

# Penguin Wound Filter Cartridges

## Series PF

### Features:

- True Depth Filtration
- Various Core and Wind Material Combinations -- including Pre-leached Fibrillated Polypropylene
- Chemical and Temperature Compatibility
- Wide Choice of Porosities

### Recommended Applications:

- Chemical Processing
- Pharmaceutical
- Electronics/Plating
- Coatings
- Magnetic Coatings
- Photo Emulsions
- Food and Beverage
- Photo Processing
- Oil Patch
- Others



## Why Penguin wound Cartridge Filters?

### 1. Greater Solids Holding Capacity

Penguin's wound cartridge filters are manufactured using a high speed, continuous wind process which creates a superior one-piece filter with hundreds of diamond shaped tunnels that get progressively smaller from the outer diameter to the core. Finer particles are progressively trapped as fluid travels to the center of the filter allowing for much greater retention capacity than that which is associated with straight surface filter media of the same dimensions and porosity. The winding pattern provides 3.5 square feet per 10" cartridge filter. For each 10" filter length there will be approximately 1/2 to 1 lb. retention of solids before replacement becomes necessary. The amount of solids retained depends on the type of solids in the solution as well as the head pressure developed by the pump.

### 2. Wide Choices of Porosities, Lengths and Diameters

Our wound cartridge filters reject particles from as low as 0.5 micron to 150 micron and are available in standard lengths ranging from 3" to 40", or longer on special orders. We offer a standard nominal 1" inside diameter and optional inside diameters of 7/8", 1 3/8", and 30mm. Our standard outside diameter is 2 1/2" with optional outside diameters ranging from 2" to 4 1/2". Thus, you can tailor your filtration system to your specific needs and economics, whether it be for single pass or recirculation filtration.

### 3. Temperature and Chemical Compatibility

Penguin offers a wide selection of wind and core materials so you can select the appropriate combination for your filtration needs. Wind materials include: standard, fibrillated, FDA and utility grade polypropylene, natural cotton, bleached cotton, rayon, polyester, nylon, modacrylic, and heat cleaned glass fiber. Core materials include: polypropylene, tin plated steel, 304 stainless steel, and 316 stainless steel.

### 4. Longer Service Life

Penguin's wound cartridge filters offer true depth filtration with high dirt holding capacity and extremely low media migration. Thus, even when the particle distribution of the contaminant is broad, Penguin filters have excellent dirt holding capacity because of density and structure. Therefore, it is not unusual for a set of cartridges to filter many millions of gallons of fluid before requiring replacement. This means less equipment downtime, extended life for chemical solutions, cleaners, oils, coolants, and liquids, not to mention the savings in labor and materials.

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Mineral Acids	Oxidizing Agents
Organic Solvents	Alkalies
Zinc Chloride	Organic Acids
Caustic Soda	Portable Water
Ferric Hydroxide	Demineralized Water
Planting Solutions	Photographic Solutions
Animal, Petroleum and Vegetable Oils	Ethyl Alcohol
	Pre-membrane Filtration

### Standard Polypropylene

Recommended for concentrated acids and alkalies, strong oxidizing agents, corrosive fluids, and gases. FDA and Non-FDA available -- Consult factory. Easily incinerated to traces of ash. Excellent micro-organism resistance. For use to 200°F.

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### Fibrillated Polypropylene - "Electronic Grade"

Non-migrating slit film polypropylene free of extractables recommended for use in ultra-pure liquids, electronics, and plating where non-leaching is critical. No extractables or sizing agents present. Chemical resistance equal to standard polypropylene. Low moisture adsorption and outstanding abrasion resistance. Lowest static propensity of any man-made fiber. High dry or wet strength.

Strong Acids	Diluted Acids
Concentrated Alkalies	Animal, Petroleum and Vegetable Oils
Oxidizing Agents	
Organic Acids	

### Modacrylic

For strong acids, concentrated alkalies, and oxidizing agents. For use to 200°F. Not recommended for organic solvents.

Organic Solvents	Organic Acids
Alkalies	Animal, Petroleum and Vegetable Oils
Dilute Acids	
Strong Acids	

### Polyester

Chemical resistance similar to polypropylene, with higher temperature resistance. For use to 350°F.





Vegetable Oils - Fatty Acids  
 Beverages - Citric Acids  
 Hydrocarbons - Alcohols  
 Demineralized Water  
 Photographic Solutions  
 Organic Solvents  
 Animal, Petroleum and Vegetable Oils

**Bleached Cotton**

Bleached to meet FDA standards for distilled water, beverages, vegetable oils, petroleum, fatty acids, and alcohols. For use to 300°F. Poor micro-organism resistance.

Vegetable Oils - Fatty Acids  
 Beverages - Citric Acids  
 Hydrocarbons - Alcohols  
 Process Water  
 Paints  
 Organic Solvents  
 Petroleum Oils

**Natural Cotton**

For oils, water, paints, organic solvents, alcohols, and petroleum. Non-FDA applications. For use to 300°F.

