Membrane Selection Guide

Microporous Membranes Organized by Application

	Durapore® PVDF	MF-Millipore™ MCE	Millipore Express® PLUS PES	Isopore™ Polycarbonate	Fluoropore™ PTFE	Omnipore™ PTFE	Mitex™ PTFE	LCR PTFE	V-Series MCE	Nylon	Silver	PVC
Lab Applications												
Clarification of cell lysates and tissue homogenates	●		●									
Cell cytology		●		●								
Sterilizing liquid filtration	●	●	●									
Air sterilization					●							
Mycoplasma reduction	●		●									
Solvent filtration	●				●	●	●	●		●		
Tissue culture media filtration	●		●									
Microdialysis of DNA and proteins									●			
Fluorescent bacteriological assays				●								
General filtration and clarification of aqueous solutions	●	●	●							●		
Clarifying acids and bases	●		●			●	●	●		●		
Chemotaxis				●								
SEM analysis				●								
Epifluorescence microscopy				●								
Venting applications					●		●					
HPLC solvent filtration	●							●		●		
Environmental Monitoring Applications												
Alpha particle monitoring					●							
Air monitoring		●		●	●		●				●	●
Industrial particle monitoring		●					●	●				●
Particle collection and analysis		●										
Gravimetric analysis		●		●								

NOTE: This chart provides general recommendations.
Contact your local Merck Millipore technical service representative to discuss the requirements of your specific application:
www.merckmillipore.com/techservice

Membrane Selection Guide

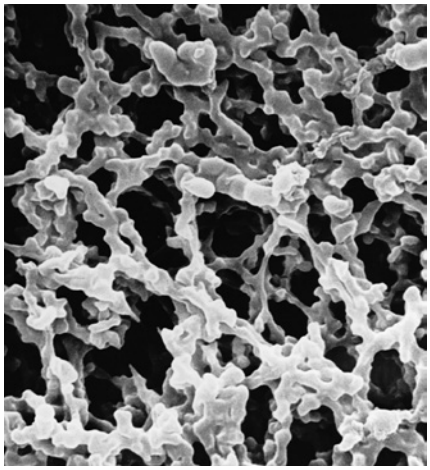
Microporous Membranes Organized by Performance

Membrane Type	Surface Chemistry	Membrane Code[4]	Pore size (µm)	Typical Flow Rate[0] Water (mL/min/cm²/psi)[1]	Air (L/min/cm²/psi)[2]	Min. Ave. Bubble Pt. (Air with H_2O, psi)[3]	Refractive Index
MF-Millipore™ MCE	Hydrophilic	VSWP	0.025	0.0	0.0	306.0	1.50
		VMWP	0.05	0.1	0.0	255.3	1.50
		VCWP	0.1	0.1	0.1	204.5	1.50
		GSWP	0.22	1.4	0.3	51.1	1.51
		PHWP	0.3	2.4	0.5	34.8	1.51
		HAWP	0.45	4.5	0.8	31.9	1.51
		DAWP	0.65	10.6	2.3	17.0	1.51
		AAWP	0.8	14.3	2.7	14.5	1.51
		RAWP	1.2	20.4	3.5	11.0	1.52
		SSWP	3	24.1	4.9	10.2	1.50
		SMWP	5	43.7	6.4	6.1	1.50
		SCWP	8	46.8	6.9	6.1	1.52
Millipore Express® PLUS PES	Hydrophilic	GPWP	0.22	1.5	0.5	20.2	NA
		HPWP	0.45	2.3	1.1	10.0	NA
Durapore® PVDF	Hydrophilic	VVLP	0.1	≥ 0.33	0.1	72.5	1.42
		GVHP	0.22	≥ 1	0.2	50.0	1.42
		HVLP	0.45	≥ 2.6	0.9	22.5	1.42
		DVPP	0.65	≥ 6	1.1	16.0	1.42
		SVLP	5	≥ 15.4	1.6	2.9	1.42
Isopore™ polycarbonate	Hydrophilic	VCTP	0.1	0.2	0.1	101.0	1.60
		GTTP	0.2	1.0	0.3	58.0	1.60
		GTBP	0.2	0.7	0.3	75.4	1.60
		HTBP	0.4	1.2	0.4	42.1	1.60
		DTTP	0.6	2.3	0.8	17.0	1.60
		ATTP	0.8	4.1	1.4	13.0	1.60
		RTTP	1.2	6.2	2.3	10.0	1.60
		TTTP	2	8.5	2.0	5.0	1.60
		TSTP	3	29.0	4.9	3.0	1.60
		TMTP	5	39.4	5.4	1.9	1.60
		TETP	8	44.0	5.5	1.3	1.60
		TCTP	10	114.7	7.2	1.0	1.60
Nylon	Hydrophilic	GNWP	0.2	0.6	0.2	42.1	NA
		HNWP	0.45	1.1	0.3	30.0	NA
		ANWP	0.8	1.4	0.3	8.0	NA
		RNWP	1.2	1.6	0.5	5.9	NA
LCR PTFE	Hydrophilic	FHLC	0.45	1.6	0.6	11.0	NA
Omnipore™ PTFE	Hydrophilic	JVWP	0.1	0.1	0.4	342.3	NA
		JGWP	0.2	0.3	0.7	197.3	NA
		JHWP	0.45	1.1	1.2	114.6	NA
		JAWP	1	3.4	3.4	52.2	NA
		JMWP	5	11.4	5.3	30.5	NA
		JCWP	10	22.7	6.8	10.2	NA
Fluoropore™ PTFE	Hydrophobic	FGLP	0.22	0.9	0.4	14.5	NA
		FHLP	0.45	1.3	1.6	9.1	NA
		FHUP	0.45	2.0	1.1	9.1	NA
		FALP	1	4.8	2.7	7.3	NA
		FSLW	3	13.8	6.4	1.5	NA
Mitex™ PTFE	Hydrophobic	LSWP	5	14.1	2.0	0.7	NA
		LCWP	10	32.3	5.0	0.4	NA
Durapore® PVDF	Hydrophobic	VVHP	0.1	≥ 0.33	0.1	26.1	1.42
		GVHP	0.22	≥ 1	0.2	18.0	1.42
		HVHP	0.45	≥ 2.6	0.5	8.7	1.42

