GVS

FILTER TECHNOLOGY

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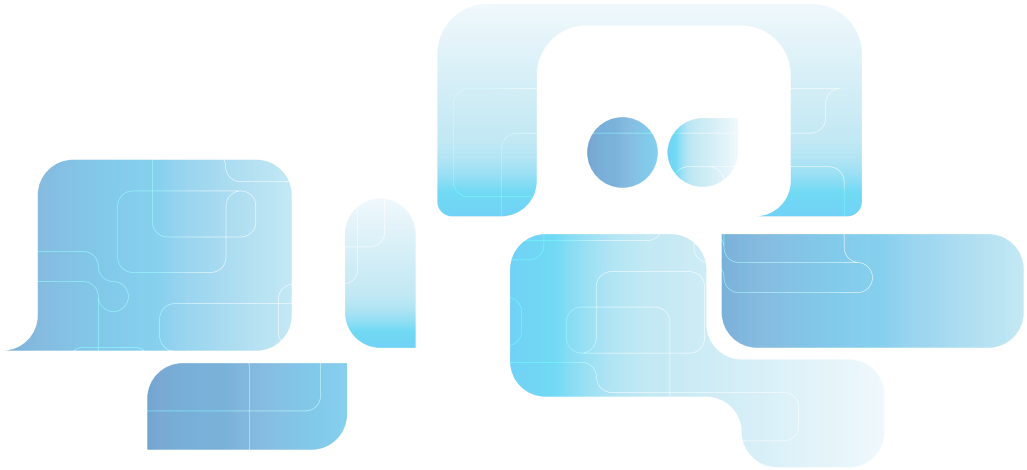
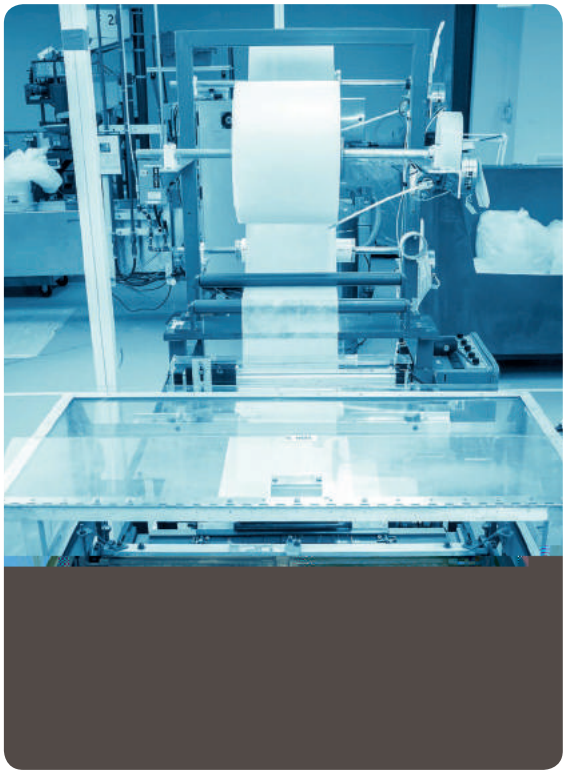


Table of Contents



About Us

GVS Filter Technology is a fully integrated producer and supplier of membrane-based solutions for the life sciences, environmental monitoring and process filtration markets. Our GVS membranes are used for laboratory research, food and beverage production, medical diagnostics, pharmaceutical research and bio-processing. All the membranes are manufactured at our facilities in North America and Italy, allowing for easy and cost-effective customization. GVS Filter Technology has the widest choise of membrane in the market, and thanks to expertise GVS is able to partner with you for all of your OEM Membrane needs.

Our History

Our roots go back to Schleicher and Schuell Bioscience (S&S), a German-based company with expertise in membrane-based products for life sciences, diagnostics and microbial monitoring. When S&S was acquired by Whatman LLC in 2006, its US operations were moved to a new facility in Sanford, Maine. The state-of-the-art research and manufacturing facility combined expertise in filtration and track etched membranes with the life sciences applications.

In 2011 the company became part of GVS Group and Life Science Membrane Center of Excellence.

Through organic growth and strategic acquisitions, the company, now branded as GVS Filter Technology, became a leading OEM supplier, contract manufacturer and finished goods producer of filtration, life sciences and environmental monitoring consumables.

We today manufacture many different type of membranes:

- Polyethersulfone (PES)
- Nylon (NY)
- Nitrocellulose (NC)
- Cellulose acetate (CA)
- Polyvinylidene difluoride (PVDF)
- Polycarbonate track etched (PCTE)
- Polyester track etched (PETE)

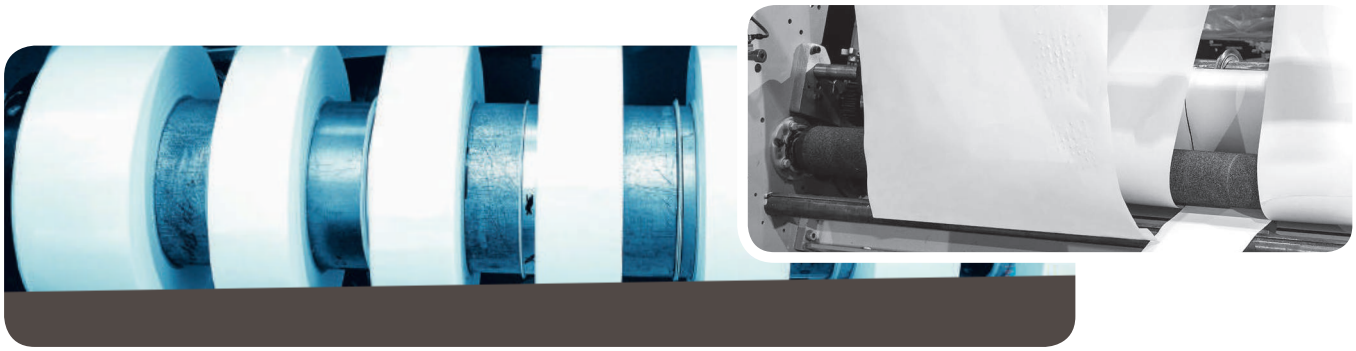
GVS FIlter Technology are recognized for quality and responsiveness to our customers. Our focus remains on providing a high level of excellence and service to successfully partner with you.

Our Facilities & Capabilities

GVS Filter Technology operates in a 24,000 ft^2 state of the art manufacturing facility in Sanford, ME and a 20,000 ft^2 membrane casting facility in Westborough, MA and 20,000 ft^2 membrane casting facilities in Bologna, Italy.

- The Massachusetts facility includes four membrane casting lines for PES, PVDF, NC and NY.
- The Maine facility includes several track etched membrane production lines for both PCTE and PETE and a membrane casting line for CA.
- The Maine facility includes nearly 20,000 ft^2 of clean room for manufacturing space and 4,000 ft^2 of R&D laboratories.
- The Bologna facility includes PVDF casting line, surface coating treating line, conversion capabilities, clean room and R&D laboratories.
- Our membrane conversion capabilities, including both razor slitters and rotary shears, provide a broad range of standard and custom roll stock slit widths.

Our expertise and quality control ensure strict adherence to the tight tolerances and performance specifications required for your applications.



Our Commitment

- **Performance** - GVS Filter Technology membranes have a long history of use in many applications. From development through continuous improvement and investment, we strive to offer membranes that exceed performance specifications.

- **Consistency** - The GVS Filter Technology Quality Management System ensures adherence to ISO guidelines, providing a quality product with every run, every time. Documentation and support are there to ensure you meet your regulatory and customer requirements. Our commitment to quality and consistency is evidenced by repeat business from many major life science customers.

- **Support** - A membrane research team comprised of Ph.D.s and engineers provides the expert technical assistance you need to choose the membrane type and dimension to suit your specific applications.

- **Product Range** - Our nine casting lines combined with the depth of our knowledge make us uniquely qualified in the field of membrane-based life science solutions.

Our Quality & Certifications

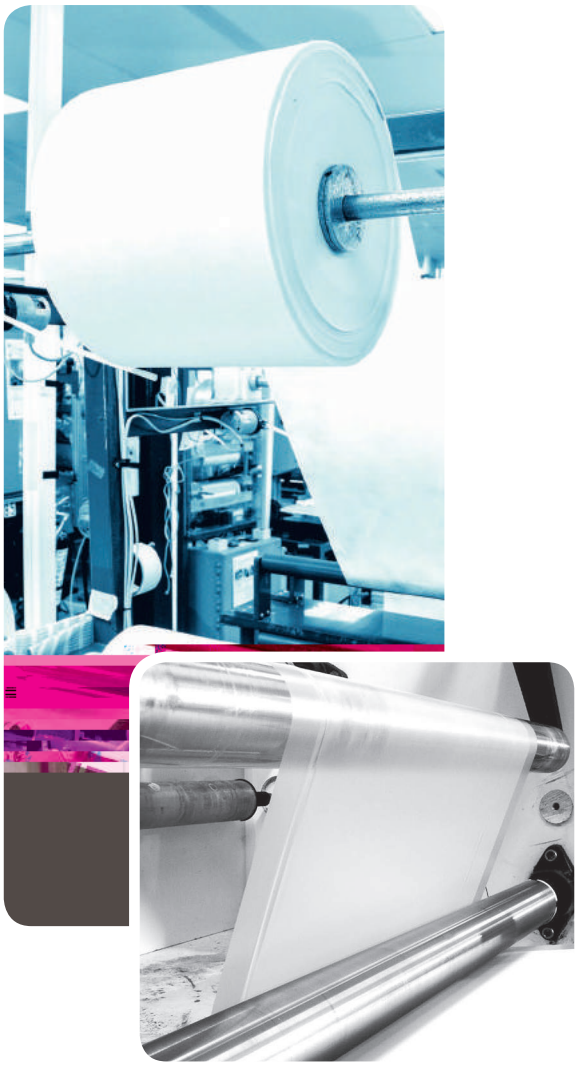
- GVS Filter Technology facilities are registered to the ISO 9001:2008 standard, and are TS 19649 compliants.
- Manufacturing clean rooms are rated to class 100,000 (ISO 5).
- GVS Filter Technology operates a Quality Management System that ensures lot-to-lot consistency, traceability and full accountability.
  - Each roll stock order comes with a Certificate of Analysis
- Most of our membranes have been tested for biocompatibility, toxicity, extractables and bacterial retention.

Our facilities have been audited by many of our major customers, and we welcome your visit and audit.

- **Continued Process Improvement** - By applying principles of Quality and continuous improvement GVS makes use of advanced design technologies, methods of error prevention and control systems. These system are used throughout the manufacturing processes worldwide to reduce the percentage of products which do not comply with specifications and helps us reach our target of 100% defect free manufacturing.

- **Flexibility/customization** - Our in-house casting capabilities combined with our conversion facilities allow us to customize almost any offering.

- **Efficiency** - GVS Filter Technology is a nimble and efficient company with low overhead and administrative burdens.
  Our size and structure help us to control costs and provide you direct access to the decision-makers and technical experts.



We're here for you at every step. Please feel free to contact us at any time for more information:
gvs@gvs.com
Look at Worldwide Distribution Centers on the last page or visiting www.gvs.com

Polymeric Membrane Application Guide

Let GVS Filter Technology be your one-source supplier for all your roll stock filtration needs. As the global leader with the widest microporous membrane portfolio, we can consolidate your supplier list. Our staff of scientific professionals have experience in many different industries and can be of assistance no matter what your industrial, bioprocess, or laboratory application may call for.

