

Fulflo® Honeycomb™ Filter Cartridges

- Acetate
- Cotton
- Food and Drug Grade Rayon
- Glass Fiber
- Polyester
- Food and Drug Grade Polypropylene
- Industrial Grade Polypropylene
- Rayon
- Nylon

Wound Depth Series

Multipurpose Filtration Solutions With Parker's Wound Depth Cartridges

Parker Process Filtration has been a leader in filter media innovation and performance since we first invented the Honeycomb™ Filter Tube over 50 years ago. Parker has one of the world's largest manufacturing plants for wound cartridges, offering superior quality along with technical, engineering and marketing support.

Effective removal ratings at nominal 90% efficiency from 100µm to 0.5µm range.

Applications

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



Features and Benefits

- A broad range of media providing excellent compatibility with a variety of organic solvents, animal, petroleum and vegetable oils.
- Optional core covers available on selected cartridges assure fiber migration control.
- Multiple length cartridges minimise change out time, eliminate spacers and are available to fit competitive filter vessels.
- One-piece extended center core option eliminates the need for cartridge guides in all competitive and Fulflo® multicartridge housings.
- Special density and cartridge dimension requirements are available.
- Cotton, rayon, polypropylene, polyester and acetate materials are FDA listed as acceptable for potable and edible liquid contact according to CFR Title 21.
- Extended center cores are available in tinned steel, 316 stainless steel and 304 stainless steel.
- A special snap-in extender is available for polypropylene cores.
- Various O-ring and end cap options are available.

Process Filtration Division

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Wound Depth Cartridge Design Function

Wound cartridges offer a gradual pressure increase during cartridge life versus surface-type media that have an abrupt flow cutoff when loaded. All wound cartridges provide true depth filtration utilising hundreds

of tapered filtering passages of controlled size and shape. As the cartridge is wound, each layer of roving is napped to increase filtration capabilities. The result, each layer of roving contributes to true depth

filtration by trapping its share of particles. In addition, the irregular outer surface reduces surface blinding, assuring both longer cartridge life and full cartridge utilisation.

Unique Ultrafine Wound Depth Cartridges for Critical Filtration Applications

Included in the Honeycomb™ wound depth cartridge family is a unique filter cartridge specifically designed for critical filtration applications in the 0.5µm range. Where absolute 0.5µm filtration is required, the Ultrafine cartridge can be used as a prefilter, thereby significantly extending membrane life. Ultrafine cartridges remove

99% of test contaminants with 39% distribution of particles in the 0.5µm range (AC Fine Dust). This type of filtration provides excellent protection for equipment or processes that must be protected from fine particles. Laboratory testing concluded that 90% of micro-organism contamination is removed with ultrafine filtration.

Suggested applications include:

- Prefilter for membranes
- Fine filtration of photoresists for the semiconductor industry
- Rinse water in semiconductor manufacturing
- Fine filtration for ultrasonic parts, washer solvents and other high-purity solvents
- Prefilter for industrial reverse osmosis equipment

Ultrafine cartridges are offered in Cotton (C), Rayon (E), Acetate (W), FDA Grade Polypropylene (M) and Industrial Grade Polypropylene (T). Available core options are 316 Stainless (S) or Polypropylene (A) and are available in 10, 20 and 30 in lengths. Desired combination can be ordered from cartridge symbols shown below:

Length (in) (mm)		Core Material	Cotton	Rayon	Acetate	FDA Grade Polypropylene	Industrial Grade Polypropylene
10	254	(S) 316 Stainless or (A) Polypropylene	C10S C10A	E10S E10A	W10S W10A	M10S M10A	T10S T10A
20	508	(S) 316 Stainless or (A) Polypropylene	C20S C20A	E20S E20A	W20S W20A	M20S M20A	T20S T20A
30	762	(S) 316 Stainless or (A) Polypropylene	C30S C30A	E30S E30A	W30S W30A	M30S M30A	T30S T30A

■ **Wound Cartridge Flow Factors for Aqueous (Water Based) Fluids (m bard – l/min @ 1 cks)**

Rating (μm)	Polypropylene Polyester Nylon	Cotton Rayon Acetate	Glass
1	13.4	36.00	9
3	5.9	11.25	7.6
5	4.3	6.54	6.3
10	2.6	3.48	3.5
20	1.6	1.94	2
30	1.27	1.54	1.5
50	1.07	1.27	1.2
75	0.97	1.16	1.1
100	0.90	1.12	1.1

■ **Wound Cartridge Flow Factors for Nonaqueous (Solvent or Oil Based) Fluids (m bar – l/min @ 1 cks)**

Rating (μm)	Polypropylene Polyester Nylon	Cotton Rayon Acetate	Glass
1	18.00	13.53	9
3	10.44	5.41	7.6
5	5.4	3.51	6.3
10	2.34	1.80	3.5
20	1.00	0.63	2
30	0.36	0.31	1.5
50	0.25	0.23	1.2
75	0.22	0.18	1.1
100	0.14	0.12	1.1

■ **Wound Cartridge Length Factors**

Length (mm)	Length Factor
102	0.4
254	1.0
508	2.0
762	3.0
1016	4.0

Flow Rate and Pressure Drop Formulas:

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

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

Notes:

1. **Clean ΔP** is m bar differential at start.
2. **Viscosity** is centistokes.
Use Conversion Tables for other units.
3. **Flow Factor** is m bard/l/min at 1 cks for 254mm (or single).
4. **Length Factors** convert flow or ΔP from 254mm (single length) to required cartridge length.