[0] NOTE: Flow rates listed are based on measurements with clean water and air, and represent typical values. Values presented here do not establish specifications.
[1] Water flow rates were measured through 9.6 cm² of membrane, using 500 mL of water at 25 °C and 27.5 in. Hg of vacuum. Hydrophobic membranes were wet with solvents and then exchanged in water for testing.
[2] Air flow rates were measured on a 25 mm disc at 10 psi using a mass flow meter.
[3] Membranes were tested with water, except for Mitex™, Fluoropore™ and hydrophobic Durapore® membranes, which were tested with methanol.
[4] Corresponds to the first four letters of the catalogue number.

MF-Millipore™ Membrane Filters

Mixed cellulose esters



Biologically inert mixtures of cellulose acetate and cellulose nitrate have made MF-Millipore™ membrane filters one of the most widely used membranes in analytical and research applications.

MF-Millipore™ filters without Triton® surfactant contain minimum amounts of wetting agent and have a lower water extractable content than standard MF-Millipore™ filters.

Features & Benefits

- Versatile filter for biological and environmental monitoring applications
- Available in a range of pore sizes, colored black or white, with or without a gridded surface
- Compatible with ethylene oxide, gamma irradiation, and autoclave sterilization methods

Specifications

Color	White or black
Surface	Plain or gridded
Wettability	Hydrophilic
Sterilization	Ethylene oxide, autoclavable (121 °C at 1 bar)
Operating Temperature	55 °C maximum
Protein Binding	150 µg/cm²
Bacterial Endotoxins	8.0 EU/mL
Gravimetric Extractables	<1.0%

Detailed Specifications

Applications	Filter Code[1]	Color	Pore Size (µm)	Bubble Point[2] (psi)	Thickness (µm)	Water Flow Rate[3] (mL/min/cm²)	Typical Air Flow[4] (L/min/cm²)	Porosity (%)
Standard MF-Millipore™ Membranes								
Microdialysis of DNA and proteins	VSWP	White	0.025	306	105	-	>0.12	70
	VMWP	White	0.05	255	105	-	>0.26	72
	VCWP	White	0.1	205	105	-	>0.37	74
Sterilizing filtration, bioassays	GSWP	White	0.22	51.1	150	>20.1	2.7	75
Sterilizing filtration, air monitoring, particle monitoring, particle removal, bioassays	PHWP	White	0.3	35.7	150	>34.0	5.1	77
Clarification of aqueous solutions, particle removal and analysis, microbiology analysis	HAW*	White	0.45	30.6	150	>48.1	8.3	79
Fluorescent bacteriological assays, particle monitoring, bioassays	HAB**	Black	0.45	33.6	150	>69.4	-	79
Particle monitoring, particle removal, dairy microbiology, retention of yeasts, molds and algae	DAWP	White	0.65	17.0	150	>140	23.4	81
Air monitoring, particle monitoring, particle removal, bioassays	AAW**	White	0.8	14.0	150	>184	26.7	82
Fluorescent assays, particle monitoring, air monitoring	AAB**	Black	0.8	16.2	150	>195	-	82
Clarification of aqueous solutions	RAWP	White	1.2	11.2	150	>284	35.2	82
QC of fluid holding tanks, fluid monitoring, air monitoring, particle collection and analysis	SSWP	White	3	10.2	150	>347	49.3	83
QC of fluid holding tanks, fluid monitoring, particle collection and analysis	SMWP	White	5	8.0	135	>520	64.5	84
QC of fluid holding tanks, fluid monitoring, air monitoring, particle collection and analysis	SCWP	White	8	6.1	135	>625	68.9	84

*Available with plain (P) or gridded (G) surface.