Polymeric Hydrophilic Membrane

Membrane Type	Characteristics	Applications	Industries
CA	Hydrophilic, low non-specific binding, low adsorption, thermally stable, uniform pore structure	Protein or enzyme filtration, protein recovery, tissue culture media filtration, wine filtration, prefiltration of plasma fractions and vaccines	Laboratory-Filtration; Environmental-Beverage and Water Testing
PES	Hydrophilic, low protein binding, high throughput, asymmetric structure	Coarse particulate filtration (large pore), final filtration (small pore), biological sample prep, IV filters	Environmental-Beverage Testing; Laboratory-Filtration, Medical Infusion
PES Positively Charged	Hydrophilic, low protein binding, high throughput	IV filters, oncology drug administration, long term administration	Medical Infusion
Air Flow Stop PES	Hydrophilic air flow stop membrane	IV drip chambers	Medical Infusion
NY	Hydrophilic, internally supported, high surface area, high protein binding, low extractables, supported for strength for automated equipment handling	HPLC sample prep, clarify aqueous and organic solvents, alkaline solutions, beverage and pharma processing	Laboratory-Filtration, Analytical, Bioprocessing; Pharmaceutical; Environmental-Beverage Testing
NY Positively Charged Filtration Membrane	Higher binding capacity than NC, internally supported, can withstand multiple reprobings, hydrophilic endotoxin retention	Radiolabeled and non-radiolabeled detection systems, Northern and Southern blots (nucleic acids), Multiple reprobings, Alkaline transfers, DNA fingerprinting, UV crosslinking, IV filters	Laboratory-Molecular Biology and Diagnostics, Medical Infusion
NC	Hydrophilic, resistant to mild acids, hydrocarbons, formaldehyde and petroleum ethers, high protein binding	Gravimetric and clarifications with aqueous solutions; microbial capture and detection	Laboratory-Filtration; Environmental-Beverage and Water Testing
PVDF Hydrophilic	High Flow Rates, Low Extractables, Broad Chemical Compatibility, Very low protein binding	TC media, pharma, ingredients, HPLC	Pharma to medical

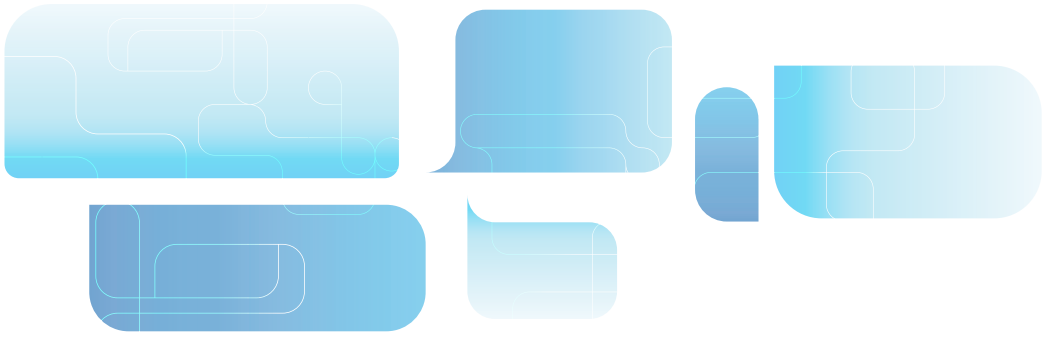
Polymeric Hydrophobic Membrane

Membrane Type	Characteristics	Applications	Industries
PVDF supported / pure Filtration Membrane	Naturally hydrophobic, pure, high sensitivity, low background, broad chemical compatibility	Protein detection via Western blotting, amino acid analysis, protein sequencing, GC sample prep	Laboratory-Molecular Biology and Diagnostics
PVDF Oleophobic / Emophobic	Naturally hydrophobic, in/post treatment super	Air/gas venting, transducer protector, suction-aspiration, medical device	Medical to pharma, Industrial, Food&beverage, Medical venting, Automotive

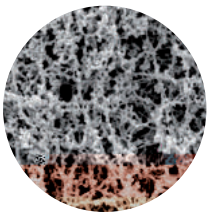
Track Etched Membrane Application Guide

Description

Membrane Type	Characteristics	Applications	Industries
PCTE-PVPF			



Polymeric Cellulose Acetate (CA) Filtration Membrane



GVS Filter Technology Cellulose Acetate (CA) Filtration Membrane is a supported, hydrophilic membrane that exhibits naturally low protein binding. Composed of cellulose acetate internally supported by an inert polyester web, resulting membrane has dimensional stability. This provides higher throughputs than competitor offerings and reduces the amount of filter changes needed during filtration of proteinaceous solutions. It is ideal for use in filtration applications where maximal recovery of protein is critical.

GVS Filter Technology CA Membrane is available in roll widths from 1 inch (2.54 cm) to 13 inches (33 cm), as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits

- Superior strength to withstand aggressive handling or use with automated equipment without breaking or tearing
- Low protein binding minimizes retention of proteins in solution
- Low extractables ensure tests will be clean with consistent results
- Lot-to-lot consistency ensures consistent flow and diffusion rates for dependable results every time
- Non-lysing of cells prevents contamination of critical solutions
- Passes USP Class VI Toxicity testing, ensuring suitability for use in medical devices
- The materials in this membrane are FDA approved for food contact under the applicable regulations in 21 CFR

Product Characteristics

- Hydrophilic
- Thermally stable with a maximum operating temperature of 274°F (135°C)
- Autoclavable
- Broad sealing compatibility, including ultrasonic, heat, radio frequency and insert molding

Typical Applications

- Protein and enzyme filtration
- Biological fluid sterilization
- Tissue culture media sterilization
- Cold sterilization
- Wine filtration
- Prefiltration of plasma fractions and vaccines

Specifications

Pore Size (µm)	Flow Rate (mL /min / cm² @10psi)	Bubble Point		Thickness (µm)
		psi	bar	
0.22	22-10	50-72	3.4-4.9	65-110
0.45	79-32	30-45	2-3.1	65-110
0.65	106-39	18-32	1.2-2.2	65-110
0.8	122-44	14-28	0.9-1.9	65-110
1.2	318-51	11-22	0.7-1.5	65-110
5.0	553-216	6-16	0.4-1.1	65-110

Ordering Informations

Filtration Grade Cellulose Acetate Membrane (CA SP) Standard Roll Part Numbers

Width	Catalog Numbers			Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.22 µm	0.45 µm	0.6 µm			
13" (33.0 cm)	1225633	1230024	1230194	350	400	Roll stock, CA, xx µm, 13" wide, 350 ft
12" (30.5 cm)	1230188	1230191	1230195	350	400	Roll stock, CA, xx µm, 12" wide, 350 ft
10" (254 mm)	1268783	1268784	3063156	350	400	Roll stock, CA, xx µm, 10" wide, 350 ft
6" (152 mm)	1230189	1230192	1230196	350	800	Roll stock, CA, xx µm, 6" wide, 350 ft
3.1 (79 mm)	1230190	1230193	1230197	350	1600	Roll stock, CA, xx µm, 3.1" wide, 350 ft
1.5" (38 mm)	3097644	3097645	1230198	350	3200	Roll stock, CA, xx µm, 1.5" wide, 350 ft
1.34" (34 mm)	1230454	3061205	1230199	350	3600	Roll stock, CA, xx µm, 1.34" wide, 350 ft
1" (25 mm)	1230455	1215874	1230200	350	5200	Roll stock, CA, xx µm, 1" wide, 350 ft

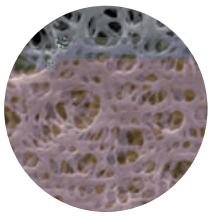
Width	Catalog Numbers			Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.8 µm	1.2 µm	5.0 µm			
13" (33.0 cm)	1230201	1230208	1230214	350	400	Roll stock, CA, xx µm, 13" wide, 350 ft
12" (30.5 cm)	1230202	1230209	1230215	350	400	Roll stock, CA, xx µm, 12" wide, 350 ft
10" (254 mm)	3019979	3005737	3007245	350	400	Roll stock, CA, xx µm, 10" wide, 350 ft
6" (152 mm)	1230203	1230210	1230216	350	800	Roll stock, CA, xx µm, 6" wide, 350 ft
3.1 (79 mm)	1230204	1230211	1230217	350	1600	Roll stock, CA, xx µm, 3.1" wide, 350 ft
1.5" (38 mm)	1230205	3032542	1230218	350	3200	Roll stock, CA, xx µm, 1.5" wide, 350 ft
1.34" (34 mm)	1230206	1230212	1230219	350	3600	Roll stock, CA, xx µm, 1.34" wide, 350 ft
1" (25 mm)	1230207	1230213	1230220	350	5200	Roll stock, CA, xx µm, 1" wide, 350 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Polymeric Polyethersulfone (PES) Filtration Membrane



GVS Filter Technology Polyethersulfone (PES) Filtration Membrane is naturally hydrophilic, has low extractables and is cast from pure polyethersulfone polymer. This strong, microporous membrane is constructed from a high-temperature polyethersulfone polymer that is acid and base resistant. Its strength and durability are advantageous during usage that involves aggressive handling or automated equipment. It is designed to remove particulates during general filtration, and its low protein and drug binding characteristics make it ideally suited for use in life sciences applications.

GVS offers the Fast Flow PES Filtration Membrane. This membrane maintains the same low protein and drug binding characteristics as its low-flow counterparts, while exhibiting faster filtration performances.

GVS Filter Technology PES Filtration Membrane is available in roll widths from 1 inch (2.54 cm) to 31 inches (78.7 cm), as well as in cut sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits

- Low extractables ensure clean results
- Low drug and protein binding maximize sample recovery
- Superior burst strength protects integrity of membrane under high pressures
- Lot-to-lot consistency for reproducible results every time
- Endotoxin and USP Class VI test results ensure membrane is suitable for use in medical devices

Product Characteristics

- Hydrophilic
- Maximum operating temperature: 266°F (130°C)
- Autoclavable
- Broad sealing compatibility, including ultrasonic, heat, radio frequency and insert molding

Typical Applications

- Protein and enzyme filtration and sterilization
- Biological fluid filtration and sterilization
- Pharmaceutical sterilization
- Environmental water studies
- Coarse particulate filtration (large pore)
- Clarification and final filtration (small pore)

Specifications Standard PES

Pore Size (µm)	Flow Rate (mL / min / cm²@10psi)	Bubble Point		Thickness (µm)
		psi	bar	
0.03	7-3	90-110	6.2-7.5	110-150
0.1	15-7	70-90	4.8-6.2	110-150
0.22	45-22	50-70	3.4-4.8	110-150
0.45	79-39	35-50	2.4-3.4	110-150
0.65	132-63	21-32	1.4-2.2	110-150
0.8	159-80	13-28	0.8-1.9	110-150
1.2	196-98	11-22	0.7-1.5	110-150

Specifications PES Fast Flow

Pore Size (µm)	Flow Rate (mL / min / cm²@10psi)	Bubble Point		Thickness (µm)
		psi	bar	
0.22	45-31	38-45	2.6-3.1	110-150

Ordering Informations

Filtration Grade Polyethersulfone Membrane (PES WP) Standard Roll Part Numbers

Width	Catalog Numbers				Typical Length* (ft)	MOQ** (ft)	Description***
	0.03 µm	0.1 µm	0.22 µm	0.45 µm			
31" (78.7 cm)	3058110	3051074	3051595	3000831	500	700	Roll stock, PES, xx µm, 31" wide, 500 ft
21" (53.3 cm)	1230066	1230073	1230079	1230083	500	700	Roll stock, PES, xx µm, 21" wide, 500 ft
20" (50.8 cm)	1230462	1267040	1264420	1264421	500	700	Roll stock, PES, xx µm, 20" wide, 500 ft
13" (33.0 cm)	1230067	1233364	1233363	1230084	500	1400	Roll stock, PES, xx µm, 13" wide, 500 ft
12" (30.5 cm)	1236395	1230463	1230080	1230085	500	700	Roll stock, PES, xx µm, 12" wide, 500 ft
10" (254 mm)	3049396	1231330	1231331	1230444	500	700	Roll stock, PES, xx µm, 10" wide, 500 ft
6" (152 mm)	1230068	1230074	1230081	3063874	500	1400	Roll stock, PES, xx µm, 6" wide, 500 ft
3.1" (79 mm)	1230069	1230075	1230082	1230086	500	2100	Roll stock, PES, xx µm, 3.1" wide, 500 ft
1.5" (38 mm)	1230070	1230076	3097641	3097642	500	5600	Roll stock, PES, xx µm, 1.5" wide, 500 ft
1.34" (34 mm)	1230071	1230077	3061202	1230445	500	5600	Roll stock, PES, xx µm, 1.34" wide, 500 ft
1" (25 mm)	1230072	1230078	1216727	1230446	500	8400	Roll stock, PES, xx µm, 1" wide, 500 ft

Width	Catalog Numbers			Typical Length* (ft)	MOQ** (ft)	Description***
	0.6 µm	0.8 µm	1.2 µm			
31" (78.7 cm)	1230087	1230094	3012607	500	700	Roll stock, PES, xx µm, 31" wide, 500 ft
21" (53.3 cm)	1230088	1230096	1230105	500	700	Roll stock, PES, xx µm, 21" wide, 500 ft
20" (50.8 cm)	3032595	1267041	1267082	500	700	Roll stock, PES, xx µm, 20" wide, 500 ft
13" (33.0 cm)	1230089	1230097	1230106	500	1400	Roll stock, PES, xx µm, 13" wide, 500 ft
12" (30.5 cm)	1233365	1230098	1230107	500	700	Roll stock, PES, xx µm, 12" wide, 500 ft
10" (254 mm)	1230464	1236144	3001198	500	700	Roll stock, PES, xx µm, 10" wide, 500 ft
6" (152 mm)	3063875	1230099	3028813	500	1400	Roll stock, PES, xx µm, 6" wide, 500 ft
3.1" (79 mm)	1230090	1230100	1230108	500	2100	Roll stock, PES, xx µm, 3.1" wide, 500 ft
1.5" (38 mm)	1230091	1230101	1230109	500	5600	Roll stock, PES, xx µm, 1.5" wide, 500 ft
1.34" (34 mm)	1230092	1230102	1230110	500	5600	Roll stock, PES, xx µm, 1.34" wide, 500 ft
1" (25 mm)	1230093	1230103	3028814	500	8400	Roll stock, PES, xx µm, 1" wide, 500 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

