

Dimensions:
Cartridge outside diameter:
6.5" (166mm)

Cartridge inside diameter:
MXG: 1.8" (46mm)
MXG HF+: 3" (76mm)

Cartridge length:
39" (986mm)

Connection:
MXG: Type 226
MXG HF+: Type 338 bayonet

Filtration area:
6.2m² (66.72ft²) per 40" cartridge

Filtration rating:
1.0 - 50 micron

Maximum Recommended Operating Conditions:
Temperature:
70°C (158°F)

Maximum allowable ΔP:
37 psi (2.5 bar) @ 80°C (176°F)

Flow rates:
MXG: 25m³/hr (157 bbl/hr) per 40" length @ 20°C (68°F)
MXG HF+: 79.5m³/hr (500 bbl/hr) per 40" length @ 20°C (68°F)

Ordering information

CARTRIDGES

MXG □ – □ – □ – □ – □

Code	Filter Media
G	Glass fibre

Code	Micron
010	1
020	2
050	5
100	10
250	25
500	50

Code	Length (Nominal)
39	39" (986mm)

Code	Seal Material
N	Buna-N
S	Silicone

Code	End Cap Configuration
SM	226 o-ring/flat cap with handle
HF+	338 o-ring with bayonet

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MAXGUARD & MAXGUARD Select

Absolute rated polypropylene and cellulose filter cartridge

Parker domnick hunter's Maxguard high capacity cartridge product line provides a cost effective alternative to bag media or standard 2.5 inch cartridges for high flow applications. Each Maxguard cartridge has a 6" (152 mm) nominal outside diameter and can handle flows up to 20cu m/hr, significantly reducing the number of cartridges required for large flow applications.

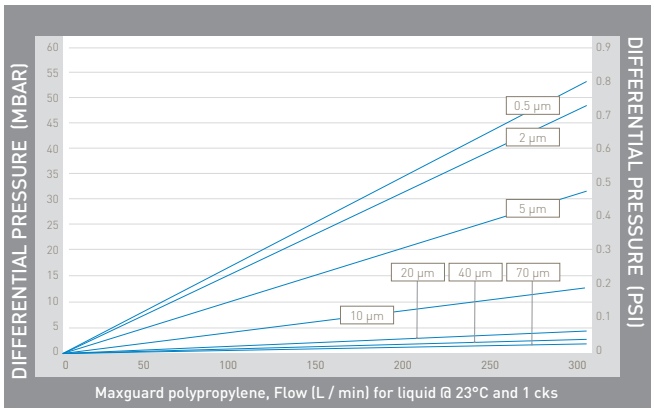
Maxguard cartridges are available in polypropylene and cellulose media. All cartridges feature an industry standard 226 positive o-ring seal and easy-to-grasp integrated handle.

All cartridges have absolute retention ratings (beta = 5000) ideal for critical applications.

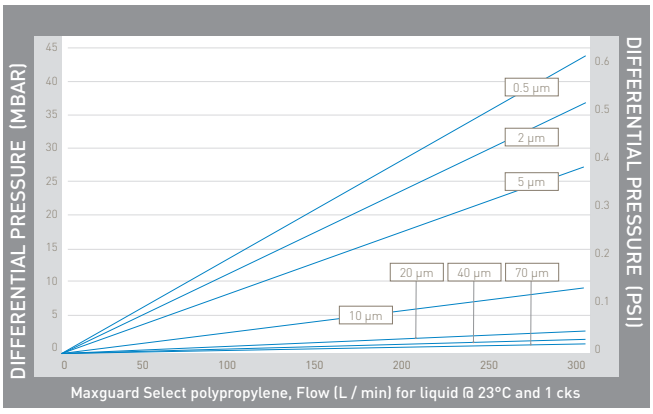
Features	Benefits
High flow capability elements with intergrated handle.	Fewer cartridges and reduced labour associated with change out times.
Double BS 226 o-ring seal.	Positive seal elimantes bypass and assures integrity.
Absolute rated efficiency 99.98% (ß5000).	Consistent absolute retention suitable for critical applications.
Large diameter and high flow rates.	Smaller housings and less capital expenditure.

APPLICATIONS

- ✓ Deep well injection
- ✓ Amines
- ✓ Process water
- ✓ Parts washing



Maxguard polypropylene, Flow (L / min) for liquid @ 23°C and 1 cks



Maxguard Select polypropylene, Flow (L / min) for liquid @ 23°C and 1 cks

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MAXGUARD & MAXGUARD Select

Absolute rated polypropylene and cellulose filter cartridge

Specifications

Materials of Construction

Filter media:	Polypropylene Cellulose
Support layers:	Polypropylene
Support core:	Polypropylene

Filtration Rating

99.98% at specified micron rating.

Maximum Recommended Operating Conditions:

Temperature:
80°C (176°F) at 2.1 bar (30.4 psi)

Pressure:
4.8 bar (69.61 psi) at 25°C (77°F)
2.1 bar (30.4 psi) at 80°C (176°F)

Flow Characteristics:

Maxguard filters are capable of filtering 340 L/min.

Maxguard Select filters are capable of filtering 378 L/min.

Recommended Operating Conditions

Change out pressure: 2.4 bar (34.8 psi)

Retention Characteristics

	Micron ratings at various efficiencies				
Cartridge Code	99.98%	99.9%	99%	98%	95%
Polypropylene					
MXGP005	0.5	0.4	0.2	>0.2	>0.1
MXGP020	2	1.4	0.4	0.2	>0.1
MXGP050	5	3.8	1.2	0.3	>0.1
MXGP100	10	7	3	0.9	>0.2
MXGP020	20	18	5	2	>0.2
MXGP400	40	23	18	8	>0.7

	Micron ratings at various efficiencies				
Cartridge Code	99.98%	99.9%	99%	98%	95%
Cellulose					
MXGC020	2	1.6	0.4	0.2	>0.1
MXGC100	10	6	1.4	0.5	>0.2
MXGC150	15	11	3	1.5	>0.6
MXGC700	70	53	8.5	3	>0.5

	Micron ratings at various efficiencies				
Cartridge Code	99.98%	99.9%	99%	98%	95%
Polypropylene Select					
MGSP005	0.5	0.4	0.2	>0.2	>0.1
MGSP020	2	1.4	0.4	0.2	>0.1
MGSP050	5	3.8	1.2	0.3	>0.1
MGSP100	10	7	3	0.9	>0.2
MGSP020	20	18	5	2	>0.2
MGSP400	40	23	18	8	>0.7
MGSP005	70	9	83	64	35

Ordering information

CARTRIDGES

MXG P □ – □ □ – □

Code	Filter Media
P	Polypropylene

Code	Micron
005	0.5
020	2
050	5
100	10
200	20
400	40

Code	Length (Nominal)
30	30" (750 mm)
40	40" (1016 mm)

Code	Seal Material
E	EPR
N	Buna-N
V	Viton
S	Silicone
T	PFA / Viton

Code	End Cap Configuration
SM	226 o-ring/flat cap with handle

MGS P □ – □ □ – □

Cartridge Series
Maxguard Select

Code	Micron
005	0.5
020	2.0
050	5.0
100	10
200	20.0
400	40.0
700	70.0

Code	Length (Nominal)
30	30" (750 mm)
40	40" (1016 mm)

Code	Seal Material
E	EPR
N	Buna-N
V	Viton
S	Silicone
T	PFA / Viton

Code	End Cap Configuration
SM	226 o-ring/flat cap with handle

MXG C □ – □ □ – □

Code	Filter Media
C	Cellulose

Code	Micron
020	2
100	10
150	15
700	70

Code	Length (Nominal)
30	30" (750 mm)
40	40" (1016 mm)

Code	Seal Material
E	EPR
N	Buna-N
V	Viton
S	Silicone
T	PFA / Viton

Code	End Cap Configuration
SM	226 o-ring/flat cap with handle

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SPUNFLOW QN

Polypropylene filter cartridges

Graded density, high porosity Spunflow QN filter elements are manufactured from thermally bonded polypropylene microfibres.

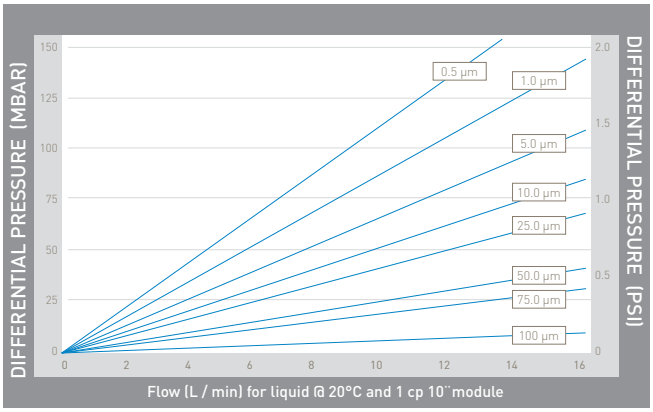
Offering high throughputs, low pressure loss, high dirt holding capacity and long on stream life, the bonded fibre construction minimises any possibility of fibre migration and resists particle shedding, even under pulse conditions.

Fibre diameter is controlled throughout extrusion, the microfibres are then thermally bonded into a complex filter matrix during filter construction. These interlinked graded density layers offer maximum support and maximum void volume resulting in true depth filtration.

Features	Benefits
Nominally rated filters ideally suited for primary filtration.	Economical filtration.
Available in a comprehensive range of end cap configurations.	Simple retrofitting to existing systems and housings.
Thermally bonded polypropylene fibres.	Broad range of chemical compatibility.
High flow rate and low pressure loss.	Longer on stream life at an economical price point.

APPLICATIONS

- ✓ Solvents
- ✓ Resins
- ✓ High purity chemicals
- ✓ Industrial coatings



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SPUNFLOW QN

Polypropylene filter cartridges

Specifications

Materials of Construction

Construction type:	Thermally bonded polypropylene microfiber
Filtration media:	Polypropylene microfiber

Maximum Recommended Operating Conditions

Temperature:
65°C (149°C)

Change out Differential Pressure:
2 bar (29 psi) @ 20°C (68°F)

Maximum Operating Conditions

Differential Pressure:
4 bar (58 psi) @ 20°C (68°F)

Dimensions:

Cartridge outside diameter:
Standard: 2.44" (62mm)
End capped: 2.51" (64mm)

Cartridge inside diameter:
Standard: 1.14" (29mm)
End capped: 1.06" (27mm)

Ordering information

CARTRIDGES

QN □ □ □ □ □ □

Code	Length (Nominal)
09	9.75" (247mm)
10	9.875" (251mm)
11	10" (254mm)
19	19.50" (500mm)
20	20" (508mm)
29	29" (750mm)
30	30" (762mm)
39	39.25" (1000mm)
40	40" (1016mm)
50*	50 (1270mm)

** Special order DOE only*

Code	Material
P	Polypropylene

Code	Micron
A5	0.5
01	1
05	5
10	10
25	25
50	50
75	75
99	100

Code	End Cap Configuration
2	Flat end / 226
3	Flat end / 222
7	Fin / 226
8	Fin / 222
9	213
X	DOE Plain end

Code	Seal Material
X	None
E	EPDM
N	Nitrile
P**	PE
S	Silicone
V	Viton

*** Plain end*

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SPUNFLOW QA

Absolute spunbonded depth filter cartridges

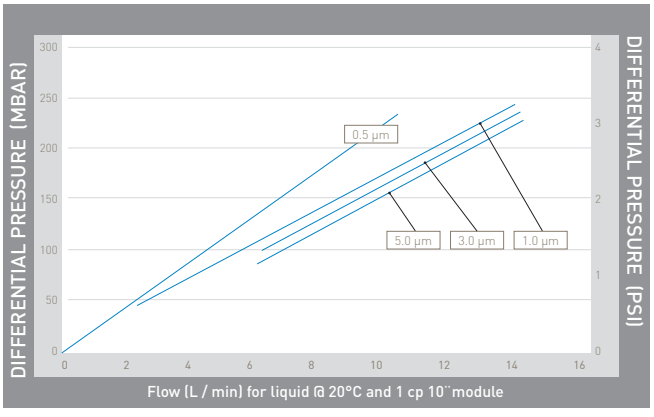
The Spunflow QA range of absolute rated, graded density filter elements are manufactured from thermally bonded microfibres layered onto a central core. The construction consists of numerous, distinctive filter zones with coarser outer layers acting as prefilters for the tighter, absolute rated central zone. This removal profile produces an element possessing high voids volume, giving high flow rates, low pressure loss, high dirt holding capacity and long life.