[1]Corresponds to first 4 digits of catalogue number.

[2]Bubble point tested with water.

[3]Water Flow Rate measured with 47 mm disc and 500 mL of water at 25 °C and 27.5 inHg vacuum.

[4]Air flow values measured at 10 psi with a digital flow meter. Values represent typical performance and are not established specifications.

Ordering Information

Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Standard MF-Millipore™ Membranes, white, plain			
0.025	13	100	VSWP01300
	25	100	VSWP02500
	47	100	VSWP04700
	90	25	VSWP09025
	142	50	VSWP14250
0.05	13	100	VMWP01300
	25	100	VMWP02500
	47	100	VMWP04700
	90	25	VMWP09025
0.1	13	100	VCWP01300
	25	100	VCWP02500
	47	100	VCWP04700
	90	25	VCWP09025
	142	50	VCWP14250
0.22	13	100	GSWP01300
	25	100	GSWP02500
	37	100	GSWP03700[1]
	47	100	GSWP04700
	90	100	GSWP09000
	142	50	GSWP14250
0.3	25	100	PHWP02500
	47	100	PHWP04700
	90	25	PHWP09025
	142	50	PHWP14250
0.45	13	100	HAWP01300
	24	100	HAWP02400
	25	100	HAWP02500
	37	100	HAWP03700[1]
	47	100	HAWP04700
	47	50 pr	HAWP0470M[2]
	50	100	HAWP05000
	90	100	HAWP09000
	142	50	HAWP14250
0.65	13	100	DAWP01300
	25	100	DAWP02500
	47	100	DAWP04700
	90	25	DAWP09025
	142	50	DAWP14250
0.8	13	100	AAWP01300
	25	100	AAWP02500
	37	100	AAWP03700[1]
	37	100	AAWP037P0[3]
	37	50 pr	AAWP037PM[4]
	47	100	AAWP04700
	47	50 pr	AAWP0470M[2]
	90	100	AAWP09000
	142	50	AAWP14250
1.2	13	100	RAWP01300
	25	100	RAWP02500
	37	100	RAWP03700
	47	100	RAWP04700
	90	25	RAWP09025
	142	50	RAWP14250
3.0	13	100	SSWP01300
	25	100	SSWP02500
	47	100	SSWP04700
	90	25	SSWP09025
	142	50	SSWP14250
5.0	13	100	SMWP01300
	25	100	SMWP02500
	37	100	SMWP03700[1]
	47	100	SMWP04700
	90	25	SMWP09025
	142	50	SMWP14250
8.0	13	100	SCWP01300
	19 x 42	100	SCWP0190R
	25	100	SCWP02500
	47	100	SCWP04700
	90	25	SCWP09025
	142	50	SCWP14250
Standard MF-Millipore™ Membranes, white, gridded			
0.45	13	100	HAWG01300
	25	100	HAWG02500
	37	100	HAWG03700[1]
	47	100	HAWG04700

[1]Monitor refills with thin absorbent pads for aerosol monitoring.
[2]Matched weight filter pairs.
[3]Monitor refills with thick absorbent pads for liquid monitoring.
[4]Monitor refills (matched weight pairs) with thick absorbent pads for liquid monitoring.
[5]Cut from specifically selected and controlled roll stock to avoid contamination by fibers. For asbestos monitoring applications.

Ordering Information – Continued

Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
0.8	13	100	AAWG01300
	25	100	AAWG0250C[5]
	37	100	AAWG03700[1]
	47	100	AAWG04700
1.2	25	100	RAWG02500
	25	100	RAWG0250C[5]
	47	100	RAWG04700
Standard MF-Millipore™ Membranes, black, plain			
0.45	25	100	HABP02500
	47	100	HABP04700
0.8	25	100	AABP02500
	47	100	AABP04700
Standard MF-Millipore™ Membranes, black, gridded			
0.45	13	100	HABG01300
	25	100	HABG02500
	47	100	HABG04700
0.8	13	100	AABG01300
	25	100	AABG02500
	37	100	AABG03700[1]
	47	100	AABG04700

[1]Monitor refills with thin absorbent pads for aerosol monitoring.
[2]Matched weight filter pairs.
[3]Monitor refills with thick absorbent pads for liquid monitoring.
[4]Monitor refills (matched weight pairs) with thick absorbent pads for liquid monitoring.
[5]Cut from specifically selected and controlled roll stock to avoid contamination by fibers. For asbestos monitoring applications.

