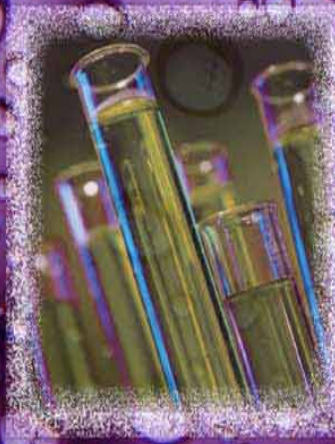




Engineered Filtration, Inc.

We Provide Liquid Filtration Solutions





Engineered Filtration, Inc.

Liquid Process Filters For High Purity Solutions

PRODUCTS

- Membrane Filters
- Absolute Rated Pleated Polypropylene Depth Filters
- Titanium and Stainless Steel Filters
- Melt-Blown Filters
- Spring Wound Filters
- Filter Housings

APPLICATIONS

- High Purity Water
- Pharmaceutical
- Cosmetics
- Electronics
- Chemicals

Продукция

- Мембранные фильтры
- Полипропиленовые фильтрующие элементы глубинного действия с абсолютным эффектом удержания примесей
- Фильтры из нержавеющей стали и титанового сплава
- Пневмоэлектрические фильтрующие элементы
- Фильтрующие элементы с нитовой наматкой
- Фильтродержатели

Применение

- Высший уровень очистки воды
- Фармацевтическая промышленность
- Производство косметики
- Электронная промышленность
- Химическая промышленность

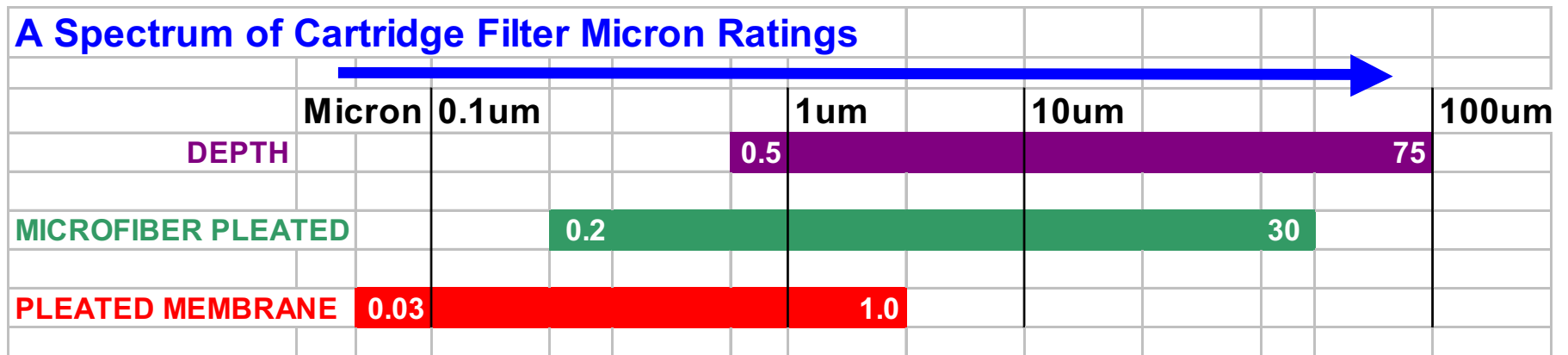


www.engfilt.com



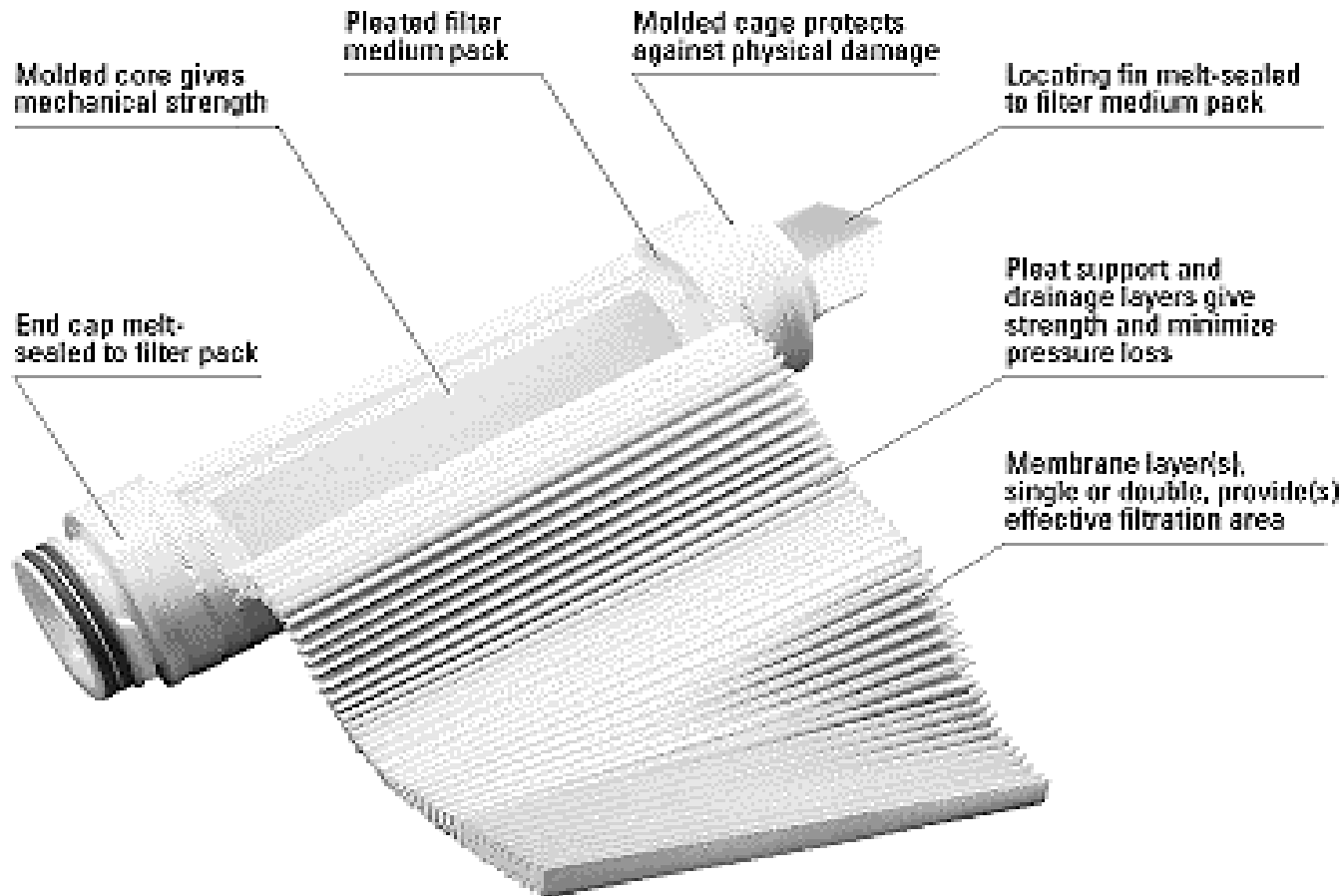
Engineered Filtration, Inc.

A Full Range of Cartridge Filters



Cartridge Design

Typical Cartridge Design



End Cap Configurations



226 O-Ring

222 O-Ring

Flat Gasket

Internal O-Ring
213 / 119



Spear / Pin

Flat Cap

Recessed Plug

020 O-Ring



223 O-Ring

222 O-Ring / 3
Tab

End Cap Codes

- 0 - Flat Gasket, double open end
- 1 - Flat Gasket w Plug
- 2 - 2-222 O-Ring / Plug
- 3 - 213 119 Internal O-ring Both Ends
- 4 - 213 119 Internal O-Ring / Plug
- 5 - 2-222 O-Ring / Flat
- 6 - 2-226 O-Ring / Flat
- 7 - 020 O-ring / Plug
- 8 - 2-222 O-ring with Spear
- 9 - 2-226 O-ring with Spear
- 21 - 2-223 O-Ring / Flat
- 22 - 2-223 O-Ring with Spear
- 23 - 2-222 O-ring 3 Tab / Flat
- 24 - 2-222 O-ring 3 Tab with Spear

Stainless Steel Rings



222 O-Ring With
Stainless Steel Ring

226 O-Ring With
Stainless Steel Ring

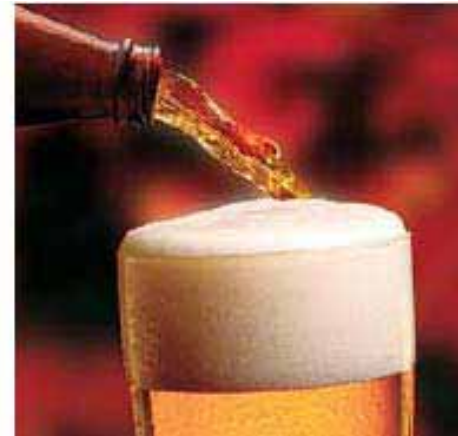
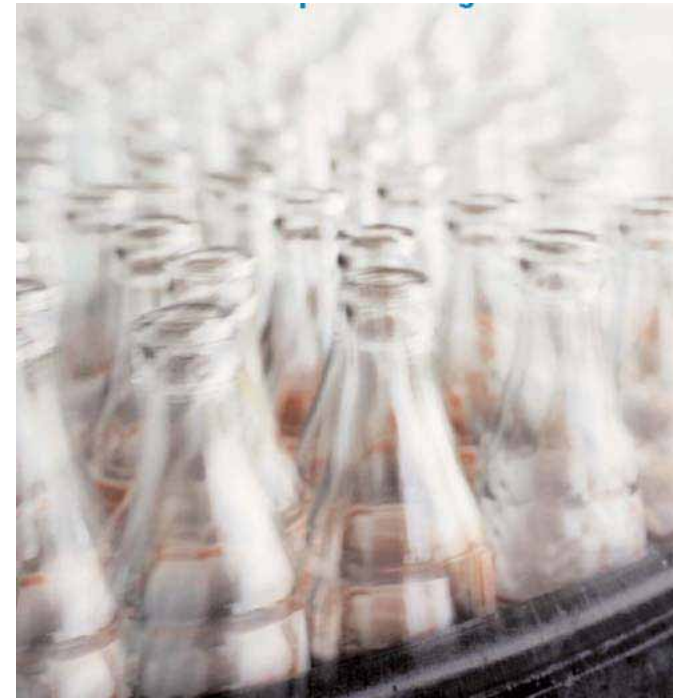
Note: The stainless steel rings are only available in the 222 and 226 end caps. Please reference the ordering guide on your data sheet and replace the 2 with an S.

Note: Consult factory if other End Cap Configurations are required.



Liquid Filter Product Applications

Where High Quality Micro Filtration Is Used ?



Engineered Filtration, Inc.

Liquid Micro-filtration is used for:

- Water Process Filtration
- Chemical Filtration
- Food & Beverage Filtration
- Electronics Filtration



Beverage Applications



- Prefiltration

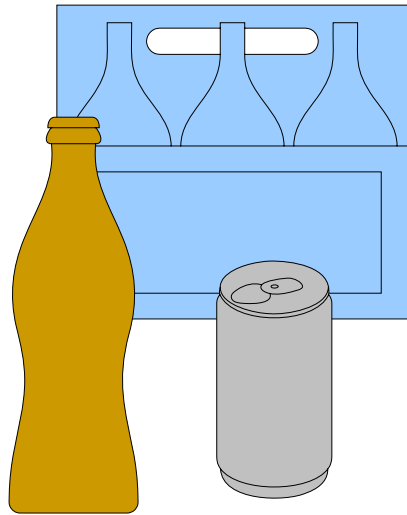
- Facility Water
- Compressed Gas
- Steam
- Detergents / Cleaning Solvents
- DE Trap
- Polishing Prior To Bottling

- Final Filtration

- Facility Water
- Facility Gas
- Tank Venting
- Chill Haze Removal
- Product



Pleated Cartridges Used In The Beverage Market

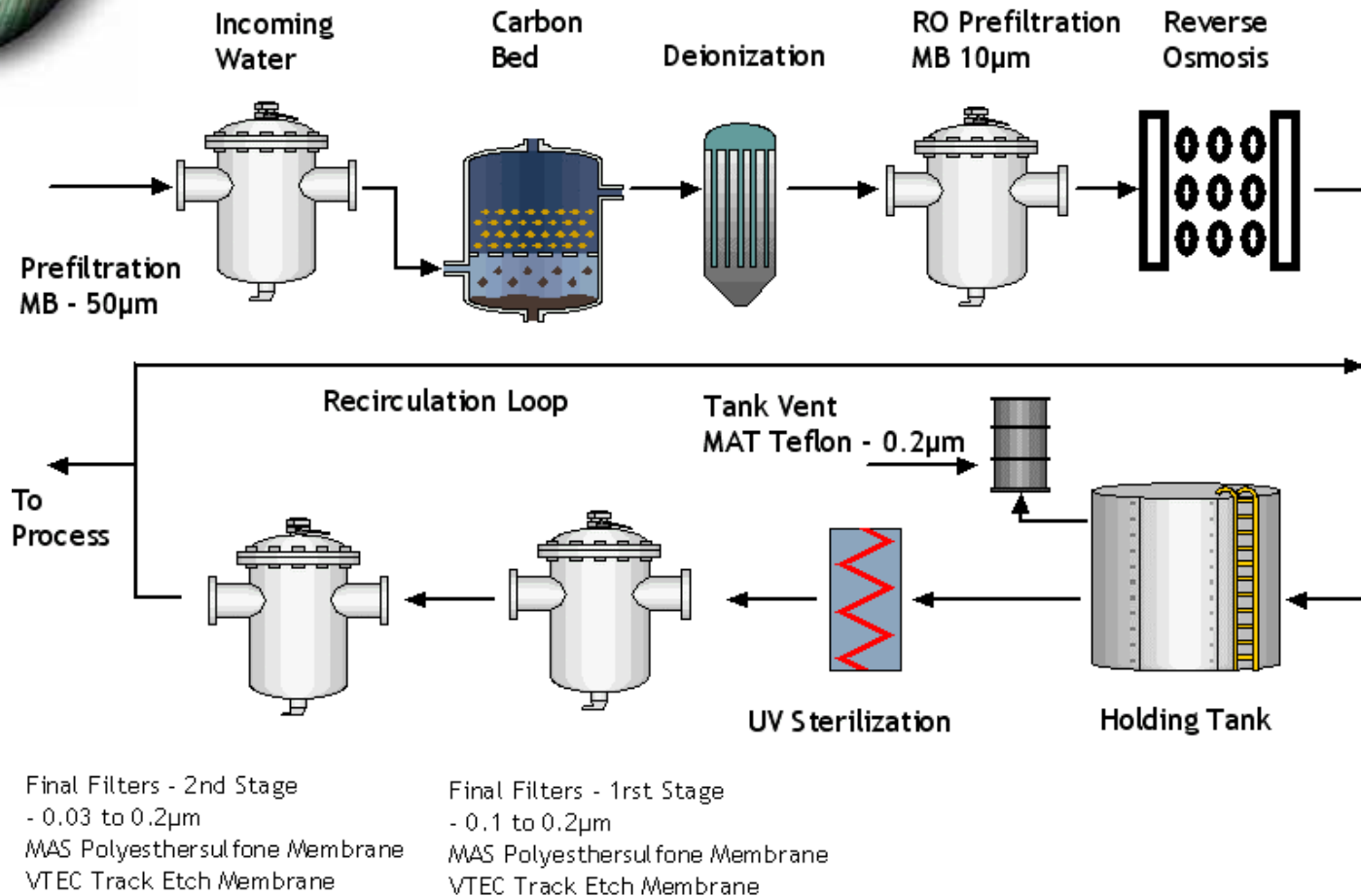


- Bottled Water
- Wine / Cider
- Clear Juices
- Beer
- New Age Beverages
- Green Tea