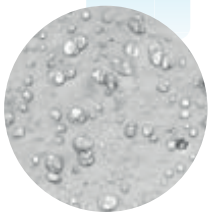
*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Ordering Informations *Continued*

Fast Flow Polyethersulfone Membrane (PES AL) Standard Roll Part Numbers

Width	Catalog Numbers	Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.22 µm			
31" (78.7 cm)	1230366	500	700	Roll stock, PES, 0.2 µm, 31" wide, 500 ft
21" (53.3 cm)	1230368	500	700	Roll stock, PES, 0.2 µm, 21" wide, 500 ft
20" (50.8 cm)	1230369	500	700	Roll stock, PES, 0.2 µm, 20" wide, 500 ft
13" (33.0 cm)	1230370	500	1400	Roll stock, PES, 0.2 µm, 13" wide, 500 ft
12" (30.5 cm)	1237254	500	700	Roll stock, PES, 0.2 µm, 12" wide, 500 ft
10" (254 mm)	1230371	500	700	Roll stock, PES, 0.2 µm, 10" wide, 500 ft
6" (152 mm)	1230372	500	1400	Roll stock, PES, 0.2 µm, 6" wide, 500 ft
3.1" (79 mm)	1230373	500	2100	Roll stock, PES, 0.2 µm, 3.1" wide, 500 ft
1.5" (38 mm)	1230374	500	5600	Roll stock, PES, 0.2 µm, 1.5" wide, 500 ft
1.34" (34 mm)	1230375	500	5600	Roll stock, PES, 0.2 µm, 1.34" wide, 500 ft
1" (25 mm)	1230376	500	8400	Roll stock, PES, 0.2 µm, 1" wide, 500 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%
** Minimum Order Quantity. If different quantity needed feel free to contact us
*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.



Air Flow Stop PES Membrane

GVS Filter Technology SAFE-IV membrane is an hydrophilic superior membrane able to stop air flow, for safer and more efficient performance.
This PES (Polyethersulfone) membrane, cast on a non-woven PET (Polyethylenethereftalate) support, has been formulated to satisfy the necessity of the use of a particle filter in IV administration sets (in compliance with ISO 8536-4) but with the additional performance of blocking automatically the air passing when the infusion container runs empty.
The fluids stay maintained in the infusion line.

SAFE-IV Air Flow Stop Membrane operates according to the principle that when wetted with fluid its surface becomes permeable to air starting from its bubble point, as a result, no air can enter into the infusion line after that the IV solution container runs empty.
Air Flow Stop PES Membrane is available in roll widths from 0.6 inch (0.15 cm) to 17.7 inches (45 cm), as well as in cut sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Product Characteristics
- Hydrophilic air flow stop membrane
- ISO 8536 - 4 Compliant

Typical Applications
- IV drip chambers

Features & Benefits
- Patient safety: prevention of air infusion and related infections
- Workload, time and costs reduction: absence of alarm and stressful situations; when the IV solution container is running empty, SAFE IV membrane keeps a constant fluid level and no air can get through the patient.
- High Flow Rate
- High through-put membrane allows minimum resistance to the flow rate.

Specifications Air Flow Stop PES Membrane

Pore Size (µm)	Water Flow Rate	Bubble Point		Thickness (µm)
		psi	bar	
8	In compliance with ISO 8536-4	2.9	0.2	140 - 160

Ordering Informations

Air Flow Stop PES Membrane Standard Roll Part Numbers

Width	Catalog Numbers	Typical Length* (ft)	MOQ** (ft^2)	Description Format***
	8 µm			
17.7" (45 cm)	M10F0800H4500	492	1076	Roll stock, Air Flow PES, 8 µm, 17.7" wide, 492 ft
5.9" (15 cm)	M10F0800H1500	492	1076	Roll stock, Air Flow PES, 8 µm, 5.9" wide, 492 ft
3.9" (10 cm)	M10F0800H1000	492	1076	Roll stock, Air Flow PES, 8 µm, 3.9" wide, 492 ft
1.9" (48 mm)	M10F0800H0480	492	1076	Roll stock, Air Flow PES, 8 µm, 1.9" wide, 492 ft
1.7" (45 mm)	M10F0800H0450	492	1076	Roll stock, Air Flow PES, 8 µm, 1.7" wide, 492 ft
0.9" (22.5 mm)	M10F0800H0225	492	1076	Roll stock, Air Flow PES, 8 µm, 0.9" wide, 492 ft
0.6" (15 mm)	M10F0800H0150	492	1076	Roll stock, Air Flow PES, 8 µm, 0.6" wide, 492 ft

Polymeric PES Positively Charged

GVS Filter technology positively charged PES membrane is the state of the art for endotoxine reduction in IV applications. The membrane guarantees high reduction log as well as high flow rate for the device.
Polymeric PES Positively Charged Membrane is available in roll widths from 0.6 inch (0.15 cm) to 17.7 inches (45 cm), as well as in cut sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Typical Applications

- IV filters
- Oncology drug administration
- Long term administration

Features & Benefits

- Long term drug administration reduce the need of IV set replacement and associated contamination risk

Product Characteristics

- Hydrophilic
- Improved Endotoxin Reduction
- High throughput

Efficiency Endotoxin Removal tester on 10 cm^2: @ flow rate 80 ml/h, endotoxin concentration 1 EU/ml, 120h (time filtration)	≥ 100%@72h ≥ 98%@96h ≥ 90% ®120h
LVR tested on 10 cm^2: @flow rate 200ml/min, endotoxin conentration 500EU/ml, 5min (time filtration)	≥ 4.0 log @ 3 min ≥ 3.5 log @ 4 min ≥ 3.0 log (@ 5 min

Specifications PES Positively Charged Membrane

Pore Size (µm)	Water Flow Rate (mL/min - @ 800 mmH_2O - 3.7 cm^2)	Bubble Point		Thickness (µm)
		psi	bar	
0.22	≥ 9	62	4.3	100 - 120

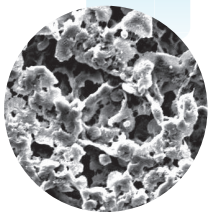
Ordering Informations

PES Positively Charged Membrane Standard Roll Part Numbers

Width	Catalog Numbers	Typical Length* (ft)	MOQ** (ft^2)	Description Format***
	0.22 µm			
17.7" (45 cm)	M08H0020H4500	492	1076	Roll stock, PES+, 0.22 µm, 17.7" wide, 492 ft
5.9" (15 cm)	M08H0020H1500	492	1076	Roll stock, PES+, 0.22 µm, 5.9" wide, 492 ft
3.9" (10 cm)	M08H0020H1000	492	1076	Roll stock, PES+, 0.22 µm, 3.9" wide, 492 ft
1.9" (48 mm)	M08H0020H0480	492	1076	Roll stock, PES+, 0.22 µm, 1.9" wide, 492 ft
1.7" (45 mm)	M08H0020H0450	492	1076	Roll stock, PES+, 0.22 µm, 1.7" wide, 492 ft
0.9" (22.5 mm)	M08H0020H0225	492	1076	Roll stock, PES+, 0.22 µm, 0.9" wide, 492 ft
0.6" (15 mm)	M08H0020H0150	492	1076	Roll stock, PES+, 0.22 µm, 0.6" wide, 492 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%
** Minimum Order Quantity. If different quantity needed feel free to contact us
*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Polymeric Nylon (NY) Membrane



GVS Filter Technology Nylon (NY) Membrane is a supported, naturally hydrophilic membrane designed to wet out evenly and retain its superior strength during use in general filtration or medical assays. The membrane is internally supported with an inert polyester support web, giving it added dimensional strength and stability that prevents cracking, tearing, curling and breaking. This is advantageous during usage that involves aggressive handling or automated equipment. GVS Filter Technology NY Membrane is produced in filtration and hybridization grades to specifications optimized for those particular applications. GVS offers the Fast Flow Nylon Filtration Membrane. This membrane maintains the same strength and bacterial retention characteristics as its low-flow counterparts, while exhibiting faster filtration performance.
GVS Filter Technology NY Membrane is available in roll widths of 1 inch (2.54 cm) to 20 inches (50.8 cm), as well as in cut sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits

- Superior strength for easy handling
- Lot-to-lot consistency provides reproducible results every time
- Passes USP Class VI toxicity testing, for use in medical devices

Typical Applications

- Sterilization and clarification of aqueous, alkaline and organic solvent solutions
- HPLC sample preparation
- Beverage and pharma processing
- High nucleic acid binding capacity of 350-450 µg/cm² makes this membrane suitable for molecular biology applications and allows binding of a broad range of nucleic acid fragment sizes (75 bp - 50 kbp)
- Low extractables ensure clean results

Product Characteristics

- Hydrophilic
- Maximum operating temperature: 356°F (180°C)
- Autoclavable
- Broad sealing compatibility, including ultrasonic, heat, radio frequency and insert molding

Specifications Standard NY

Pore Size (µm)	Flow Rate (mL / min / cm² @ 10psi)	Bubble Point		Thickness (µm)
		psi	bar	
0.1	5-2	70-100	4.8-6.8	65-130
0.22	14-6	50-72	3.4-4.9	65-130
0.45	36-18	30-45	2.0-3.1	65-130
0.5	56-22	25-42	1.7-2.8	65-130
0.65	88-33	18-32	1.2-2.2	65-130
0.8	122-43	13-28	0.8-1.9	65-130
1.2	318-51	11-22	0.7-1.5	65-130
3.0	286-127	8-16	0.5-1.1	65-130
5.0	454-223	6-13	0.4-0.8	65-130
10.0	795-335	5-11	0.3-0.7	65-130
20.0	2545-424	3-10	0.2-0.6	65-130

Specifications NY Fast Flow

Pore Size (µm)	Flow Rate (mL / min / cm² @ 10psi)	Bubble Point		Thickness (µm)
		psi	bar	
0.22	14-8	40-60	2.7-4.1	65-130

NY Positively Charged Filtration Membrane

GVS Filter technology NY Membrane variation is an inherently charged nylon membrane, specifically designed to allow for numerous reprobings. The membrane is the state of the art for endotoxine reduction in IV applications. NY Positively Charged guarantees high reduction log as well as high flow rate for the device.
GVS Filter Technology NY Membrane is available in roll widths of 1 inch (2.54 cm) to 20 inches (50.8 cm), as well as in cut sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Typical Applications

- IV filters
- Oncology drug administration
- Long term administration
- Radiolabeled and non-radiolabeled detection systems
- Northern and Southern blots (nucleic acids)
- Multiple reprobings
- Alkaline transfers
- DNA fingerprinting
- UV crosslinking

Features & Benefits

- Long term drug administration reduce the need of IV set replacement and associated contamination risk

Product Characteristics

- Hydrophilic
- Improved Endotoxin Reduction
- High throughput

Specifications

Pore Size (µm)	Part Number	Flow Rate (mL / min / cm²@10psi)	Bubble Point		Thickness (µm)
			psi	bar	
0.22					
0.45	1220976	79-21	14-20	0.9-1.3	120-190

Ordering Informations

Filtration Grade Nylon Membrane (NY SP) Standard Roll Part Numbers

Width	Catalog Numbers						Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.1 µm	0.22 µm	0.45 µm	0.5 µm	0.6 µm	0.8 µm			
20" (50.8 cm)	3044033	3032955	3032957	1230132	3032996	1230147	750	700	Roll stock, NY, xx µm, 20" wide, 750 ft
13" (33.0 cm)	1230120	1232196	1232197	1230133	1230139	1215958	750	700	Roll stock, NY, xx µm, 13" wide, 750 ft
12" (30.5 cm)	1230121	1237926	1237927	1230134	1230140	1230148	750	700	Roll stock, NY, xx µm, 12" wide, 750 ft
10" (254 mm)	1231334	1231335	1239825	1264836	1264837	3097586	750	700	Roll stock, NY, xx µm, 10" wide, 750 ft
6" (152 mm)	1230122	1230127	1230129	1230135	1230141	1256011	750	700	Roll stock, NY, xx µm, 6" wide, 750 ft
3.1" (79 mm)	1230123	1230128	1230130	1230136	1230142	1230149	750	2100	Roll stock, NY, xx µm, 3.1" wide, 750 ft
1.5" (38 mm)	1230124	3054906	3039203	3097618	1230143	1230150	750	4200	Roll stock, NY, xx µm, 1.5" wide, 750 ft
1.34" (34 mm)	1230125	1230447	1230449	1230137	1230144	1230151	750	4900	Roll stock, NY, xx µm, 1.34" wide, 750 ft
1" (25 mm)	1230126	1230448	1230450	1230138	1230145	1230152	750	7000	Roll stock, NY, xx µm, 1" wide, 750 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%
** Minimum Order Quantity. If different quantity needed feel free to contact us
*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Ordering Informations *Continued*

