

Wound Filter Cartridges

Multipurpose Filtration Solutions with Cardinal Wound Filter Cartridges

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

Wound Depth Cartridge Design & Function

Wound cartridges provide true depth filtration utilizing thousands 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 longer cartridge life and full cartridge dirt-holding capacity utilization.

Applications

- Photo Solutions
- Potable Liquids
- Edible Oils
- Vegetable Oils
- Petroleum Oils
- Amines
- Organic Acids & Solvents
- Prefilter for RO Membranes
- Water
- Oxidizing Agents
- Concentrated Alkalines



 Made in the USA

Benefits

- Multiple-length cartridges minimize change out time, eliminate spacers and are available to fit any industry standard filter vessel.
- 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 need for cartridge guides in all industry standard multi-cartridge vessels.
- A special snap-in extender is available for polypropylene cores.
- Cotton, rayon, polypropylene, nylon and polyester materials meet FDA regulations for indirect food contact under 21CFR177 (current revision).
- Various O-ring and end cap options are available.



Specifications

Nominal Removal Ratings:	@ 90% efficiency from 0.5 µm to 150 µm
Maximum Recommended Operating Conditions:	
Change out ΔP	35 psi (2.1 bar)
ΔP @ Ambient Temperature	60 psi (4.1 bar)
Flow Rate	Up to 10 GPM per 10 in length
Temperature	(See Temperature Chart)
Dimensions	(R) 1 in ID x 2-7/16 in OD x up to 50 in lengths (BB) 1 in ID x 4 - 1/2 in OD x up to 20 in lengths

Temperature Chart

Cartridge Material	Metal Core	Polypropylene Core	Glass-Filled Polypropylene Core
Cotton	250 deg F (121 deg C)	120 deg F (49 deg C)	-
Glass	750 deg F (402 deg C)	-	-
Nylon	275 deg F (135 deg C)	120 deg F (49 deg C)	-
Polypropylene	200 deg F (93 deg C)	120 deg F (49 deg C)	200 deg F (93 deg C)
Polyester	275 deg F (135 deg C)	120 deg F (49 deg C)	-
Rayon	250 deg F (121 deg C)	120 deg F (49 deg C)	-
Maximum Operating Temperature @ 35 psid			

Note: All glass fiber cartridges (UG, BG) have core cover as standard component (no adder).
 Baked glass fiber (BG) cartridges are individually wrapped (no adder).

Flow Rate and Pressure Drop Formulas

- Flow Rate (GPM) = (Clean ΔP x Length Factor) $\div$ (Viscosity x Flow Factor)
- Clean ΔP = (Flow Rate x Viscosity x Flow Factor) $\div$ (Length Factor)

Table 1: Wound Cartridge Flow Factors (psid/gpm @ 1 cks)

Micron (μ m)	Polypropylene Polyester Nylon		Cotton Rayon		Glass	
	Aqueous	Solvent/Oil	Aqueous	Solvent/Oil	Aqueous	Solvent/Oil
0.5	0.9924	1.8350	2.6590	1.3800	0.5000	0.5000
1	0.7463	1.0000	2.0000	0.7519	0.4211	0.4211
3	0.3330	0.5800	0.6250	0.3003	0.3478	0.3478
5	0.2381	0.3003	0.3636	0.1949	0.1951	0.1951
10	0.1429	0.1299	0.1931	0.1000	0.1430	0.1430
20	0.0898	0.0560	0.1075	0.0350	0.1096	0.1096
30	0.0704	0.0200	0.0855	0.0175	0.0816	0.0816
50	0.0595	0.0141	0.0709	0.0130	0.0678	0.0678
75	0.0538	0.0120	0.0645	0.0100	0.0611	0.0611
100	0.0500	0.0080	0.0624	0.0065	0.0590	0.0590

Table 2: Wound Cartridge Length Factors

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

Table 3: Nominal Micron Ratings Liquids / Gas

Micron (μ m)	Liquids	Compressed Air & Gas	Glass Fiber
0.5	0.5	< 0.5	< 1
1	1	< 1	< 1
3	3	1	< 1
5	5	2	< 1
7	7	-	< 1
10	10	3	< 1
15	15	5	1
20	20	7	3
25	25	-	-
30	30	10	5
40	40	-	7
50	50	12	-
75	75	13	10
100	100	15	10
150	150	-	100+

Definitions

- Clean ΔP is PSI differential at start (cartridge only).
- Viscosity in centistokes. Use conversion tables for other units.
- Flow Factor (Table 1) is ΔP /GPM at 1 cks for each 10 in length.
- Length Factors (Table 2) convert flow or ΔP from 10 in (single length) to required cartridge length.