Detailed Specifications

Applications	Filter Code[1]	Color	Pore Size (µm)	Bubble Point[2] (psi)	Thickness (µm)	Water Flow Rate[3] (mL/min/cm²)	Typical Air Flow[4] (L/min/cm²)	Porosity (%)
MF-Millipore™ Membranes without Triton® surfactant								
For biological solutions, cell contact, or very small volumes, requiring surfactant-free surfaces	GSTF	White	0.22	51.1	150	>20	2.7	77
	HATF	White	0.45	30.6	150	>48	8.3	79
	RATF	White	1.2	11.2	150	>284	35.2	82

[1]Corresponds to first 4 digits of catalogue number.
[2]Bubble point tested with water.
[3]Water Flow Rate measured with 47 mm disc and 500 mL of water at 25 °C and 27.5 inHg vacuum.
[4]Air flow measured at 10 psi. Values represent typical performance and are not established specifications.

Ordering Information

Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
MF-Millipore™ Membranes without Triton® surfactant, white, plain			
0.22	13	100	GSTF01300
	25	100	GSTF02500
	47	100	GSTF04700
	90	100	GSTF09000
	142	50	GSTF14250
0.45	13	100	HATF01300
	25	100	HATF02500
	47	100	HATF04700
	90	25	HATF09025
	142	50	HATF14250
1.2	47	100	RATF04700
	142	50	RATF14250

Accessory

Description	Qty/Pk	Catalogue No.
Filter Forceps, blunt end, stainless steel	3	XX6200006P

For more information visit: www.merckmillipore/filterdiscs

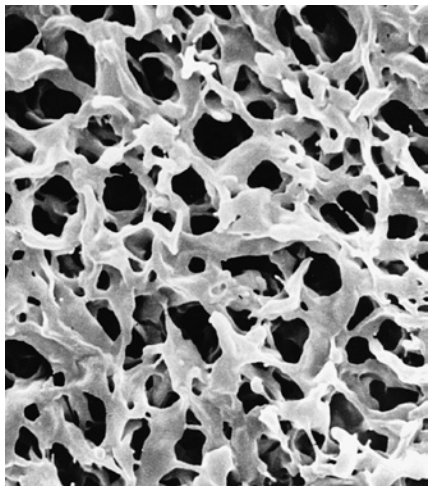
Durapore® Membrane Filters

Polyvinylidene fluoride (PVDF)

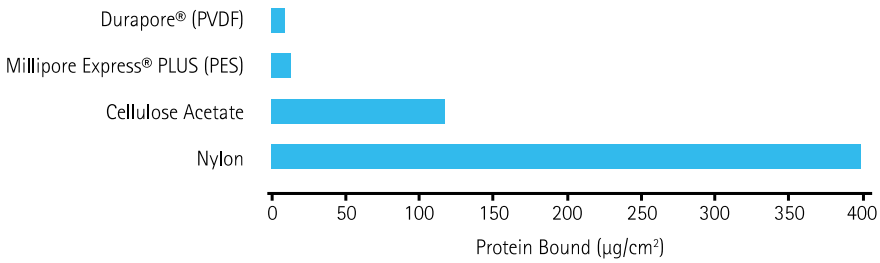
Durapore® membranes provide high flow rates and throughput, low extractables and broad chemical compatibility. Hydrophlic Durapore® membrane binds far less protein than nylon, nitrocellulose, or PTFE membranes.

Features & Benefits

- Available in several pore sizes (both hydrophilic and hydrophobic varieties) to suit your application needs
- Durapore® membrane filters have very low protein binding to minimize interaction with your sample and maximize recovery



Product Performance



Lowest protein binding with Durapore® PVDF membrane. Membrane disks with a 0.22 µm pore size were exposed to a 1 mg/mL solution of ^{125}I-labeled IgG. The chart shows protein binding after incubation (normalized to membrane surface area).

Specifications

Color	White
Surface	Plain
Wettability	Hydrophilic or hydrophobic
Sterilization	Ethylene oxide, gamma irradiation, autoclavable (121 °C at 1 bar)
Operating Temperature	85 °C maximum
Thickness	125 µm
Bacterial Endotoxins	0.5 EU/mL
Gravimetric Extractables	<0.5%

Detailed Specifications

Applications	Filter Code[1]	Pore Size (µm)	Wettability	Bubble Point (psi)	Water Flow Rate[2] (mL/min/cm²)	Typical Air Flow[3] (L/min/cm²)	Protein Binding (µg/cm²)
Mycoplasma reduction in biological solutions	VVLP	0.1	Hydrophilic	≥75 psi, air with water	>4	-	4
Sterilizing filtration of biological solutions	GVWP	0.22	Hydrophilic	≥50 psi, air with water	>12	-	4
Clarifying filtration of biological solutions	HVLP	0.45	Hydrophilic	≥22 psi, air with water	>34	-	4
Clarifying filtration of biological solutions	DVPP	0.65	Hydrophilic	≥15 psi, air with water	>78	-	4
Clarifying filtration of biological solutions, particle monitoring	SVLP	5.0	Hydrophilic	≥3 psi, air with water	>208	-	4
Air sterilization, gas sterilization	VVHP	0.1	Hydrophobic	≥26 psi, air with methanol	-	0.9	150
Air sterilization, gas sterilization, solvent filtration	GVHP	0.22	Hydrophobic	≥18 psi, air with methanol	-	1.7	150
Air clarification, gas filtration, solvent filtration	HVHP	0.45	Hydrophobic	≥9 psi, air with methanol	-	4.9	150

[1]Corresponds to first 4 digits of catalogue number.