Width	Catalog Numbers					Typical Length* (ft)	MOQ** (ft)	Description Format***
	1.2 µm	3.0 µm	5.0 µm	10.0 µm	20.0 µm			
20" (50.8 cm)	3032994	1230158	1230168	1230173	1230181	750	700	Roll stock, NY, xx µm, 20" wide, 750 ft
13" (33.0 cm)	1230154	1230159	1230452	1230174	1269744	750	700	Roll stock, NY, xx µm, 13" wide, 750 ft
12" (30.5 cm)	1215965	1230160	1230169	1230175	3055962	750	700	Roll stock, NY, xx µm, 12" wide, 750 ft
10" (254 mm)	3015725	1230161	3097587	1263858	3097588	750	700	Roll stock, NY, xx µm, 10" wide, 750 ft
6" (152 mm)	3002935	1230162	1230170	1230176	1230182	750	700	Roll stock, NY, xx µm, 6" wide, 750 ft
3.1" (79 mm)	1230155	1230163	1230171	1230177	1230183	750	2100	Roll stock, NY, xx µm, 3.1" wide, 750 ft
1.5" (38 mm)	3097640	1230164	3054907	1230178	1230184	750	4200	Roll stock, NY, xx µm, 1.5" wide, 750 ft
1.34" (34 mm)	1230451	1230165	1230453	1230179	3063155	750	4900	Roll stock, NY, xx µm, 1.34" wide, 750 ft
1" (25 mm)	1230156	1230166	1268882	1268791	1230185	750	7000	Roll stock, NY, xx µm, 1" wide, 750 ft

Fast Flow Nylon Membrane (NY AL) Standard Roll Part Numbers

Width	Catalog Numbers	Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.22 µm			
20" (50.8 cm)	1230377	750	700	Roll stock, NY, 0.2 µm, 20" wide, 750 ft
13" (33.0 cm)	1230378	750	700	Roll stock, NY, 0.2 µm, 13" wide, 750 ft
12" (30.5 cm)	1230379	750	700	Roll stock, NY, 0.2 µm, 12" wide, 750 ft
10" (254 mm)	1230380	750	700	Roll stock, NY, 0.2 µm, 10" wide, 750 ft
6" (152 mm)	1230381	750	700	Roll stock, NY, 0.2 µm, 6" wide, 750 ft
3.1" (79 mm)	1230382	750	2100	Roll stock, NY, 0.2 µm, 3.1" wide, 750 ft
1.5" (38 mm)	3097617	750	4200	Roll stock, NY, 0.2 µm, 1.5" wide, 750 ft
1.34" (34 mm)	1230383	750	4900	Roll stock, NY, 0.2 µm, 1.34" wide, 750 ft
1" (25 mm)	1230384	750	7000	Roll stock, NY, 0.2 µm, 1" wide, 750 ft

Reprobing Charged Transfer Grade Nylon Membrane (NY HY+) Standard Roll Part Numbers

Width	Catalog Numbers		Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.22 µm	0.45 µm			
11.81" (30.0 cm)		1230399	750	700	Roll stock, NY, 0.4 µm, 11.81" wide, 750 ft
10" (254 mm)		1230400	750	700	Roll stock, NY, 0.4 µm, 10" wide, 750 ft
6" (152 mm)		1230401	750	700	Roll stock, NY, 0.4 µm, 6" wide, 750 ft
3.1" (79 mm)		1230402	750	2100	Roll stock, NY, 0.4 µm, 3.1" wide, 750 ft
1.5" (38 mm)		1230403	750	4200	Roll stock, NY, 0.4 µm, 1.5" wide, 750 ft
1.34" (34 mm)		1230404	750	4900	Roll stock, NY, 0.4 µm, 1.34" wide, 750 ft
1" (25 mm)		1230405	750	7000	Roll stock, NY, 0.4 µm, 1" wide, 750 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Ordering Informations

White Filtration Grade Nitrocellulose Membrane (NC WP) Standard Roll Part Numbers

Width	Catalog Numbers					Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.1 µm	0.22 µm	0.45 µm	0.5 µm	0.7 µm			
15.75" (40.0 cm)	1230221	1230230	1230234	1230239	1230248	250	275	Roll stock, NC, xx µm, 15.75" wide, 250 ft
13" (33.0 cm)	1230222	1232194	1232195	1230240	1230249	125	275	Roll stock, NC, xx µm, 13" wide, 125 ft
12" (30.5 cm)	1230223	1230231	1230235	1230241	1230250	125	275	Roll stock, NC, xx µm, 12" wide, 125 ft
10" (254 mm)	1230224	3028681	3019605	1230242	1230251	125	275	Roll stock, NC, xx µm, 10" wide, 125 ft
6" (152 mm)	1230225	1230232	1230236	1230243	1230252	125	550	Roll stock, NC, xx µm, 6" wide, 125 ft
3.1" (79 mm)	1230226	1230233	1230237	1230244	1230253	125	1375	Roll stock, NC, xx µm, 3.1" wide, 125 ft
1.5" (38 mm)	1230227	3100010	3041261	1230245	1230254	125	2750	Roll stock, NC, xx µm, 1.5" wide, 125 ft
1.34" (34 mm)	1230228	1230456	1230238	1230246	1230255	125	3025	Roll stock, NC, xx µm, 1.34" wide, 125 ft
1" (25 mm)	1230229	3053980	3053981	1230247	1230256	125	4400	Roll stock, NC, xx µm, 1" wide, 125 ft

Width	Catalog Numbers				Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.8 µm	1.2 µm	5.0 µm	8.0 µm			
15.75" (40.0 cm)	1230257	1230264	1230273	1230323	250	275	Roll stock, NC, xx µm, 15.75" wide, 250 ft
13" (33.0 cm)	1215909	1230265	1215919	1215921	125	275	Roll stock, NC, xx µm, 13" wide, 125 ft
12" (30.5 cm)	1230258	1230266	1230274	1230279	125	275	Roll stock, NC, xx µm, 12" wide, 125 ft
10" (254 mm)	3057289	1230267	1230275	1230280	125	275	Roll stock, NC, xx µm, 10" wide, 125 ft
6" (152 mm)	1230259	1230268	3034840	1230281	125	550	Roll stock, NC, xx µm, 6" wide, 125 ft
3.1" (79 mm)	1230260	1230269	1230321	1230282	125	1375	Roll stock, NC, xx µm, 3.1" wide, 125 ft
1.5" (38 mm)	1230261	1230270	3041262	1230283	125	2750	Roll stock, NC, xx µm, 1.5" wide, 125 ft
1.34" (34 mm)	1230262	1230271	1230322	1230284	125	3025	Roll stock, NC, xx µm, 1.34" wide, 125 ft
1" (25 mm)	1230263	1230272	3034841	1268884	125	4400	Roll stock, NC, xx µm, 1" wide, 125 ft

Black Filtration Grade Nitrocellulose Membrane (NC BP) Standard Roll Part Numbers

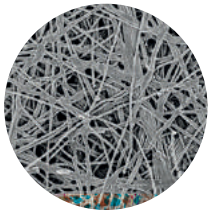
Width	Catalog Numbers				Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.45 µm	0.8 µm	5.0 µm	8.0 µm			
15.75" (40.0 cm)	1230285	1230294	1230303	1230312	250	275	Roll stock, NC, xx µm, 15.75" wide, 250 ft
13" (33.0 cm)	1230286	1230295	1230304	1230313	125	275	Roll stock, NC, xx µm, 13" wide, 125 ft
12" (30.5 cm)	1230287	1230296	1230305	1230314	125	275	Roll stock, NC, xx µm, 12" wide, 125 ft
10" (254 mm)	1230288	1230297	1230306	1230315	125	275	Roll stock, NC, xx µm, 10" wide, 125 ft
6" (152 mm)	1230289	1230298	1230307	1230316	125	550	Roll stock, NC, xx µm, 6" wide, 125 ft
3.1" (79 mm)	1230290	1230299	1230308	1230317	125	1375	Roll stock, NC, xx µm, 3.1" wide, 125 ft
1.5" (38 mm)	1230291	1230300	1230309	1230318	125	2750	Roll stock, NC, xx µm, 1.5" wide, 125 ft
1.34" (34 mm)	1230292	1230301	1230310	1230319	125	3025	Roll stock, NC, xx µm, 1.34" wide, 125 ft
1" (25 mm)	1230293	1230302	1230311	1230320	125	4400	Roll stock, NC, xx µm, 1" wide, 125 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Polymeric Polyvinylydene (PVDF) Hydrophilic Supported Membrane



GVS Filter Technology Hydrophilic Polyvinylidene Difluoride (Hydrophilic PVDF) Filtration Membrane is a supported, hydrophilic membrane that exhibits broad chemical compatibility and low protein binding. Composed of PVDF internally supported by an inert polyester web, the resulting membrane has dimensional stability. This provides higher throughputs than competitor offerings and reduces the amount of filter changes needed during filtration. It is ideal for use in filtration applications of biological solutions. GVS Filter Technology Hydrophilic PVDF Membrane is available in roll widths from 1 inch (2.54 cm) to 12 inches (30.5 cm), as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits

- Superior strength to withstand aggressive handling or use with automated equipment without breaking or tearing
- Low protein binding minimizes retention of proteins in solution
- Low extractables ensure tests will be clean with consistent results
- Lot-to-lot consistency ensures consistent flow and diffusion rates for dependable results every time

Product Characteristics

- Hydrophilic
- Thermally stable with a maximum operating temperature of 274°F (135°C)
- Autoclavable
- Broad sealing compatibility, including ultrasonic, heat, radio frequency and insert molding

Typical Applications

- Sterilizing and clarifying filtration of biological solutions.
- Preparation of protein-containing solutions prior to chromatography or other instrument analyses.
- Useful for a wide range of applications, including aggressive and non-aggressive solvent-based mobile phase.
- Offers excellent chemical compatibility, even with aggressive acids and alcohols.
- Provides high flow rates and throughput, low extractables and broad chemical compatibility.
- Better protection of your analytical results.

Specifications

Pore Size (µm)	Flow Rate (mL / min / cm² @10psi)	Bubble Point		Thickness (µm)
		psi	bar	
0.22	> 4	> 28	> 1.9	150-200
0.45	> 7	> 23	> 1.5	150-200

Ordering Informations

Width	Catalog Numbers		Typical Length* (ft)	MOQ** (ft²)	Description Format***
	0.2 µm	0.45 µm			
17.7" (45 cm)	M09F0020H4500	M09F0045H4500	492	1076	Roll stock, Hy Supp PVDF, 0.22 µm, 17.7" wide, 492 ft
10" (25.4 cm)	M09F0020H2540	M09F0045H2540	492	1076	
7.87" (20 cm)	M09F0020H2000	M09F0045H2000	492	1076	
1.29" (33 mm)	M09F0020H0332	M09F0045H0332	492	1076	
0.6" (15.2 mm)	M09F0020H0155	M09F0045H0155	492	1076	