Typical Pure Water System



Bottled Water

- Pre-filters
 - MB Melt Blown
- Cyst reduction filter
 - QCR or 1 Micron
- Vent Filter
 - MAT Teflon
- Bacterial contaminant removal filters
 - MA Polyethersulfone



What Level Of Filtration Is Required For Bottled Water?



- International Bottled Water Association

- Recommends **1um Absolute** Filtration for Cryptosporidium Removal

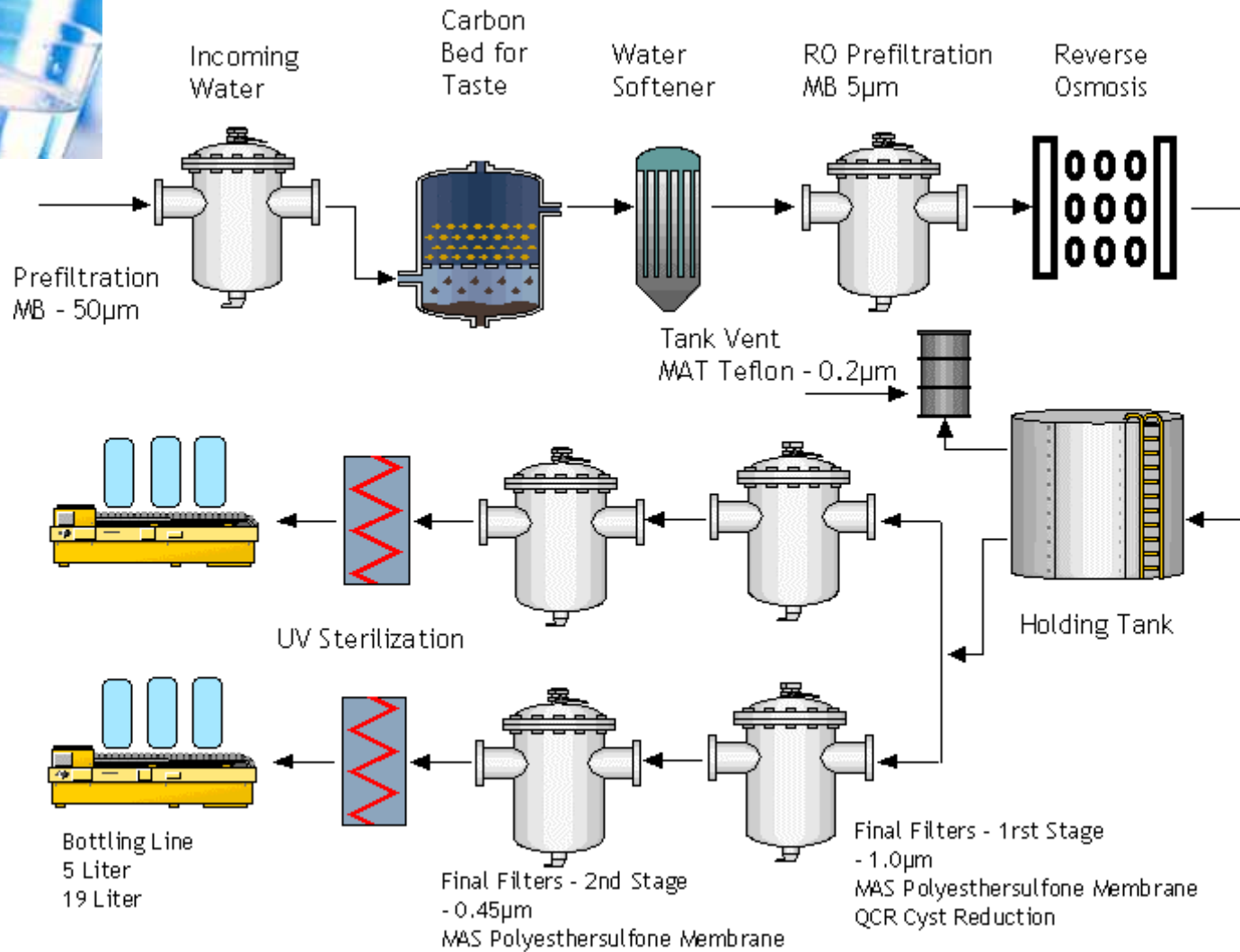
- National Sanitation Foundation - NSF

- Standard 53 - Cyst Removal - 99.9% at 3-5 um
- Revising Standard to 99.9% at 1um (99.99% at 3um) for Commercial Operations



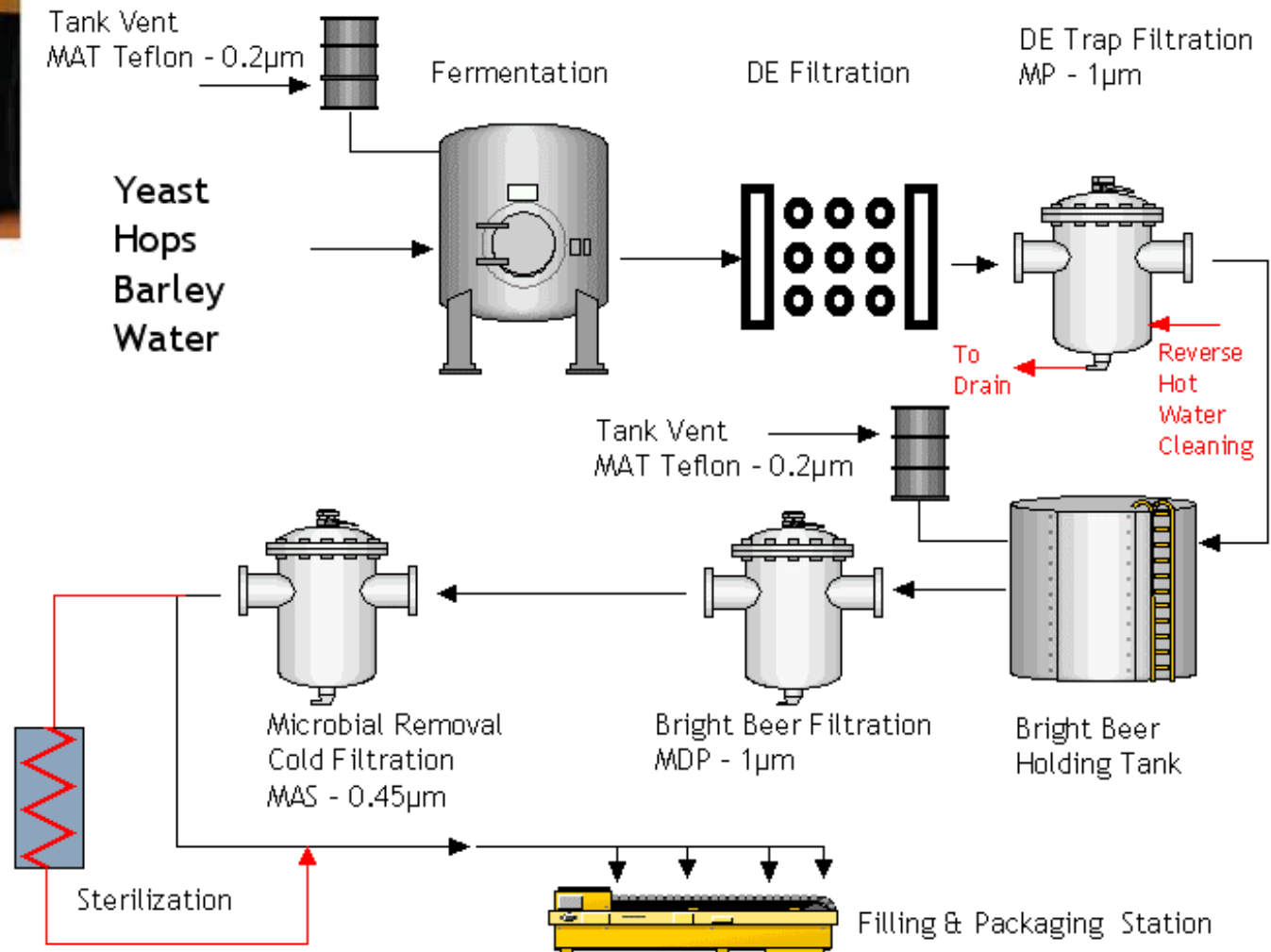


Bottled Water





Beer Filtration



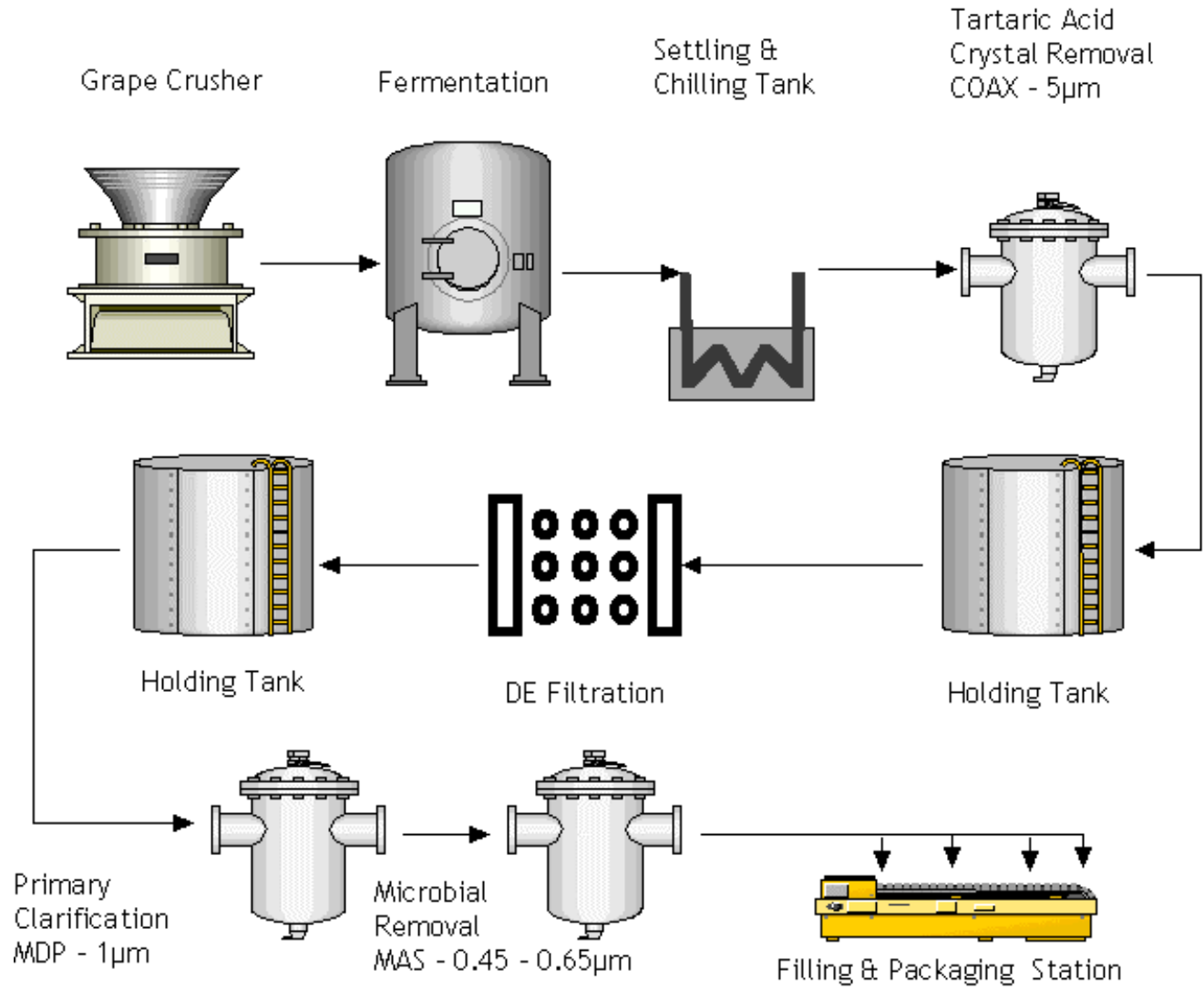
Filtration in Wine Processing



- *Tartaric Acid Crystals* - remove precipitated colloids and crystals.
- *Primary Clarification*- removal yeasts and solids
- *Intermediate Stabilization*-sterilizing gases and removing impurities while in storage or transport.
- *Final Filtration*- Removal of organisms that can cause spoilage.