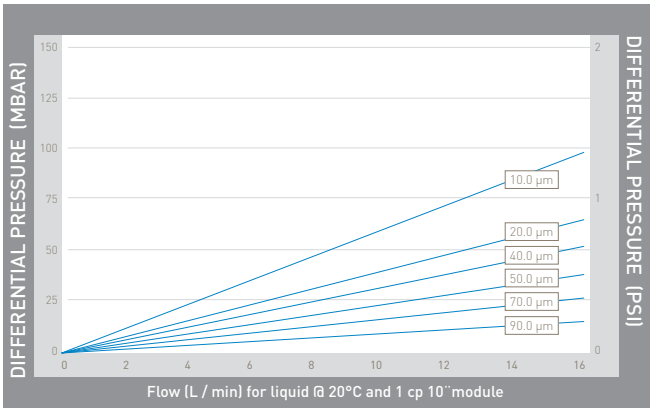
The thermally bonded media also eliminates fibre migration and resists unloading during service. Available in two grades, polypropylene and polyester / nylon, the range offers extremely wide chemical compatibility.

Features	Benefits
Absolute rated efficiency 99.98% from 0.5 to 90 micron.	Depth filtration with consistent absolute retention.
Unique outer graded density structure.	Increased dirt holding capacity.
Available in a comprehensive range of end cap configurations.	Simple retrofitting to existing systems and housings.
All polypropylene structure plus optional polyester media with nylon end caps.	Broad range of chemical compatibility.

APPLICATIONS

- ✓ Solvents
- ✓ Membrane prefiltration
- ✓ Industrial coatings
- ✓ Photographic chemicals





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SPUNFLOW QA

Absolute spunbonded depth filter cartridges

Specifications

Materials of Construction

Filtration media:	Polypropylene
	Polyester
End caps:	Polypropylene
	Nylon

Maximum Recommended Operating Conditions

Temperature:
Polyester / Nylon: 275°F (135°C)
Polypropylene: 149°F (65°C)

Change out Differential Pressure:
29psi (2 bar) @ 68°F (20°C)

Maximum Operating Conditions

Differential Pressure:
58 psi (4 bar) @ 68°F (20°C)

Dimensions:

Cartridge outside diameter:
2.52¨(64mm).

Cartridge inside diameter:
1.14¨ (29mm).

Ordering information

CARTRIDGES

QA

Code	Length (Nominal)
09	9.75¨ (247mm)
10	9.875¨ (251mm)
11	10¨ (254mm)
19	19.50¨ (500mm)
20	20¨ (508mm)
29	29¨ (750mm)
30	30¨ (762mm)
39	39.25¨ (1000mm)
40	40¨ (1016mm)

Code	Material
P	Polypropylene
S	Polyester / Nylon

Polyester / nylon core and end fitting 1 to 90 micron

Code	Micron
A5	0.5
01	1
03	3
05	5
10	10
20	20
40	40
50	50
70	70
90	90

Code	End Cap Configuration
0	DOE (Double open end)
2	Flat end / 226
3	Flat end / 222
7	Fin / 226
8	Fin / 222
9	213

Code	Seal Material
E	EPDM
N	Nitrile
S	Silicone
V	Viton

Code	Cage Option
S	Standard

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HONEYCOMB

Wound depth filter cartridges

Honeycomb precision wound depth filter cartridges are manufactured to provide considerable dirt holding capacity, coupled with high flow rates and low pressure loss. Honeycomb elements consist of a metal or plastic perforated support core onto which yarn is wound at a pre-set rate, providing each rating of element with its own distinctive winding pattern and performance.

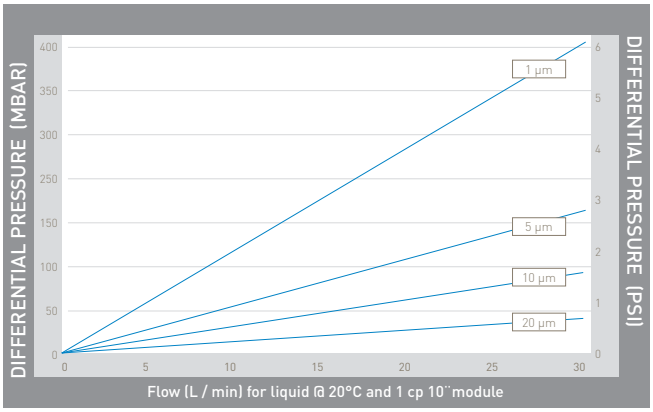
During the winding process the yarn is usually brushed (or napped). This increases the working area of the elements, providing a higher dirt holding capacity whilst maintaining the rigid structure.

Fibres such as polyester, cotton and nylon can operate at higher temperatures and have differing chemical compatibility compared to polypropylene. For very high temperatures and very strong oxidising agents, baked glass fibre elements are used. Glass fibre elements are fitted with voiles and stainless steel cores as standard, other cartridges can also be fitted with voiles where necessary.

Features	Benefits
Wide range of yarn and core materials.	Excellent compatibility across a wide range of fluids.
Available in 62mm diameter and standard lengths.	Designed for most commercially available housings and will retrofit most brands.
True depth filtration.	Suitable for gel and deformable particle capture and protection of absolute rated elements.
Tortuous filtration path.	High dirt holding capacity.

APPLICATIONS

- ✓ Process water
- ✓ Plating
- ✓ Dilute acids and alkaliis
- ✓ Amines



PERFORMANCE CHARACTERISTICS

Wound cartridges provide true depth filtration by utilising hundreds of tapered filtering passages of controlled size and shape. Each layer of roving contributes to true depth filtration by trapping its share of particles.

Wound filter elements display gradual pressure increase during cartridge life versus surface-type media that have an abrupt flow cut-off when loaded.

In addition, irregular outer layers reduce surface blinding, assuring both longer cartridge life and full cartridge utilisation.

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HONEYCOMB

Wound depth filter cartridges

Specifications

Materials of Construction

Filtration media:	Polyester
(various yarns)	Polypropylene
	Bleached cotton
	Glass fibre
	Washed polypropylene
	Nylon
Inner support core:	Polyester
	Polypropylene
	316 stainless steel

Recommended Operating Conditions

Maximum temperature with stainless core:	
Cotton	149°C (300°F)
Polypropylene	93°C (199°F)
Polyester	121°C (250°F)
Glass fibre	399°C (750°F)

Maximum temperature with polypropylene core:	
Cotton	60°C (140°F)
Polypropylene	60°C (140°F)
Polyester	60°C (140°F)

Baked glass fibre cartridge nominal ratings

Cartridge designation:	Liquids	Compressed air & gas
K5B	100-150	100+
K5R	75-100	10
K6R	40	7
K8R	30	5
K10R	20	3
K12R	15	1
K15R	10	>1
K19R	5	>1
K23R	3	>1
K27R	1	>1
K39R	0.5	>1

Ordering information

CARTRIDGES

Code	Filter Medium
None	Cotton (FDA)
K	Baked glass fiber
M	FDA grade polypropylene
N	Nylon (FDA)
S	Polyester (FDA)
T	Washed PP industrial grade
UK	Unbaked glass fibre

Code	Micron
6R	150
8R	100
10R	75
11R	50
13R	30
15R	20
19R	10
23R	5
39R	1

Code	Length (Nominal)
5	125mm
9	248mm
10	254mm
19-4	500mm
20	508mm
29-4	750mm
30	762mm
39-4	1000mm
40	1016mm

Code	Diameter (Nominal)
None	62mm
-2	68mm
-3	66mm
-45	100mm

Code	Core Material
A	Polypropylene
PE	Polyester
S	316 stainless steel
G	304 stainless steel

Code	End Cap Configuration
None	DOE (w/o gasket)
DO	DOE (w/gasket)
TC	222 / closed
TF	222 / fin
T3	222 blank no recess
SC	226/closed
SF	226/fin
XC	Extended metal

Code	Seal Material
E	EPDM
N	Buna-N
S	Silicone
V	Viton

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PROBOND

Spiral wrapped long fibre resin bonded filter cartridge.

Parker domnick hunter's Probond cartridges have a unique proprietary two-stage filtration design to maximise particle removal and service life in viscous fluid applications.

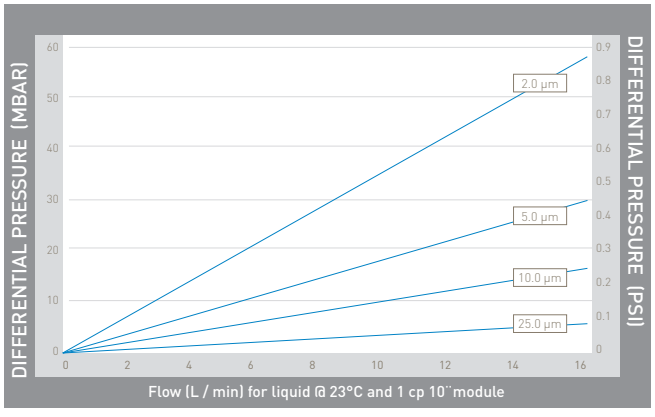
An outer spiral prefilter wrap increases cartridge strength and eliminates residual debris associated with conventional, machined, resin bonded cartridges. This outer wrap collects large particles and agglomerates whilst the inner layers control the particle removal at the rated size. Construction utilizes a phenolic resin impregnation resulting in a cartridge strong enough for use with fluid viscosities up to 3200 centipoise.

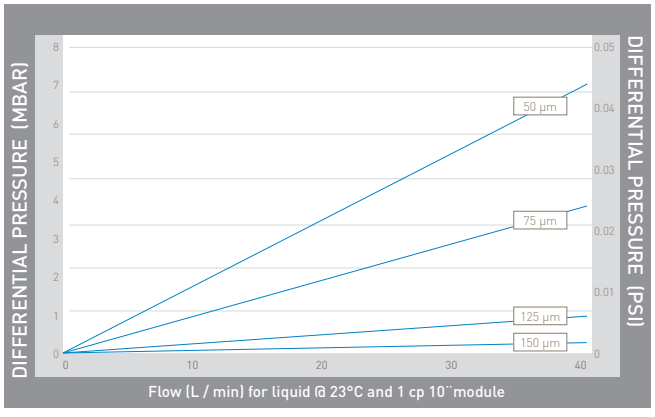
Probond filter cartridges are available in nine differentiated removal ratings from 2 to 200 micron to meet a wide range of performance requirements.

Features	Benefits
Silicone-free construction.	Eliminates adhesion problems between substrate and coating.
Extra-long acrylic fibres and phenolic resin impregnation.	Significantly reduces fibre migration and thus contamination.
Unique outer spiral wrap design.	Eliminates loose debris associated with machined products whilst capturing larger particles.

APPLICATIONS

- ✓ Paints
- ✓ Adhesives
- ✓ Resins
- ✓ Printing inks
- ✓ Chemical coatings
- ✓ Emulsions
- ✓ Plasticiser
- ✓ Oil & gas fluids
- ✓ Petroleum products





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PROBOND

Spiral wrapped long fibre resin bonded filter cartridge.

Specifications

Materials of Construction

1st stage prefilter wrap:	Polyester / acrylic Long staple fibre
2nd stage	Acrylic Long staple fibre Fibres impregnated with Phenolic bonding resin
End caps:	ABS (Acrylonitrile Butadiene Styrene) or Nylon (NTC) None on double open end style
Type of consruction:	Coreless, one-piece, rigid resin bonded fibrous matrix.