Oxalic Acid	Organic Solvents
Phosphoric Acid	Oils
Sulfuric Acid	Organic Acids
Oxidizing Agents	Strong Acids
Sodium Cyanide	Dilute Acids
Nitric Acid	

**Heat Cleaned Glass Fiber**

Traces of oil sizing removed by heat cleaning, yielding virgin glass fiber. Recommended for high temperatures and high corrosion applications. For use to 750°F.

Organic Solvents  
 Oils  
 Organic Acids  
 Alkalies  
 Alcohols - Hydrocarbons  
 Fatty Acids

**Rayon**

Fluid compatibility similar to bleached cotton, but with more coarse fibers, and less absorbent than cotton. Swells in aqueous solutions. For use to 300°F.

Organic Solvents  
 Oils  
 Process Water  
 Alkalies  
 Hydrocarbons

**Nylon**

For special process applications, concentrated alkalies, and hydrocarbons. Excellent micro-organism resistance. For use to 300°F.

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### Core Selection Guide

Media Type	Description
<b>Polypropylene</b>	Economical core of choice for most applications in water and corrosives to 200° F. FDA material.
<b>Tin Plated Steel</b>	General purpose metal core for oils, solvents, paints, and other non-FDA applications. For use to 400° F. These cores are vapor de-greased to remove trace amounts of oil or residue prior to winding.
<b>304 SS</b>	For high temperature applications on diluted acids and moderately corrosive fluids. FDA applications. For use to 750° F. These cores are vapor helically-welded to eliminate a possible source of filtrate contamination and vapor-degreased to remove trace amounts of oil or residue prior to winding.
<b>316SS</b>	For high temperature applications on strong acids and highly corrosive fluids. FDA applications. For use to 750° F. These cores are vapor helically-welded to eliminate a possible source of filtrate contamination and vapor-degreased to remove trace amounts of oil or residue prior to winding.
<b>Core Cover</b>	For fiber migration control. Core material compatible with and/or equal to the resistance of the fiber is standard. Materials include voile, polypropylene, nylon, polyester, fiberglass, etc.
<b>End Treatment</b>	For additional fiber migration protection. End treatment is compatible with and/or equal to the resistance of the fiber medium.
<b>Extended Core</b>	Available in polypropylene and 316SS only. Extended cores eliminate chamber V-posts and increase cartridge change-out time.

### General Cartridge Filtration Guide

1. Cartridge filtration is favored in systems where the contaminant levels are less than 0.01% by weight (<100ppm)
2. Cartridges need to be replaced when the differential pressure (AP) approaches 35 psid.
3. Never exceed a differential pressure (AP) of 75 psid because the cartridge could collapse or "unload" the contaminants.
4. Clean initial pressure drop in liquid applications should be a differential pressure of 2-5 psid.
5. The cost of filtration increases as the micron rating of the cartridge decreases. "Never do a better job of filtration than you must or than is required."
6. The lower the flow rate, the greater the contaminate-holding capacity of the filter tube. Flows in excess of 5 gpm per 10" tube are not recommended, with 2.5-3 gpm being preferred.
7. Oversizing your cartridge vessel will help minimize the flow rate per cartridge. We recommend a minimum of 1-10" cartridge per 50 gallons of solution to be filtered. When 2-10" cartridges per 50 gallons are employed, cartridge consumption is reduced by approximately 29%. When 4-10" cartridges per 50 gallons are employed, cartridge consumption is reduced by approximately 50%.
8. Also, oversizing by a factor of 4 doubles the dirt holding capacity per cartridge as well. Consider series filtration in lieu of single.

### Packaging

Length	Number of Cartridges per case
4"	30
6"	30
9 3/4"	30
9 7/8"	30
10"	30
12"	30
19 1/2"	15
20"	15
29 1/4"	15
30"	15
39 1/4"	10
40"	10

### Nomenclature

PF	P	15	R	10	P	Core Cover	End Treatment	Extended Core
Penguin Wound Cartridge Filters	Filter Media	Micron Rating	Tube O.D	Length	Core Type			
	P = polypropylene	0.5	R = 2 1/2"	4 = 4"	P = Polypropylene	No symbol = none	No symbol = none	No symbol = none
	PW = fibrillated polypropylene	1	A = 2"	6 = 6"	T = Tin Steel	C = cover compatible with media	T = treatment compatible with media	X = compatible to core
	UGP = utility grade polypropylene	3	B = 2 3/8"	93 = 9 3/4"	S = 304SS			
	PFDA = polypropylene FDA	5	C = 2 3/4"	97 = 9 7/8"	A = 316SS			
	U = natural cotton	10	S = special	10 = 10"	X = special			
	C = bleached cotton	15		12 = 12"				
	R = ryon	20		19 = 19 1/2"				
	K = polyester	25		20 = 20"				
	N = nylon	30		29 = 29 1/4"				
	M = modacrylic (dynel)	40		30 = 30"				
	G = glass	50		39 = 39 1/4"				
	GH = heat treated glass	75		40 = 40"				
		100		0 = special				
		150						