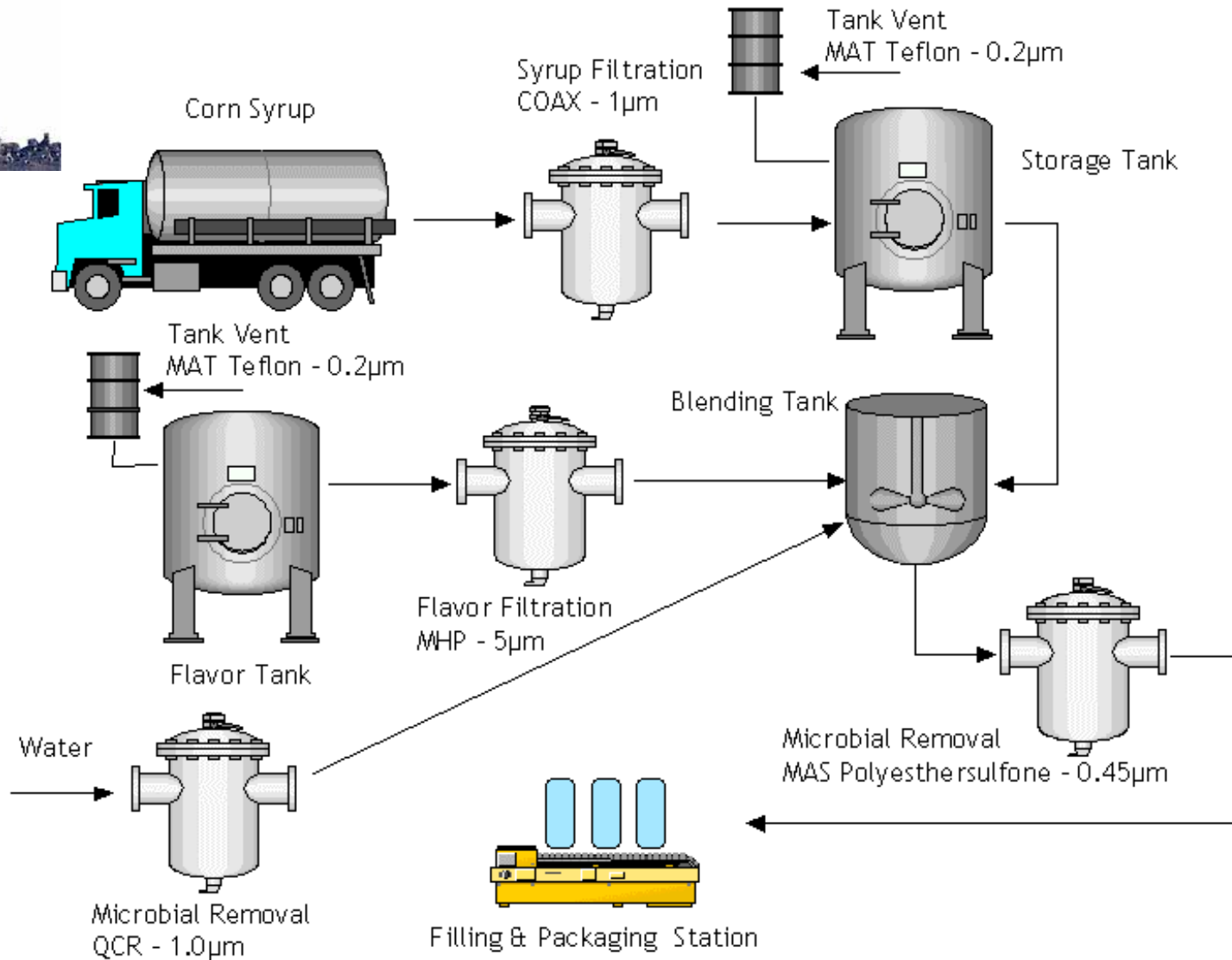


Wine Filtration





Soft Drink Filtration



Function of Filters in Food Bio-Processing

- *Clarification*- remove entrained solids and cell debris from fermentation and maturation process.
- *Particle Removal*- remove organic & inorganic materials which are sources of contamination and turbidity.
- *Micro-organism Removal*- Bacteria, yeasts, and other micro-organisms can cause spoilage, sickness, and product recall.
- *Final Filtration*- goal is to provide consistent product runs with stable and aesthetically pleasing food product.



Food Filtration

- Milk, Cheese, Whey
- Sweeteners
- Enzyme & Gelatine Processing
- Fermentation
- Edible Oils
- Flavors & Fragrances
- Vinegar
- Vegetable Proteins
- Utilities-gas, air, water, etc.



Membrane Products

- **VTEC** - Polyester Track-Etch
- **MAS** - Polyethersulfone
- **MAP** - Polypropylene
- **MAN** - Nylon
- **MAT** - Teflon

Available in:

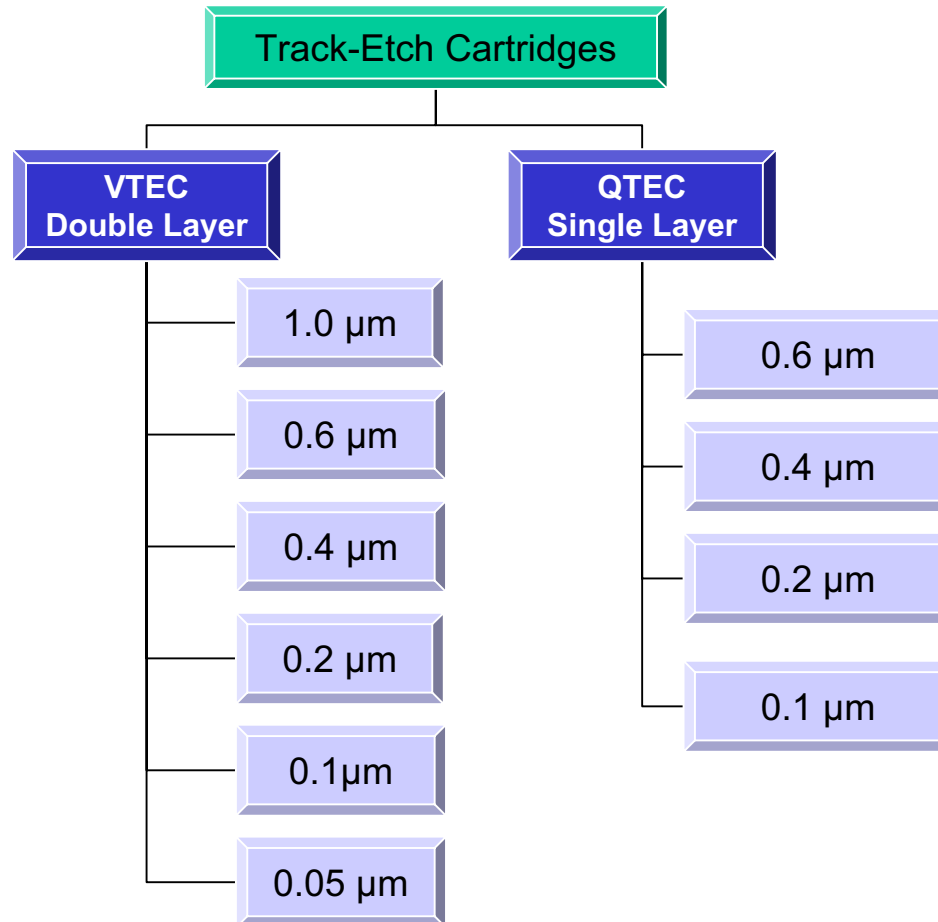
Beverage Grade

Electronics Grade

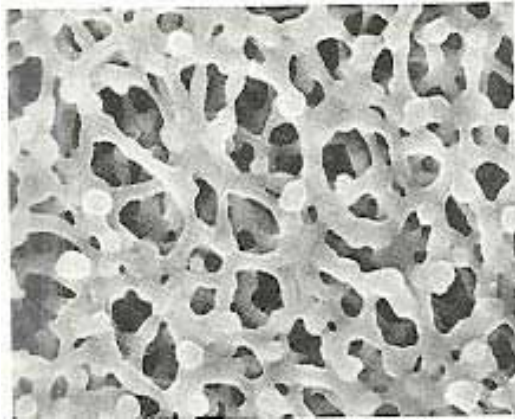
Pharmaceutical Grade



Track-Etch Membrane Cartridges



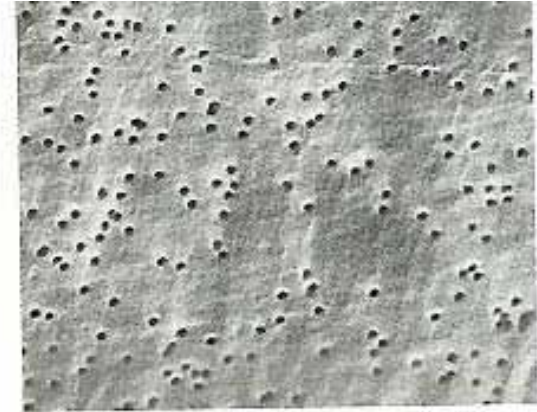
Track-Etch Offers Precise Pore Structure



**0.2 μ Polyethersulfone
(x10,000)**



**0.2 μ Nylon 66
(x10,000)**



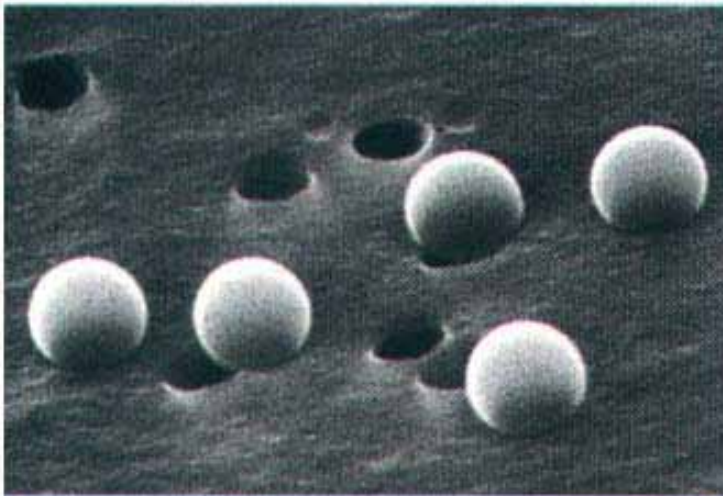
**0.2 μ Track-Etch
(x10,000)**



Track-Etch - Precise Filtration

Latex Bead Retention Efficiency of 0.2 μm Filters (%)

<i>Membrane</i>	<i>Bead Size (μm)</i>		
	0.149	0.198	0.220
<i>Polyester Track-Etch</i>	35	99	100
<i>PVDF Cast</i>	8	13	15
<i>PES Cast</i>	6	17	17
<i>Charged Nylon Cast</i>	ND	38	34

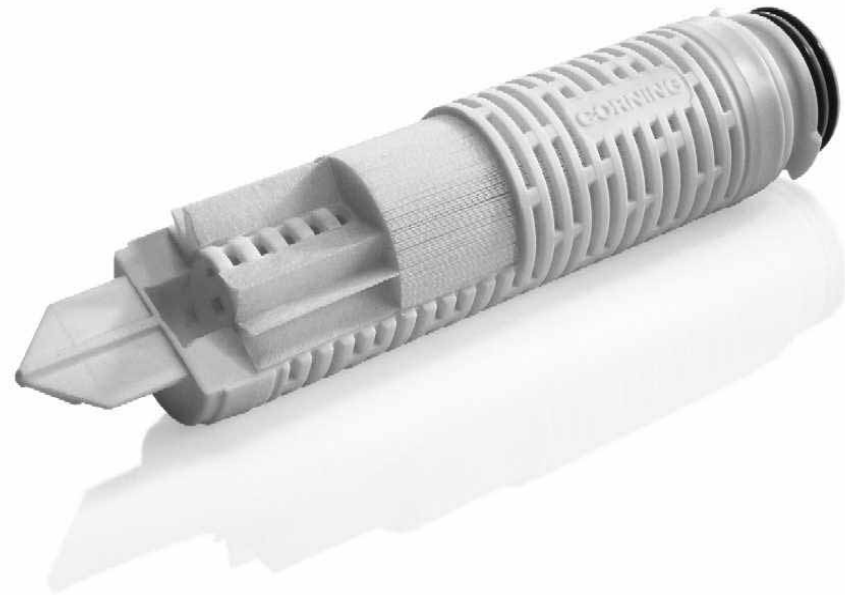


Nuclepore 0.4 μm Track-etch membrane with 0.5 μm latex beads.

