



## WDSS Filter Cartridges

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

### Wound Depth Series

## Multipurpose Filtration Solutions With Clark-Reliance's Wound Depth Cartridges

Clark-Reliance Filtration Group has been a supplier of media and performance since establishing our depth wound element, 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 WDSS 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.



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# Wound Depth WDSS 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 WDSS 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

## 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:

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

## 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

Micron Retention	Liquid Rating	Compressed Air and Gases
150	100 - 150	100+
100	75-100	10
40	40	7
30	30	5
20	20	3
15	15	1
10	10	<1
5	5	<1
3	3	<1
1	1	<1
0.5	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.

# Wound Depth Series

## Ordering Information

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