

Fulflo® Poly-Mate™ Filter Cartridges

■ Polypropylene

Pleated Series

Quality, Economical Filtration for Critical Process Applications

Parker's Poly-Mate™ Cartridges incorporate a unique combination of polypropylene melt blown and spunbonded media to provide high surface area, finish-free and non-fiber releasing filtration. All-polypropylene construction maximizes chemical resistance to acids, bases, salts and most organic solvents.

Poly-Mate Pleated Cartridges are available in 0.5µm, 1µm, 5µm, 10µm, 30µm, and 60µm pore sizes (99% removal; β = 100).

For PED compliance contact Parker.

Applications

- Food & Beverage
- Photographic
- High-Technology Coatings
- Deionized Water
- R.O. Membrane Prefiltration
- Disposal Wells
- Process Water
- Fine Chemicals
- Wastewater
- Plating Chemicals



Features and Benefits

- High efficiency rated for critical process applications (99% efficiency).
- High pleated surface area for extended service life, low pressure drop and high flow capacity.
- Poly-Mate Xtra Duty™ (PXD) cartridge features glass-filled polypropylene core for high temperature and high pressure use with rigid outer cage supporting pleated media in backwash applications.
- Poly-Mate Xtra Duty cartridges are available with backwashable construction, reducing replacement maintenance and cartridge disposal costs. See page 4 for procedure.
- All materials of construction are FDA listed as acceptable for potable and edible liquid contact according to CFR Title 21.
- One piece, continuous to 40 in length, integrally sealed pleated filter media.

Process Filtration Division



The Filters of Choice for . . .

Foods and Beverages

Foods and beverages must be filtered with products made from components complying with FDA regulations for food contact use. Extraction of binders, chemical additives and media fragments into foods and beverages is unacceptable. Poly-Mate™ cartridges are thermally bonded and meet all FDA required standards. In many applications, Poly-Mate™ cartridges are a more cost-effective alternative to melt blown and spunbonded depth cartridges.

High Technology Coatings

High tech coatings used on magnetic tape, floppy discs, lenses and optical fibers require filtration with products that capture agglomerates and large contaminants with high efficiency while allowing the smaller coating particles to pass. The desired cutoff particle size should not change during filtration of the batch. This requires the high surface area and fixed pore media found in Poly-Mate cartridges.

Photographic

Photographic gelatins, emulsions, rinses and chemicals benefit from filtration with Poly-Mate cartridges. They are non-photosensitive, do not leach harmful contaminants and provide long service life at low initial pressure drop.

R.O. Filtration

Prefiltration requirements for reverse osmosis membranes are similar to those for foods and beverages, although FDA acceptability is often not required. The finish-free, thermally bonded media and large surface area of Poly-Mate cartridges make them the perfect choice for this liquid process application.

Specifications

Filtration Ratings:

- 99% at 0.5µm, 1µm, 5µm, 10µm, 30µm, and 60µm pore sizes

Effective Filtration Area:

- Up to 6.8 ft²/10 in (0.6m²/254mm)

Materials of Construction:

- Filter Media and Support Layers: polypropylene
- Bonding Polymer: none, completely fusion-sealed
- Surface Treatment: none (fusion-sealed), chemically inert and neutral
- Media Protection:
PM - polypropylene netting
PXD - polypropylene cage
- Support Core:
PM - polypropylene
PXD - glass-filled polypropylene
- Pleat Pack Side Seal:
fused polypropylene

- End Caps: polypropylene
- Seals: Buna-N, EPR, silicone, Viton,* Teflon* encapsulated Viton* O-rings, polyethylene foam gaskets

Recommended Operating Conditions:

- Poly-Mate Cartridges:
Change Out ΔP: 35 psid (2.4 bar)
Maximum Temperature: 200°F (93°C)
Maximum Temperature @ 35 psid (2.4 bar): 125°F (52°C)
Maximum ΔP @ 70°F (21°C): 60 psid (4.1 bar)
Maximum ΔP @ 200°F (93°C): 10 psid (0.7 bar)
- Poly-Mate Xtra-Duty™ Cartridges:
Change Out ΔP: 35 psid (2.4 bar)
Maximum Temperature: 200°F (93°C)
Maximum Temperature @ 35 psid (2.4 bar): 200°F (93°C)
Maximum ΔP @ 70°F (21°C): 90 psid (6.1 bar)
Maximum ΔP @ 200°F (93°C): 35 psid (2.4 bar)

Dimensions:

- Overall Length: See catalog sheet C-2090. SOE fits standard vessels with O-ring seals.
- Cartridge Outside Diameter: 2-1/2 in (63.5 mm)
- Cartridge Inside Diameter: DOE - 1-1/16 in (27 mm); SOE - 1 in (25.4 mm)

Recommended Maximum Flow Rate:

- Maximum 7 gpm per 10 in length

Designed Flow Rate (in water):

- 2.5 gpm per 10 in length (9.5 lpm per 254 mm)

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

Performance Profile

Parker's Process Filtration Division test procedures address the varying filtration requirements of customers. Selection of media of the Poly-Mate™ product line maximizes performance in terms of efficiency, dirt-holding capacity, flow and other characterization variables. Tests and analyses were conducted using microprocessor technology for accuracy.

High Filtration Efficiency

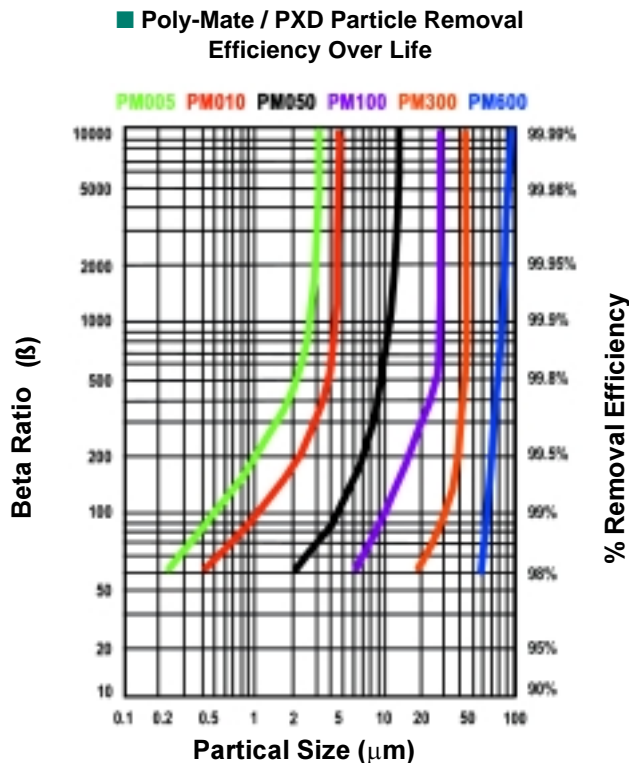
Filtration efficiency is affected by media pore size and fluid velocity. The removal efficiency below is based on a design flow rate of 2.5 gpm per 10 in (9.5 lpm per 254 mm cartridge). Lower flow rates yield higher efficiencies. Higher flow rates result in lower efficiencies.

Higher Throughput

Higher flow rates result in the use of fewer cartridges and smaller housings to achieve system flow rate requirements. In addition, lower ΔP will reduce power requirements and pump wear and tear.

The initial clean water (1 centistoke) ΔP through a 10 in (254 mm) cartridge is very low. The flow rate restriction from the filter vessel is the determining factor when considering the system ΔP. The high dirt-holding capacity of Poly-Mate cartridges provides longer service life and reduces the frequency of filter change out and associated costs. The Poly-Mate Xtra-Duty™ cartridge is designed specifically for backwash applications and can reduce cartridge disposal and labor costs.

Liquid Particle Retention Ratings (μm) @ Removal Efficiencies of:						
Cartridge	β = 5000 Absolute	β = 1000 99.9%	β = 100 99%	β = 50 98%	β = 20 95%	β = 10 90%
PM / PXD005	3	2.8	0.5	<0.5	<0.5	<0.5
PM / PXD010	5	4.8	1.2	<0.5	<0.5	<0.5
PM / PXD050	15	12	5	2.2	<1	<0.5
PM / PXD100	32	30	11	7	3	1.7
PM / PXD300	50	48	30	20	10	5
PM/PXD600	100	90	60	50	30	15



Beta Ratio (β) = $\frac{\text{Upstream Particle Count @ Specified Particle Size and Larger}}{\text{Downstream Particle Count @ Specified Particle Size and Larger}}$

$$\text{Percent Removal Efficiency} = \left(\frac{\beta - 1}{\beta} \right) \times 100$$

Performance determined per ASTM F-795-88, Single-Pass Test using AC test dust in water at a flow rate of 2.5 gpm per 10 in (9.5 lpm per 254 mm).