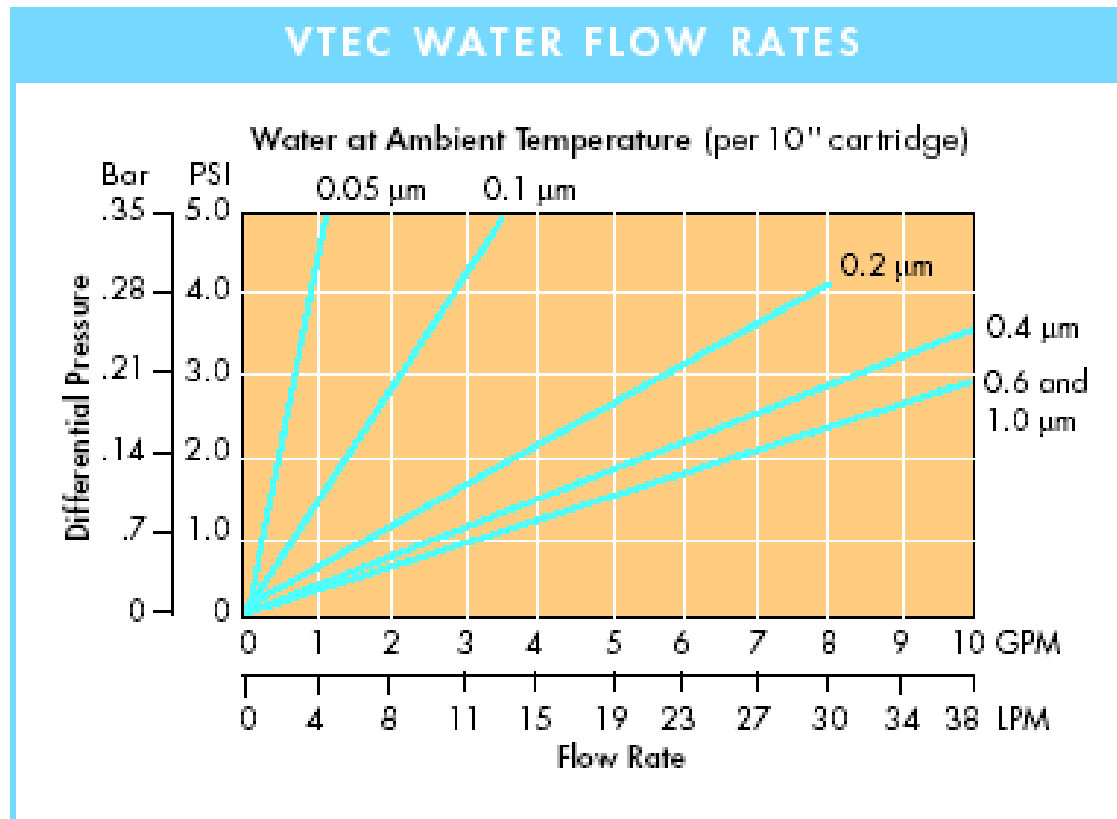


VTEC Membrane Filter Cartridges

- Validated
- Integrity testable
- High flow
- Precise removal
- Exceptionally clean
- Superior chemical compatibility
- Retention unaffected by process conditions
- Meets a broad range of bio-safety standards



VTEC - Flow Rates



VTEC Manufacturing

- VTEC - *2 Layers of Polyester*
- Each VTEC 10” sub-assembly is integrity tested, serialized and data recorded
- Each VTEC box - Instructions for Use Insert
- Certificate of Compliance
- Made in a Controlled Environment
- Tested and packaged in a Class 10,000 clean room
- Cartridges are rinsed in 18 Meg-Ohm Water



VTEC - Integrity Test

Pore Size	Stabilizing Pressure (psid)	Test Pressure (psid)	Maximum Diffusion (cc/min) per 10-Inch
0.05 μm	40	60	60
0.1 μm	35	50	50
0.2 μm	30	40	50
0.4 μm	10	20	20
0.6 μm	5	14	20
1.0 μm	5	10	10



Integrity Testing

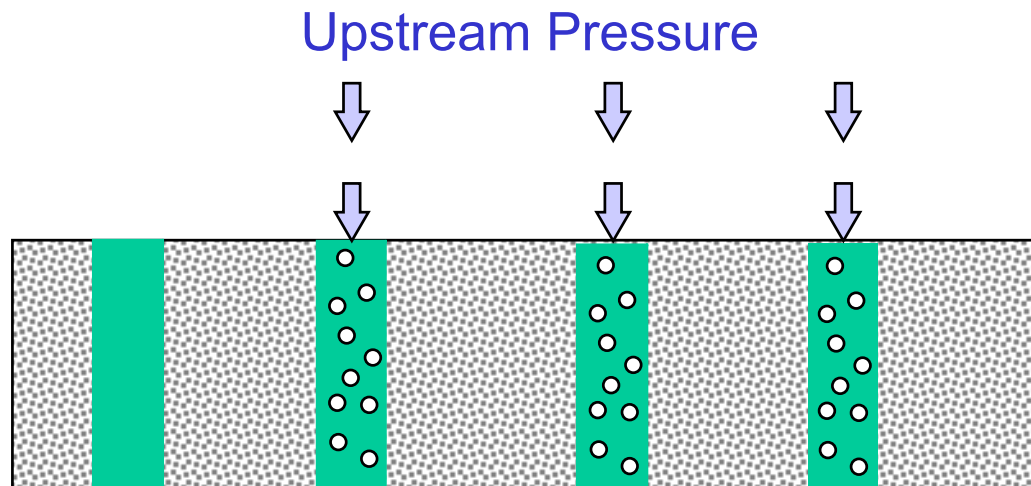
- Integrity Testing: A non-destructive method of evaluating filter performance to manufacturer's published specifications.
 - Bubble Point
 - Diffusional Flow
 - Pressure Hold
 - Water Intrusion



Integrity Testing *Diffusional Flow*

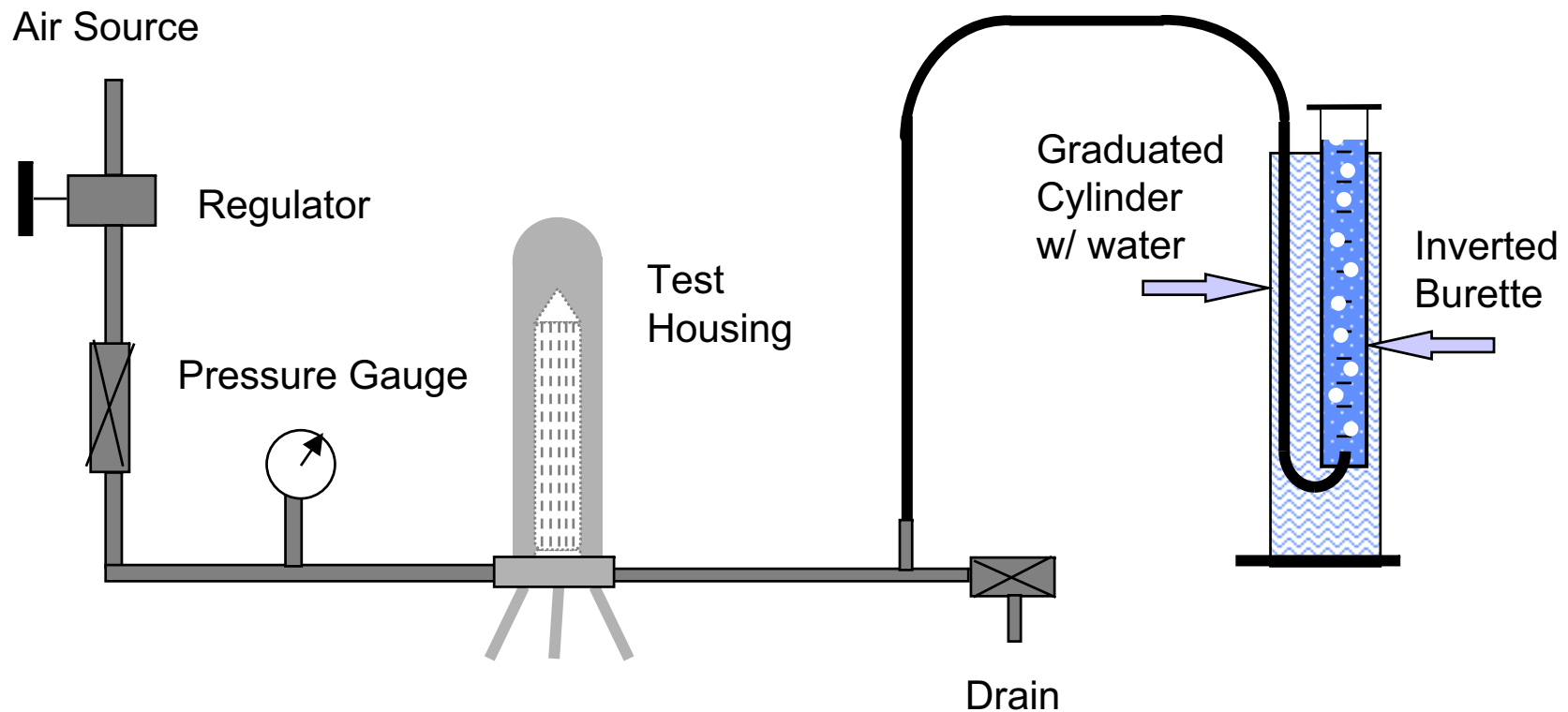
Basic Procedure

- Pre-wet membrane
- Apply pressure to upstream side to 80% of bubble point
- Measure volume of gas collected on downstream side



Integrity Testing

- Bubble Point / Diffusional Flow Test Stand



Chemical Sterilization

- Up to 4% Hydrogen Peroxide
- Up to 200 ppm NaOCl
- VTEC Cartridges and OZONE
 - Validate under the actual operating conditions
 - DO NOT EXCEED 0.2 PPM OVER 24 HOURS UNDER ANY CONDITION
- Graver Technologies does not warranty the use of VTEC in ozone applications.



Performance Characteristics

- **Ozone Compatibility**

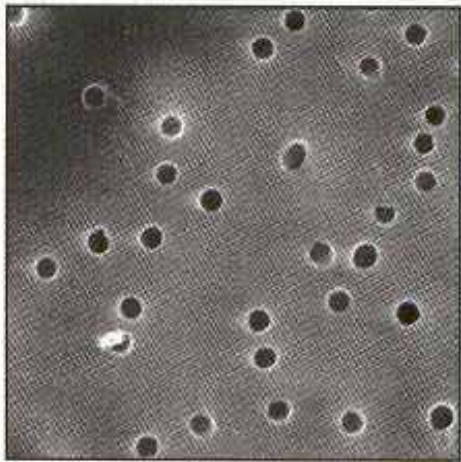
- Total Exposure before failure = 122 hours
 - Ozone Concentration - 0.19 to 0.28 ppm
- Total Exposure before failure = 255 hours
 - Ozone Concentration - 0.01 to 0.1 ppm

- **Back Pulse**

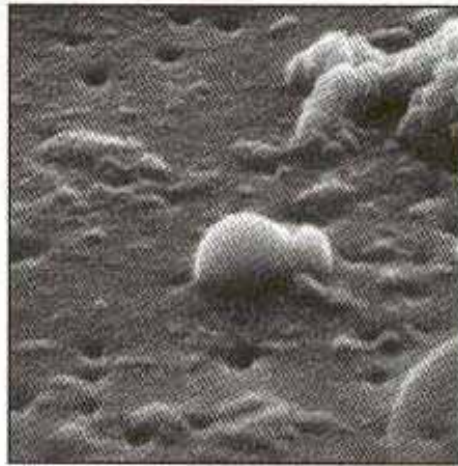
- Service life of the VTEC filter may be extended through periodic Back Pulse
- Can be used with appropriate cleaning agents
- Unique structure of Graver Track-Etch membrane allows Back-Pulse



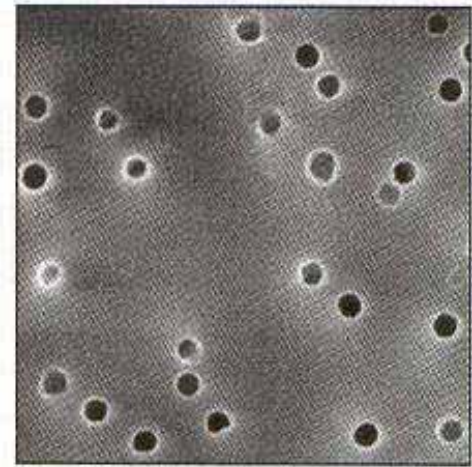
Back Pulsed Membrane



New Membrane



Membrane Plugged
with Yeast and Proteins



Back Pulse Cleaned Membrane



VTEC Validation Claims

- Cartridge Integrity Testing
- Differential Pressure Stress Testing
- Sterilization and Sanitization
 - Hot Water
 - Steam
 - Hydrogen Peroxide
- Particle Shedding, Resistivity and TOC
- Micro-organism Retention Claims
- Bio-safety Testing



VTEC - Bacterial Retention Data

	<i>Saccharomyces cerevisiae</i> (ATCC# 9763)	<i>Dekkera intermedia</i> (ATCC # 34448)	<i>Pediococcus acidilactici</i> (ATCC # 33314)	<i>Lactobacillus brevis</i> (ATCC #14869)	<i>Leuconostoc oenos</i> (ATCC# 23279)
VTEC 1.0 μm	> LRV 11	> LRV 11			
VTEC 0.6 μm			> LRV 11	> LRV 11	
VTEC 0.4 μm					> LRV 10

VTEC - Summary

<i>Features</i>	<i>Benefits</i>
Precise Track-Etch Pore Structure	◆ VTEC Filters Offer Reliable Performance
Integrity tested and serialized	◆ Verifiable performance ◆ Fully traceable
Clean Manufacturing	◆ Presence of contaminants minimized
Good Chemical compatibility	◆ Can be Chemically Sanitized*
Back Pulse™	◆ Can be cleaned by back flushing

*** - No Caustic**



VTEC Applications

Validated precision filtration

- Semiconductor Ultrapure water
- Pharmaceutical Ultrapure Water
- Bottled Water
- Wine (mostly White Wine)

