

Fulflo® Honeycomb Filter Cartridges

Multi-purpose filtration solutions with wound depth cartridges

Parker has been a leader in filter media innovation and performance since we first invented the Honeycomb™ Filter Tube over 65 years ago. Parker has the world's largest manufacturing capacity for wound cartridges, offering superior quality along with technical, engineering and marketing support.

Effective removal ratings at nominal 90% efficiency from 0.5µm to 150µm.



Benefits

- A broad range of media provide excellent compatibility with a variety of organic solvents, animal, petroleum and vegetable oils
- Optional core covers and end treatments assure fiber migration control
- Multiple length cartridges minimize change-out time, eliminate spacers and are available to fit competitive filter vessels
- FDA grade polypropylene (DOE only) cartridges certified to ANSI/NSF61 standard for contact with drinking water components
- Continuous strand winding geometry provides performance consistency
- One-piece metal extended center core option eliminates the need for cartridge guides in all competitive and Fulflo® multi-cartridge vessels
- A special snap-in extender is available for polypropylene cores
- Cotton, rayon, polypropylene, nylon and polyester materials are FDA listed as acceptable for potable and edible liquid contact according to CFR Title 21
- Various O-ring and end cap options are available

Applications

- Oxidizing Agents
- Concentrated Alkalies
- Potable Liquids & Alkalies
- Mineral Acids
- Organic Acids & Solvents
- Petroleum Oils
- Photo Solutions
- Amines
- Water
- Prefilter for Membranes

Ful o Honeycomb Cartridges

Wound Depth Cartridge Design and Function

Wound cartridges provide true depth filtration utilizing 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 cartridges offer a gradual pressure increase during cartridge life versus surface-type media that have

an abrupt flow cutoff when loaded. In addition, the irregular outer layer reduces surface blinding, assuring both longer cartridge life and full cartridge utilization.

Ultrafine Wound Depth Cartridges for Critical Filtration Applications

Ultrafine cartridges are a unique member of the Honeycomb™ wound depth cartridge family. They are specifically designed for critical filtration applications in the 0.5µm range. When absolute 0.5µm filtration is required, the nominal Ultrafine

cartridge can be used as a prefilter, thereby significantly extending membrane life. Ultrafine cartridges remove 90% of particles larger than 0.5µm in size. This type of filtration provides excellent protection for equipment or processes that must be protected from fine particles.

- Applications include:
- Prefilter for membranes
 - Rinse water in semiconductor manufacturing
 - Fine filtration for ultrasonic parts, washer solvents and other high-purity solvents
 - Prefilter for industrial reverse osmosis equipment

Ultrafine Ordering Information

Filter Medium		Nominal Length		Core Material		Core Cover Material		End Cap Configuration		Seal Material	
Code	Description	Code	Size (Inches)	Code	Description	Code	Description	Code	Description	Code	Material
C	FDA Grade Cotton	9-4	9-7/8	None	Tinned Steel	None	No Cover	None	DOE (w/o gaskets)	None	Std. DOE
E	FDA Grade Rayon	10	10	A	Polypropylene	<i>Note: Core cover material is glass paper with polyester overlay.</i>		DO	DOE (w/ gaskets)	A	Polyfoam
M	FDA Grade Polypropylene	19-4	19-1/2	A3	Glass-filled Polypropylene			OB	Std. Open End/ Polypro Spring Closed End	E	EPDM
T	Industrial Grade Polypropylene	20	20	G	304 Stainless Steel			TB	222/Open end/ Polypro Spring Closed End	N	Buna-N
WC	Industrial Grade White Cotton	29-4	29-1/4	S	316 Stainless Steel			TC	222/Closed	S	Silicone
		30	30-3/16	TF	222/Fin			V	Viton®		
		39-4	39			TX	222/Flex fin				
		40	40-3/16			SC	226/Closed				
						SF	226/Fin				
						SX	226/Flex fin				
						XA	Polypro Extender				
						XB	Extended Core Open End/Polypro Spring Closed End				
						XC	Extended Metal				

Specifications are subject to change without notification. For User Responsibility Statement, see www.parker.com/safety

Ful o Honeycomb Cartridges

Wound Cartridge Flow Factors for Aqueous (Water-based) Fluids (psid/gpm @ 1cks)

Rating (µm)	Polypropylene Polyester Nylon	Cotton Rayon	Glass
0.5	0.9924	2.6590	0.5000
1	0.7463	2.0000	0.4211
3	0.3330	0.6250	0.3478
5	0.2381	0.3636	0.1951
10	0.1429	0.1931	0.1430
20	0.0898	0.1075	0.1096
30	0.0704	0.0855	0.0816
50	0.0595	0.0709	0.0678
75	0.0538	0.0645	0.0611
100	0.0500	0.0624	0.0590

Wound Cartridge Flow Factors for Non-Aqueous (Solvent or Oil based) Fluids (psid/gpm @ 1cks)

Rating (µm)	Polypropylene Polyester Nylon	Cotton Rayon	Glass
0.5	1.8350	1.3800	0.5000
1	1.0000	0.7519	0.4211
3	0.5800	0.3003	0.3478
5	0.3003	0.1949	0.1951
10	0.1299	0.1000	0.1430
20	0.0560	0.0350	0.1096
30	0.0200	0.0175	0.0816
50	0.0141	0.0130	0.0678
75	0.0120	0.0100	0.0611
100	0.0080	0.0065	0.0590

