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Product Selection Guide

Microfiltration Membranes for the Laboratory



Millipore's expert team of scientists understands the complexity of collection, separation and purification processes and supports your most difficult challenges in life science, environmental and industrial research.



Choosing the proper membrane device for your laboratory process is an important first step in any successful analysis. To help you identify the filtration device best suited to your specific application we created a handy membrane selection guide that will help you choose the Millipore® membrane that will provide you with the highest quality, consistent results from downstream analyses. If you need further help or have a question, you can access our knowledgeable Millipore technical service representatives by visiting www.millipore.com/techservice or browse our extensive on-line technical library at www.millipore.com.

Membrane Selection for Mobile Phase Preparation: Chemical Compatibility

Membrane Material	SOLVENTS				Diluent		Buffers					
	MOBILE PHASE				Sample		Modifiers					
	MeOH	Water	ACN	IPA	DMSO	DMF	2% Fomic Acid	0.1% TEA	10 mM Phosphate Buffer	50 mM Ammonia	0.1% TFA	50 mM Ammonium Acetate
PTFE	●	●	●	●	●	●	●	●	●	●	●	●
PVDF	●	●	●	●	●	●	●	●	●	●	●	●
PES	●	●	●	●	●	N	N	●	●	●	●	N
NYLON	N	●	●	N	●	●	●	●	●	N	●	●

● Excellent ● Good ● Poor N No Data

An important consideration when choosing a membrane for any application is the chemical compatibility of the membrane material with the mobile phase you plan to use. As technological improvements by instrument manufacturers continue to drive detection limits lower, the elimination of extractables in your sample becomes essential to maintaining the accuracy of downstream analyses. This chart, developed by Millipore scientists, rates the chemical compatibility of a variety of common membrane and mobile phase combinations based on the level of extractables observed. A comprehensive chemical compatibility chart is available at www.millipore.com/chemcompat

Microfiltration

Microfiltration (MF) is the process of removing particles or biological entities in the 0.025 µm to 10.0 µm range from fluids or gasses by passage through a microporous medium such as a membrane filter. Although micron-sized particles can be removed by non-membrane or depth materials such as those found in fibrous media, only a membrane filter having a precisely defined pore size can ensure quantitative retention (Figure 1). Membrane filters can be used for either final filtration or prefiltration, whereas a depth filter is generally used in clarifying applications where quantitative retention is not required or as a prefilter to prolong the life of a downstream membrane. Membrane and depth filters offer certain

advantages and limitations. They can complement each other when used together in a microfiltration process system or fabricated device.

The retention boundary defined by a membrane filter can also be used as an analytical tool to validate the integrity and efficiency of a system. For example, in addition to clarifying or sterilizing filtration, fluids containing bacteria can be filtered to trap the microorganisms on the membrane surface for subsequent culture and analysis. Microfiltration can also ensure accurate dissolution testing results by removing undissolved excipients from the sample.

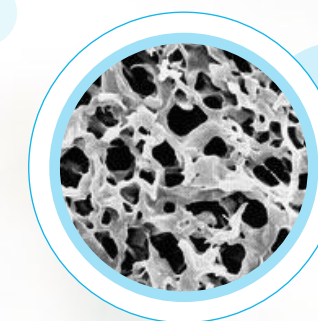
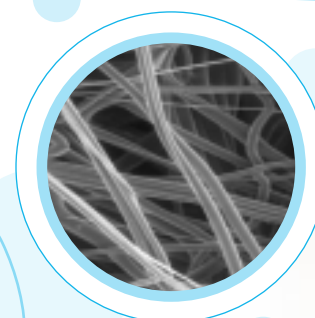


Figure 1: Depth filters (left) have a random network of flow channels that trap particles throughout the depth of the matrix. Membrane filters (right) have a geometrically regular matrix of pores. Particles are retained by size exclusion.



Laboratory Filtration Membranes and Materials

FILTER MEMBRANE	Membrane Material	Brand Name	SEM Image	Pore Sizes	Hydrophilic/ Hydrophobic	Binding	Chemical Compatibility	Key Properties	Common Applications	Product Formats
	PVDF	Durapore®		0.1 µm to 5 µm	Philic	Lowest	Good	Lowest protein binding	RLB, Luminex bead assays, general filtration	Cut discs, MultiScreen® filter plates, Ultrafree® filters, sterile & non-sterile Millex® syringe filters, Steriflip®/Stericup® filter systems
	Polyethersulfone	Millipore Express™		0.22 µm and 0.45 µm	Philic	Low	Limited	Fastest flowing for sterile filtration	Sterile filtration	Cut discs, sterile filtration (Steriflip filter/cup/cap), sterile & non-sterile Millex syringe filters
	Mixed cellulose esters	MF-Millipore		0.025 µm to 8 µm	Philic	High	Limited	Most widely used/ referenced general purpose filter	Elispot, environmental monitoring, general filtration	Cut discs, environmental monitors, sterile & non-sterile Millex syringe filters, MultiScreen® multiwell filter plates
	Polycarbonate	Isopore™		0.05 µm to 12 µm	Philic	Low	Limited	Smooth surface for microscopy	Particle analysis, drug permeability & solubility	Cut discs, MultiScreen filter plates
	Nylon	Nylon		0.22 µm and 0.45 µm	Philic	Medium	Excellent	Alternative for solvent filtration	Clarification of organic solutions	Cut discs, non-sterile Millex syringe filters
	PTFE	Fluoropore™, Mitex™		0.22 µm to 10 µm	Phobic	Low	Best	Best solvent resistance	Clarification of organic solutions, gas filtration, total drug analysis	Cut discs, Millex FG ₅₀ filter, MultiScreen filter plates, Solvintert™ filter plates
LCR, Omnipore™			0.1 µm to 10 µm	Philic	Cut Discs, non-sterile Millex syringe filters, MultiScreen filter plates, Solvintert filter plates					

PREFILTER/NET FILTER	Membrane Material	Brand Name	SEM Image	Pore Sizes	Hydrophilic/ Hydrophobic	Binding	Chemical Compatibility	Key Properties	Common Applications	Product Formats
	Glass fiber	AP filters		0.2 µm to 8 µm	Philic	Medium	Good	Variety of filter types	RLB, cell harvesting	Cut discs, MultiScreen filter plates, non-sterile Millex syringe filters
	Polypropylene	PP prefilters		0.6 µm to 30 µm	Phobic	Low	Excellent	Resists solvents & high temperatures	Prefiltration	Cut discs, MultiScreen, Solvintert filter plates
	Cellulose	RW prefilters		0.2 µm to 1.2 µm	Philic	N/A	Limited	Non-shedding prefilter	Prefiltration	Cut discs
	PVC	PVC filters		0.8 µm and 5 µm	Philic	N/A	Limited	Medical-grade	Air monitoring	Cut discs
	Nylon	Nylon net filters		11 µm to 180 µm	Philic	Medium	Excellent	Largest pore size available	Cell & organism filtration, lysate clearing	Cut discs, Steriflip filtration system, MultiScreen filter plates
Polypropylene	PP net filters		25 µm to 80 µm	Phobic	Low	Excellent	Resists solvents & high temperatures	Prefiltration	Cut discs	