Maximum Recommended Operating Conditions

Flow rate:
18.9 lpm per 254mm in length (5gpm per 10¨in length)

Temperature: 121°C (250°F)

Maximum recommended change out ΔP:
3.5 bar (50 psid)

Dimensions

Outside diameter: 65mm (2.6¨)
Inside diameter: 28.6mm (1.2¨)
Lengths: Nominal, 10, 20, 30 and 40 inch

Recommended Maximum Differential Pressure

Temperature		Cartridge Pressure Resistance	
°C	°F	(bar)	(psid)
21	70	10	150
38	100	8.6	125
65	150	6.2	90
82	180	4.5	65
121	250	1.7	25

Particle Removal Ratings

2µm, 5µm, 10µm, 25µm, 75µm, 125µm, 150µm and 200µm.

Environmental / Chemical Compatibility

Classified as a non-hazardous material

- Incinerable (8000 BTU/lb)
- Crushable and shredable
- Certified silicone-free
- Suitable for weak acids and bases (pH 5-9)
- Unsuitable for oxidizing agents
- Not recommended for FDA applications

Probond Flow Factors	
Rating (µm)	Flow Factors
2	0.08
5	0.04
10	0.02
25	0.012
50	0.01
75	0.006
125	0.0013
150	0.0010
200	0.0005

Probond Length Factors	
Length (in)	Length Factor
9	1.0
10	1.0
19	2.0
20	2.0
29	3.0
30	3.0
39	4.0
40	4.0

Flow rate and pressure drop formulas.

$$\text{Flow rate (gpm)} = \frac{\text{Clean } \Delta P \times \text{Length factor}}{\text{Viscosity} \times \text{Flow Factor}}$$

$$\text{Clean } \Delta P = \frac{\text{Flow rate} \times \text{Viscosity} \times \text{Flow Factor}}{\text{Length Factor}}$$

1. Clean ΔP is psi differential at start.
2. Viscosity is centistokes. Use conversion tables for other units.
3. Flow factor is ΔP / GPM at 1cks for 10¨ (or single)
4. Length factors convert flow or ΔP from 10¨ (single length) to required cartridge length.

Ordering information

CARTRIDGES

PRO □ – □ □ – □

Code	Micron
2	2
5	5
10	10
25	25
50	50
75	75
125	125
150	150
200	200

Code	Length (Nominal)
9	9.75¨ (248mm)
10	10¨ (254mm)
19	19.50¨ (495mm)
20	20¨ (508mm)
29	29.50¨ (743mm)
30	30¨ (762mm)
39	39¨ (991mm)
40	40¨ (1016mm)

Code	End Cap Configuration
Blank	DOE (w/o gaskets)
XA	Poly Extender
XB	Poly Extender/ Poly spring closed
TC	2-222 / Flat (ABS)
NTC	2-222 / Flat (Nylon)
C	Tined Steel Core
CXC	Extended Tinned Steel Core

Code	Seal Material
Blank	No seal material
E	EPR
S	Silicone
N	Buna-N
T	PFA encapsulated viton (222, 226 o-ring)
V	Viton
W	Poly foam gaskets

Parker domnick hunter

CARBOFLOW MX

Activated carbon filters

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

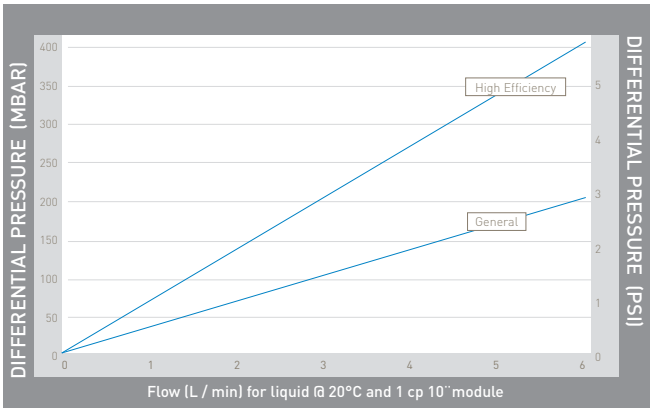
The result is a filter offering unsurpassed adsorptive capacity, up to 20 times that of traditional granular carbon or carbon impregnated filters, and high particle removal efficiency.

The rigid structure of Carboflow MX not only minimises any possibility of channeling, bypass or fluidising, 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	Benefits
Extruded solid carbon structure.	Prevents channeling and bypass allowing greater fluid contact with carbon structure.
Outer polypropylene prefiltration layer.	Protects the carbon structure from larger particulate and extends lifetime.
Polypropylene hardware and polyethylene binder.	Excellent chemical compatibility.
Steam activated microporous coconut sourced carbon.	Ideal for chlorine and chloroform reduction, odour and taste removal and the removal of coloured impurities from fluids.

APPLICATIONS

- ✓ Product rinse waters
- ✓ Plating solutions
- ✓ De-colourisation
- ✓ De-chlorination



Parker domnick hunter

ENGINEERING YOUR SUCCESS.

CARBOFLOW MX

Activated carbon filters

Specifications

Materials of Construction

Carbon:	Coconut shell
Carbon type:	Steam activated
	Acid wash
Carbon weight per 10¨:	350g
End caps:	Polypropylene
Standard o-rings / gasket:	EPDM
	Nitrile
	PE
	Silicone
	Viton

Maximum Operating Temperature

60°C (158°F)

Maximum Differential Pressure

7 bar (101.52 psid)

Recommended Change Out Differential Pressure

2 bar (29.00 psid)

Retention Characteristics

	1 High Efficiency	2 General
Particle removal	99.98% @ 2 mic	99.98% @ 5 mic
Chlorine reduction**	28 cu.m @ 4l/min	24 cu.m @ 4.1l/min

* *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.*

These cartridges contain a small amount of carbon fines (very fine black powder). After the installation, flush the system for a minimum of 5 minutes to remove all traces of the fines before using the water.

Ordering information

CARTRIDGES

Code	Flow Path
C	Carbon

Code	Length (Nominal)	
05	4.75¨	(124mm)
09	9.75¨	(247mm)
10	9.875¨	(251mm)
11	10¨	(254mm)
19	19.50¨	(500mm)
20	20¨	(508mm)
29	29.50¨	(750mm)
30	30¨	(762mm)
39	39.25¨	(1000mm)
40	40¨	(1016 mm)

Code	Type
M	Extruded

Code	Grade
1	High Efficiency
2	General

Code	End Fitting
0	DOE
2	Flat / 226
3	Flat / 222
7	Fin / 226
8	Fin / 222
9	213
S	SOE

Code	Seal Material
E	EPDM
N	Nitrile
P	PE
S	Silicone
V	Viton

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HPM Filter Housings

Filter housing for Parmax and Parmax-R

Parker domnick hunter offer a range of housings for Parmax and Parmax-R large diameter cartridges. The range consists of single, 3 and 5 round housings.

The range is available in both horizontal and vertical configurations. A horizontal arrangement makes change-outs easier, whereas a vertical set up can be advantageous where space is limited. Parker's range of HPM vessels offer significant footprint and cost reduction possibilities in comparison to conventionally sized cartridges.

The vessels are designed for high flow rates and large volume operations where the large diameter and increased surface area of the elements offer significant advantages in decreasing the downtime associated with change-outs when compared to standard 2.5¨ diameter cartridges.

Features	Benefits
Designed for use with large diameter cartridges.	Smaller number of cartridges facilitates quick and simple change-out.
Horizontal and vertical orientation options.	Installation optimisation to facilitate floor space planning.
Reduced footprint requirement and high flow operation.	Reduced capital outlay and lower operating costs.

APPLICATIONS

- ✓ Completion fluids
- ✓ Pre-filtration for desalination
- ✓ API's and solvents

Specifications

Materials of Construction

Type:	SS 316 Ti
Seal material:	EPDM FDA
Surface finish Internal and external:	Pickled and passivated
Welding:	All welds are full penetration, crevice and undercut free.

Certification:
Supplied as standard with vessel inspection certificate

Material Test Certification:
EN10204 3.1 supplied upon request.
only available at time of order.

Directives:
Housings designed in accordance with the European Council Pressure Equipment Directive (PED).

Fluid Group:
Group 2 (non hazardous) liquids.

Design Basis:
AD-2000

Maximum Recommended Operating Conditions:
Temperature:
-10 / 90°C (14 - 194°F)

Maximum Allowable Pressure:
-1 / 10 bar (-14.5 / 145 psi).

Volume:

Volume (Litres)	20¨	40¨	60¨
HMPCE01	27L	46L	64L
HPMCE03	-	450L	590L
HMPCE05	-	450L	590L

Parker domnick hunter

ENGINEERING YOUR SUCCESS.

HPM Filter Housings

Filter housing for Parmax and Parmax-R

Specifications

Physical Characteristics:
Dimensions are approximate only, based on illustration shown with flanged fittings,BSP / NPT vent and drains available, supplied without plugs. For accurate dimensions, please contact Parker domnick hunter.

Dimensions

3 and 5 Round Housings - Vertical Dimensions (mm)					
		3 Round Housings		5 Round Housings	
		40¨ Height	60¨ Height	40¨ Height	60¨ Height
DN150	DIM 'A'	1850	2360	1850	2360
	DIM 'B'	450	450	450	450
	DIM 'C'	425	425	485	485
	DIM 'D'	315	315	340	340
	DIM 'E'	450	450	610	610
DN200	DIM 'A'	1850	2360	1850	2360
	DIM 'B'	560	560	560	560
	DIM 'C'	425	425	485	485
	DIM 'D'	315	315	340	340
	DIM 'E'	450	450	610	610
DN250	DIM 'A'	1850	2360	1850	2360
	DIM 'B'	700	700	700	700
	DIM 'C'	425	425	485	485
	DIM 'D'	315	315	340	340
	DIM 'E'	450	450	610	610

3 and 5 Round Housings - Horizontal Dimensions (mm)					
		3 Round Housings		5 Round Housings	
		40¨ Height	60¨ Height	40¨ Height	60¨ Height
DN150	DIM 'A'	1850	2360	1850	2360
	DIM 'B'	450	450	450	450
	DIM 'C'	315	315	340	340
	DIM 'D'	425	425	485	485
	DIM 'E'	450	450	610	610
DN200	DIM 'A'	1850	2360	1850	2360
	DIM 'B'	860	1100	860	1100
	DIM 'C'	315	315	340	340
	DIM 'D'	425	425	485	485
	DIM 'E'	450	450	610	610
DN250	DIM 'A'	1850	2360	1850	2360
	DIM 'B'	860	1100	860	1100
	DIM 'C'	315	315	340	340
	DIM 'D'	425	425	485	485
	DIM 'E'	450	450	610	610

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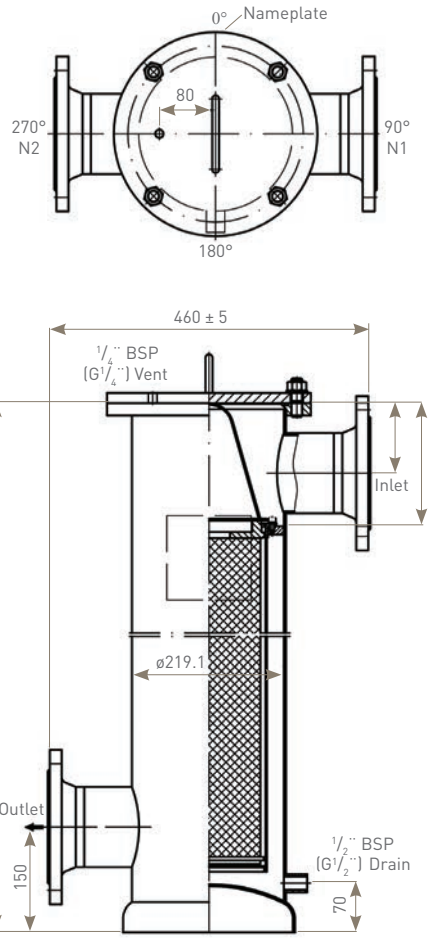
HPM Filter Housings