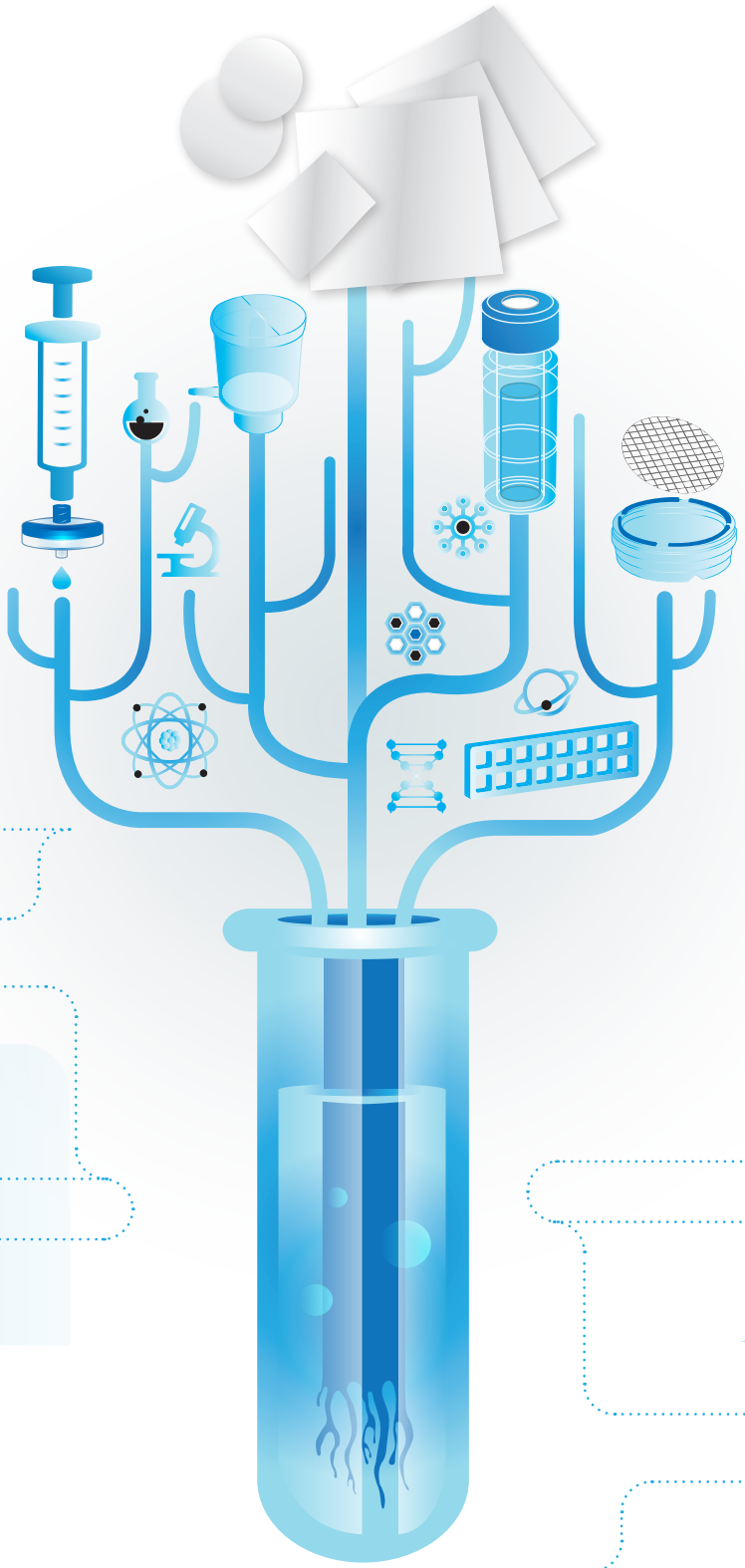
* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

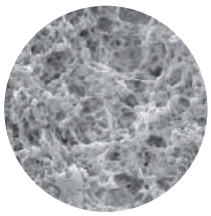
*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

GVS

FILTER TECHNOLOGY



Polymeric Polyvinylidene Difluoride (PVDF) Pure and Supported Membrane



GVS Filter Technology PVDF is a naturally hydrophobic membrane. GVS offers the widest range of this membrane: pure transfer PVDF membrane, supported transfer PVDF membrane and the supported oleophobic PVDF. Polyvinylidene Difluoride membrane has a high binding capacity and low backgrounds and is ideal for use in protein binding applications such as Western blots, solid phase assays and immunoblotting procedures. PVDF ensures reproducible results with maximum sensitivity. Proteins can be electroblotted from a variety of gel matrices. In addition, PVDF membrane will not degrade, distort or shrink when using a high concentration of methanol for destaining. The exceptional tensile strength allows for easy removal of target bands without concern for the membrane tearing, fracturing or curling.
GVS Filter Technology PVDF Transfer Membrane is available in roll widths from 1 inch (2.54 cm) to 11.81 inches (30 cm), as well as in sheets and cut disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits

- Broad chemical compatibility allows for the use of all commonly used stains
- Low backgrounds ensure the highest sensitivities across a broad range of molecular weights
- High sensitivity provides detection of low-level proteins
- High protein binding capacity (125 µg/cm² for immunoglobulins) allows capture of proteins across a broad range of concentrations
- Strong binding affinity prevents protein from passing through the membrane
- Strict quality control prevents signal variation across membrane lots
- Superior strength prevents distortion and breaking with aggressive handling and processing

Product Characteristics

- Hydrophobic
- Durable

Typical Applications

- Western blots (protein)
- Protein sequencing
- Amino acid analysis
- Dot / slot blots

PVDF Hydrophobic pure membrane

Specifications

Pore Size (µm)	Flow Rate (mL / min / cm²@ 10psi)	MIN Water Breaktrough (bar)	Thickness (µm)
0.22	15.91-3.18	> 1.8	140-250
0.45	45.45-7.95	> 1	140-250

PVDF Hydrophobic supported membrane

Specifications

Pore Size (µm)	Flow Rate (mL / min / cm²@10psi)	MIN Water Breaktrough (bar)	Thickness (µm)
0.22	13-7	> 1.8	150-200
0.45	32-16	> 1	150-200

Ordering Informations

PVDF Hydrophobic pure membrane (PVDF HY) Standard Roll Part Numbers

Width	Catalog Numbers		Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.2 µm	0.4 µm			
11.81" (30.0 cm)	3057290	3057291	300	590	Roll stock, PVDF, xx µm, 11.81" wide, 300 ft
10" (254 mm)	3042090	3042091	300	590	Roll stock, PVDF, xx µm, 10" wide, 300 ft
6" (152 mm)	1230186	1230438	300	1180	Roll stock, PVDF, xx µm, 6" wide, 300 ft
3.1" (79 mm)	1230187	1230439	300	2950	Roll stock, PVDF, xx µm, 3.1" wide, 300 ft
1.5" (38 mm)	1230385	1230440	300	6490	Roll stock, PVDF, xx µm, 1.5" wide, 300 ft
1.34" (34 mm)	1230437	1230441	300	7670	Roll stock, PVDF, xx µm, 1.34" wide, 300 ft
1" (25 mm)	1230458	1230459	300	10030	Roll stock, PVDF, xx µm, 1" wide, 300 ft

PVDF Hydrophobic Supported membrane (PVDF HY) Standard Roll Part Numbers

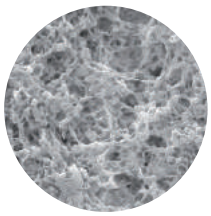
Width	Catalog Numbers		Typical Length* (ft)	MOQ** (ft^2)	Description Format***
	0.22 µm	0.45 µm			
17.7" (45 cm)	M09G0020H5000	M09G0045H5000	492	1076	Roll stock, Phobic Supp PVDF, xx µm, 17.7" wide, 492 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Polyvinylidene Difluoride (PVDF) Hydrophobic/Oleophobic/Emophobic membrane



GVS Filter Technology PVDF is a naturally hydrophobic membrane. GVS offers the widest range of this membrane: pure transfer PVDF membrane, supported transfer PVDF membrane and the supported oleophobic PVDF. This oleophobic membrane thanks GVS treatment has an enhanced oleophobicity and hydrophobicity, that make this membrane ideal for venting application as well as bloodlines applications. PVDF membrane will not degrade, distort or shrink when using a high concentration of methanol for destaining.
The exceptional tensile strength allows for easy removal of target bands without concern for the membrane tearing, fracturing or curling. GVS Filter Technology PVDF Olephobic Membrane is available in roll widths from 1 inch (2.54 cm) to 11.81 inches (30 cm), as well as in sheets and cut disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits

- Broad chemical compatibility allows for the use of all commonly used stains
- Strict quality control prevents signal variation across membrane lots
- Superior strength prevents distortion and breaking with aggressive handling and processing

Product Characteristics

- Hydrophobic/Oleophobic/Emophobic
- Durable
- Wide chemical compatibility
- Not wettable by most low surface tension liquids
- Execellence handling properties
- High mechanical strenght

Typical Applications

- Venting
- Spike vents
- IV filter vents
- Transducer protectors
- Vacuum suction canisters
- Urine drain bags
- Ostomy bags

Polyvinylidene Difluoride (PVDF) Oleophobic membrane

Specifications

Pore Size (µm)	Thickness (µm)	MIN Air Flow Rate (l/min at 1 cm² at 1 bar)	MIN Water Breaktrough (bar)
0.20	150 - 220	2,1	> 1,80
0.45	150 - 220	4,5	> 1,00

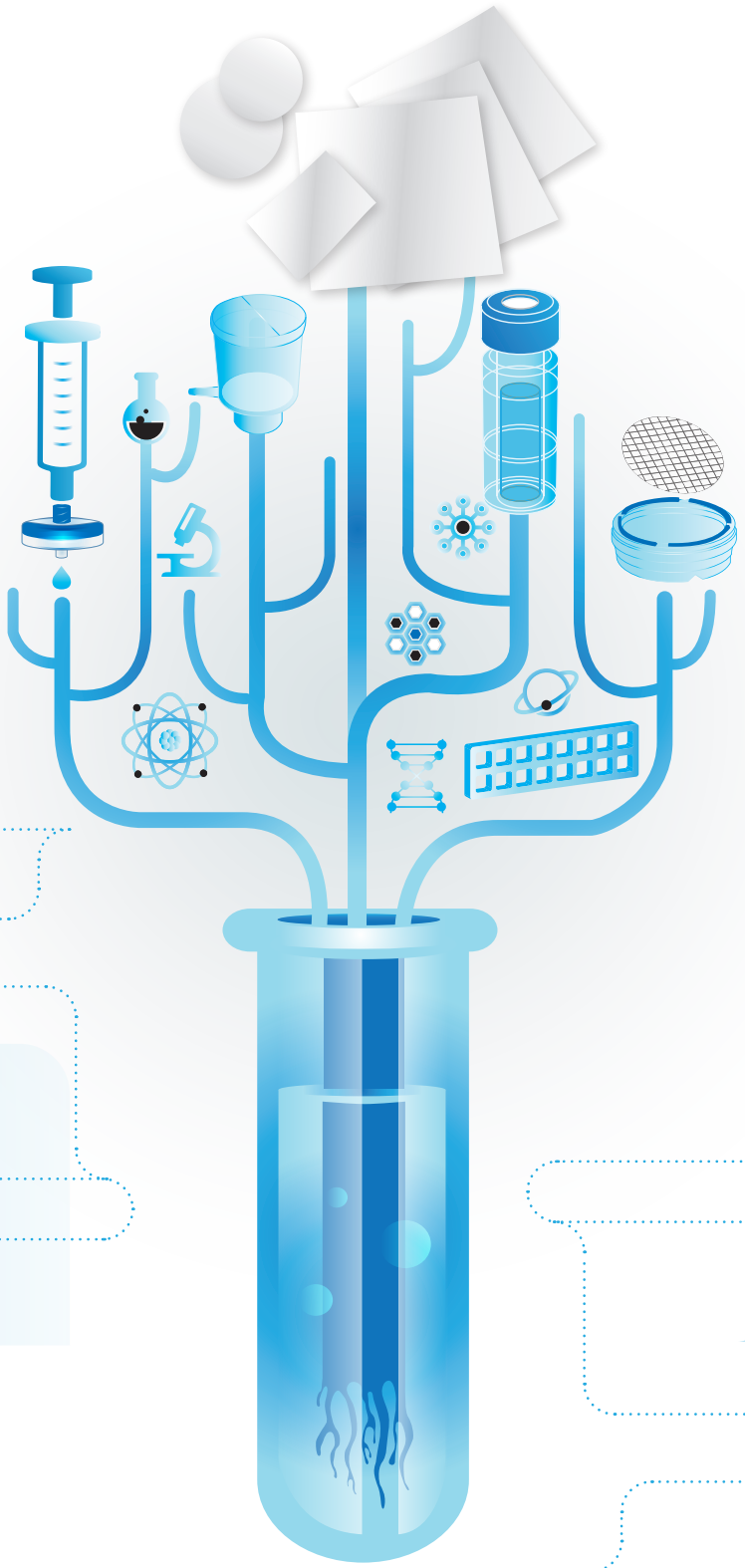
Ordering Informations

Polyvinylidene Difluoride (PVDF) Oleophobic membrane Standard Roll Part Numbers

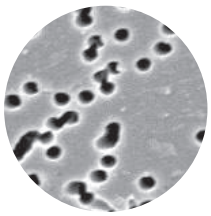
Width	Catalog Numbers		Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.22 µm	0.45 µm			
17.7" (45 cm)	M09G0020H4500E	M09G0045H4500E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 17.7" wide, 492 ft
11.8" (30 cm)	M09G0020H3000E	M09G0045H3000E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 11.8" wide, 492 ft
10.6" (27 cm)	M09G0020H2700E	M09G0045H2700E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 10.6" wide, 492 ft
8.2" (210 mm)	M09G0020H2100E	M09G0045H2100E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 8.2" wide, 492 ft
3.2" (83 mm)	M09G0020H0833E	M09G0045H0833E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 3.2" wide, 492 ft
1.7" (43 mm)	M09G0020H0430E	M09G0045H0430E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 1.7" wide, 492 ft
1.22" (31 mm)	M09G0020H0310E	M09G0045H0310E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 1.22" wide, 492 ft
0.9" (24 mm)	M09G0020H0245E	M09G0045H0245E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 0.9" wide, 492 ft
0.8" (20.6 mm)	M09G0020H0206E	M09G0045H0206E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 0.8" wide, 492 ft
0.6" (15.5 mm)	M09G0020H0155E	M09G0045H0155E	492		Roll stock, Oleophobic Supp PVDF, xx µm, 0.6" wide, 492 ft