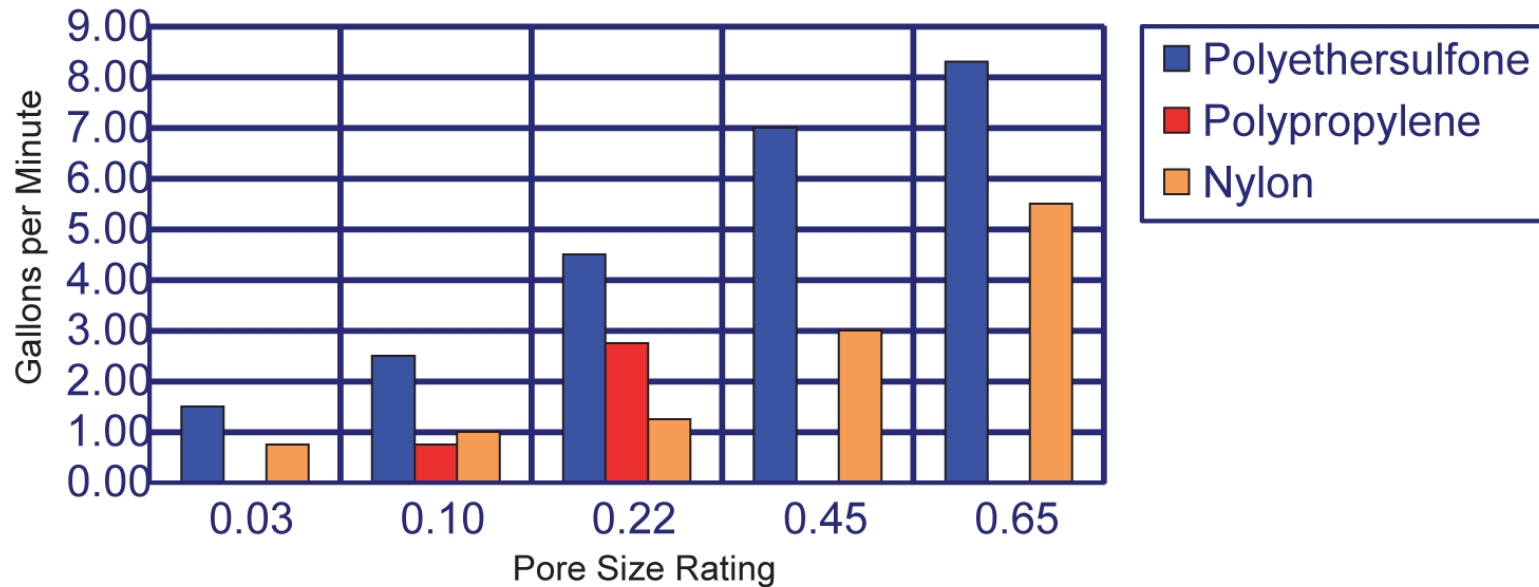


MA Membrane Cartridges

- 3 Medias
 - MAS** - Polyethersulfone
 - MAP** - Polypropylene
 - MAN** - Nylon
- 100% Integrity Tested
- Rinsed & Flushed with 17+ megaohm water
- Meets FDA Title 21 Code of Federal Regulations
- Validated to USP class 6 Toxicology



MA Series - Flow Rates

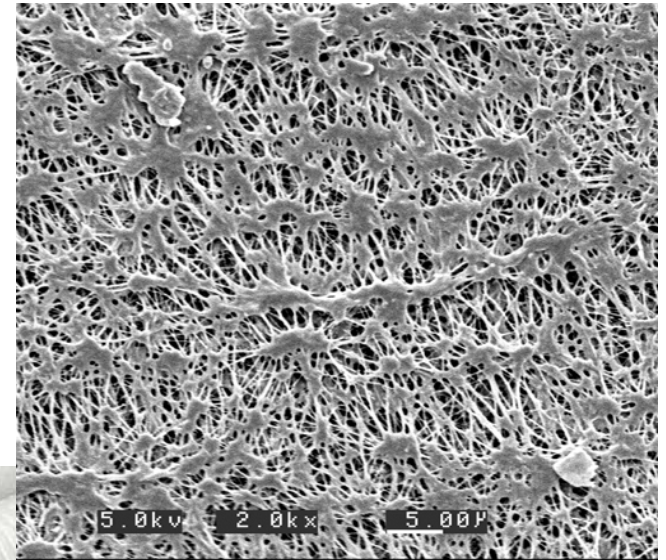


This chart represents typical water flow @ 1 PSID per 10" cartridge length. The test fluid is water at ambient temperature. Extrapolation for multiple elements tends to be linear, but as flows increase the ΔP of the housing becomes more apparent. †Deduct 15% of the flow rate when using a pre-layer of poly depth media.



New Product: TefTEC Teflon Filter Cartridges

- Single layer goretex PTFE membrane with polypropylene supports
- Hydrophobic membrane for air/vent applications
- Superior chemical compatibility
- High Surface Area
- HIMA Retentive membrane

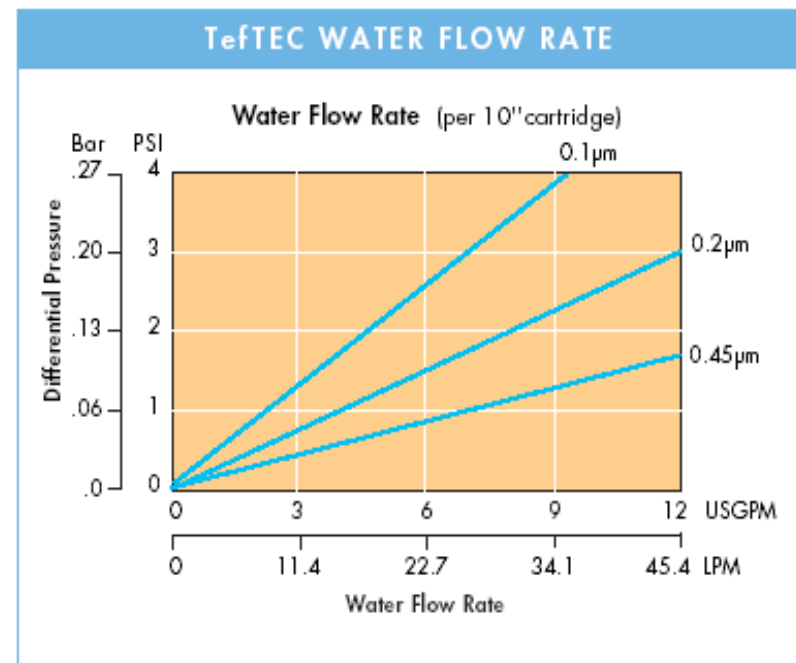
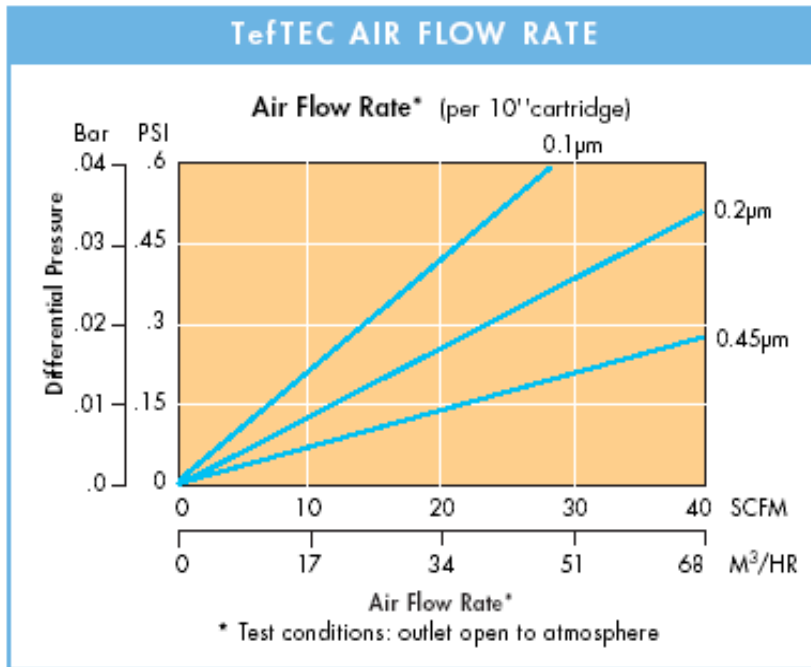


TefTEC Highlights

- Single layer membrane
- “STRETCHED” PTFE
- Integrity Testable
- Steam Sterilizable
- FDA acceptable materials-USP Class VI
- 0.8 m² (8.5 ft²) of membrane per TIE
- 0.1, 0.2, & 0.45 microns



TefTEC - Flow Rates



TefTEC - Summary

<i>Features</i>	<i>Benefits</i>
◆ PTFE membrane	◆ Hydrophobic ◆ Chemically compatible
◆ Integrity testable	◆ Assures structural integrity



TefTEC Filter Cartridges

TefTEC is used in processing:

- Fermentation feed air
- Tank vents/exhausts for autoclaves
- Aggressive chemicals - corrosive acids, solvents, esters, ketones
- Electronics- high purity chemicals, photo resists
- Pharmaceuticals



Pleated Depth Products

- MDP-absolute PP pleated
- MHP-nominal PP pleated
- QCR-Cyst removal
- QXP-profile star/Filterite XLD alternative
- MPP-economical PP absolute pleated
- MDG-Glass fiber

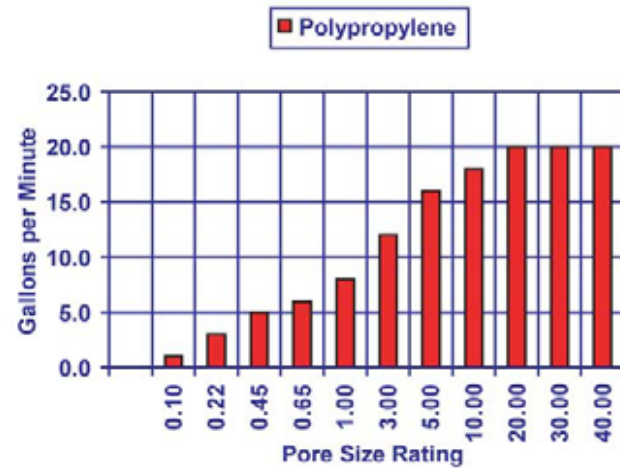


MD Filter Cartridges

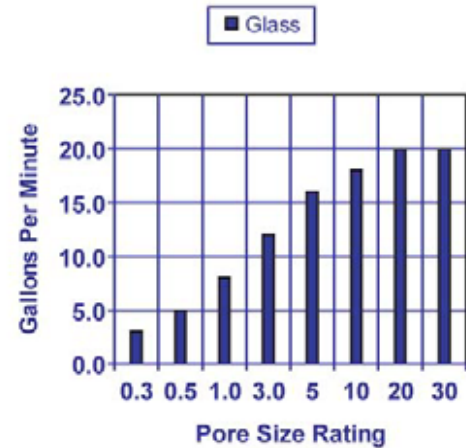
- Pleated, Graded Density Polypropylene Melt Blown Media
- 0.7 M² (7.7 ft²) of Surface Area
- Absolute Rated - 99.98%
- High Flow Rates
- High Dirt Capacity



MD - Flow Rates



These charts represents typical water flow @ 1 PSID per 10" cartridge length.



QCR Filter Cartridges

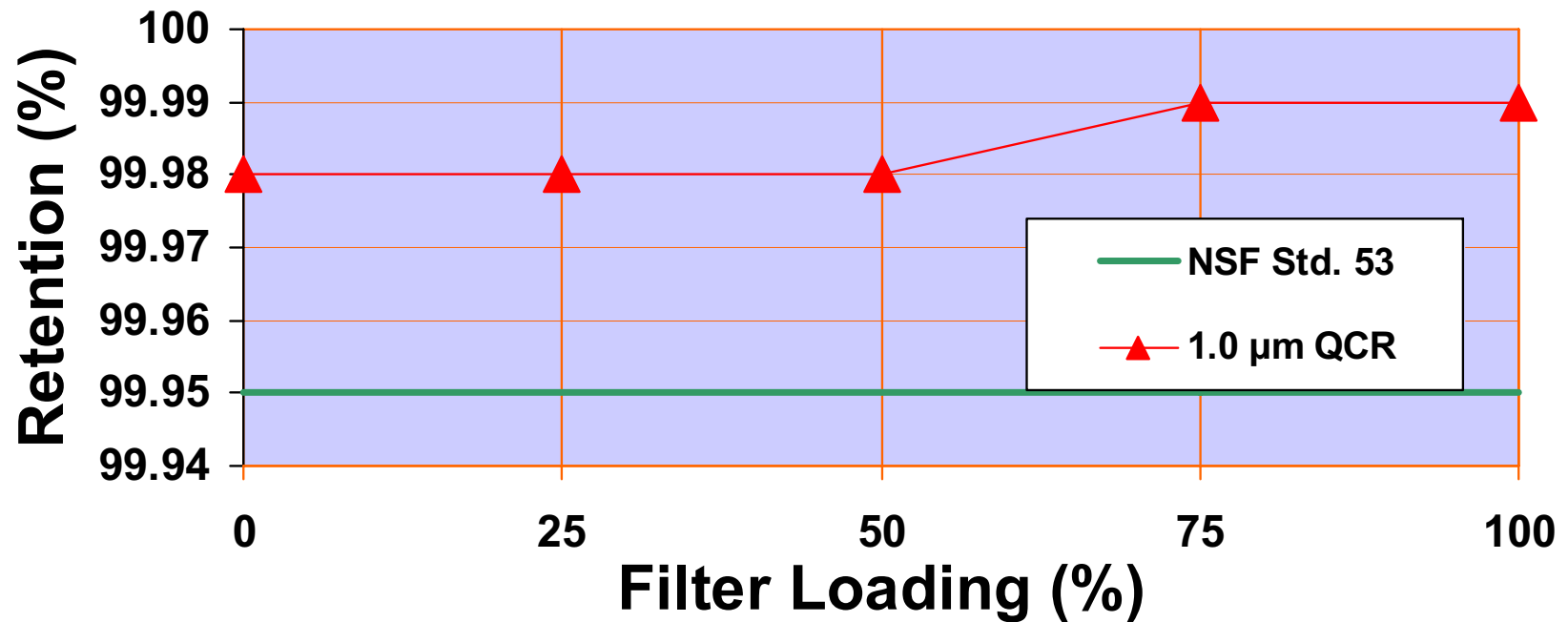
- Pleated, graded density polypropylene melt blown media
- Meets/exceeds ANSI/NSF Standard 53 for cyst reduction of 99.95%
- 0.7 M² (7.7 ft²) of surface area - long on-line life
- Ideal for bottled water and beverages