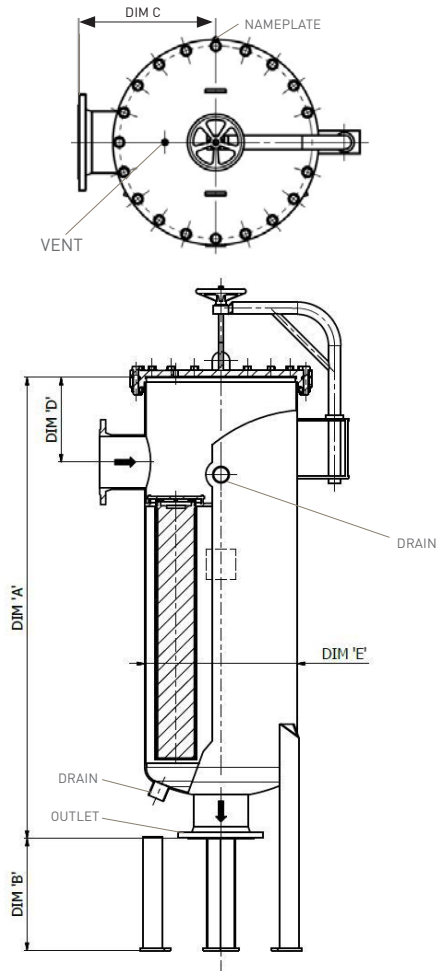
Filter housing for Parmax and Parmax-R

Specifications

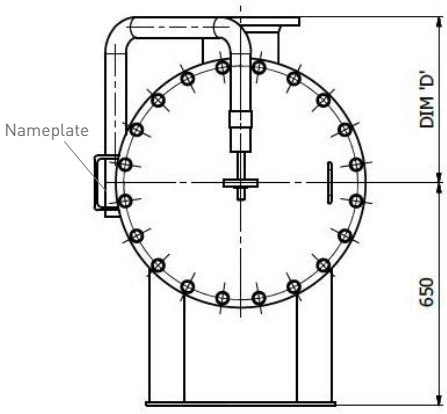
Single Housing - Vertical

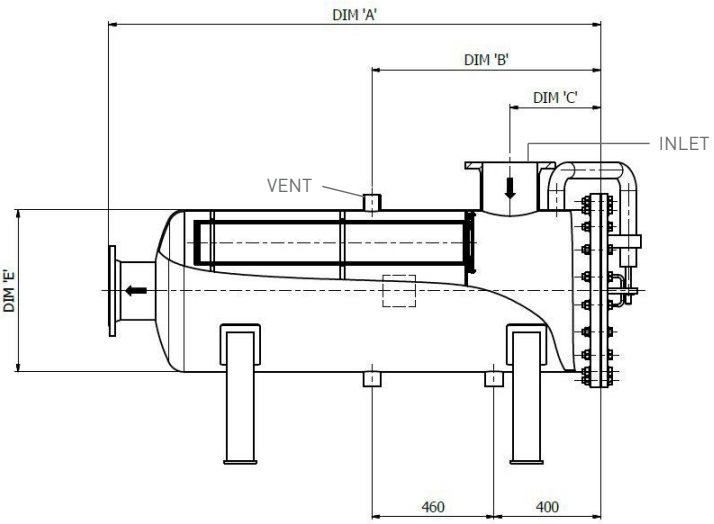


3 & 5 Round Housing - Vertical



3 & 5 Round Housing - Horizontal





HPM Filter Housings

Filter housing for Parmax and Parmax-R

Standard Offerings, BSP Vent and Drain, Industrial Finish

Parker domnick hunter Code	Number of Cartridges	Length (Nominal)	Connection Size	Seal	Orientation
HPMCE012EL-L-E-I-V-B*	1	20" (500 mm)	4" (DN100)	EPDM	Vertical
HPMCE012EL-L-E-I-H-B*	1	20" (500 mm)	4" (DN100)	EPDM	Horizontal
HPMCE014EL-L-E-I-V-B*	1	40" (1000 mm)	4" (DN100)	EPDM	Vertical
HPMCE014EL-L-E-I-H-B*	1	40" (1000 mm)	4" (DN100)	EPDM	Horizontal
HPMCE016EL-L-E-I-V-B*	1	60" (1500 mm)	4" (DN100)	EPDM	Vertical
HPMCE016EL-L-E-I-H-B*	1	60" (1500 mm)	4" (DN100)	EPDM	Horizontal
HPMCE034GL-L-E-I-V-B*	3	40" (1000 mm)	6" (DN150)	EPDM	Vertical
HPMCE036GL-L-E-I-V-B*	3	60" (1500 mm)	6" (DN150)	EPDM	Vertical
HPMCE034GL-L-E-I-H-B*	3	40" (1000 mm)	6" (DN150)	EPDM	Horizontal
HPMCE036GL-L-E-I-H-B*	3	60" (1500 mm)	6" (DN150)	EPDM	Horizontal
HPMCE034HL-L-E-I-V-B*	3	40" (1000 mm)	8" (DN200)	EPDM	Vertical
HPMCE036HL-L-E-I-V-B*	3	60" (1500 mm)	8" (DN200)	EPDM	Vertical
HPMCE034HL-L-E-I-H-B*	3	40" (1000 mm)	8" (DN200)	EPDM	Horizontal
HPMCE036HL-L-E-I-H-B*	3	60" (1500 mm)	8" (DN200)	EPDM	Horizontal
HPMCE054JL-L-E-I-V-B*	5	40" (1000 mm)	10" (DN250)	EPDM	Vertical
HPMCE056JL-L-E-I-V-B*	5	60" (1500 mm)	10" (DN250)	EPDM	Vertical
HPMCE054JL-L-E-I-H-B*	5	40" (1000 mm)	10" (DN250)	EPDM	Horizontal
HPMCE056JL-L-E-I-H -B*	5	60" (1500 mm)	10" (DN250)	EPDM	Horizontal

* check coding chart for complete code

Note:
NPT vent and drain available upon request.
Inlet/outlet available same and opposite sides.
Vessels are packed in wooden crates for protection during transport.

Ordering information

HOUSINGS

HPM

Code	No.
CE	Standard

Code	Cartridges
01	1
03	3
05	5

Code	Length (Nominal)
2*	20" (500mm)
4	40" (1000mm)
6	60" (1500mm)

Code	Connection Size***
C	2" (DN50)
D	3" (DN80)
E	4" (DN100)
G	6" (DN150)
H	8" (DN200)
J	10" (DN250)

Code	Connection Type
L	DIN 2633

Code	Cartridge Description
L	Large diameter

Code	Seal
E	EPDM

Code	Internal / External Finish
I	Pickled & Passivated

Code	Orientation
H	Horizontal
V	Vertical

Code	Vent & Drain
B	BSP (G)
N	NPT

Code	Inlet / Outlet Orientation
A*	180°C
B*	0°C
X**	N/A

* *Singles only*
** *3 and 5 round only*

Code	Material Certification
M	Material cert.
None	No cert.

*** Available connection sizes per housing size.

Number of Cartridges	Code	Connection Code
1	01	C,D,E
3	03	G,M
5	05	J

Parker domnick hunter

HIL Filter Housings

Industrial Liquid

Industrial liquid housing for prefiltration and clarification duties

STANDARD product
- BSP (G) or NPT connections and standard finish

PLUS product
- Available in 3 different vessel classes:
- Standard (CE), ATEX and High Pressure
- Standard and electropolished surface finishes available
- A number of inlet / outlet port connections
- Choice of BSP (G) / ISO 228, NPT or no vent
- Choice of BSP (G) / ISO 228 or NPT drain
- Option of C (226) location and fabricated (not cast) head

Features	Benefits
CE, ATEX, HP version available.	Certified for a wide range of applications.
A number of inlet / outlet port options available.	Flexible installation.
Economic design.	Low capital cost.

APPLICATIONS

- ✓ Prefiltration
- ✓ Bulk chemical
- ✓ Water

Specifications

Materials of Construction
Standard Range:

Housing:	Cast head - Stainless steel Bowl - 316L Stainless Steel
Seal material:	EPDM FDA
Clamps:	304 Stainless Steel
Surface finish: Internal	As welded
Surface finish: External	Polished 0.8µm Ra (32µIn Ra)

Plus Range:

Housing:	Cast head - Stainless steel Bowl - 316L Stainless Steel
Seal material:	EPDM FDA PTFE FDA Silicone FDA Viton / FKM FDA
Clamps:	304 Stainless Steel

Surface Finish
Two finishes available:

Standard finish	
Head cast:	Pickled and passivated
Bowl internal:	As welded Pickled and passivated
Bowl external:	Polished 0.8µm Ra (32µIn Ra)

Standard Electropolished finish	
Head cast:	Electropolished
Bowl internal:	Electropolished
Bowl external:	Polished 0.8µm Ra (32µIn Ra)

All finished pickled and passivated.

Welding:
All assembly welds are full penetration.
All welds are crevice and undercut free.
Weld finish and detail drawings available upon request.

Certification:
Supplied as standard with vessel inspection certificate.

Material Test Certification:
EN10204 3.1 supplied upon request.

Directives:
Housings designed in accordance with the European Council Pressure Equipment Directive (PED).
ATEX (where applicable).

Design Basis:
ASME VIII Division 1.

Approvals:
EAC 010-2011, (No. TC N RU D-GB. АИ01.B.00512)
Approval type: Import Certificate, TR CU Pressure Equipment (available on request)

EAC

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HIL Filter Housings

Industrial Liquid

Specifications

STANDARD Range

Working Condition PED			Maximum Pressure		
Fluid Group	State	Temperature	011	012	013
Non Dangerous	Liquid / Gas	150 °C (302 °F)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Dangerous	Liquid / Gas	150 °C (302 °F)	5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)
PED Conformity Assessment Category			SEP	CAT I	CAT I
Volume (litres)			3.2	5.1	7.0

PLUS Range

CE	Working Condition PED			Maximum Pressure			
Fluid Group	State	Temperature		011	012	013	014
Non Dangerous	Gas / Vapour	150 °C (302 °F)		10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Dangerous	Gas / Vapour	150 °C (302 °F)		5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)
Non Dangerous	Liquid	150 °C (302 °F)		10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Dangerous	Liquid	150 °C (302 °F)		5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)
PED Conformity Assessment Category			Code B & D Code C	SEP SEP	CAT I SEP	CAT I CAT I	CAT I CAT I
Volume (litres)			Code B & D Code C	3.2 2.9	5.1 4.8	7.0 6.7	8.9 8.6

ATEX	Working Condition PED			Maximum Pressure			
Fluid Group	State	Temperature		011	012	013	014
Non Dangerous	Gas / Vapour	135 °C (275 °F)		10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Dangerous	Gas / Vapour	135 °C (275 °F)		5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)
Non Dangerous	Liquid	135 °C (275 °F)		10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Dangerous	Liquid	135 °C (275 °F)		5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)	5 barg (73 psig)
PED Conformity Assessment Category			Code B & D Code C	SEP SEP	CAT I SEP	CAT I CAT I	CAT I CAT I
Volume (litres)			Code B & D Code C	3.2 2.9	5.1 4.8	7.0 6.7	8.9 8.6

High Pressure	Working Condition PED			Maximum Pressure			
Fluid Group	State	Temperature		011	012	013	014
Non Dangerous	Gas / Vapour / Liquid	205 °C (401 °F)		16 barg (232 psig)	16 barg (232 psig)	16 barg (232 psig)	16 barg (232 psig)
PED Conformity Assessment Category			Code B & D Code C	CAT I 2.9	CAT I 4.8	CAT I 6.7	CAT I 8.6
Volume (litres)			Code B & D Code C	3.2 SEP	5.1 CAT I	7.0 CAT I	8.9 CAT I

Note: All housings are vacuum rated.