GVS

FILTER TECHNOLOGY



Polycarbonate Track Etched (PCTE) Membrane



GVS Filter Technology Polycarbonate Track Etched (PCTE) Membrane is made from a thin polycarbonate film with precisely defined pores. It is ideally suited for use in cellular-based filtration assays as well as filtration applications where high purity is required. The membrane is produced through a two-step, proprietary manufacturing process that employs high quality standards. In the first step, polycarbonate film is exposed to ion particles that pass through it. As the ions pass through the film, they create “tracks” where the polymer is damaged. The beamed film is then exposed to a chemical that etches out the tracks creating precise, cylindrical pores. Pore density is controlled by the number of tracks per unit area, and pore size is controlled by varying the temperature, strength and time of exposure to the etching solution. This unique process allows for increased control over pore size and density to ensure the physical properties of each membrane precisely fit your specifications. The resulting membrane is a thin, translucent polycarbonate film with a smooth, flat surface. All particles larger than the pore size are captured on its surface.

To optimize the suitability of PCTE, we offer a variety of products with unique characteristics:

- PVP (polyvinylpyrillidone)-treated for a hydrophilic membrane
- AOX-certified for applications requiring extremely low extractables
- Black-dyed membrane for staining applications
- PVP-free for a hydrophobic membrane

GVS Filter Technology PCTE Membrane is available in roll widths from 1/4 inch (0.63 cm) to 20 inches (50 cm) as well as in sheets and cut disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Features & Benefits
(of all PCTE variations)

- Absolute pore size and density allows for precise size separation
- Direct thickness and pore size measurements provide accurate characteristics
- Smooth, thin, glass-like surface is suitable for microscopy and cellular applications
- Superior strength allows for aggressive handling
- Low protein binding ensures clean results
- Resists chemical staining to ease microscopic visualization
- Passes USP VI Class toxicity testing for use in medical devices
- Low cytotoxicity offers biocompatibility

Product Characteristics (of all PCTE variations)

- Membrane thickness 5-12 µm
- Maximum operation temperature: 284°F (140°C)
- Autoclavable
- Broad sealing compatibility including ultrasonic, heat, radio frequency and insert molding

PCTE AOX (Hydrophilic)

GVS Filter Technology PCTE AOX-certified membrane is made from the same thin, microporous polycarbonate film that is the base for our standard PCTE products. AOX-certified membrane is further tested to provide a PCTE membrane with the level of trace volatile, chlorinated organics in the base film at or below 0.03 µg/cm (or 0.15 µg for a 25 mm membrane) by EPA method 8010. It is ideally suited for use in groundwater and wastewater testing to determine the level of organic halides.
Halide levels are often regulated and their presence is frequently used as a pollution indicator.

Features & Benefits

- AOX-certified for halide measurement using regulated tests
- Low levels of trace volatile, chlorinated organics eliminates interference with result

Typical Applications

- Groundwater testing
- Wastewater testing
- Food and dairy testing

PCTE PVP-Treated (Hydrophilic)

Typical Applications

- General filtration
- Removal of red blood cells from plasma
- Flow control of reagents through assays
- Precise filtration and prefiltration
- Fuel testing
- Cytology
- Microscopy

PCTE Black (Hydrophilic)

GVS Filter Technology PCTE Membrane is available with a black surface for staining applications. Treatment of GVS Filter Technology PCTE with a proprietary black dye makes this membrane appear dark gray. The membrane exhibits essentially no autofluorescence and is ideal for direct microscopy applications.

Typical Applications

- Epifluorescence
- Observation of microorganisms
- Direct counting of microorganisms
- Water testing

Features & Benefits

- Smooth, thin, glass-like surface ensures no microorganisms are caught within the filter structure
- Microorganisms are retained on one plane allowing for easy microscopic visualization
- Lack of staining, negligible autofluorescence and non-specific absorption ensures low backgrounds

Product Characteristics

- Hydrophilic
- Dark gray
- Similar characteristics, except for transparency, as standard PCTE membrane

Polycarbonate Track Etched (PCTE) Membrane

Typical Specifications (all PCTE variations)

Minimum Pore Size (µm)	Maximum Pore Size (µm)	Pore Density (pores / cm^2)	Minimum Air Flow Rates @ 10 psi (l / min / cm^2)	Target Water Flow Rates @ 10 psi (mL / min / cm^2)	Minimum Bubble Point ***	
					psi	bar
0.008*	0.010*	6.0 x 108	0.008	NA	NA	NA
0.024*	0.030	6 x 108	0.08	NA	NA	NA
0.04*	0.050*	6 x 108	0.4	0.4	50	3.4
0.064	0.080	4 x 108	0.8	0.6	38	2.6
0.08	0.1	4 x 108	1.6	2.5	30	2.0
0.16	0.20	3 x 108	3	10	20	1.3
0.32	0.40	1 x 108	7.5	33	12	0.8
0.36	0.45	7 x 107	8	40	11	0.7
0.48	0.6	3 x 107	7.5	60	9	0.6
0.64	0.8	3 x 107	18	90	7	0.4
0.8	1.0	2 x 107	20	130	6	0.4
1.6	2.0	2 x 106	16.5**	200	3	0.2
2.4	3.0	2 x 106	37.5**	440	2	0.1
4.0	5.0	4 x 105	30**	700	1.2	0.08
6.4	8.0	1 x 105	30**	1000	0.7	0.05
9.0	10.0	1 x 105	34.5**	1150	0.5	0.03
11.0	12.0	1 x 105	64**	1250	0.4	0.02
13.0	14.0	5 x 104	64**	1400	0.2	0.01
15.0	16.0	4 x 104	12**	NA	NA	NA
17.0	18.0	4 x 104	12**	NA	NA	NA
19.0	20.0	4 x 104	12**	NA	NA	NA

* Reference use only
** Air flow @ 5 psi
*** Test with IPA

Ordering Informations

Hydrophilic Polycarbonate Track Etched Membrane (PCTE PVP) Standard Roll Part Numbers

Width	Catalog Numbers						Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.01 µm	0.03 µm	0.05 µm	0.08 µm	0.1 µm	0.22 µm			
20" (50.8 cm)	3059225	3030158	3059233	3059238	3059243	3059247	650	3000	Roll stock, GVS PC, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059226	3059230	3059234	3059239	3059244	1230457	650	3000	Roll stock, GVS PC, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059227	3059231	3059235	3059240	3059245	3059248	650	3000	Roll stock, GVS PC, xx µm, 12" wide, 650 ft
10" (254 mm)	3059228	1268122	3059236	3059241	1268123	1268124	650	3000	Roll stock, GVS PC, xx µm, 10" wide, 650 ft
6" (152 mm)	3059229	3059232	3059237	3059242	3059246	3059249	650	6000	Roll stock, GVS PC, xx µm, 6" wide, 650 ft

Width	Catalog Numbers						Typical Length* (ft)	MOQ** (ft)	Description Format
	0.45 µm	0.6 µm	0.8 µm	1.0 µm	2.0 µm	3.0 µm			
20" (50.8 cm)	3059250	3059253	3059257	3059261	3059265	3059270	650	3000	Roll stock, GVS PC, xx µm, 20" wide, 650 ft
13" (33.0 cm)	1234432	1234720	1234391	3059262	3059266	3059271	650	3000	Roll stock, GVS PC, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059251	3059254	3059258	3059263	3059267	3059272	650	3000	Roll stock, GVS PC, xx µm, 12" wide, 650 ft
10" (254 mm)	1268125	3059255	3059259	3029946	3059268	3029945	650	3000	Roll stock, GVS PC, xx µm, 10" wide, 650 ft
6" (152 mm)	3059252	3059256	3059260	3059264	3059269	3059273	650	6000	Roll stock, GVS PC, xx µm, 6" wide, 650 ft

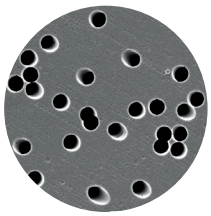
Width	Catalog Numbers						Typical Length* (ft)	MOQ** (ft)	Description Format***
	5.0 µm	8.0 µm	10.0 µm	12.0 µm	14.0 µm	20.0 µm			
20" (50.8 cm)	3059274	3059277	3059281	3059286	3059289	3059294	650	3000	Roll stock, GVS PC, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059275	3059278	3059282	1240068	3059290	3059295	650	3000	Roll stock, GVS PC, xx µm, 13" wide, 650 ft
12" (30.5 cm)	1216728	3059279	3059283	3059287	3059291	3063878	650	3000	Roll stock, GVS PC, xx µm, 12" wide, 650 ft
10" (254 mm)	3029944	3029943	3059284	3029942	3059292	3059296	650	3000	Roll stock, GVS PC, xx µm, 10" wide, 650 ft
6" (152 mm)	3059276	3059280	3059285	3059288	3059293	3059297	650	6000	Roll stock, GVS PC, xx µm, 6" wide, 650 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Polyester (PETE) Track Etched Membrane



GVS Life Sciences PETE Membrane is made from a thin polyester film with a high density of solvent resistance. It is ideal for use in blood assays or general filtration where chemically aggressive solvents may be used. The membrane is produced through a two-step proprietary manufacturing process similar to that of the PCTE membrane. In the first step, polyester film is exposed to ion particles that pass through the film. As the ions pass through the film, they create "tracks" where the polymer is damaged. The beamed film is then exposed to a chemical solution which etches out the tracks creating precise, cylindrical pores. Pore density is controlled by the number of tracks per unit area, and pore size is controlled by varying the temperature, strength and time of exposure to the etching solution. This unique process allows for increased control over pore size and density to ensure the physical properties of each membrane precisely fit your specifications.
The resulting membrane is a thin, translucent polyester film with a smooth, flat surface containing pores of controlled diameter and number. The membrane has better solvent resistance than polycarbonate and captures all particles larger than the precisely controlled pore size on its surface.