■ **Wound Cartridge Nominal Micrometer Ratings**

Cartridge Designation	Rating (μm)	Compressed Air and Gas Micron Rating
8R, E8R, W8R, N8R, U8R, S8R, M8R, R8R, T8R, WC8R	100	15
10R, E10R, W10R, N10R, U10R, S10R, R10R, T10R, M10R, WC10R	75	13
11R, E11R, W11R, N11R, U11R, S11R, M11R, R11R, T11R, WC11R	50	12
12R, E12R, W12R, N12R, U12R, S12R, M12R, R12R, T12R, WC12R	40	—
13R, E13R, W13R, N13R, U13R, S13R, M13R, R13R, T13R, WC13R	30	10
15R, E15R, W15R, N15R, U15R, S15R, M15R, R15R, T15R, WC15R	20	7
17R, E17R, W17R, N17R, U17R, S17R, M17R, R17R, T17R, WC17R	15	5
19R, E19R, W19R, N19R, U19R, S19R, M19R, R19R, T19R, WC19R	10	3
21R, E21R, W21R, N21R, U21R, S21R, M21R, R21R, T21R, WC21R	7	—
23R, E23R, W23R, N23R, U23R, S23R, M23R, R23R, T23R, WC23R	5	2
27R, E27R, W27R, N27R, U27R, S27R, M27R, R27R, T27R, WC27R	3	1
39R, E39R, W39R, N39R, U39R, S39R, M39R, R39R, T39R, WC39R	1	Less than 1

Wound Depth Series

Specifications

Nominal Removal Ratings:

- @ 90% efficiency from 100µm to 0.5µm

Recommended Operating Conditions:

- Change Out ΔP: 30 psi (2.1 bar)
- Maximum Operating ΔP @ Ambient Temperature: 60 psi (4.1 bar)

Dimensions:

- 25.4mm ID x 63.5mm OD
762mm to 1270mm lengths

Wound Cartridge Glass Fiber Nominal Micrometer Ratings

Cartridge Designation	Liquids	Compressed Air and 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
K27R	1	<1
K39R	0.5	<1

Maximum Operating Temperature

Cartridge Material	Metal Core	Polypropylene Core	Glass-Filled Polypropylene
Acetate	250°F (121°C)	120°F (49°C)	180°F (82°C)
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)†	180°F (82°C)
Polyester	275°F (135°C)	120°F (49°C)	—
Rayon	250°F (121°C)	120°F (49°C)	—

† 200°F (93°C) if ΔP is limited

Ordering Information

E	13R	10	2	A	V	L	TC	N
Cartridge Code	Density Micron Number Rating (µm)	Nominal Cartridge Length (mm)	Nominal Cartridge Diameter	Core Material	Core Cover Material	End Treatment	End Cap Options	Seal Options
No Symbol = Cotton (FDA)	8R	100	3 = 762	No Symbol = Tinned Steel	No Symbol = No Cover	No Symbol = No Treatment	TC = 222 Closed	N = Buna
E = FDA Grade Rayon	10R	75	4 = 101.6	A = Polypropylene	V = Nonwoven	L = Lacquer	TF = 222 Fin	E = EPR
K = Glass Fibre	11R	50	6 = 152	A3 = Glass-Filled Polypropylene	W = Nonwoven Paper	E = Acetone	SC = 226 Closed	S = Silicone
M = FDA Grade Polypropylene	12R	40	7 = 178	G = 304L Stainless Steel	Y = Polypropylene	D = Sodium Silicate	SF = 226 Fin	V = Viton*
N = Nylon	13R	30	8 = 2032	S = 316 Stainless Steel		M = Singed	XA = Poly Extender	None = DOE
R = Rayon	15R	20	9-4 = 248	SR = Passivated 316 SS (Special Order)			XC = Tinned Steel Extender	
S = Polyester (FDA)	17R	15	10 = 254				GXC = 304L SS Extender	
T = Industrial Grade Polypropylene	19R	10	19-4 = 495				SXC = 316 SS Extender	
U = Natural Cotton	21R	7	20 = 508					
W = Acetate (FDA)	23R	5	29-4 = 743					
WC = White Cotton	27R	3	30 = 762					
	39R	1	39-4 = 990					
			40 = 1016					
			Special Order					
			50 = 1270					

* A trademark of E. I. du Pont de Nemours & Co.

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