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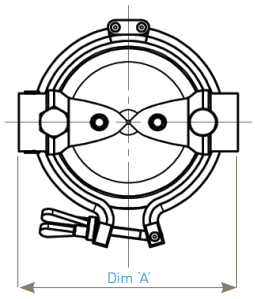
HIL Filter Housings

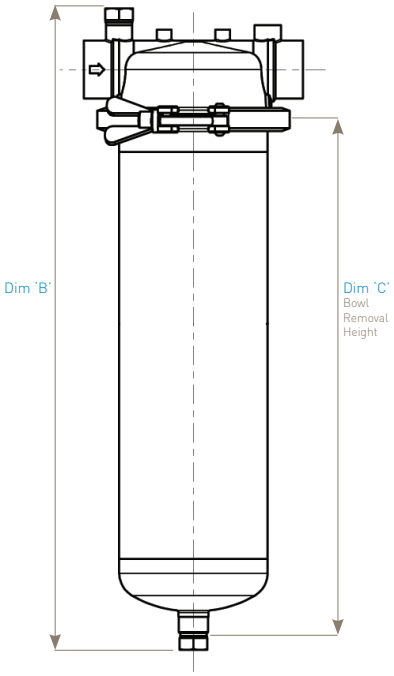
Industrial Liquid

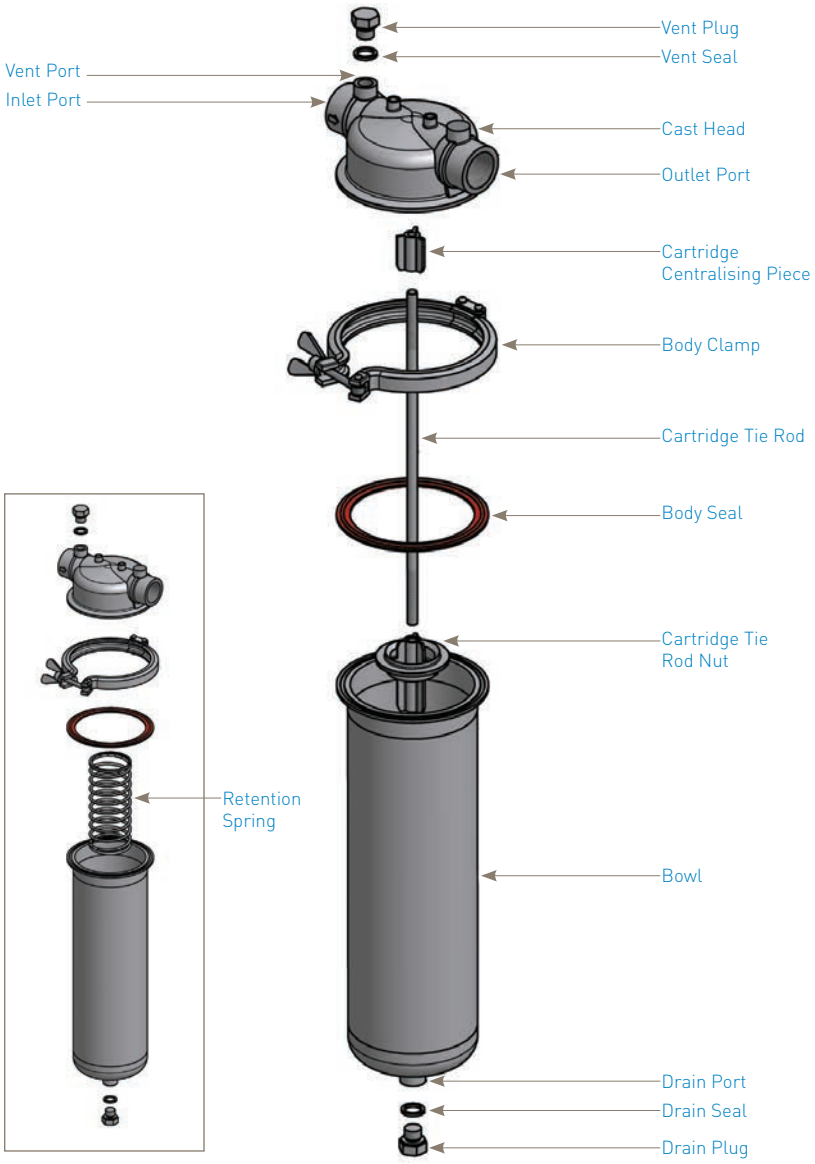
Physical Characteristics

Bowl Height	Dimensions (mm) 'A'	'B'	'C'	Typical Weight Bowl	Head	Total
250 mm (10")	150 mm (5.9")	441 mm (17.4")	297 mm (11.7")	1.5 Kg (3.3 lbs)	1.2 Kg (2.6 lbs)	3.8 Kg (8.4 lbs)
500 mm (20")	150 mm (5.9")	691 mm (27.2")	550 mm (21.7")	2.5 Kg (5.5 lbs)	1.2 Kg (2.6 lbs)	4.9 Kg (10.8 lbs)
750 mm (30")	150 mm (5.9")	936 mm (26.9")	814 mm (32.0")	3.5 Kg (7.7 lbs)	1.2 Kg (2.6 lbs)	6.0 Kg (13.2 lbs)

Dimensions shown are based on the STANDARD range. For accurate dimensions, please contact Parker domnick hunter.







Example: Showing 10" Size with 1" connections

The PLUS product range is available with many options of connections, vents, drains, surface finish, seals classification, etc. Please see product coding.

HIL Filter Housings

Industrial Liquid

STANDARD Range - 10" to 30"

HIL [ ] 01 [ ] [ ] [ ] - [ ] - [ ]

Code	Vessel Class
CE	Standard

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

Code	Connection Size
B	1" (25.4mm)

Code	Connection Type
B	BSPP (G) ISO 228
N	NPT

Code	Cartridge
B	DOE
D	222

Code	Seal
E	EPDM

PLUS Range - 10" to 40"

HIL [ ] 01 [ ] [ ] [ ] [ ] [ ] - [ ] [ ] - [ ] - [ ]

Code	Vessel Class
CE	Standard
At	ATEX
HP*	High Pressure

* Supplied complete with a double bolted clamp

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

Code	Connection Size
B	1" (25.4mm)
Y	1 1/2" (38.1mm)

Code	Connection Type
B[1]	BSPP (G) ISO 228
F[2]	FLANGE ANSI cl. 150
H	FLANGE ANSI cl. 300
L	EN 1092-1 PN16
N[1]	NPT (F)
T[1][3]	Tri-Clamp

[1] Only available in 1" connection
[2] Not suited for High Pressure Vessels. HP Vessels to use ANSI RF 300.
[3] Only available with 'C' Style cartridge configuration

Code	Cartridge
B	DOE
C	226
D	222

Code	Seal
E	EPDM
P*	PTFE
S	Silicone
V	Viton/FKM

* Double bolted clamp required

Code	Vent
B	1/4"BSPP / G1/4"
N	1/4"NPT
X[3]	No Vent

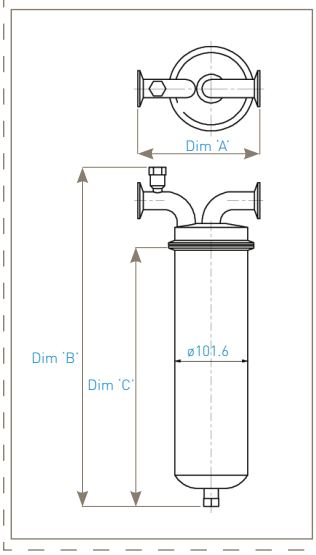
[3] Only available with 'C' Style cartridge configuration

Code	Drain
B	1/4"BSPP / G1/4"
N	1/4"NPT

Code	Surface	Internal	External
E	Standard Electropolished	Electropolished	0.8µm
I	Standard	As welded	0.8µm

Code	Tagged
T	Yes
X	No

For tagged options customer identification numbers required at time of ordering



C Style Locator

Important Note:
As shown on the coding chart above, the HIL is also available with an option 'C' (226) location. This design incorporates a machined, not cast, head and swept bend connections, as show in the diagram.

Bowl Height	Dimensions (mm) 'A'	'B'	'C'
250 mm (10")	196 mm (7.7")	429 mm (16.9")	297 mm (11.7")
500 mm (20")	196 mm (7.7")	679 mm (26.7")	550 mm (25.4")
750 mm (30")	196 mm (7.7")	924 mm (36.4")	814 mm (32.0")
1000 mm (40")	196 mm (7.7")	1174 mm (46.2")	1058 mm (41.7")

Dimensions based on C Style with no vent and 1 inch BSPP connection

Tri-Clamp® is a trademark of Alfa-Laval, Inc.

Note: All Tri-Clamp® connections conform to BS4825 Pt. 3

HIL Multi Filter Housings

Industrial Liquid

- Flow efficient range of multi element industrial liquid housings.
- Designed specifically for prefiltration and clarification applications.
- Available with a number of inlet/outlet port connections.
- Standard and electropolished surface finishes.
- Suitable for cartridge types:
  - DOE or 222 (10¨to 40¨)
- Option for ATEX compliance.

Features	Benefits
CE, ATEX, HP version available.	Certified for a wide range of applications.
A number of inlet / outlet port options available.	Flexible installation.
Economic design.	Low capital cost.

APPLICATIONS

- ✓ Water prefiltration
- ✓ PED Group 2 (harmless) liquids

Specifications

Materials of Construction Standard Range:

Housing:	316L Stainless Steel
Seal material:	EPDM FDA Silicone FDA Viton / FKM FDA
Clamps:	304 Stainless Steel

Surface Finish Two finishes available:

Standard finish 'I'	
Internal	As welded Pickled and passivated
External	Polished 0.8µm Ra (32µln Ra)

Electropolished finish 'E'	
Internal	As welded Electropolished
External	Electropolished 0.8µm Ra (32µln Ra)

Welding:
All assembly welds are full penetration.
All welds are crevice and undercut free.
Weld finish and detail drawings available upon request.

Certification:
Supplied as standard with vessel inspection certificate and EU Declaration of conformity.

Material Test Certification:
EN10204 3.1 supplied upon request.

Directives:
Housings designed in accordance with the European Council Pressure Equipment Directive (PED).
ATEX (where applicable).

Design Basis:
ASME VIII Division 1.