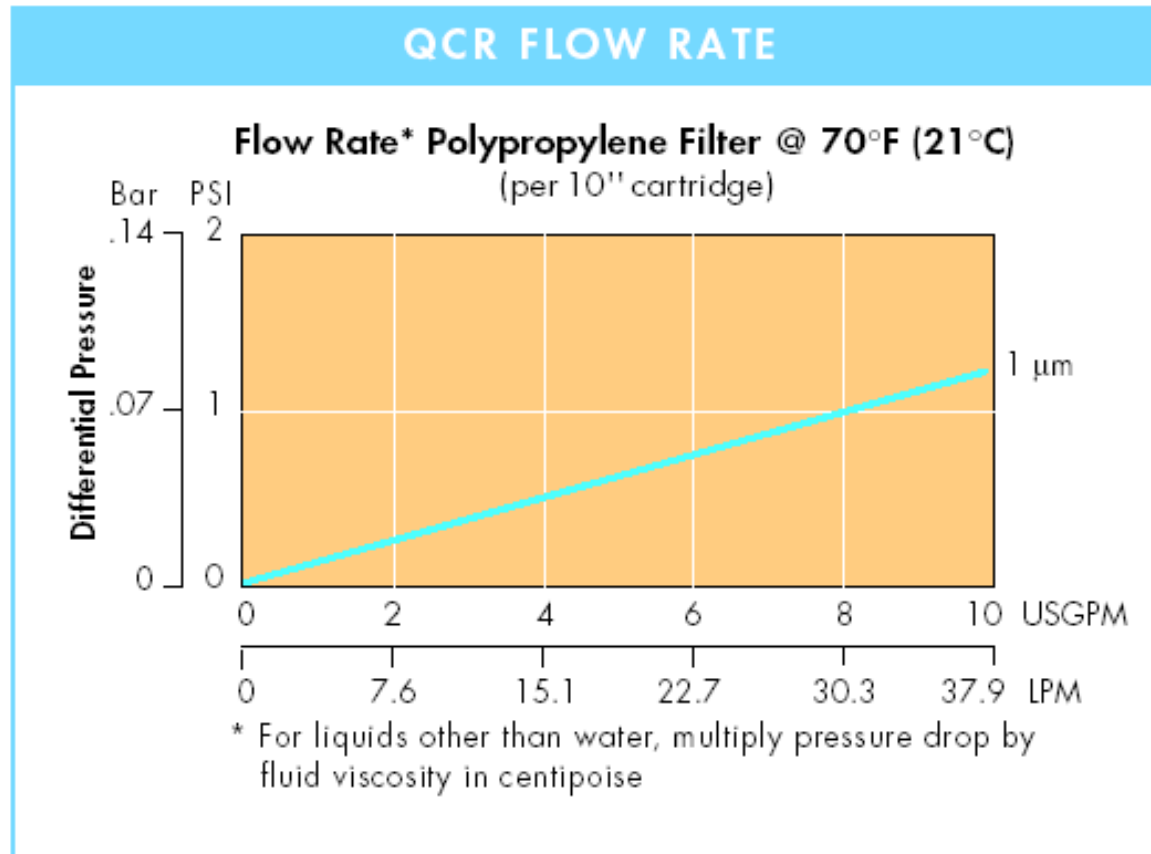
QCR - NSF-53

Retention Performance

QCR Cyst Retention Analysis



QCR Flow Rates



QCR - Summary

Features	Benefits
Meets/Exceed ANSI/NSF Standard 53	<ul style="list-style-type: none">◆ Removes >99.95% of Cryptosporidium and Giardia cysts◆ Ideal for bottled water
Graded Density	<ul style="list-style-type: none">◆ Good retention◆ Higher Dirt holding capacity
High Flow Rates	<ul style="list-style-type: none">◆ Lesser # of filters – economical◆ Lower energy use
USP 27 Plastics Testing	<ul style="list-style-type: none">◆ Suitable for pharmaceutical and food applications



QXP Pleated Depth Filter



- Designed for filtration of industrial solutions containing agglomerated particles & gels. **Heavy viscosity fluids.**
- True graded density polypropylene depth filter with 0.25 M² (2.7 ft²) of surface area per 10”.
- Absolute (99.98%) rated in 1, 5, 10, 20, 40 microns.
- Ideal for inks, slurries, photo resists, edible oils, paints and beverages.



QXP Technology

- **Layer 1 (Separation)** - This is to separate the agglomerated particles especially the abrasive materials into its original size.
- **Layer 2 (Separation)** - This is to polish & make sure the agglomerated particles are separated to its original size.
- **Layer 3 (Filtration)** - This is the true filtration stage to make sure all particles larger than the desired range is filtered out.

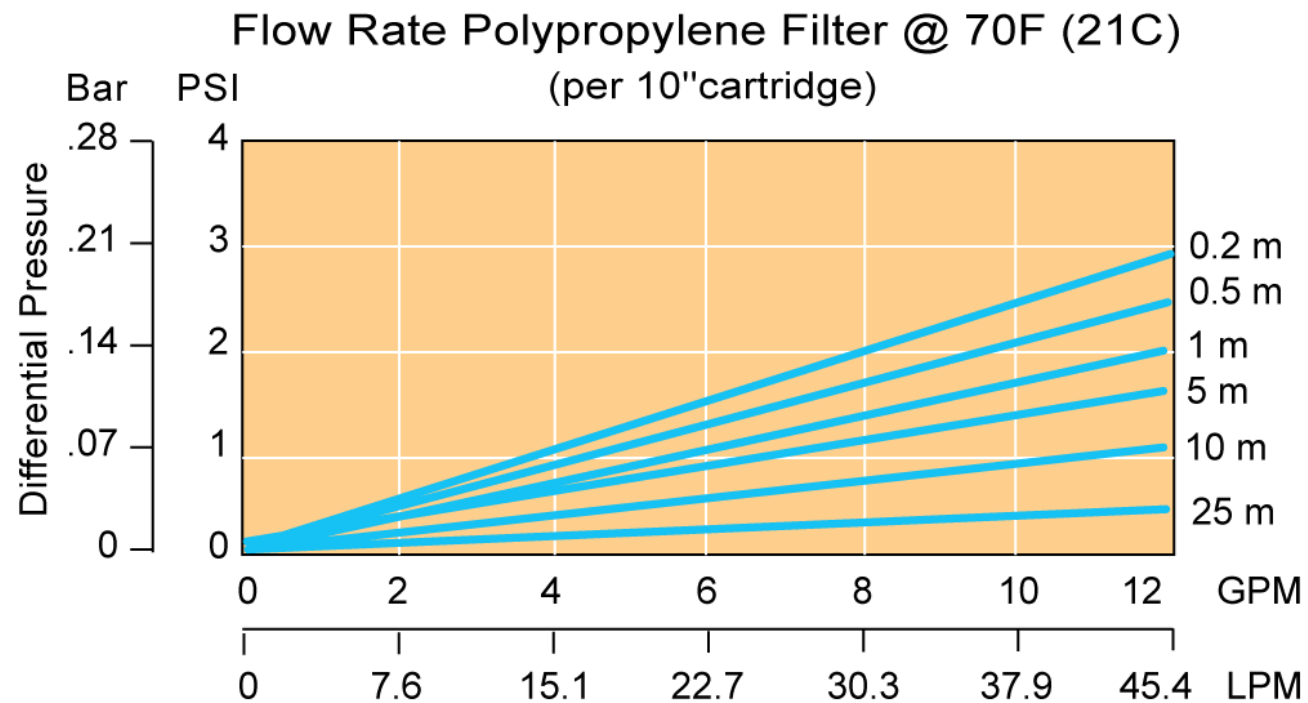


MHP Filter Cartridges

- Pleated, graded density polypropylene melt blown media
- 0.5 m² (5.5 ft²) of surface area
- Absolute rated - 99.98%



MHP - Flow Rates



MHP - Summary

<i>Features</i>	<i>Benefits</i>
◆ Polypropylene melt blown media	◆ Chemically Compatible
◆ Absolute rated at 99.98%	◆ Absolute performance at economy price
◆ FDA Listed Components	◆ Acceptable for food and beverage contact

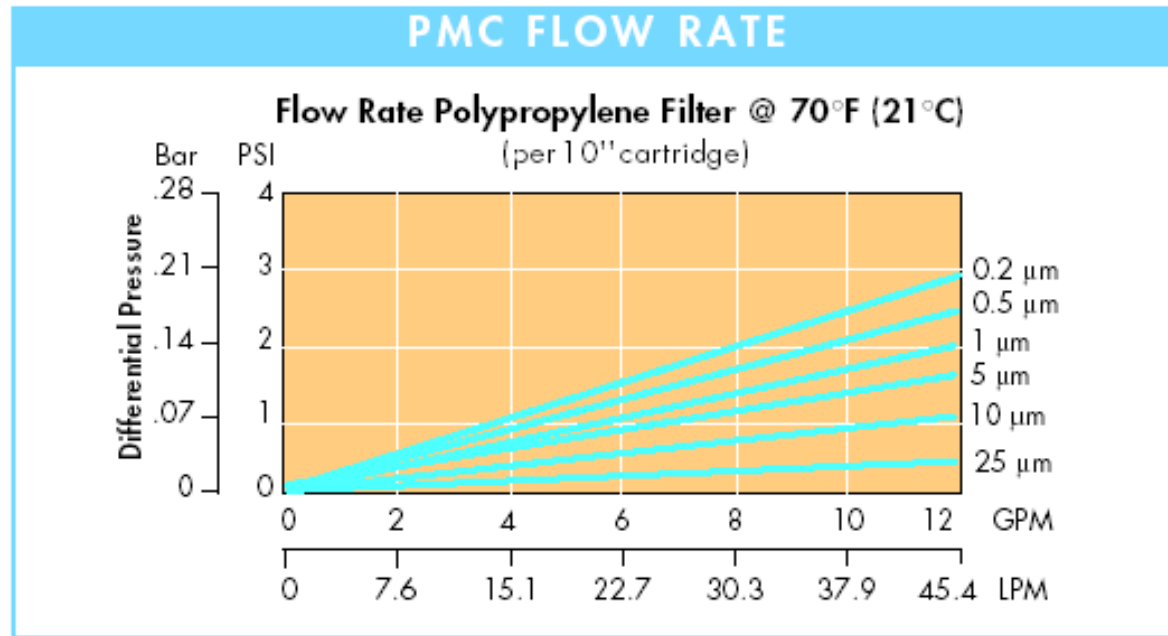


MPP Filter Cartridges

- Pleated, graded density polypropylene melt blown media
- 0.5 m² (5.5 ft²) of surface area
- Nominally rated - 90%



MPP - Flow Rates



MPP Performance Characteristics

Filter Removal Efficiency

<i>Beta Ratio Efficiency</i>	<i>Beta 10 90%</i>	<i>Beta 5 80%</i>
Polypropylene		
<i>0.25 micron</i>	<i>0.25</i>	<i>0.10</i>
<i>0.50 micron</i>	<i>0.50</i>	<i>0.20</i>
<i>1.0 micron</i>	<i>1.0</i>	<i>0.50</i>
<i>2.0 microns</i>	<i>2.0</i>	<i>1.0</i>
<i>5.0 microns</i>	<i>5.0</i>	<i>4.0</i>
<i>10.0 microns</i>	<i>10.0</i>	<i>6.0</i>
<i>25.0 microns</i>	<i>25.0</i>	<i>15.0</i>



MPP - Summary

<i>Features</i>	<i>Benefits</i>
◆ Polypropylene melt blown media	◆ Chemically Compatible
◆ Nominally rated at 90%	◆ Economical pleated elements
◆ FDA Listed Components	◆ Acceptable for food and beverage contact



Non-Pleated Products

- COAX-profile/sartofine alternative
- MS-String Wound
- MBF-Claris alternative
- MBA-Nexis alternative
- TPM-Porous Titanium filter



MB & COAX DEPTH FILTERS

- Contains No Wetting Agents, Solvents, Anti-static Agents Or Binders
- Continuous Manufacturing
- Self Supporting
- Fast Rinse-up To 18 Megaohm
- Fluid Compatibility
- Easy Disposal



MB Melt Blown



Coax



MB & COAX DEPTH FILTERS

- ISO 9001 Certified
- FDA Certified For Food & Beverage Contact
- Blown Microfiber Process
- Thermally Bonded Construction
- True Graded Density



CAT SCAN SHOWING GRADED DENSITY

- Stringwound Filter

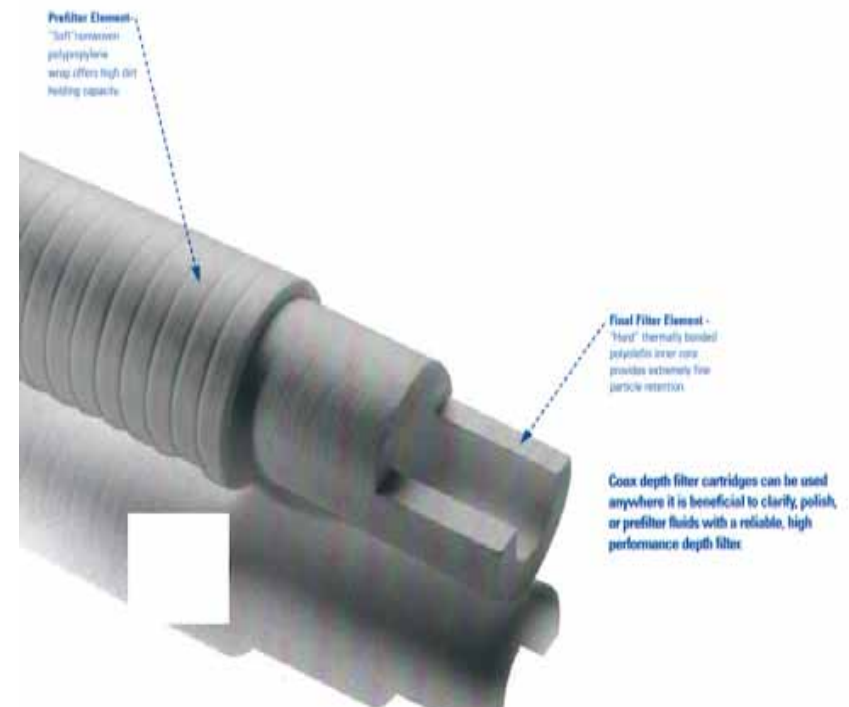


- MBF Depth Filter



COAX Wrapped Depth Filter

- Coaxial two-stage graded density wrapped filter
- Coarse outer prefilter layer
- Finer inner prefilter layer
- Rigid self-supporting core
- Consistently high flow rate with low pressure drop
- High dirt holding capacity
- Superior filtrate purity
- Broad chemical compatibility