[2]Water Flow Rate measured with 500 mL of water at 25 °C and 27.5 inHg vacuum through 47 mm disc.

[3]Air flow rate measured at 10 psi. Values represent typical performance and are not established specifications.

Ordering Information

Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Hydrophilic Durapore® Membrane Filters			
0.1	13	100	VVLP01300
0.1	25	100	VVLP02500
0.1	47	100	VVLP04700
0.1	90	50	VVLP09050
0.1	142	50	VVLP14250
0.22	13	100	GVWP01300
0.22	25	100	GVWP02500
0.22	47	100	GVWP04700
0.22	90	50	GVWP09050
0.22	100	50	GVWP10050
0.22	142	50	GVWP14250
0.45	13	100	HVLP01300
0.45	25	100	HVLP02500
0.45	47	100	HVLP04700
0.45	90	50	HVLP09050
0.45	304 mm x 3 m	1	HVLP00010
0.65	13	100	DVPP01300
0.65	25	100	DVPP02500
0.65	47	100	DVPP04700
0.65	82	50	DVPP08250
0.65	90	50	DVPP09050
0.65	142	50	DVPP14250
0.65	293	25	DVPP29325
5.0	13	100	SVLP01300
5.0	13	100	SVLP01300
5.0	25	100	SVLP02500
5.0	47	100	SVLP04700
5.0	75	50	SVLP07550
5.0	47	100	SVWG04700
5.0	90	50	SVLP09050
Hydrophobic Durapore® Membrane Filters			
0.1	47	100	VVHP04700
0.22	13	100	GVHP01300
0.22	25	100	GVHP02500
0.22	47	100	GVHP04700
0.22	90	50	GVHP09050
0.22	142	50	GVHP14250
0.22	304 mm x 3 m	1	GVHP00010
0.45	13	100	HVHP01300
0.45	25	100	HVHP02500
0.45	47	100	HVHP04700
0.45	90	50	HVHP09050
0.45	142	50	HVHP14250
Accessory			
Filter Forceps, blunt end, stainless steel		3	XX6200006P

*The membrane disc (cat. no. SVWG04700) has a gridded surface.

For more information visit: www.merckmillipore/filterdiscs

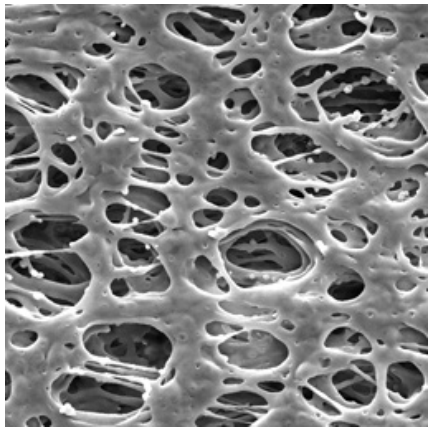
Millipore Express® PLUS Membrane Filters

Polyethersulfone (PES)

The Millipore Express® PLUS membrane provides ultrafast filtration of tissue culture media, additives, buffers and other aqueous solutions. This high throughput, low protein-binding membrane is also used in many of our ready-to-use sterile filtration devices.

Features & Benefits

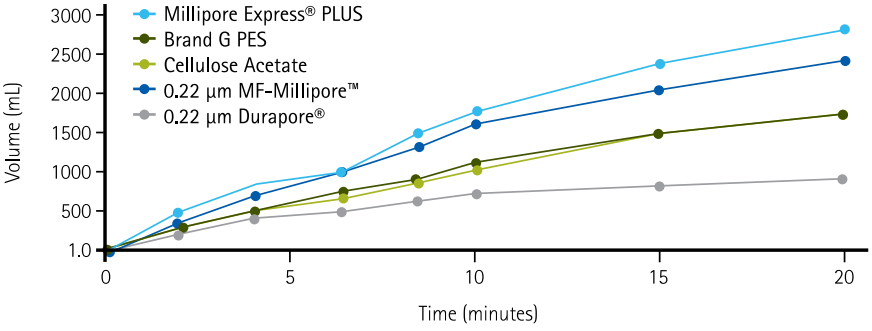
- Ultra fast filtration and high throughput shorten process time
- Can be sterilized by autoclave, ethylene oxide, or gamma irradiation for sterile filtration applications



Applications

Sterile Filtration, Buffer Filtration, Tissue Culture Media Filtration

Product Performance



Proven fast flow rate. 47 mm membrane disks with a 0.22 µm pore size were challenged with DMEM with 10% FBS, and the time required to measure each volume was recorded.