GVS Life Sciences PETE is available in roll widths from 1/4 inch (0.63 cm) to 20 inches (50 cm), as well as in sheets and cut disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Typical Applications

- General filtration
- Removal of red blood cells from plasma
- Flow control of reagents through assays
- Precise filtration and prefiltration
- Air analysis
- Filtration of aggressive solutions
- Cellular assays and diagnostics
- Trace element analysis

Features & Benefits

- Broad range of chemical compatibility for a wide range of applications
- Direct thickness and pore size measurements ensure accurate characteristics
- Naturally hydrophilic so pre-treatments and wetting agents are not required
- Smooth, thin, glass-like surface for microscopic visualization
- Low protein binding ensures clean results

Product Characteristics

- Membrane thickness: 10-20 µm
- Naturally hydrophilic
- Maximum operating temperature: 284°F (140°C)
- Autoclavable
- Broad sealing compatibility including ultrasonic, heat, radio frequency and insert molding

Typical Specifications

Minimum Pore Size (µm)	Maximum Pore Size (µm)	Pore Density (pores / cm^2)	Minimum Air Flow Rates @ 10 psi (l / min / cm^2)	Target Water Flow Rates @ 10 psi (mL / min / cm^2)	Minimum Bubble Point	
					psi	bar
0.16	0.20	3 x 108	3	10	20	1.3
0.32	0.40	1 x 108	7.5	33	12	0.8
0.48	0.6	3 x 107	7.5	60	9	0.6
0.64	0.8	3 x 107	18	90	7	0.4
0.8	1.0	2 x 107	20	130	6	0.4
1.6	2.0	2 x 106	16.5*	200	3	0.2
2.4	3.0	2 x 106	37.5*	440	2	0.1
4.0	5.0	4 x 105	30*	700	1.2	0.8
6.4	8.0	1.0 105	30*	1000	0.7	0.04
9.0	10.0	1 x 105	34.5*	1150	0.5	0.03

* Air flow @ 5 psi

Ordering Informations

Polyester Track Etched Membrane (PETE) Standard Roll Part Numbers

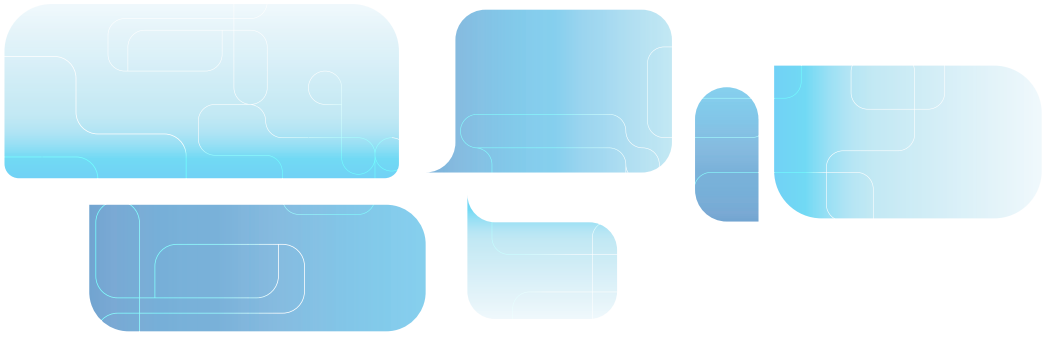
Width	Catalog Numbers					Typical Length* (ft)	MOQ** (ft)	Description Format
	0.22 µm	0.45 µm	0.8 µm	1.0 µm	2.0 µm			
20" (50.8 cm)	1264519	3059374	3059378	1256143	3059386	650	3000	Roll stock, GVS PET, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059370	3059375	3059379	3059383	3059387	650	3000	Roll stock, GVS PET, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059371	3059376	3059380	3059384	3059388	650	3000	Roll stock, GVS PET, xx µm, 12" wide, 650 ft
10" (254 mm)	3059372	3029941	3059381	3029940	3059389	650	3000	Roll stock, GVS PET, xx µm, 10" wide, 650 ft
6" (152 mm)	3059373	3059377	3059382	3059385	3059390	650	6000	Roll stock, GVS PET, xx µm, 6" wide, 650 ft

Width	Catalog Numbers				Typical Length* (ft)	MOQ** (ft)	Description Format***
	3.0 µm	5.0 µm	8.0 µm	10.0 µm			
20" (50.8 cm)	3059391	3059395	3059399	3059403	650	3000	Roll stock, GVS PET, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059392	3059396	3059400	3059404	650	3000	Roll stock, GVS PET, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059393	1262786	3059401	3059405	650	3000	Roll stock, GVS PET, xx µm, 12" wide, 650 ft
10" (254 mm)	1262784	3059397	1262785	3059406	650	3000	Roll stock, GVS PET, xx µm, 10" wide, 650 ft
6" (152 mm)	3059394	3059398	3059402	3059407	650	6000	Roll stock, GVS PET, xx µm, 6" wide, 650 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.



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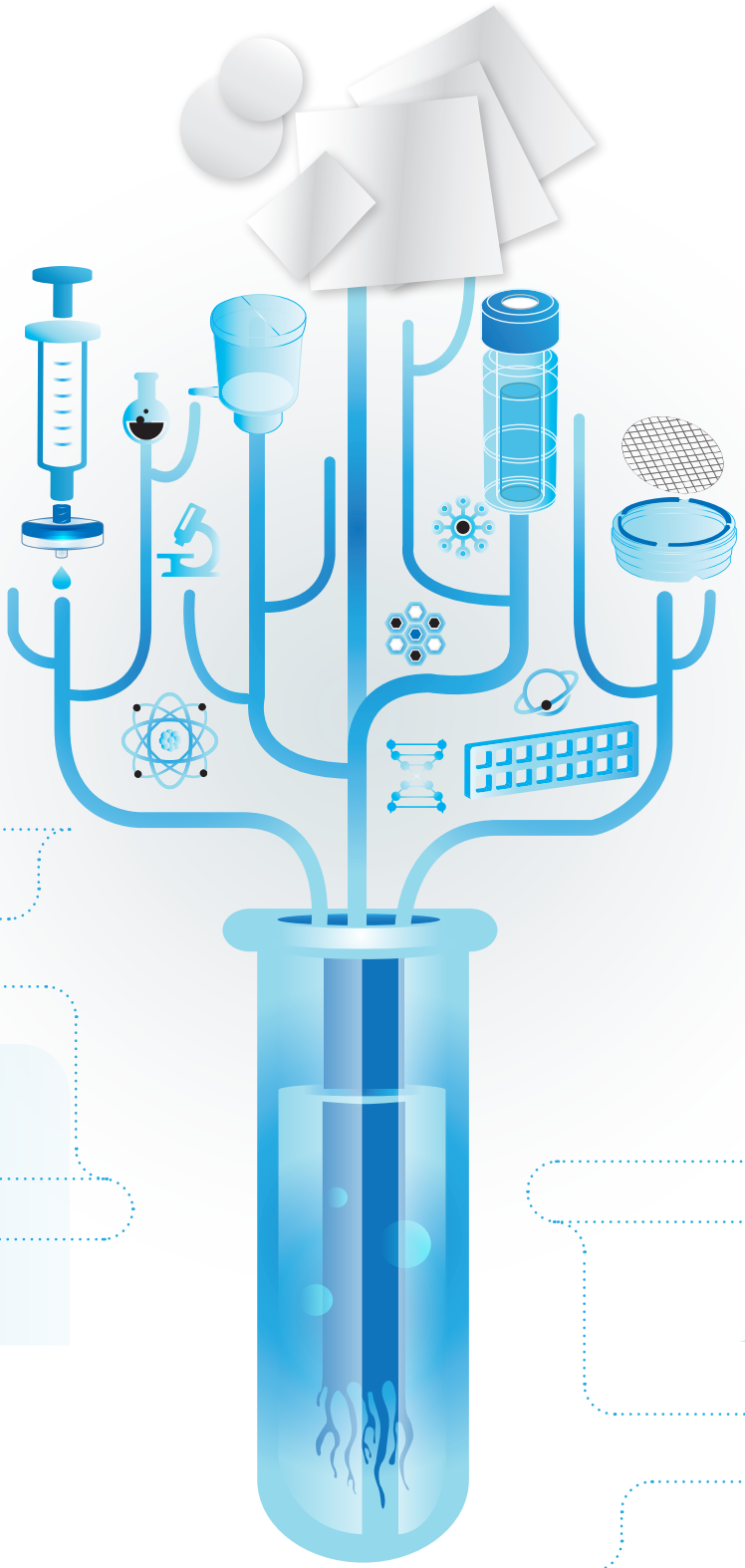
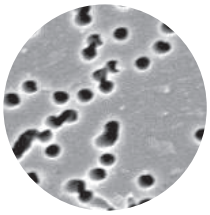


Polycarbonate Track Etched (PCTE - PVPF) Hydrophobic Membrane



GVS Filter Technology Polycarbonate Track Etched (PCTE) Membrane is made from a thin polycarbonate film with precisely defined pores. It is ideally suited for use in cellular-based filtration assays as well as filtration applications where high purity is required. The membrane is produced through a two-step, proprietary manufacturing process that employs high quality standards. In the first step, polycarbonate film is exposed to ion particles that pass through it. As the ions pass through the film, they create “tracks” where the polymer is damaged. The beamed film is then exposed to a chemical that etches out the tracks creating precise, cylindrical pores. Pore density is controlled by the number of tracks per unit area, and pore size is controlled by varying the temperature, strength and time of exposure to the etching solution. This unique process allows for increased control over pore size and density to ensure the physical properties of each membrane precisely fit your specifications. The resulting membrane is a thin, translucent polycarbonate film with a smooth, flat surface. All particles larger than the pore size are captured on its surface.

PCTE PVP-Free (Hydrophobic)

GVS Filter Technology PCTE Membrane is also available as a hydrophobic membrane ideally suited for cellular assays, bioprocessing and diagnostics. This membrane is not treated with PVP, so it retains its natural hydrophobicity.
Other characteristics and specifications are similar to those of the PCTE membrane.

Product Characteristics

- Hydrophobic

Product Characteristics (of all PCTE variations)

- Membrane thickness 5-12 µm
- Maximum operation temperature: 284°F (140°C)
- Autoclavable
- Broad sealing compatibility including ultrasonic, heat, radio frequency and insert molding

Features & Benefits (of all PCTE variations)

- Absolute pore size and density allows for precise size separation
- Direct thickness and pore size measurements provide accurate characteristics
- Smooth, thin, glass-like surface is suitable for microscopy and cellular applications
- Superior strength allows for aggressive handling
- Low protein binding ensures clean results
- Resists chemical staining to ease microscopic visualization
- Passes USP VI Class toxicity testing for use in medical devices
- Low cytotoxicity offers biocompatibility

GVS Filter Technology PCTE Membrane is available in roll widths from 1/4 inch (0.63 cm) to 20 inches (50 cm) as well as in sheets and cut disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

Typical Applications

- Cellular assays
- Tissue culture
- Chemotaxis
- Diagnostics

Typical Specifications (all PCTE variations)

Minimum Pore Size (µm)	Maximum Pore Size (µm)	Pore Density (pores / cm^2)	Minimum Air Flow Rates @ 10 psi (l / min / cm^2)	Target Water Flow Rates @ 10 psi (mL / min / cm^2)	Minimum Bubble Point ***	
					psi	bar
0.008*	0.010*	6.0 x 108	0.008	NA	NA	NA
0.024*	0.030	6 x 108	0.08	NA	NA	NA
0.04*	0.050*	6 x 108	0.4	0.4	50	3.4
0.064	0.080	4 x 108	0.8	0.6	38	2.6
0.08	0.1	4 x 108	1.6	2.5	30	2.0
0.16	0.20	3 x 108	3	10	20	1.3
0.32	0.40	1 x 108	7.5	33	12	0.8
0.36	0.45	7 x 107	8	40	11	0.7
0.48	0.6	3 x 107	7.5	60	9	0.6
0.64	0.8	3 x 107	18	90	7	0.4
0.8	1.0	2 x 107	20	130	6	0.4
1.6	2.0	2 x 106	16.5**	200	3	0.2
2.4	3.0	2 x 106	37.5**	440	2	0.1
4.0	5.0	4 x 105	30**	700	1.2	0.08
6.4	8.0	1 x 105	30**	1000	0.7	0.7
9.0	10.0	1 x 105	34.5**	1150	0.5	0.03
11.0	12.0	1 x 105	64**	1250	0.4	0.02
13.0	14.0	5 x 104	64**	1400	0.2	0.01
15.0	16.0	4 x 104	12**	NA	NA	NA
17.0	18.0	4 x 104	12**	NA	NA	NA
19.0	20.0	4 x 104	12**	NA	NA	NA

* Reference use only
** Air flow @ 5 psi
*** Test with IPA

Ordering Informations

Hydrophobic Polycarbonate Track Etched Membrane (PCTE PVP free) Standard Roll Part Numbers

Width	Catalog Numbers					Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.01 µm	0.1 µm	0.22 µm	0.45 µm	0.6 µm			
20" (50.8 cm)	3059298	3059303	3059308	3059312	3059317	650	3000	Roll stock, GVS PC, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059299	3059304	3059309	3059313	3059318	650	3000	Roll stock, GVS PC, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059300	3059305	3029947	3059314	3059319	650	3000	Roll stock, GVS PC, xx µm, 12" wide, 650 ft
10" (254 mm)	3059301	3059306	3059310	3059315	3059320	650	3000	Roll stock, GVS PC, xx µm, 10" wide, 650 ft
6" (152 mm)	3059302	3059307	3059311	3059316	3059321	650	6000	Roll stock, GVS PC, xx µm, 6" wide, 650 ft

Width	Catalog Numbers					Typical Length* (ft)	MOQ** (ft)	Description Format***
	0.8 µm	1.0 µm	2.0 µm	3.0 µm	5.0 µm			
20" (50.8 cm)	3059322	3059327	3059332	3059337	3013822	650	3000	Roll stock, GVS PC, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059323	3059328	3059333	3059338	3059342	650	3000	Roll stock, GVS PC, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059324	3059329	3059334	3059339	3059343	650	3000	Roll stock, GVS PC, xx µm, 12" wide, 650 ft
10" (254 mm)	3059325	3059330	3059335	3059340	3059344	650	3000	Roll stock, GVS PC, xx µm, 10" wide, 650 ft
6" (152 mm)	3059326	3059331	3059336	3059341	3059345	650	6000	Roll stock, GVS PC, xx µm, 6" wide, 650 ft

Width	Catalog Numbers					Typical Length* (ft)	MOQ** (ft)	Description Format***
	8.0 µm	10.0 µm	12.0 µm	14.0 µm	20.0 µm			
20" (50.8 cm)	3013821	3059350	3059355	3059360	3059365	650 ft	3000	Roll stock, GVS PC, xx µm, 20" wide, 650 ft
13" (33.0 cm)	3059346	3059351	3059356	3059361	3059366	650 ft	3000	Roll stock, GVS PC, xx µm, 13" wide, 650 ft
12" (30.5 cm)	3059347	3059352	3059357	3059362	3059367	650 ft	3000	Roll stock, GVS PC, xx µm, 12" wide, 650 ft
10" (254 mm)	3059348	3059353	3059358	3059363	3059368	650 ft	3000	Roll stock, GVS PC, xx µm, 10" wide, 650 ft
6" (152 mm)	3059349	3059354	3059359	3059364	3059369	650 ft	6000	Roll stock, GVS PC, xx µm, 6" wide, 650 ft

* Typical lengths assume ≥3 splices per roll and a tolerance of ±10%

** Minimum Order Quantity. If different quantity needed feel free to contact us

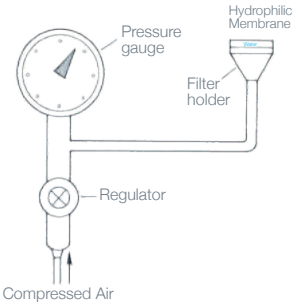
*** GVS Filter Technology Membrane is available in roll as well as in sheets and disks that can be customized to meet your application and size requirements. If different width is required we can slit following your needs.