■ Poly-Mate Length Factors

Length (in)	Length Factor
9	1.0
10	1.0
19	2.0
20	2.0
29	3.0
30	3.0
40	4.0

Flow Rate and Pressure Drop Formulas:

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

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

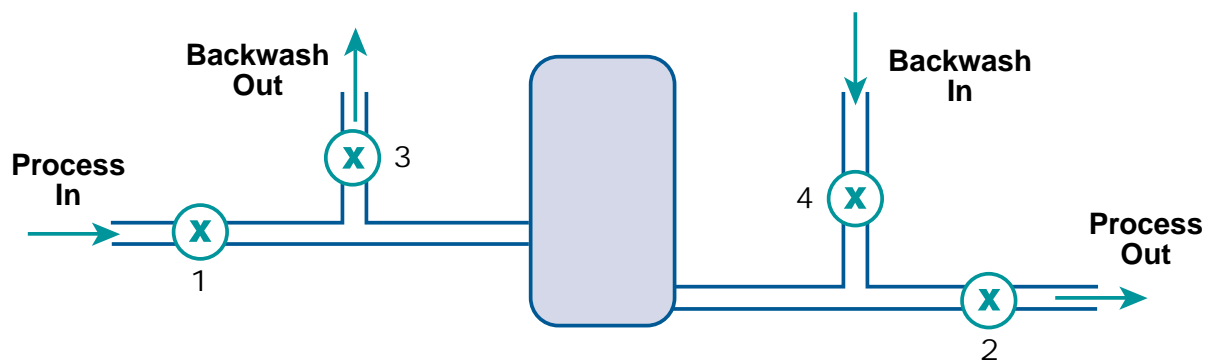
Notes:

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.

■ Poly-Mate / PXD Flow Factors (psid/gpm @ 1 cks)

Rating (μm)	Flow Factor
0.5	0.0900
1.0	0.0530
5.0	0.0290
10.0	0.0068
30.0	0.0048
60.0	0.0030

Pleated Series



Backwash Schematic

Backwash Protocol

Since applications vary, rigid rules for backwash operation are impossible. Please use these guidelines:

- Initiate a backwash cycle when the pressure drop rises about 3-4 psid (0.2 to 0.3 bar) above the initial value (1-5 psid [0.1 to 0.4 bar] for most systems) or alternately on a timed cycle, e.g., daily.
- Stop the process flow by closing valves 1 and 2.
- Begin backwash flow by opening valves 3 and 4.
- Backwash pressure should be about 10 psi (0.7 bar) greater than the existing pressure drop.
- A momentary pressure surge is beneficial in breaking particles free.
- Backwash flow rate is critical. It should be 1 to 1-1/2 times the process flow rate. Allow sufficient time to flush the contaminant from the vessel.
- Close valves 3 and 4 and open valves 1 and 2 to resume normal filtration. Vent the vessel. Note the decrease in pressure drop.
- Continue backwash cycles until the pressure drop no longer decreases. Change cartridges at about 35 psid (2.4 bar).
- Note: Valves 3 and 4 could be attached to the vessel's dirty and clean drains, respectively.

Ordering Information

PM050	10	A	N	TC
Cartridge Code (µm)	Nominal Length (code) (in) (mm)	Core	Gasket/O-Ring Options	End Cap Options
PM=Standard PXD=XtraDuty		A = Polypropylene (PM core only)	E = EPR N = Buna-N S = Silicone (SOE O-Ring only)	DO=Double Open End (DOE) DX=DOE With Core Extender
PM005 – 0.5	9 9-5/8 244	F = Glass-Filled Polypropylene (PXD core only)	V = Viton* O-Ring	SC = 226 O-Ring/Cap
PM010 – 1.0	19 19-5/8 498	N = Natural Polypropylene (All support components)	T = PFA Encapsulated Viton* (222,226 O-Ring only)	SF = 226 O-Ring/Fin
PM050 – 5.0	20 20 506		A = Polyethylene Foam Gasket (DOE Gasket only)	TC = 222 O-Ring/Cap
PM100 – 10.0	29 29-1/4 743			TF = 222 O-Ring/Fin
PM300 – 30.0	30 30 764			AR = 020 O-Ring/Recessed (Gelman)
PM600 – 60.0	40 40 1016			LR = 120 O-Ring/Recessed (Nuclepore; Gelman G Style)
				LL = 120/120 (Filterite LMO and Nuclepore Polymeric Vessels; Gelman N Style)
				PR = 213 O-Ring/Recessed (Ametek and Parker LT Polymeric Vessels; Gelman H Style)

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For pleated cartridge configurations and dimensions, see Bulletin A-700 in the Appendix.

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