Ordering Information

Line 1

Line 2

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Line 1

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Series		Materials of Construction		Nominal Micron Ratings Liquids / Gas					Cartridge Diameter		Cartridge Length (in)		
Code	Description	Code	Description	Micron	W	WE	WU	WWX	Code	Code	Description	Code	Description
W	Standard String Wound	P ^{2,3}	Polypropylene	0.5	-	-	X	-	0.5	R	Standard 1 in ID x 2- 7/16 in OD	3	3
		FB	Fibrillated Polypropylene	1	X	X	-	X	1	BB		Large 1 in ID x 4- 1/2 in OD	4
WE	Economy	BC ^{1,2,3}	White Cotton (bleached)	3	X	X	-	X	3				5
WU	Ultrafine	UC ²	Natural Cotton (unbleached)	5	X	X	-	X	5			6	6
WWX	Extended Life SW	BG	Baked Glass Fiber	7	X	-	-	-	7			7	7
		UG	Unbaked Glass Fiber	10	X	X	-	X	10			8	8
		FC ^{1,2,3}	FDA Grade Cotton	15	X	-	-	-	15			9.75	9-3/4
		FE	FDA Grade Polyester	20	X	X	-	X	20			9.8	9-7/8
		FN	FDA Grade Nylon	25	X	X	-	-	25			10	10
		FP ^{2,3}	FDA Grade Polypropylene	30	X	X	-	X	30			19.5	19-1/2
		FR	FDA Grade Rayon	40	X	-	-	-	40			20	20
		Note: 1 WE-Series, 2 WU-Series, 3 WWX-Series		50	X	X	-	-	50			29.25	29-1/4
		75	X	X	-	-	75			30	30-3/16		
		100	X	X	-	-	100			39	39		
		150	X	-	-	-	150			40	40 -3/16		
Note: Order according to Liquids micron rating.													
Call for Custom Length (less than 50 in)													

Line 2

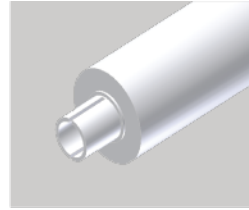
	-		-		-		-				
Core Material		Core Cover Material		End Cap Configuration		End Treatment		Seal		Shrink Wrap	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	For Individually shrink wrapped cartridges add a 'W' to the end of the ordering code.	
GP	Glass-Filled Polypropylene	Blank	None	Blank	None	Blank	None	Blank	None		
P	Polypropylene	B	Nylon	DG*	Double Open End with gaskets	D	Sodium Silicate	B	Buna-N		
SS	304 Stainless Steel	V	Nonwoven Polyester	2C*	222 Open End /Flat Closed End	L	Lacquer	E	EPDM		
16S	316 Stainless Steel	W	Cellulosic Paper	2F*	222 Open End/Fin Closed End	M	Singed	S	Silicone		
16SP	316 Stainless Steel, Passivated (Special Order)	Y	Polypropylene	6C*	226 Open End/Flat Closed End			V	Viton®		
T	Tinned Steel			6F*	226 Open End/Fin Closed End			T	Teflon® Encapsulated Viton®		
				XP	Polypropylene Core Extender			Viton® is a registered trademark of E.I. DuPont de Nemours & Co., Inc.			
				XM	Tinned Steel Core Extender						
				XM	304 SS Core Extender						
				XM	316 SS Core Extender						
				OP	Standard Open End/ Polypropylene Spring Closed End						
				XOP	Extended Core Open End/Polypropylene Spring Closed End						
				Specify	Select from "Seal" Table						
				Call for Special Orders							

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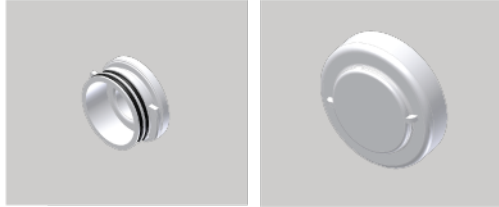
End Configurations



DG - Double Open End (DOE) with Gaskets (DG)



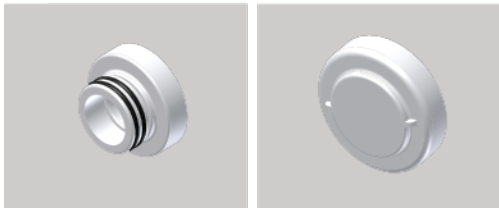
XP, XM - Core Extender



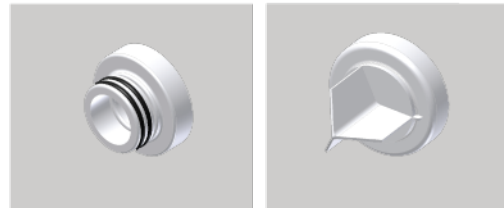
6C - 226 O-Ring Open End / Closed End Flat



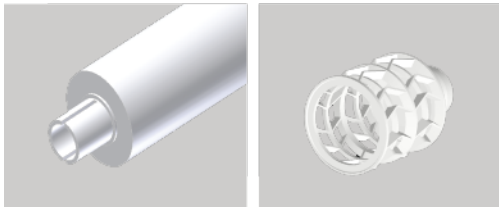
6F - 226 O-Ring Open End / Closed End Fin



2C - 222 O-Ring Open End / Closed End Flat



2C - 222 O-Ring Open End / Closed End Fin



XOP - Extended Core Open End / Closed End
Polypropylene Spring



OP - Gasketed Open End / Closed End
Polypropylene Spring

Many other end configurations are available meeting virtually every industry standard design. Please inquire for your requirements. Minimum order levels may apply.

Example 1: W-P-10-BB-9.8-P Cardinal wound depth filter cartridge industrial grade polypropylene 10 micron 1 in ID x 4-1/2 in OD x 9-7/8 in length polypropylene core without core cover double open end (DOE) without gasket. 120 deg F @ 35 psid. 12/case.

Example 2: W-FP-1-R-10-P-2F-V Cardinal wound depth filter cartridge FDA Grade polypropylene 1 micron 1 in ID x 2-7/16 in OD x 10 in length polypropylene core without core cover 222 O-ring, closed fin end and Viton gasket/o-ring. 120 deg F @ 35 psid. 30/case.