Approvals:
EAC 010-2011, (No. TC N RU D-GB. Ай 01.B.00512)
Approval type: Import Certificate, TR CU Pressure Equipment (available on request)

EAC

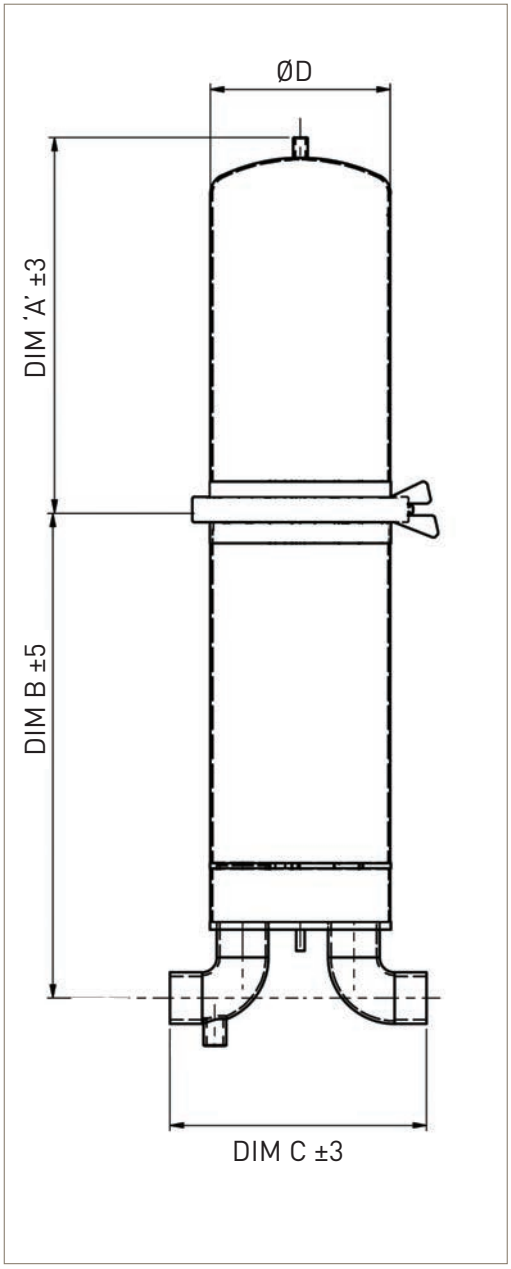
HIL Multi Filter Housings

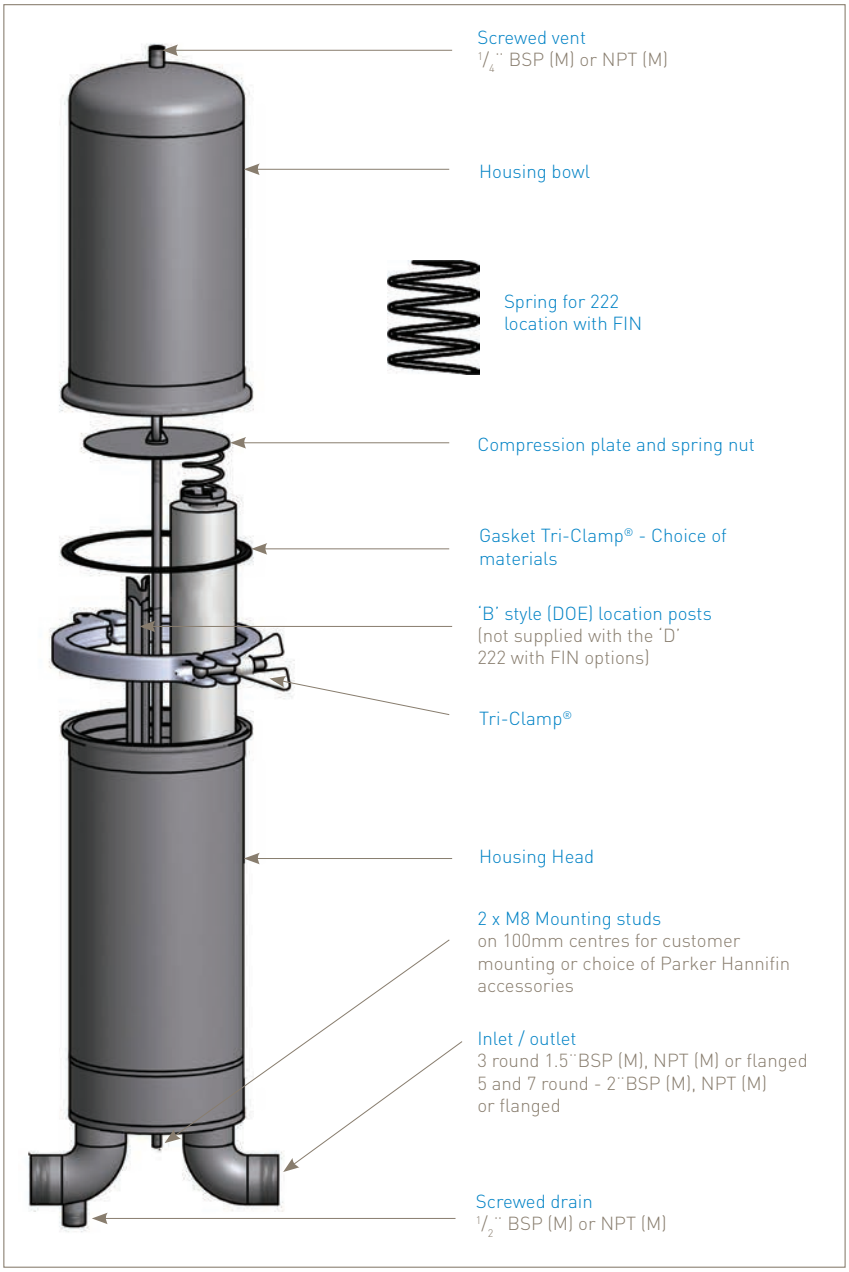
Industrial Liquid

CE Working Condition PED			Maximum Pressure +FV		
Fluid Group	State	Temperature	3 Round	5/7 Round	8/10 Round
Non Dangerous	Liquid	-10 °C (14 °F) to 150 °C (302 °F)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Non Dangerous	Gas		8 barg (116 psig)	4 barg (58 psig)	3 barg (44 psig)
PED Conformity Assessment Category			CAT I	CAT I	CAT I

ATEX Working Condition PED			Maximum Pressure +FV		
Fluid Group	State	Temperature	3 Round	5/7 Round	8/10 Round
Non Dangerous	Liquid	-10 °C (14 °F) to 135 °C (275 °F)	10 barg (145 psig)	10 barg (145 psig)	10 barg (145 psig)
Non Dangerous	Gas		8 barg (116 psig)	4 barg (58 psig)	3 barg (44 psig)
PED Conformity Assessment Category			CAT I	CAT I	CAT I

Note: All housings are full vacuum rated.



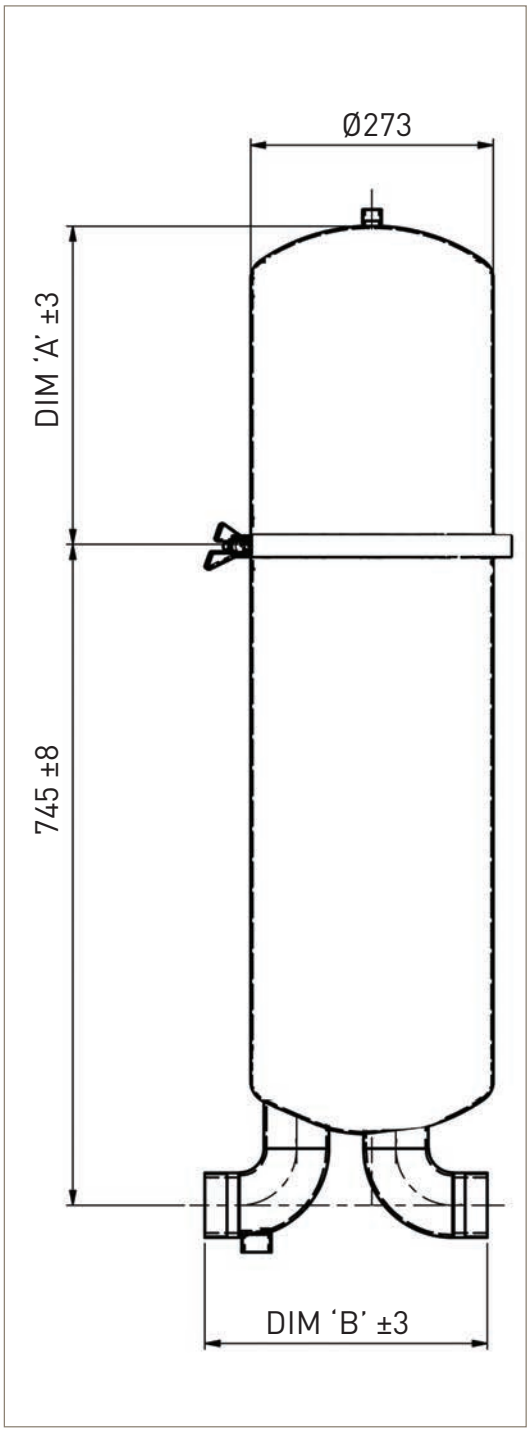


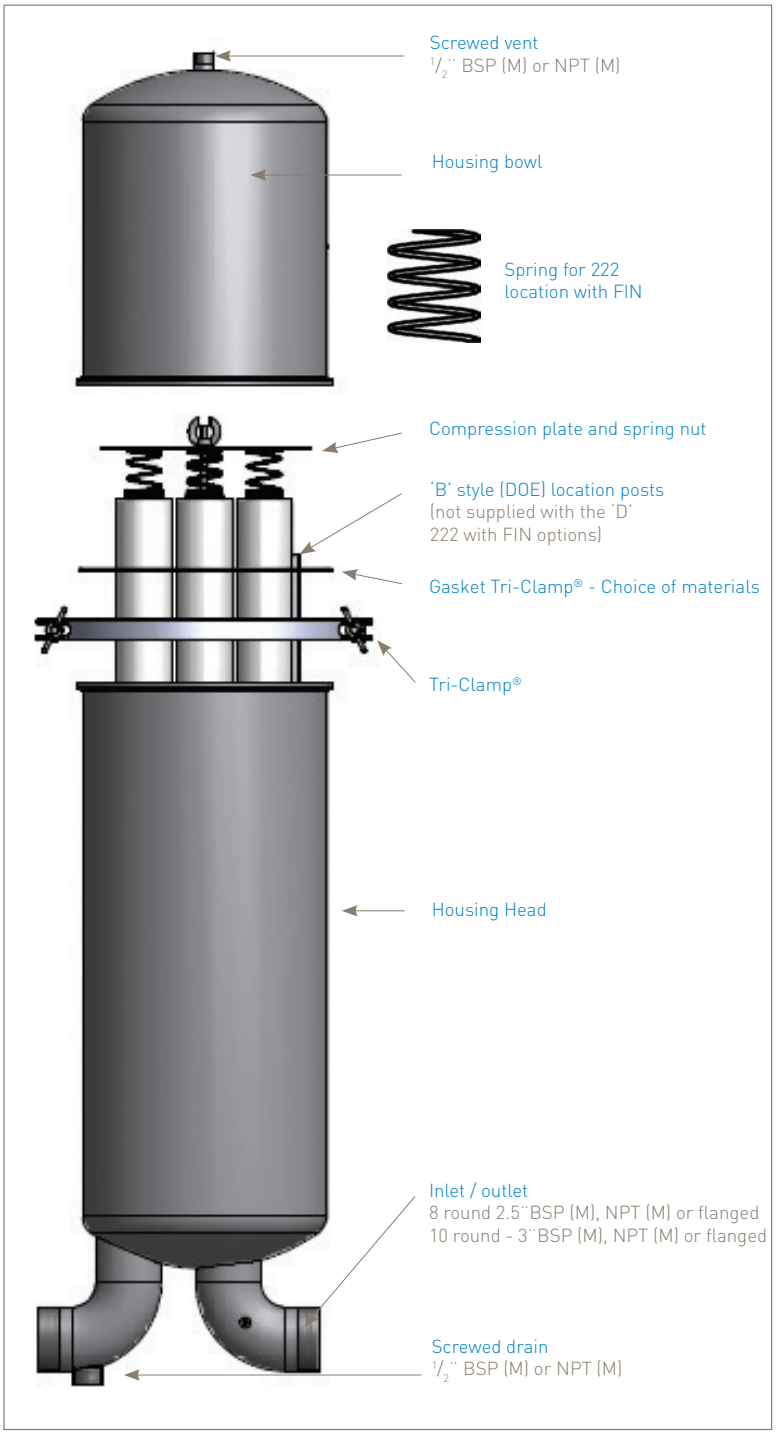
Refer to coding structure for configuration options.

