

QPPM Filter Cartridges

■ Polypropylene

Quality-Pure Pleated Series

Quality, Economical Filtration for Critical Process Applications

Clark-Reliance Quality-Pure 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.

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

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.
- Quality-Pure (QPPM) cartridge features glass-filled polypropylene core for high temperature and high pressure use with rigid outer cage supporting pleated media in backwash applications.
- Optional stainless steel O-ring adapter inserts provide added strength for *in situ* sterilization.
- Quality-Pure QPPM 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.



WARNING! FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.
This document and other information from Clark-Reliance Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection for the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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. Quality-Pure cartridges are thermally bonded and meet all FDA required standards. In many applications, Quality-Pure 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 Quality-Pure cartridges.

Photographic

Photographic gelatins, emulsions, rinses and chemicals benefit from filtration with Quality-Pure 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 Quality-Pure 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 6.0 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*, PFA encapsulated Viton* O-rings, polyethylene foam gaskets

Recommended Operating Conditions:

- Quality-Pure 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)
- Quality-Pure BW 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 bulletin A-700. SOE fits standard vessels with O-ring receptacles.
- 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 10 gpm per 10 in length

Designed Flow Rate (in water):

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

Performance Profile

Clark-Reliance Filtration Group test procedures address the varying filtration requirements of customers. Selection of media of the Quality-Pure 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 Technology Coatings

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.

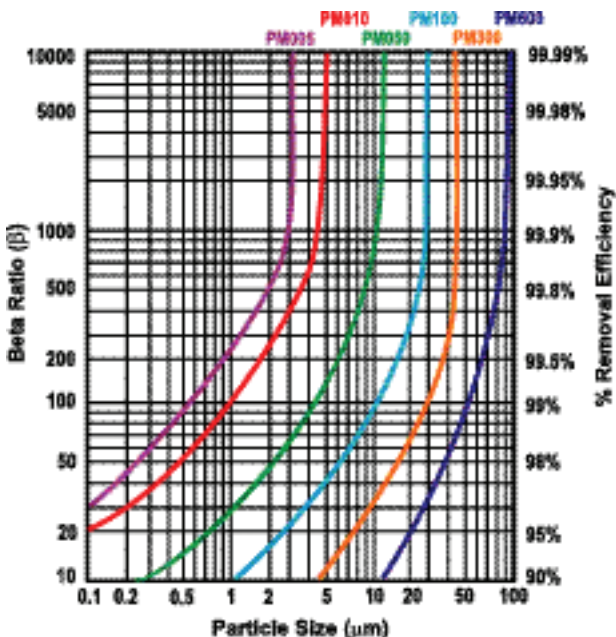
Higher Throughput

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 Quality-Pure cartridges provides longer service life and reduces the frequency of filter change out and associated costs. The Quality-Pure BW cartridge is designed specifically for backwash applications and can reduce cartridge disposal and labor costs.

Liquid Particle Retention Ratings (μm) @ Removal Efficiency of:						
Cartridge	$\beta=5000$ Absolute	$\beta=1000$ 99.9%	$\beta=100$ 99%	$\beta=50$ 98%	$\beta=20$ 95%	$\beta=10$ 90%
QPPM PXD005	3	3	0.5	.25	<0.1	<0.1
QPPM PXD010	5	4.5	1.0	0.5	0.2	<0.1
QPPM PXD050	15	10	4	2.0	0.7	0.25
QPPM PXD100	30	28	10	6	3	1.2
QPPM PXD300	45	43	30	18	8	4.5
QPPM PXD600	95	90	50	40	20	12

■ Quality-Pure / PXD Particle Removal Efficiency Over Life



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

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

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).

■ Quality-Pure 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

■ Quality-Pure BW 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

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.

Quality-Pure Pleated Series

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 containment 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

QPPM 050	A	N	TC	R
Cartridge Code	Core	Seal Material	End Cap Configuration	Special Options
QPPM = Standard	A = Natural Polypropylene (PM core only)	A = Polyethylene Foam (DOE Gasket Only)	AR = 020 O-Ring/Recessed	B = Bubble Point Test
QPPMX = Xtra Duty	F = Glass-Filled Polypropylene (PXD core only)	E = EPR	DO = Double-Open-End (DOE)	R = Rinse with DI Water (5 mins.)
QPPM005 = 0.5µm	G = 304 Stainless Steel (Core only)	N = Buna-N	DX = DOE With Core Extender	Z6 = Individual poly bag only (PXD Only)
QPPM010 = 1.0µm	N = Natural Polypropylene (All support components)	S = Silicone	LL = 120/120**	Z15 = Individual poly bag 15/ctn. (20", 30", 40") (PXD only)
QPPM050 = 5.0µm		T = PFA Encapsulated Viton (222,226 O-Ring Only)	LR = 120 O-Ring/Recessed**	Z30 = Individual poly bag 30/ctn. (10") (PXD only)
QPPM100 = 10.0µm		V = Viton	OB = Std. Open End/Polypro Spring Closed End	
QPPM300 = 30.0µm			PR = 213 O-Ring/Recessed**	
QPPM600 = 60.0µm			SC = 226 O-Ring/Cap	
			SF = 226 O-Ring/Fin	
			SSC = S.S. Inserted 226 O-Ring/Closed	
			SSF = S.S. Inserted 226 O-Ring/Fin	
			STC = S.S. Inserted 222 O-Ring/Closed	
			STF = S.S. Inserted 226 O-Ring/Fin	
			TC = 222 O-Ring/Cap	
			TF = 222 O-Ring/Fin	
			TX = 222 O-Ring/Flex Fin	
			XB = Ex. Core Open End/ Polypro Spring Closed End	

10		
Nominal Length		
(code)	(in)	(mm)
9	9-5/8	244
10	9-13/16	249
19	19-5/8	498
20	19-15/16	506
29	29-1/4	743
30	30-1/16	764
40	40	1016

** Available only in 9-5/8" (-9) and 19-5/8" (-19) lengths.

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