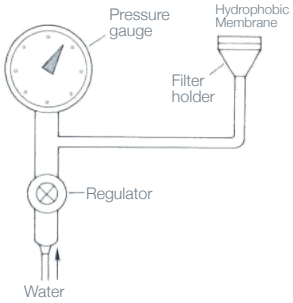
Measuring a Filter Media's Performance

GVS Filter Technology uses tests to rate the performance of its media. For any other information, feel free to contact us.

Bubble Point

Measure of the air pressure required to force liquid from the largest wetted pore of a membrane. Serves as an indication of pore size and a barrier to particulates. The bubble point is dependent on the liquid used to wet the membrane; for a given pore size the bubble point will be higher in a liquid with a higher surface tension (such as water) than in a liquid with a lower surface tension (such as isopropyl alcohol). The bubble point rating is determined when the largest pore yields a bubble; the larger the pore, the less pressure required to form the bubble. Expressed in units of pounds/square inch (psi) or bar for membranes.





Water Breaktrough

Measure of the amount of pressure required to transmit water through the largest pore of a dry hydrophobic media. Serves as an indication of pore size for a hydrophobic membrane. The larger the pore size, the less pressure required to intrude the water. Expressed in the membrane industry in units of pounds/square inch (psi) or bar.

Water Flow

Measure of the amount of water that flows through a membrane. Related to the degree of contamination, differential pressure, total porosity, and filter area. Expressed in the membrane industry in units of milliliters/minute/square centimeter at a defined pressure.

Air Flow

Measure of the amount of air that flows through a membrane. Related to the degree of contamination, differential pressure, total porosity, and filter area. Commonly expressed in the membrane industry in liters/minute/square centimeter at a given pressure.

Filter Efficiency

Measure of the quantity of particulate retained as a function of the total number and size of the challenging particles and differential pressure. Usually expressed as a percentage of retention of predetermined particle size at a given challenge concentration. In the case of bacterial removal efficiency, this may be expressed as a log reduction value.

Biological Safety Test

Tests conducted on filter construction materials that come in contact with test solutions that simulate most body fluids. Extracts of filter construction materials are tested to establish whether there are potential "leachables" present. Testing is performed to determine whether leachables are capable of inducing measurable degrees of systemic toxicity, localized skin irritation, sensitization reaction, or other biological responses.

Pirogenicity

Property of a substance that, when injected into the body, causes a rise in body temperature. Filtration materials that come in contact with injectable fluids must meet pyrogenicity standards and are therefore classified as non-pyrogenic.

Chemical Compatibility

Chemical		Membrane						
		CA	NC	NY	PC	PES	PET	PVDF
Acids	Acetic Acid, 5%	R	R	R	R	R	R	R
	Acetic Acid, 10%	N	N	L	R	R	R	R
	Acetic Acid, Glacial	N	N	N	L	R	R	R
	Boric Acid	R	R	L	R	T	R	R
	Hydrochloric, 6N	L	N	N	R	R	L	R
	Hydrochloric, Conc.	N	N	N	R	R	N	R
	Hydrofluoric, 10%	N	N	N	R	T	R	R
	Hydrofluoric, 35%	N	N	N	R	T	R	R
	Nitric Acid, 6N	L	R	N	R	N	R	R
	Nitric Acid, Conc.	N	N	N	R	N	N	L
	Sulfuric Acid, 6N	L	R	N	R	T	R	R
	Sulfuric Acid, Conc.	N	N	N	N	N	N	R
Alcohols	Amyl Alcohol	R	N	R	R	N	R	R
	Benzyl Alcohol	L	R	L	L	N	R	R
	Butyl Alcohol	R	R	R	R	R	R	R
	Butyl Cellosolve	L	N	R	L	T	R	R
	Ethyl Alcohol <80%	R	R	R	R	R	R	R
	Ethyl Alcohol >80%	R	L	R	R	R	R	R
	Ethylene Glycol	R	L	R	R	R	R	R
	Glycerine (Glycerol)	R	R	R	R	R	R	R
	Isobutyl Alcohol	R	R	R	R	T	R	R
	Isopropanol	R	L	R	R	R	R	R
	Methanol	R	N	L	R	R	R	R
	Methyl Cellosolve	L	L	R	N	T	R	R
	Propanol	R	R	R	R	T	R	R
Bases	Ammonium Hydroxide, 6N	N	N	N	N	R	L	R
	Potassium Hydroxide, 6N	N	N	R	N	T	N	R
	Sodium Hydroxide, 6N	N	N	N	N	R	L	R
Solvents	Acetone	N	N	R	L	N	R	L
	Acetonitrile	N	N	R	L	R	R	R
	Amyl Acetate	L	N	R	R	L	R	R
	Aniline	N	N	R	N	R	R	R
	Benzene	L	R	R	L	R	R	R
	Bromoform	N	R	R	N	T	R	T
	Butyl Acetate	L	N	R	R	L	R	L
	Carbon Tetrachloride	L	R	R	L	R	R	R
	Cellosolve	R	N	R	R	T	R	L
	Chloroform	N	R	R	N	N	R	R

Chemical Compatibility *Continued*

Chemical		Membrane						
		CA	NC	NY	PC	PES	PET	PVDF
	Cyclohexanone	N	R	L	N	R	N	R
	Diethyl Acetamide	N	N	R	L	T	R	R
	Dimethyl Formamide	N	N	R	N	N	R	N
	Dimethyl Sulfoxide (DMSO)	N	N	R	N	N	R	R
	Dioxane	N	N	R	N	L	R	L
	Ethyl Ether	L	L	R	R	R	R	R
	Ethylene Dichloride	L	L	R	N	T	R	R
	Formaldehyde	L	N	R	R	R	R	R
	Freon TF	R	R	R	R	R	R	R
	Gasoline	R	R	R	R	T	R	R
	Hexane	R	R	R	R	T	R	R
	Isopropyl Acetate	N	N	R	R	T	R	N
	Kerosene	R	R	R	R	T	R	R
	Methyl Acetate	N	N	R	N	T	R	L
	Methyl Ethyl Ketone (MEK)	N	N	R	L	N	R	L
	Methyl Isobutyl Ketone	N	N	R	L	T	T	N
	Methylene Chloride	N	N	L	N	N	R	L
	Nitrobenzene	N	N	R	N	N	R	L
	Pentane	R	R	R	R	R	R	R
	Perchloroethylene	R	R	R	R	N	T	R
	Pyridine	N	N	R	N	N	R	L
	Tetrahydrofuran	N	N	L	N	N	R	L
	Toluene	L	R	R	L	N	R	R
	Trichloroethane	L	N	R	N	R	T	R
	Trichlorethylene	R	R	R	N	R	R	R
	Triethylamine	R	L	R	L	T	R	R
	Xylene	R	R	R	R	L	R	R
	Cottonseed Oil	R	R	R	R	T	T	R
	Hydrogen Peroxide (30%)	R	R	R	R	T	R	R
	Kodak KMER FTFR	N	N	R	R	T	R	T
	Peanut Oil	R	R	R	R	T	R	R
Miscellaneous	Petroleum Oils	T	R	T	R	L	R	R
	Sesame Oil	R	R	R	R	T	R	R
	Shipley (AS-111,340,1350)	N	N	R	R	T	R	T
	Silicone Oils	R	R	R	R	R	R	R
	Turpentine	R	R	R	R	T	R	R

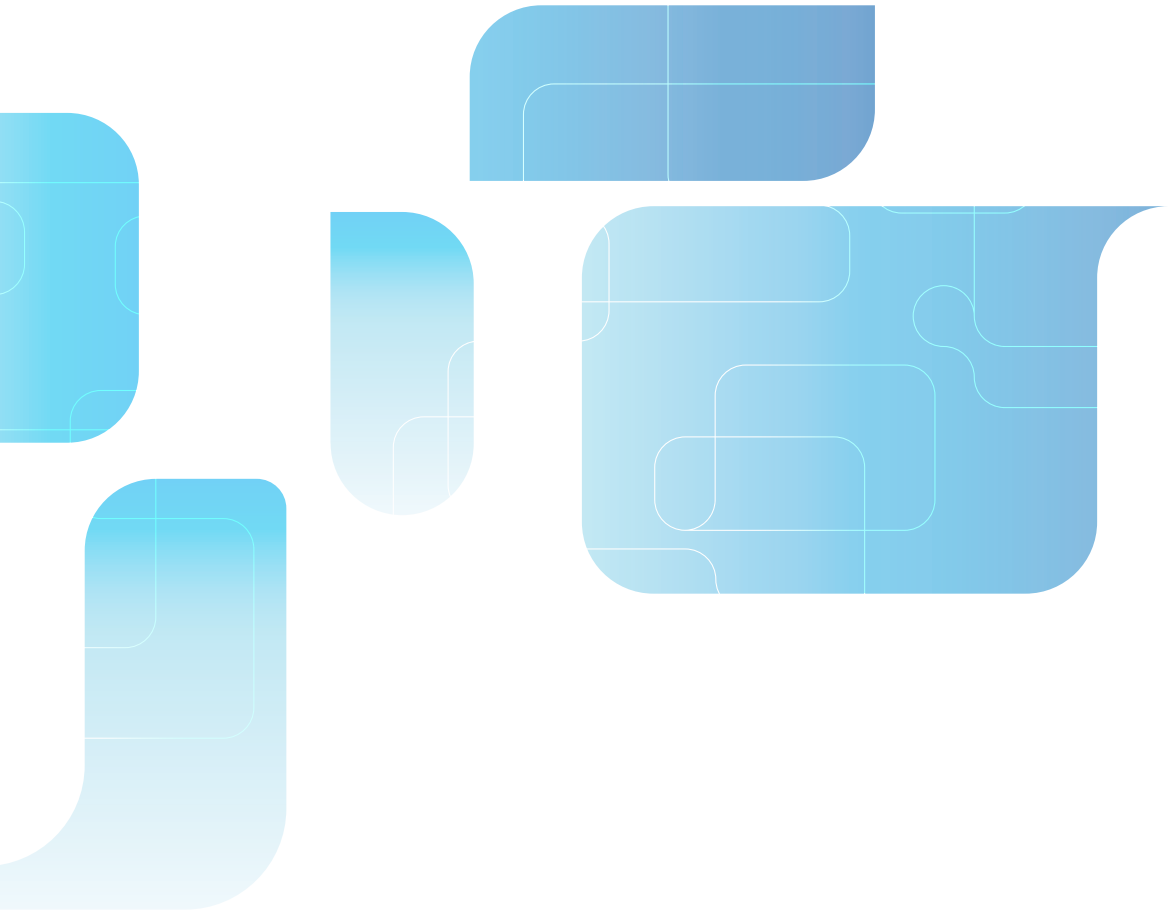
Key

R = Recommended

L = Limited Resistance (testing before use is recommended)

N = Not Recommended

T = Not Tested



All the specifications conteined in this catalog have to be confirmed with the certificate of analyses. We are at you disposal for any further information you need.

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