Specifications

Color	white
Surface	plain
Bacterial Endotoxins	0.5 EU/mL
Gravimetric Extractables	<0.5%
Sterilization	Ethylene oxide, gamma irradiation, autoclave (121 °C at 1 bar)

Detailed Specifications

Filter Code[1]	Pore Size (µm)	Bubble Point[2] (psi)	Thickness (µm)	Water Flow Rate[3] (mL/min/cm²)
GPWP	0.22	20	170	>27
HPWP	0.45	10	140	>44

[1]Corresponds to first 4 digits of catalogue number.
[2]Bubble point measured with isopropyl alcohol.
[3]Water flow rate measured with 500 mL of water at 25 °C and 27.5 in. Hg vacuum through 47 mm disc.

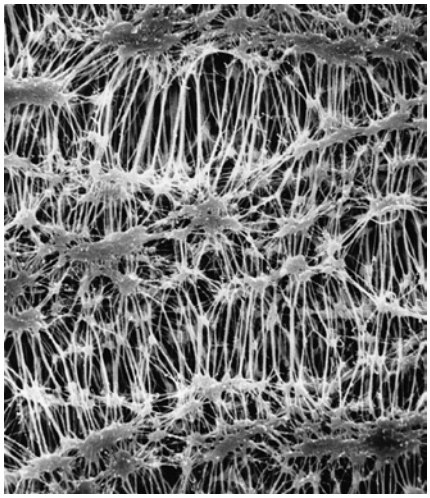
Ordering Information

Description	Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Millipore Express® PLUS Membrane	0.22	13	100	GPWP01300
		25	100	GPWP02500
		47	100	GPWP04700
		90	50	GPWP09050
		142	50	GPWP14250
	0.45	13	100	HPWP01300
		25	100	HPWP02500
		47	100	HPWP04700
		90	50	HPWP09050
		142	50	HPWP14250
Accessory				
Filter Forceps, blunt end, stainless steel			3	XX6200006P

For more information visit: www.merckmillipore/filterdiscs

Fluoropore™ and Omnipore™ PTFE Membrane Filters

PTFE with and without backing material



Features & Benefits

- Biologically and chemically inert
- High porosity yields high flow rates
- Hydrophobic and hydrophilic PTFE varieties available for filtration of aqueous and organic-based samples

Applications

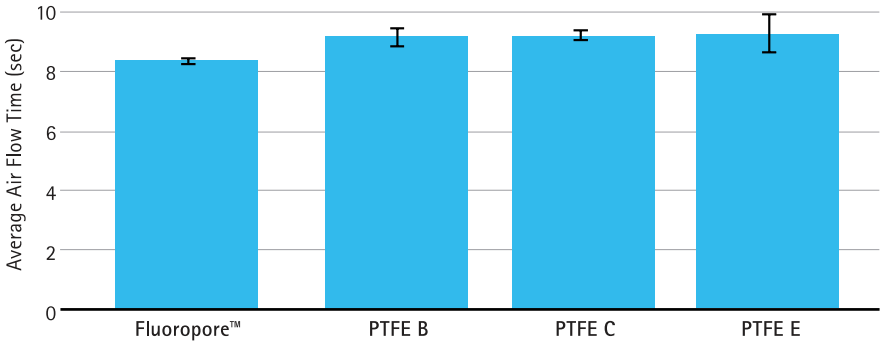
Fluoropore™ Membrane: Clarifying Acids, Bases and Solvents; Air Monitoring; Filtering and Venting Gases; UV Spectroscopy

Omnipore™ Membrane: Filtration of Aqueous Solutions, Clarifying Acids and Alkaline Solution

Fluoropore™ Membrane is a hydrophobic, polytetrafluoroethylene (PTFE) polymer membrane bonded to a high density polyethylene support. (Catalogue numbers containing ""FHUP"" have no backing.) Fluoropore™ Membranes provide broad chemical compatibility, high flow rates and consistency.

Omnipore™ Membrane is hydrophilic PTFE compatible with virually all solvents, acids, and alkaline solutions.

Product Performance



Faster flow and less variability than competitors for consistently strong performance. Air flow through PTFE membranes from various suppliers was measured using a Gurley 4110 Densometer with 0.1 in^2 aperture size and 100 cc air setting and a 20 oz cylinder.