		Dimensions						Approximate weight and volume		
		A'	B'	C' BSP (M)	C' NPT (M)	C' FLANGED	'D'	BOWL	TOTAL (Threaded version only)	VOLUME
3 ROUND	10"	101 mm (4.0 in)	455 mm (17.9 in)	230 mm (9 in)	230 mm (9 in)	294 mm (11.6 in)	168 mm (6.6 in)	2.0 kg (4.4 lbs)	8.9 kg (21.0 lbs)	10.4 L (2.75 USg)
	20"	348 mm (13.7 in)						4.0 kg (8.8 lbs)	11.0 kg (24.0 lbs)	15.7 L (4.15 USg)
	30"	598 mm (23.5 in)						6.0 kg (13.2 lbs)	13.1 kg (29.9 lbs)	21.0 L (5.5 USg)
	40"	848 mm (33.4 in)						8.0 kg (17.6 lbs)	15.2 kg (33.5 lbs)	26.3 L (6.8 USg)
5 & 7 ROUND	10"	109 mm (4.3 in)	468 mm (17.7 in)	296 mm (11.7 in)	296 mm (11.7 in)	347 mm (13.7 in)	219 mm (8.6 in)	1.6 kg (3.5 lbs)	12.9 kg (28.0 lbs)	18.0 L (4.6 USg)
	20"	360 mm (14.2 in)						4.4 kg (9.7 lbs)	15.7 kg (35.0 lbs)	27.0 L (7.0 USg)
	30"	610 mm (24.0 in)						7.1 kg (15.6 lbs)	18.4 kg (41.0 lbs)	36.0 L (9.3 USg)
	40"	860 mm (33.9 in)						9.8 kg (21.6 lbs)	21.1 kg (46.5 lbs)	45.0 L (11.7 USg)

HIL Multi Filter Housings

Industrial Liquid





Refer to coding structure for configuration options.

		Dimensions				Approximate weight and volume		
		A'	B'			BOWL	TOTAL (Threaded version only)	VOLUME
			BSP (M)	NPT (M)	FLANGED			
8 ROUND	20" 30" 40"	107 mm (4.2 in) 357 mm (14 in) 607 mm (24 in)	316 mm (12.4 in)	332 mm (13.1 in)	356 mm (14 in)	2.2 kg (5.0 lbs) 5.7 kg (12.5 lbs) 9.0 kg (20 lbs)	20.0 kg (44.0 lbs) 23.5 kg (52.0 lbs) 27.0 kg (60.0 lbs)	42.0 L (11.1 USg) 56.0 L (14.8 USg) 69.0 L (18.2 USg)
10 ROUND	20" 30" 40"	107 mm (4.2 in) 357 mm (14 in) 607 mm (24.0 in)	410 mm (16.1 in)	410 mm (16.1 in)	382 mm (15 in)	2.2 kg (5.0 lbs) 5.6 kg (12.3 lbs) 9.0 kg (20 lbs)	22.2 kg (49.0 lbs) 25.6 kg (56.4 lbs) 29.0 kg (63.9 lbs)	45.0 L (11.9 USg) 59.3 L (15.7 USg) 73.5 L (19.4 USg)

HIL Multi Filter Housings

Industrial Liquid

STANDARD Range - 10¨ to 30¨

	Connection	Code	Max Flow	
HIL **03	1.5¨Connections	Y	175 L/min	45 USg/min
HIL **05 /07	2¨Connections	C	280 L/min	72 USg/min
HIL **08	2.5¨Connections	X	420 L/min	109 USg/min
HIL **10	3¨Connections	D	650 L/min	168 USg/min

HIL

Code	Vessel Class
CE	PED
AT	PED +ATEX

Code	Round
03	3
05	5
08	8

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

Code	Nozzle
Y	1.5¨
C	2.0¨
X	2.5¨

Code	Connection Size
B[1]	BSP (M) ISO 7
N[2]	NPT Male
F	ANSI RF150
L[1]	EN1092-1 PN16

Connection Type
1 - Only available with BSP(M) drain
2 - Only available with NPT(M) drain

Code	Cartridge
B	DOE
D	222

Code	Seal
E	EPDM
S	Silicone
V	Viton / FKM

Code	Vent
B	BSP (M) / ISO 7
N	NPT (M)

Code	Drain
B	BSP (M) / ISO 7
N	NPT (M)

Vent and Drain Sizes
3 and 5 round: 1/4¨ vent, 1/2¨ drain
8 round 1/2¨ vent, 1/2¨ drain

Code	Surface finish
I	Pickled and passivated
E	Electropolished

Code	Tagged
X	Not tagged
T	Tagged

Code	Packing
C	Carton
E	Wood crate

Only 62 and 64 mm diameter cartridges can be used in the 7 and 10 round housings.

HIL

Code	Vessel Class
CE	PED
AT	PED +ATEX

Code	Round
07	7
10	10

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

Code	Nozzle
C	2.0¨
D	3.0¨

Code	Connection Size
B[1]	BSP (M) ISO 7
N[2]	NPT Male
F	ANSI RF150
L[1]	EN1092-1 PN16

Connection Type
1 - Only available with BSP(M) drain
2 - Only available with NPT(M) drain

Code	Cartridge
B	DOE
D	222

Code	Seal
E	EPDM
S	Silicone
V	Viton / FKM

Code	Vent
B	BSP (M) / ISO 7
N	NPT (M)

Code	Drain
B	BSP (M) / ISO 7
N	NPT (M)

Vent and Drain Sizes
3 and 5 round: 1/4¨ vent, 1/2¨ drain
8 round 1/2¨ vent, 1/2¨ drain

Code	Surface finish
I	Pickled and passivated
E	Electropolished

Code	Tagged
X	Not tagged
T	Tagged

Code	Packing
C	Carton
E	Wood crate

Notes:
3, 5 and 7 Round housings available for use with 10¨to 40¨cartridges
8 and 10 Round housings available for use with 20¨to 40¨cartridges (diameter <64mm)

Delivery schedules (excluding shipping)

Blue Options - 2-3 working weeks
Orange Options - 4-5 working weeks

Viton™ is a registered trademark of DuPont Performance Elastomers L.L.C.
Tri-Clamp® is a registered trademark of Alfa-Laval, Inc.
Note: All Tri-Clamp® Connections conform to BS4825 Pt.3

HIL Multi Filter Housings

Industrial Liquid

Accessories

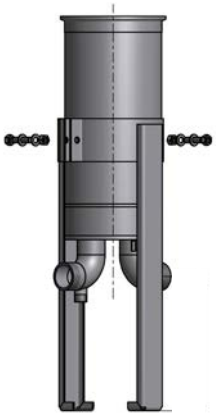
Adjustable legs.
Accessory Kit

3 round
639504203 (XLGSS12IL1)

5 and 7 round
639504204 (XLGSS12IL2)

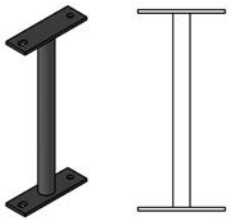
8 and 10 round
639504205 (XLGSS13IL1)

Adjustable legs giving centre to floor height adjustment between 50 and 375 mm for 3, 5 and 7 round and 50-300 mm for 8 and 10 round. (clearance required for drain)

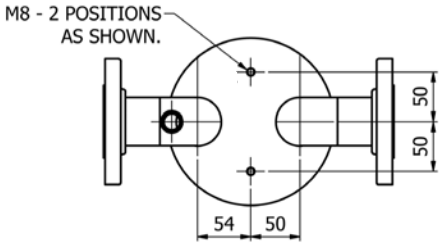


Fixed legs.
Accessory Kit
3, 5 and 7 round only
639504206 (XLGSS12IL3)

Fixed base support for M8 mounting studs giving centre to floor height of 230 mm. Vessel to be properly supported on the pipework as close as possible to the inlet/outlet.

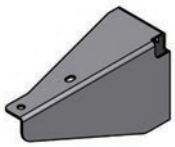


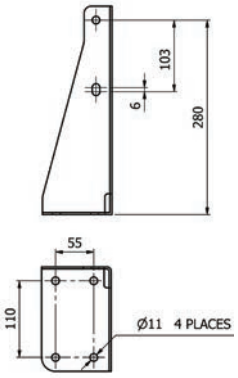
Customer mounting, 3, 5 & 7 round only.
Two M8 mounting studs are provided as shown to allow the customer to custom mount the housing as they require, alternatively we provide accessories shown.



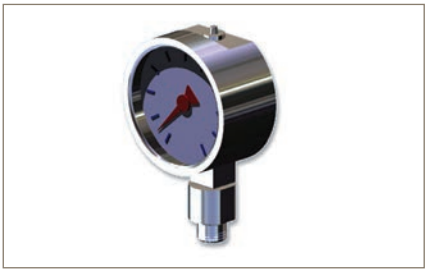
Note A
Gap available for 50 mm (2 inch) wide support.

Wall mounting, 3, 5 & 7 round only.
Accessory Kit - 639504207 (XMBSS12IL1)
Wall mounting bracket. Customer to ensure wall strength and if necessary provide a backing plate.

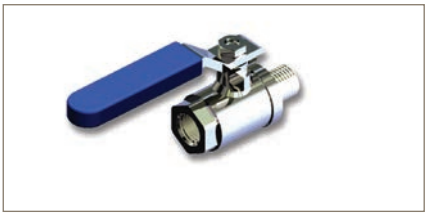




HIL Pressure Gauge			
Type	**Connection**	**Pressure**	**Ordering Code**
All stainless steel wetted parts with glycerine fill fluid (includes adapter for assembly to housing. Also includes adaptor for connecting vent valve ($^1/_4$" BSP(F) / $^1/_4$" NPT (F))	$^1/_4$" / $^1/_2$" BSP	0 - 10 barg	639504201 (XPGSS03BS01)
	$^1/_4$" / $^1/_2$" NPT	0 - 10 barg	639504202 (XPGSS03NP01)

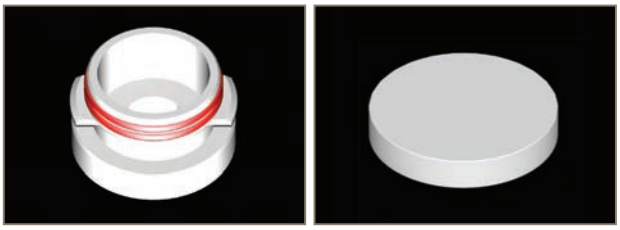


Industrial 1 Piece Ball Valve		
Type	**Connection**	**Ordering Code**
316 stainless steel 1 piece ball valve with PTFE ball. Female / female.	$^1/_4$" BSP	639502594 (XVASS03BS6)
	$^1/_4$" NPT	639504220 (XVASS03NP1)
	$^1/_2$" BSP	639502595 (XVASS04BS1)
	$^1/_2$" NPT	639504221 (XVASS04NP2)