Wound Cartridge Nominal Micrometer Ratings

Cartridge Designation									Micron Rating	Compressed Air & Gas Micron Rating
8R	E8R	N8R	U8R	S8R	M8R	R8R	T8R	WC8R	100	15
10R	E10R	N10R	U10R	S10R	M10R	R10R	T10R	WC10R	75	13
11R	E11R	N11R	U11R	S11R	M11R	R11R	T11R	WC11R	50	12
12R	E12R	N12R	U12R	S12R	M12R	R12R	T12R	WC12R	40	-
13R	E13R	N13R	U13R	S13R	M13R	R13R	T13R	WC13R	30	10
15R	E15R	N15R	U15R	S15R	M15R	R15R	T15R	WC15R	20	7
17R	E17R	N17R	U17R	S17R	M17R	R17R	T17R	WC17R	15	5
19R	E19R	N19R	U19R	S19R	M19R	R19R	T19R	WC19R	10	3
21R	E21R	N21R	U21R	S21R	M21R	R21R	T21R	WC21R	7	-
23R	E23R	N23R	U23R	S23R	M23R	R23R	T23R	WC23R	5	2
27R	E27R	N27R	U27R	S27R	M27R	R27R	T27R	WC27R	3	1
39R	E39R	N39R	U39R	S39R	M39R	R39R	T39R	WC39R	1	Less than 1
Ultrafine (C, E, M, T, WC)									0.5	Less than 0.5

Wound Cartridge Length Factors

Length (in)	Length Factor
10	1.0
20	2.0
30	3.0
40	4.0
50	5.0

Flow Rate and Pressure Drop Formulae:

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

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

Notes:

- Clean ΔP is psi differential at start.
- Viscosity is centistokes. Use Conversion Tables for other units.
- Flow Factor is $\Delta P/GPM$ at 1cks for 10 in (or single).
- Length Factors convert flow or ΔP from 10 in (single length) to required cartridge length.

Nominal Removal Ratings:

- @ 90% efficiency from 0.5µm to 150µm

Maximum Recommended Operating Conditions:

- Change Out ΔP : 30psi (2.1bar)
- ΔP @ Ambient Temperature: 60psi (4.1bar)
- Flow Rate: 10gpm (38 lpm) per 10 in. length
- Temperature (See Max. Operating Temp.table)

Dimensions:

- 1 in. ID x 2-⁷/₁₆ OD
- 3 in. to 50 in. lengths

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Fullo Honeycomb Cartridges

Wound Cartridge Baked Glass Fiber Nominal Micrometer Ratings

Cartridge Designation	Liquids	Compressed Air & Gases
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

Note: All glass cartridges have standard glass core cover.

Maximum Operating Temp. @ 35psid

Cartridge Material	304/316 SS Metal Core	Polypropylene Core	Glass-Filled Polypropylene
Cotton	250°F (121°C)	120°F (49°C)	—
Glass	750°F (402°C)	—	—
Nylon	275°F (135°C)	120°F (49°C)	—
Polypropylene	200°F (93°C)	120°F (49°C) [†]	200°F (93°C)
Polyester	275°F (135°C)	120°F (49°C)	—
Rayon	250°F (121°C)	120°F (49°C)	—

Note: Refer to Materials Selection Guide for additional compatibility information.

Ordering Information

Filter Medium		Density		Nominal Length		Core Material		Core Cover Material		End Cap Configuration		Seal Material	
Code	Description	Code	Micron	Code	Size (Inches)	Code	Description	Code	Description	Code	Description	Code	Material
None	Cotton (FDA)	6R	150	3	3	None	Tinned Steel	None	No Cover	None	DOE- Double open end (w/o gaskets)	None	Std. DOE
E	FDA Grade Rayon	8R	100	4	4	A	Polypropylene	B	Nylon	DO	DOE (w/ gaskets)	A	Polyfoam
K*	Baked Glass Fiber	10R	75	5	5	A3	Glass-filled Polypropylene	V	Non-woven Polyester	OB	Std. Open End/ Polypro Spring Closed End	E	EPDM
M	FDA Grade Polypropylene	11R	50	6	6	G	304 Stainless Steel	W	Cellulosic Paper	TB	222/Open End/ Polypro Spring Closed End	N	Buna-N
N	Nylon (FDA)	12R	40	7	7	S	316 Stainless Steel	Y	Polypropylene	TC	222/Closed	S	Silicone
R	Rayon	13R	30	8	8	SR	Passivated 316 Stainless Steel (Special Order)			TF	222/Fin	V	Viton®
S	Polyester (FDA)	14R	25	9-4	9-7/8					TX	222/Flex fin		
T	Industrial Grade Polypropylene	15R	20	10	10					SC	226/Closed		
U	Natural Cotton	17R	15	19-4	19-1/2					SF	226/Fin		
UK	Unbaked Glass Fiber	19R	10	20	20					XA	Polypro Extender		
WC	White Cotton	21R	7	29-4	29-1/4					XB	Extended Core Open End/ Polypro Spring Closed End		
		23R	5	30	30-3/8					XC	Extended Metal		
		27R	3	39-4	39								
		39R	1	40	40-3/8								
				50	50								

End Treatment	
Code	Description
None	No Treatment
D	Sodium Silicate
L	Laquer
M	Singed

Packaging Options	
Code	Description
Z	Individual Poly Bag
TIS	Tissue Wrap

Nominal Cartridge Diameter	
Code	Description
None	1" ID x 2-7/16" OD
-2	1" ID x 2-1/16" OD
-45	1" ID x 4-1/2" OD (9-7/8" and 20" length only) for Fullo LTG and Ametek Big Blue Vessels

*Poly wrap packaging is standard. Additional pricing applies for other packaging options.