Specifications

Sterilization	Ethylene oxide or autoclave (121 °C at 1 bar)
Bacterial Endotoxins	0.5 EU/mL
Gravimetric Extractables	<0.5%

Detailed Specifications

Applications	Filter Code[1]	Pore Size (µm)	Bubble Point[2] (psi)	Thickness (µm)	Liquid Flow Rate[3] (mL/min/cm^2)	Air Flow Rate[4] (L/min/cm^2)	Oper. Temp. (°C)	Porosity (%)
Fluoropore™ Membranes (hydrophobic)								
Clarifying acids, bases, and solvents, air monitoring, filtering or venting gases, UV spectroscopy	FGLP	0.2	14.8	150	24	5	130	85
	FHLP	0.45	9.2	150	60	9	130	85
	FALP	1.0	7.0	150	110	16	130	85
	FSLW	3.0	1.0	150	286	20	130	85
	FHUP	0.45	6.2	50	75	9	130	NA
Omnipore™ Membranes (hydrophilic)								
Clarifying acids, alkaline solutions, and virtually all solvents	JVWP	0.1	23.6	30	>10			
	JGWP	0.2	13.6	65	>28			
	JHWP	0.45	7.9	65	>74			
	JAWP	1.0	3.6	85	>156			
	JMWP	5	2.1	85	>391			
	JCWP	10	0.7	85	>446			

[1]Corresponds to first 4 digits of catalogue number.
[2]Bubble point determined with methanol, except FHUP which was tested with isopropyl alcohol (IPA). Omnipore™ membrane tested with IPA.
[3]Fluoropore™ membrane tested with methanol at 27.5 in. Hg. (average values). For Omnipore™ membrane, 100 mL water, 20 °C, 47 mm disc, 8.97" in. Hg. vacuum
[4]Air flow rates for Fluoropore™ membrane are tested at 10 psi.

Ordering Information

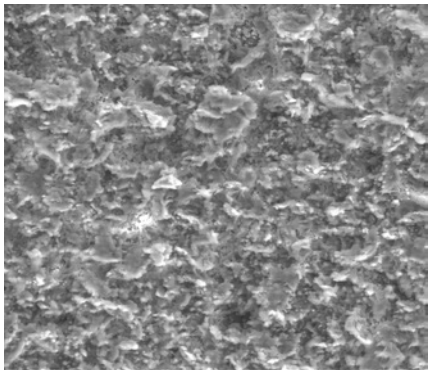
Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Fluoropore™ (PTFE) Membrane Filters			
0.22	13	100	FGLP01300
	25	100	FGLP02500
	47	100	FGLP04700
	90	50	FGLP09050
	142	50	FGLP14250
0.45	13	100	FHLP01300
	25	100	FHLP02500
	37	100	FHLP03700
	47	100	FHLP04700
	90	50	FHLP09050
	142	50	FHLP14250
1.0	13	100	FALP01300
	25	100	FALP02500
	37	100	FALP03700
	47	100	FALP04700
	90	50	FALP09050
	142	50	FALP14250
3.0	25	100	FSLW02500
	37	100	FSLW03700
	47	100	FSLW04700
	90	25	FSLW09025
	142	10	FSLW14200
Unlaminated Fluoropore™ (PTFE) Membrane Filter			
0.45	47	100	FHUP04700

Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Omnipore™ (hydrophilic PTFE) Membrane Filters			
0.1	13	100	JVWP01300
	25	100	JVWP02500
	47	100	JVWP04700
	90	25	JVWP09025
	142	25	JVWP14225
0.2	13	100	JGWP01300
	25	100	JGWP02500
	47	100	JGWP04700
	90	25	JGWP09025
	142	25	JGWP14225
0.45	13	100	JHWP01300
	25	100	JHWP02500
	47	100	JHWP04700
	90	25	JHWP09025
	142	25	JHWP14225
1.0	13	100	JAWP01300
	25	100	JAWP02500
	47	100	JAWP04700
	90	25	JAWP09025
	142	25	JAWP14225
5.0	13	100	JMWP01300
	25	100	JMWP02500
	47	100	JMWP04700
	90	25	JMWP09025
	142	25	JMWP14225
10.0	13	100	JCWP01300
	25	100	JCWP02500
	47	100	JCWP04700
	90	25	JCWP09025
	142	25	JCWP14225

For more information visit: www.merckmillipore/filterdiscs

Mitex™ PTFE Membrane Filters

Pure PTFE



Mitex™ PTFE Membrane is unaffected by almost all liquids, including organic solvents, concentrated acids and bases, propellants, and cryogenic fluids. Mitex™ membrane is unbacked, yet is easy to handle, combining the convenience of a backed membrane with the versatility of a pure PTFE membrane. Mitex™ membrane is hydrophobic.

Features & Benefits

- Broad chemical compatibility
- Biologically and chemically inert
- Stable at temperatures in excess of 260 °C (500 °F) and below -100 °C (-148 °F)

Applications

Clarifying Acids, Bases, and Cryogenic Fluids; Clarifying Propellants; Analyzing Hydraulic Fluids; Isolating RNA

Specifications

Sterilization	Ethylene oxide or autoclave (121 °C at 1 bar)
Bacterial Endotoxins	0.5 EU/mL
Gravimetric Extractables	<0.5%

Detailed Specifications

Filter Code[1]	Pore Size (µm)	Bubble Point[2] (psi)	Thickness (µm)	Water Flow Rate[3] (mL/min/cm²)	Air Flow Rate[4] (mL/min/cm²)	Oper. Temp. (°C)
LSWP	5	0.9	170	>47	>117	260
LCWP	10	0.7	130	>125	>167	260

[1]Corresponds to first 4 digits of catalogue number.
[2]Bubble point measured with ethanol at 23 °C.
[3]Water Flow Rate measured with 500 mL of water at 25 °C and 27.5 in. Hg vacuum through 47 mm disc.
[4]Air flow rates measured on 47 mm disc at 10 mbar with digital flow meter.