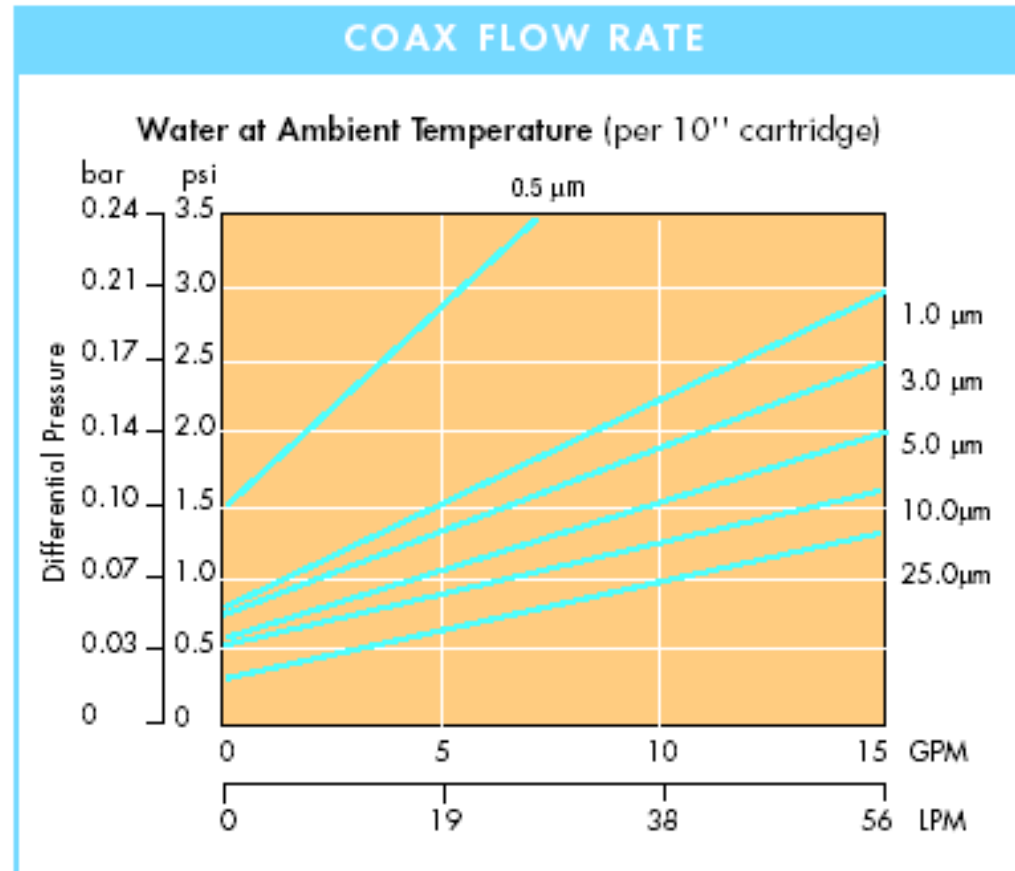


COAX Pore Ratings

Grade	Micron Rating (μm)	90% Removal	95% Removal	>99% Removal (Absolute)
CX-005	0.5	0.5	2.0	4.0
CX-01	1.0	1.0	3.0	8.0
CX-03	3.0	3.0	5.0	12.0
CX-05	5.0	5.0	8.0	20.0
CX-10	10.0	10.0	13.0	30.0
CX-25	25.0	25.0	30.0	50.0
CX-50	50.0	50.0	60.0	100.0
CX-75	75.0	75.0	110.0	150.0
CX-100	100.0	100.0	125.0	200.0



COAX Flow Rates



COAX - Additional Information

- Steam Sterilizable - 121 °C under static conditions
- Solvent Stable - in basic format
- Surfactant free
- Meets FDA standards
- Silicone free - Certificate available
- Smooth fiber-free interior - won't shed particles
- Strong inner core - cannot easily be crushed or collapsed - no contraction up to 115 psi pressure
- Weight of 10" CoaX 170 to 180 grams. Water extractables < 10 mg



COAX - Summary

<i>Features</i>	<i>Benefit</i>
Uniform Fiber Diameter 1.5 to 2.0 D	Consistent contaminant removal characteristics
Rigid Structure	Cartridge will not collapse and unload
Retention along the length	Excellent ability to retain deformable particles
High-flows and low pressure drop	Reduces Filtration Cost and lower energy requirements
Dual Filtration Zone	Normally about 2x lifetime Vs Competition
Made of all plastic – strong core	No need for metal core, easy disposal



MB Filter Cartridges

- Non-pleated melt blown media
- Nominally rated 80%
- True graded pore structure
- Extruded core for high strength and no flow restriction
- High porosity for high dirt holding capacity
- Continuous fibers are thermally bonded so no fiber migration

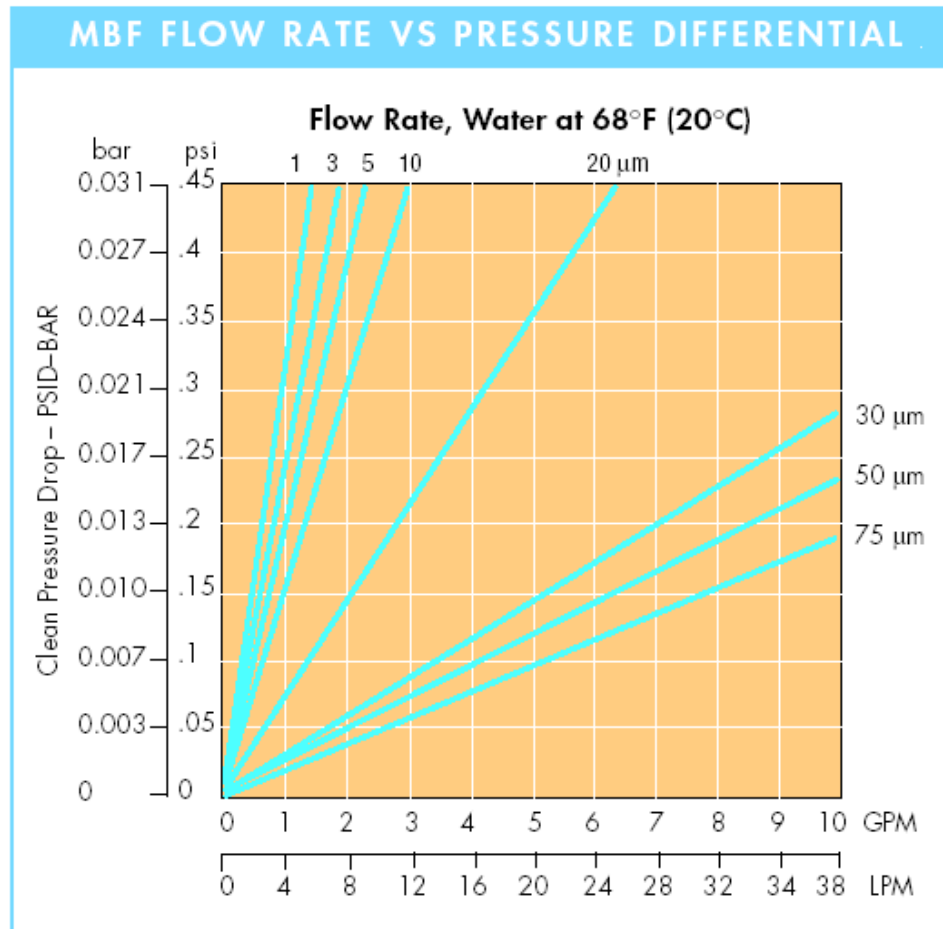


MB Filter Cartridges

- 100% Polypropylene melt blown filter
- Highly consistent performance
- Easy disposal through crushing or incineration
- Graded pore structure, high void volume for high DHC



MB - Flow Rates



MBF - Summary

<i>Features</i>	<i>Benefits</i>
◆ 100% Non-pleated melt blown media	◆ Chemically compatible
◆ Free of binders, adhesives and surfactants	◆ Low extractables
◆ FDA Listed components	◆ Acceptable for food and beverage contact








TPM Filter Cartridges

- Sintered porous titanium elements
 - High corrosion resistance
- Absolute rated - 99.5%
- Cleanable/backwashable
 - Allows for re-use
- Idea for use in high temperature, high viscosity, corrosive applications



TPM Configurations

TPM CARTRIDGE SELECTION INFORMATION					
End Cap Style Description					
	P DOE ¹	P2 226/flat	P3 222/flat	M-1 3/4" Male NPT ²	M-2 1" Male NPT



TPM Efficiency

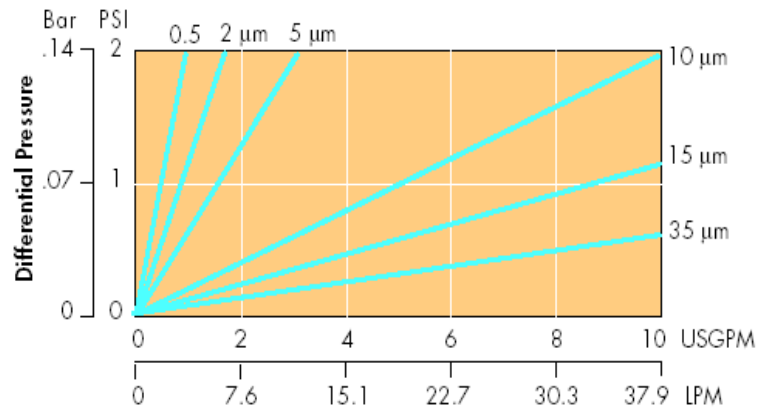
Filter Removal Efficiency

Micron Rating	Efficiency		
	90%	95%	99.5%
<i>0.5 micron</i>	<i>0.1 micron</i>	<i>0.3 micron</i>	<i>0.5 micron</i>
<i>2 micron</i>	<i>0.4 micron</i>	<i>0.8 micron</i>	<i>2 micron</i>
<i>5 microns</i>	<i>1 micron</i>	<i>3 microns</i>	<i>5 microns</i>
<i>10 microns</i>	<i>5 microns</i>	<i>8 microns</i>	<i>10 microns</i>
<i>15 microns</i>	<i>10 microns</i>	<i>12 microns</i>	<i>15 microns</i>
<i>35 microns</i>	<i>28 microns</i>	<i>32 microns</i>	<i>35 microns</i>

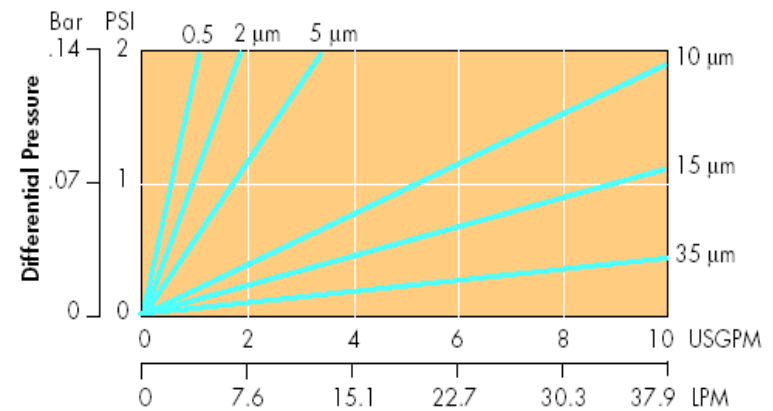


TPM - Flow Rates

TPM 2.36" (60mm) WATER FLOW RATES



TPM 2.75" (70mm) WATER FLOW RATES



TPM - Summary

<i>Features</i>	<i>Benefits</i>
◆ 100% Sintered titanium powder	◆ Chemically compatible ◆ Corrosion resistant
◆ Backwashable/cleanable	◆ Maximum economy through re-use
◆ Absolute rated at 99.5%	◆ High efficiency filtration from 0.5 to 35 microns



CP Capsules

FEATURES

- Housing constructed entirely of polypropylene
- Disposable after use
- Can be sanitized and sterilized
- Thermal sealed ends
- Can enclose any cartridge or media
- Various end cap configurations
- Easily retrofits most systems
- Includes vents & drains
- All materials meet US FDA
- Meets USP 27 Class VI Biological Test for plastics



SHELCO Filter Housings

- FOS Series - Single Cartridge
- RHS - Single Cartridge - Heavy Duty
- CSF - Single Cartridge - 222/226 oring
- VPH - Single Cartridge - Polypro
- 4FOS - 52FOS Series - Multi-Cartridge
- 1SIF Sanitary Housing



FOS Series

- Single Cartridge Housing
- Economically Priced
- 304L or 316L Stainless steel
- Bolt Closure with O-ring Seal
- 17 bar @ 135° C Design
- Knife Edge Seal
- 9 ¾”, 10”, 20”, 30” lengths
- BSP or NPT Thread Connection



Призматический уплотнитель тонкой машинной обработки



Обработанная канавка для герметизирующей прокладки



RHS Series

- Single Cartridge Housing
- 316L Stainless Steel
- Threaded Ring Closure
- 20.5 bar @ 93° C Design
- Knife Edge Seal
- 9 ¾”, 10”, 20”, 30” lengths
- BSP or NPT Thread Connection



CSF Series

- Single Cartridge Housing
- 316L Stainless Steel
- Threaded Ring Closure
- 20.5 bar @ 93° C Design
- 222 or 226 O-ring Style cartridges with fin or flat end cap
- 10", 20", 30" lengths
- BSP or NPT Thread Connection



VPH Series

- Single Cartridge Housing
- 100% Virgin Polypropylene
- Meets FDA Requirements For Food or Beverage Applications
- 10 bar @ 52 °C Design
- DOE or 222 O-ring Style cartridges with fin or flat end cap
- 10", 20" lengths
- NPT Thread Connection



Multi Cartridge FOS Series

- Multi-Cartridge Housing
- 304L or 316L Stainless Steel
- V-Band or Swing Bolt Closure
- 4, 5, 7, 12, 22, 36 & 52 Columns of Cartridges
- Knife Edge Seal or 222/226 Cartridge Adapters
- Threaded NPT or BSP, DN Flanged connections



1SIF Series

- Sanitary High Purity Applications
- Built to 3A Sanitary Standards
- 316L Stainless Steel, Electro-polished with 25RA Internal and 32RA External Finish
- 222 or 226 Cartridge End Caps
- Available 1, 3, 5 & 7 Round “T” Style
- Available 1 Cartridge In-line



What is Reverse Osmosis?

