



Fulflo® Honeycomb™ Filter Cartridges

- Cotton
- Rayon
- Polyester
- Polypropylene
- Nylon
- Glass

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 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 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 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 changeout 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® multicartridge 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..

Process Filtration Division



Wound Depth Series

Specifications

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

M	10	A	Y	XA
Filter Medium	Nominal Length	Core Material	Core Cover Material	End Cap Configuration
C = FDA Grade Cotton E = FDA Grade Rayon M = FDA Grade Polypropylene T = Industrial Grade Polypropylene WC = Industrial Grade White Cotton	9-4 = 9-7/8 10 = 10 19-4 = 19-1/2 20 = 20 29-4 = 29-1/4 30 = 30-3/16 39 = 39 40 = 40-3/16	No Symbol = Tinned Steel A = Polypropylene A3 = Glass Filled Polypropylene G = 304 Stainless Steel S = 316 Stainless Steel	No Symbol = No Cover B = Nylon V = Nonwoven Polyester W = Cellulosic Paper Y = Polypropylene	None = DOE (without gaskets) - DO = DOE (With Gaskets) - TC = 222/Closed - OB = Std. Open End/Polypro Spring Closed End - TF = 222/Fin - SC = 226/Closed - SF = 226/Fin XA = Polypro Extender - XB = Ex. Core Open End/Polypro Spring Closed End XC = Extended Metal

Specifications

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

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 Nonaqueous (Solvent or Oil Based) Fluids (psid/gpm @ 1 cks)

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 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 ΔP/GPM at 1 cks for 10 in (or single).
- Length Factors** convert flow or ΔP from 10 in (single length) to required cartridge length.

Wound Cartridge Nominal Micrometer Ratings

Cartridge Designation	Rating (µm)	Compressed Air and Gas Micron Rating
8R, E8R, N8R, U8R, S8R, M8R, R8R, T8R, WC8R	100	15
10R, E10R, N10R, U10R, S10R, R10R, T10R, M10R, 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 Depth Series

Specifications

Nominal Removal Ratings:

- @ 90% efficiency from 0.5µm to 150µm

Maximum Recommended Operating Conditions:

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

Dimensions:

- 1 in ID x 2-7/16 OD
- 3 in to 50 in 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
K23R	3	<1
K27R	1	<1
K39R	0.5	<1

Note: All glass cartridges have standard glass core cover.

Maximum Operating Temperature @ 35 psid

Cartridge Material	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 Material Selection Guide for additional compatibility information.

Ordering Information

T	13R	30		A	Y	M	XA		
Filter Medium	Density Number	Micron Rating (µm)	Nominal Cartridge Length (in)	Nominal Cartridge Diameter	Core Material	Core Cover Material	End Treatment	End Cap Configuration	Seal Material
No Symbol = Cotton (FDA)	6R	150	3 = 3	No Symbol =	No Symbol = Tinned Steel	No Symbol =	No Symbol =	None = DOE (without gaskets)	None = Standard DOE
E = FDA Grade Rayon	8R	100	4 = 4	1 in ID x 2-7/16 in OD	A = Polypropylene	No Cover	No Treatment	- DO = DOE (With Gaskets)	A = Poly-ethylene
K = Baked Glass Fiber	10R	75	5 = 5	-2 = 1 in ID x 2-11/16 in OD	A3 = Glass-Filled Polypropylene	B = Nylon	D = Sodium Silicate	- OB = Std. Open End/Polypro Spring Closed End	E = EPR
M = FDA Grade Polypropylene	11R	50	6 = 6	-45 = 1 in ID x 4-1/2 in OD (9-7/8 and 20 in length only) for Fulflo LTG and Ametek Big Blue Vessels	G = 304 Stainless Steel	V = Nonwoven Polyester	L = Lacquer M = Singed	- TC = 222/Closed	N = Buna N
N = Nylon (FDA)	12R	40	7 = 7		S = 316 Stainless Steel	W = Cellulosic Paper		- SF = 226/Fin	S = Silicone
R = Rayon	13R	30	8 = 8		SR = Passivated 316 SS (Special Order)	Y = Polypropylene		XA = Polypro Extender	V = Viton*
S = Polyester (FDA)	14R	25	9-4 = 9-7/8					- XB = Ex.Core Open End/Polypro Spring Closed End	
T = Industrial Grade Polypropylene	15R	20	10 = 10					XC = Extended Metal	
U = Natural Cotton	17R	15	19-4 = 19-1/2						
UK = Unbaked Glass Fiber	19R	10	20 = 20						
WC = White Cotton	21R	7	29-4 = 29-1/4						
	23R	5	30 = 30-3/16						
	27R	3	39-4 = 39						
	39R	1	40 = 40-3/16						
			50 = 50						

Note: Consult factory for other options.

* A trademark of E. I. duPont de Nemours & Co.

Bulletin C-1000
Page 4 of 4

Process Filtration Division

Parker Hannifin Corporation
Process Filtration Division
6640 Intech Boulevard
Indianapolis, Indiana 46278
Toll Free 1-888-C-FULFLO (238-5356)
Telephone (317) 275-8300
Fax (317) 275-8410
http://www.parker.com