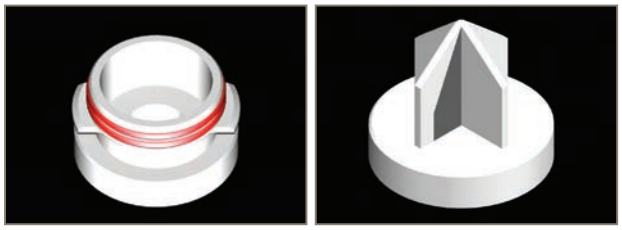


Parker domnick hunter

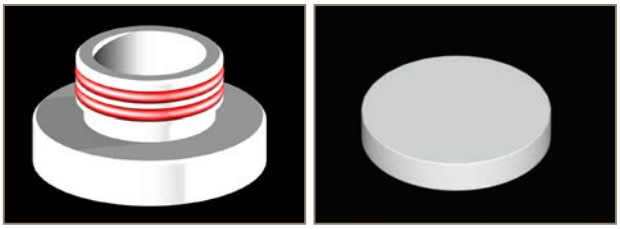
End Cap Styles



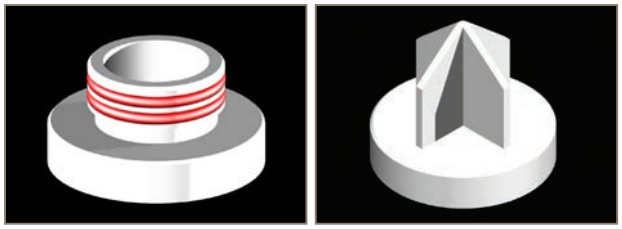
(2) BS226 and Flat



(7) BS226 and Spear



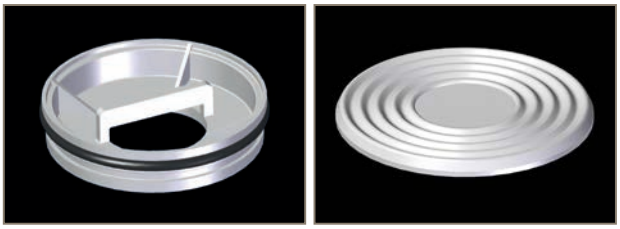
(3) BS222 and Flat



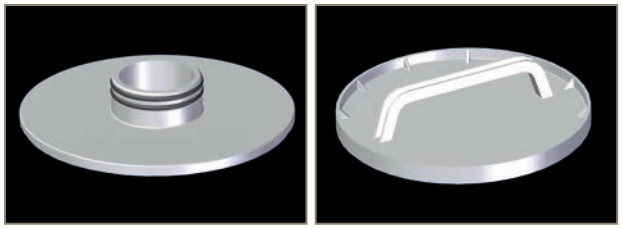
(8) BS222 and Spear

(9) BS213 and Flat

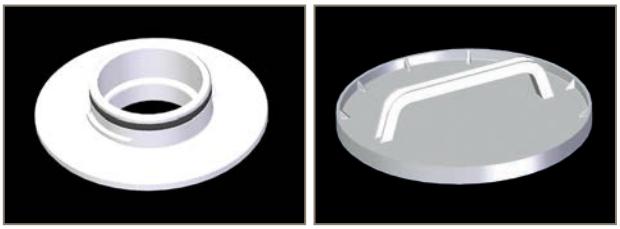
(0) DOE



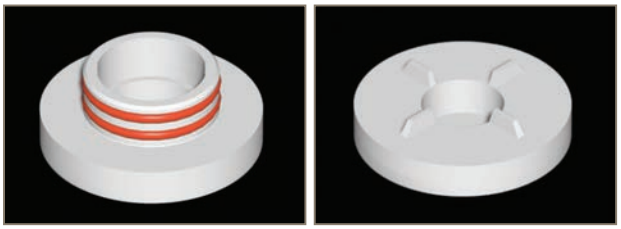
Parmax-R 435 o-ring flat cap with handle



Maxguard 226 o-ring flat cap with handle



Maxguard HF+ 338 bayonet o-ring flat cap with handle



R222 o-rings / Recessed blank

Cross reference end cap chart				
Parker domnick hunter	PA	MI	SA	AM
0	MCY 10¨	F	23	
2	2			
3	3	0	27	
7	7	7	25	
8	8	5	26	
9				9R

End cap code equivalents used in this catalogue		
BS 226 / Flat	2	SC
BS 226 / Spear	7	SF
BS 222 / Flat	3	TC
BS 222 / Spear	8	TF
BS 213 / Flat	9	PR
DOE	0	DO, XX

Chemical Compatibility

NC = Not Compatible LC = Limited Compatibility C = Compatible - = No Data	SPUNFLOW QA	SPUNFLOW QN	PROBOND	TEXFLOW (PP)	POLYFLOW II	POLYFLOW II G	MAXGUARD (SERIES)	PARMAX-R	CARBOFLOW MX	NITRILE	EPDM	VITON	SILICONE
Acetic acid 3.5N	C	C	-	C	C	C	C	C	C	LC	C	C	C
Acetic acid 8.75N	C	C	-	C	C	C	C	C	C	LC	LC	LC	NC
Acetic acid conc 17.5N	C	C	-	C	C	C	C	C	C	LC	LC	NC	NC
Acetone	C	C	-	C	C	C	C	C	C	NC	NC	NC	NC
Acetonitrile	C	C	-	C	C	C	C	C	C	NC	NC	NC	NC
Ammonium Hydroxide 8N	C	C	-	C	C	C	C	C	C	NC	C	C	C
Ammonium Oxalate 0.07N	C	C	-	C	C	C	C	C	C	NC	C	C	C
Amyl Acetate	C	C	NC	C	C	C	C	C	C	NC	NC	NC	LC
Aqueous Ammonia 15.5N	C	C	-	C	C	C	C	C	-	LC	C	C	C
Butan-1-ol	C	C	LC	C	C	C	C	C	C	LC	C	C	C
Butan-2-ol	C	C	LC	C	C	C	C	C	C	LC	LC	C	C
Carbon Tetrachloride	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	C	NC
Chloroform	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	LC	NC
Cyclohexane	NC	NC	-	NC	NC	NC	NC	NC	NC	LC	NC	NC	NC
Ethanol	C	C	-	C	C	C	C	C	C	LC	C	C	LC
Ethanol 45%	C	C	-	C	C	C	C	C	C	LC	C	C	C
Ethyl Acetate	LC	LC	NC	LC	LC	LC	LC	LC	NC	N	C	NC	LC
Formic acid conc.	C	C	-	C	C	C	C	C	LC	LC	C	NC	NC
Glycerol	C	C	LC	C	C	C	C	C	C	C	C	C	C
Hexane	NC	NC	LC	NC	NC	NC	NC	NC	NC	C	NC	NC	NC
Hydrochloric acid 1N	C	C	NC	C	C	C	C	C	C	LC	C	C	C
Hydrochloric acid 10%	-	-	LC	-	-	-	-	-	C	-	-	-	-
Hydrochloric acid Conc	C	C	-	C	C	C	C	C	LC	NC	NC	NC	NC
Hydrochloric acid conc. 13%	-	-	LC	-	-	-	-	-	C	NC	NC	NC	NC
Hydrogen Peroxide	C	C	LC	C	C	C	C	C	C	NC	C	C	C
Hydrogen Peroxide 10 Vol	C	C	LC	C	C	C	C	C	C	NC	C	C	C
Hydrogen Peroxide 100 Vol	C	C	LC	C	C	C	C	C	C	NC	C	C	C
Methanol	C	C	-	C	C	C	C	C	C	C	C	NC	C
Methyl-Iso-Butylketone	C	C	NC	C	C	C	C	C	NC	NC	NC	NC	LC
Methylene Chloride @ 40°C (104°F)	LC	LC	-	LC	LC	LC	LC	LC	NC	NC	-	-	-
Nitric Acid 2N 14.4%	C	C	LC	C	C	C	C	C	C	NC	LC	C	C

NC = Not Compatible
LC = Limited Compatibility
C = Compatible
- = No Data

	SPUNFLOW QA	SPUNFLOW QN	PROBOND	TEXFLOW (PP)	POLYFLOW II	POLYFLOW II G	MAXGUARD (SERIES)	PARMAX-R	CARBOFLOW MX	NITRILE	EPDM	VITON	SILICONE
Nitric acid 15.8N	C	C	NC	C	C	C	C	C	LC	NC	NC	NC	NC
Ozone	-	-	NC	-	-	-	-	-	NC	NC	-	-	-
Paraffin yellow	C	C	C	C	C	C	C	C	C	LC	NC	C	NC
Pentane	LC	LC	-	LC	LC	LC	LC	LC	NC	C	NC	C	NC
Perchloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum spirits	NC	NC	-	NC	NC	NC	NC	NC	NC	NC	NC	C	NC
Phenol (aq) (0.5N)	-	-	-	-	-	-	-	-	LC	-	-	-	-
Phenol 5%	C	C	-	C	C	C	C	C	LC	-	C	C	C
Phenol 0.25%	C	C	-	C	C	C	C	C	LC	NC	C	C	C
Polyethylene Glycol 600	C	C	-	C	C	C	C	C	-	-	-	-	-
Potassium Dichromate 0.1N	C	C	LC	C	C	C	C	C	C	C	C	C	C
Potassium Iodine 0.6N	C	C	-	C	C	C	C	C	C	C	C	C	C
Potassium Hydroxide 10N	C	C	-	C	C	C	C	C	C	LC	C	C	C
Potassium Permanganate 0.1N	C	C	LC	C	C	C	C	C	C	LC	C	C	C
Propan-1-ol	C	C	C	C	C	C	C	C	C	C	C	C	LC
Propan-2-ol	C	C	C	C	C	C	C	C	C	LC	C	C	LC
Pyridine	C	C	LC	C	C	C	C	C	C	NC	C	NC	C
Sodium Chloride 0.5N	C	C	LC	C	C	C	C	C	C	C	C	C	C
Sodium Hydroxide 2N,8%	C	C	-	C	C	C	C	C	C	C	C	C	C
Sodium Hydroxide 7N,28%	C	C	-	C	C	C	C	C	C	C	C	C	LC
Sodium Hypochlorite	-	-	-	-	-	-	-	-	LC	NC	-	-	-
Sodium salts	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium thiosulphate 0.1N	C	C	C	C	C	C	C	C	C	LC	C	C	C
Sulphuric acid 1N	C	C	LC	C	C	C	C	C	C	LC	C	C	C
Sulphuric acid conc.	LC	LC	NC	LC	LC	LC	LC	LC	NC	NC	-	-	-
Sulphurous acid	-	-	LC	-	-	-	-	-	C	LC	-	-	-
Toluene	NC	NC	LC	NC	NC	NC	NC	NC	NC	NC	NC	LC	NC
1,1,1 Trichloroethane	-	-	-	-	-	-	-	-	NC	NC	-	-	-
1,1,2 Trichloroethane	LC	LC	-	LC	LC	LC	LC	LC	NC	NC	NC	LC	LC
Trichloroacetic Acid 80%	C	C	-	C	C	C	C	C	C	-	NC	LC	NC
Trichloroacetic Acid 5N	-	-	-	-	-	-	-	-	C	-	-	-	-
Xylene	NC	NC	LC	NC	NC	NC	NC	NC	NC	NC	C	LC	NC

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.

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 dependent 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 3.

Autoclave
A closed pressure vessel into which steam is introduced (typically at a temperature of 121 - 134 °C (250 - 273 °F)) to sterilize 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.

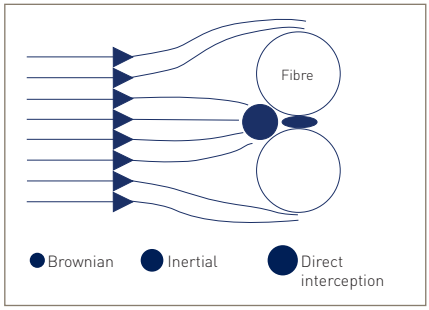
Concentrate
The retained non filtered stream from a crossflow filter system.

Cross flow filtration
A filter characterized by the feed stream traveling 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 characterized 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:

$$(Vmax) = \frac{400 + 400T_1}{(T_2 - 2T_1)}$$

$$FI = (T_2 - 2T_1)$$

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.

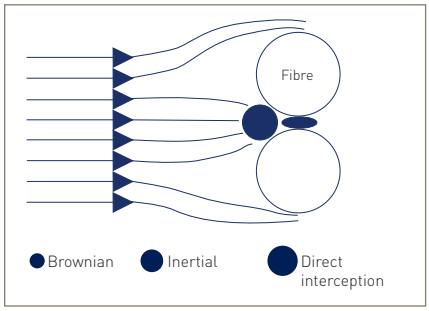
H

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

Media (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

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

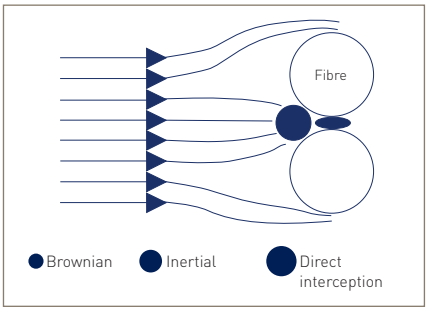
Sanitization
Reduction not elimination of a microbial population to render a fluid/system free from spoilage organisms and increase shelf-life of products.

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).

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 milliliters / 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.

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