Reverse osmosis is the process of pushing water through a filter that traps the impure liquid on one side and allows the pure water to be obtained from the other side.

The membranes have a dense polymer barrier layer in which separation takes place

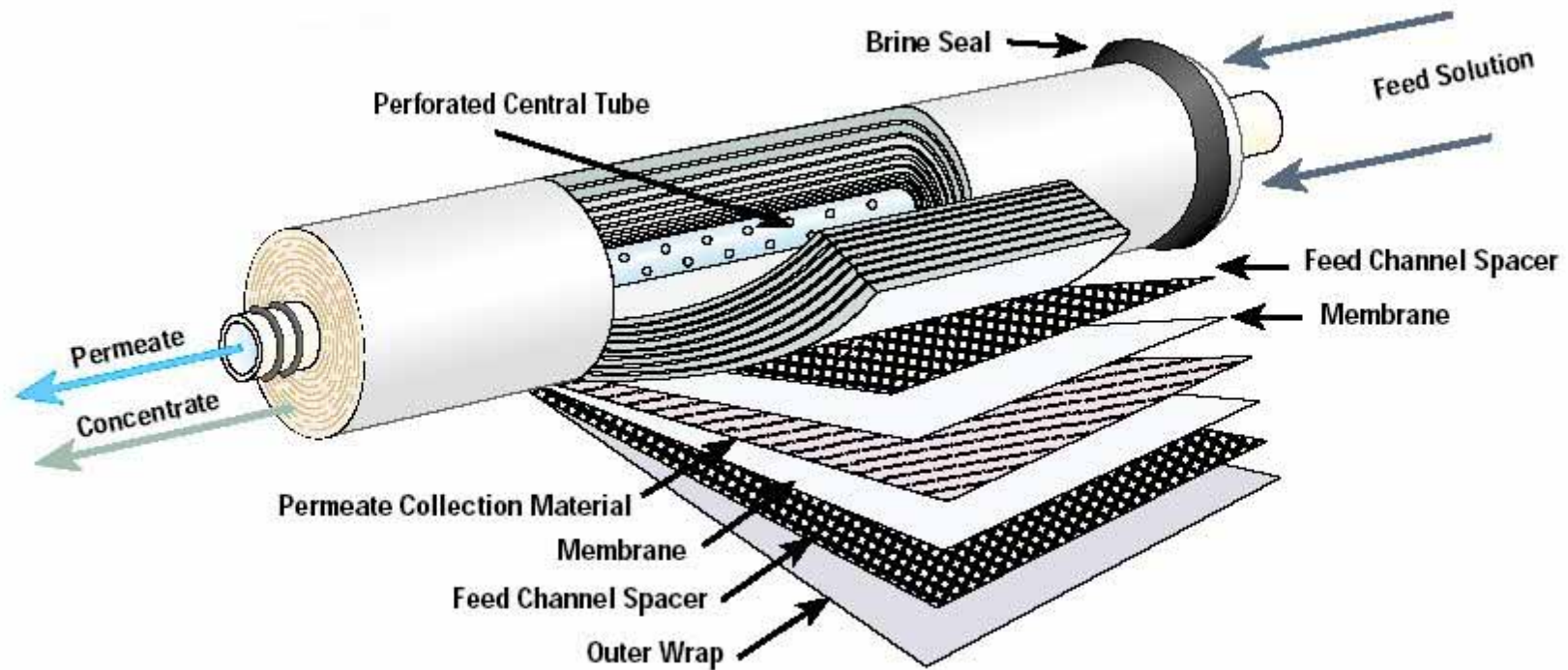
The membrane is designed to allow only water to pass through this dense layer while preventing the impurities (such as salt) from passing through.

The process requires high pressure on the high concentration side of the membrane, usually 2–14 bar (30–200 pounds per square inch) for fresh and brackish water, and 40–70 bar [(600–1000 psig)] for seawater.

This process is best known for its use in desalination (removing the salt from sea water to get fresh water) and has been used in this way since the early 1970s.

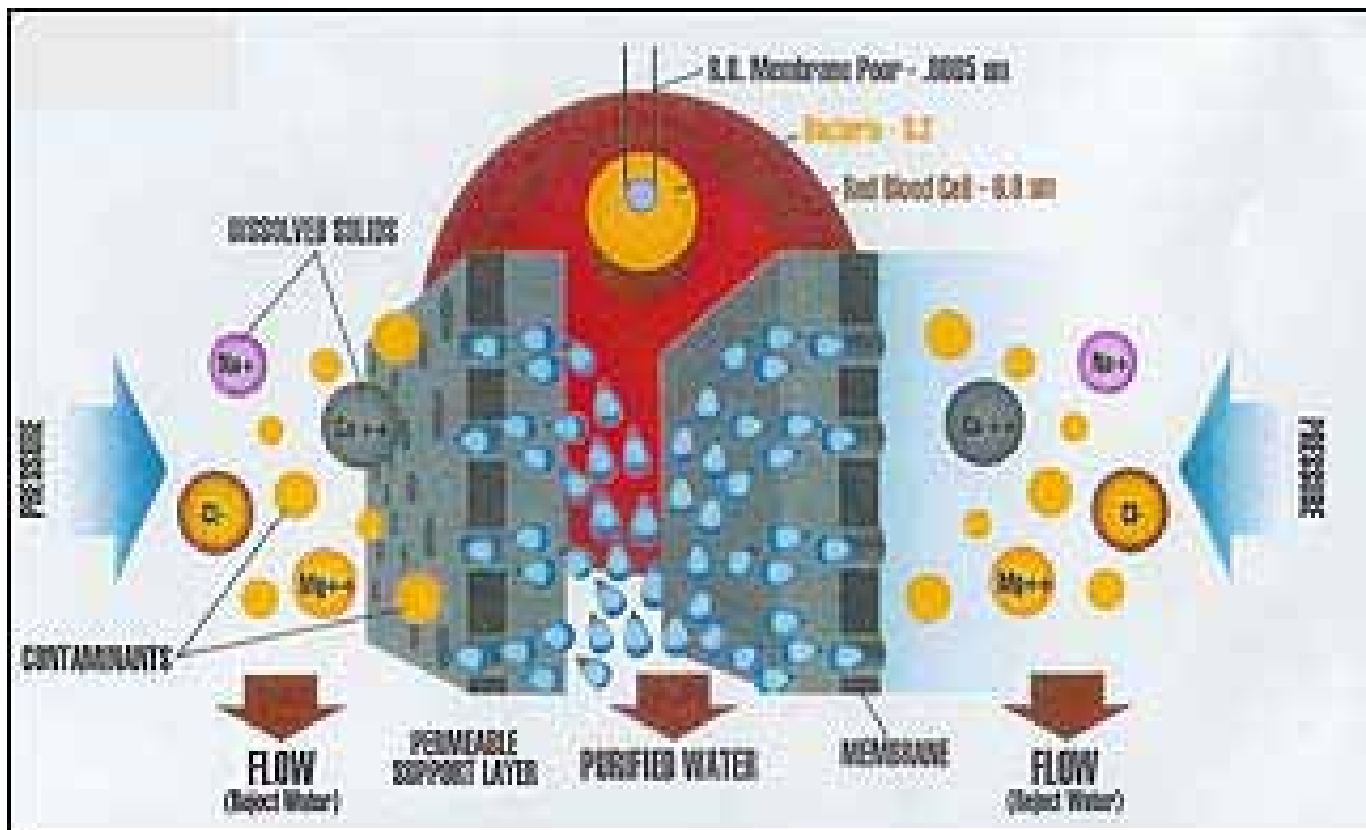


Reverse Osmosis Membranes



Reverse Osmosis

How it works.....



Hydraulic Filtration

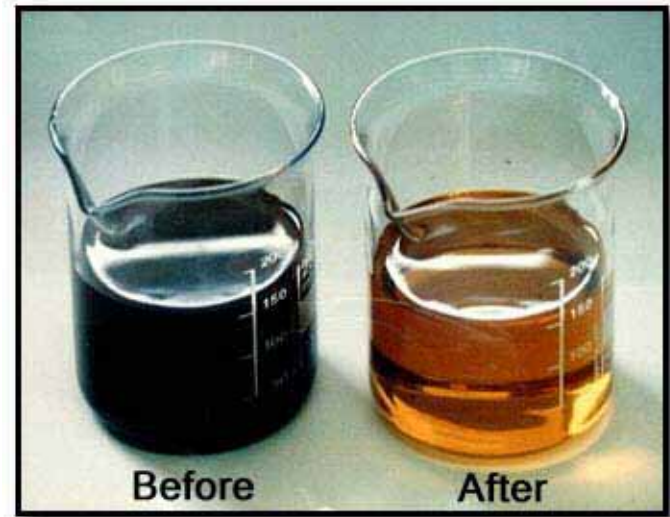
Beta 1000 Rated Replacements

List of Companies

ABB, Aircraft Porous, Allison Transmission, American Crane, Argo, Bea Filtri, Boll & Kirsch, Bomag, Bombardier, Bosch, Bowser, Brueninghaus, Hydromatik, Can-Flo, Case, Caterpillar, Cincinnati Milicron, Cooper Turbo, Crosland, Demag, Diagnostics, Ditch Witch, Donaldson, Dresser Rand, Ebara, Enervac, EPE, Euclid, Hitachi, F.B.O., Facet, Fairey Arlon, Falk, Fendt, Ferromatik, Fiat, Filtrec, Filu, Finn, Fluidtech, Gardner Denver, General Electric, General Motors, Gresen, Grove, Hagglunds, Hastings, Hilco, Hitachi, Husky, Hy-Dynamics, Hycoa, Hycon, HYDAC, Hydramac, Hydreco, Hydrowatt, IHC, Ikron, Indufil, Ingersoll Rand, International Harvester, Internormen, JCB, JLG, John Deere, Joy, Kassbohrer, Kato, Kaydon, Keene, Kobelco, Koehring, Komatsu, Kralinator, Kramer, Labrie, Laeis, Leach, Lenz, Leroi, LHA, Liebherr, Link Belt, Lorain, Luber-Finer, Lucas, Magerle, Mahle, Man, Manitou, Mann & Hummel, Marion, Marvel, Massey Ferguson, Masuda, Mazak, McNeilus, Mega, Menzi, Muck, Modina, Moog, Mopar, Morbark, MP Filtri, MTS Systems, Muncie, Mycom, National Filter, Nelson, New Holland, Norco, Norman, Norman Ultraporous, Nugent, Nuovo, Nustar, O&K, OFS Oil Filtration Systems, Okuma, OMT, Orion, Oshkosh, Owatonna P & H Harnischfeger Palfinger, Pall, Parker, Peco, Perry, PMI, Porous Media, Prentice, Prince, PTI, Purolator, Putzmeister, Racine, Refilco, Regel Technik, Reinhausen, REP, Rexnord, Rexroth, Rimpull, Ripley, Rolls Royce, Rosco, Royal, Ryco, SAE Auto ID, Sandvik, Santasalo, Savara, Schmeck Pegasus, Schroeder, Schwing, Sennebogen, Separation Technologies, Servolife, Servtek, SMC, SOF, Sofima, Sofrance, Solar, Sommermeyer, Stauff, Steiger, Sullair, Sumitomo, Sunstrand, Taisei Kogyo, Tamrock, Tamrotor, TEC-FIL, Tennant, Terex, Texas Filters, Textron, Timberland, Torite, Toro, Towmotor, Trak, Trico, Tuxco Caddy, UCC, UFI, Unitech, United Engine Life, Universal, Valmet, Van Dorn Demag, Velcon, Venieri, Vermeer, Versatile, Vickers, Vogel, Vokes, Volvo, Western, Westinghouse, Winslow, Wix, Woodgate, Yamashin, York, YSK, Zeichung, Zettelmeyer, ZF, Zinga, Zirkon



Oil Purification Systems



Low Vacuum Oil Purifiers

- Dehydration and degasification of industrial oils.
- Removal of free, emulsified and dissolved water, free and dissolved air and gases, and particulate matter.



Low Vacuum Oil Purifiers - Performance

- Removes up to 2% water in a single pass, down to 50 PPM or less (total water) in multiple passes
- Removes down to .5 micron in filtration
- Does not remove costly additives
- Flow pattern does not agitate the oil
- Unit is modular
- Electrical: explosion / weather-proof enclosures
- Automatic controls designed for unattended operation
- Heater controls are solid state



Where Are The Lo-Vac's Used ?

- Turbine Oil
- Compressor Oil
- Paper Machine Oil
- Hydraulic Oil
- Transformer Oil
- Cutting & Cooling Oil
- Lube Oil
- Synthetic Oil
- Phosphate Ester Oil
- Power Plants
- Ammonia Compressors
- Extrusion Plants
- Steel Mills
- Pulp & Paper
- Petrochemical Plants
- Refineries
- Chemical Plants
- Injection Plants
- Machinery Manufacturers
- Aircraft Manufacturers



Natural Gas Filtration



Solar Gas Turbine
Natural Gas Coalescer
Skid



Duplex Natural Gas Coalescer
Skid