Ordering Information

Description	Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Mitex™ PTFE Membrane Filters, plain	5.0	13	100	LSWP01300
		25	100	LSWP02500
		37	100	LSWP03700
		47	100	LSWP04700
		90	25	LSWP09025
		142	50	LSWP14250
	10.0	13	100	LCWP01300
		25	100	LCWP02500
		47	100	LCWP04700
		90	25	LCWP09025
		142	50	LCWP14250
Mitex™ PTFE Membrane Filters, gridded	5.0	25	100	LSWG02500
		47	100	LSWG04700
	10.0	25	100	LCWG02500
		47	100	LCWG04700

For more information visit: www.merckmillipore/filterdiscs

LCR PTFE Membrane Filters

Low extractables PTFE for clearer results

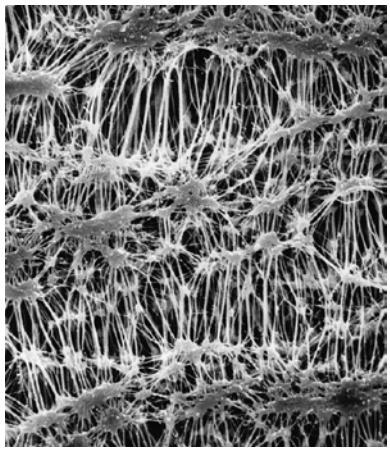
LCR membrane is an unsupported, hydrophilic PTFE membrane compatible with all commonly used HPLC solvents. The membrane undergoes a special treatment process to remove any residual extractabes, ensuring that it will not add anything to your HPLC solvents, providing clearer analysis results.

Features & Benefits

- Hydrophilic membrane can be used to filter aqueous fluids without prior wetting
- Ultraclean membrane will not add extractables to your samples or solvents

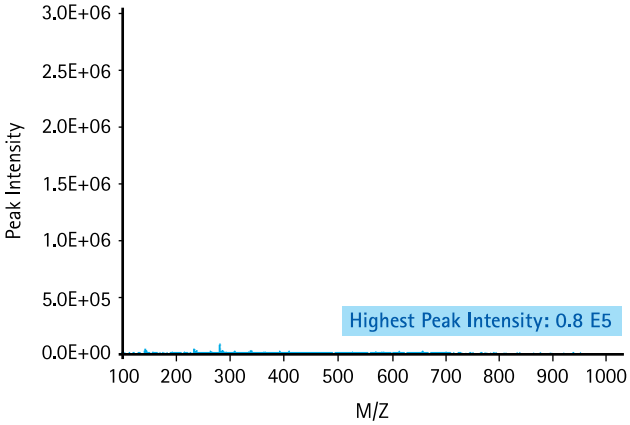
Applications

HPLC Mobile Phase Filtration; Clarifying Acids, Bases and Dilute Protein Solutions; Isolating RNA

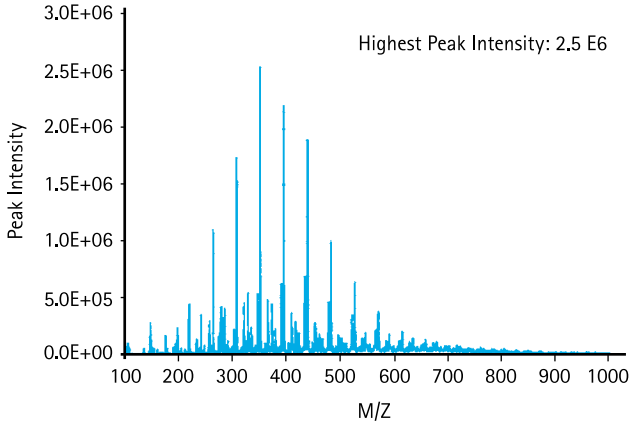


Product Performance

A. Millex® Filter Unit, PTFE



B. Polypropylene



Millex® filters feature low extractables. Mass spectrometry detects few extractable impurities from Millex® syringe filters containing 0.45 µm pore hydrophilic PTFE membrane (A). In contrast, a syringe filter containing 0.45 µm pore polypropylene membrane from another vendor (B) shows significant leaching of impurities.

Specifications

Filter Code[1]	Pore Size (µm)	Bubble Point[2] (psi)	Thickness (µm)	Water Flow Rate[3] (mL/min/cm²)	Typical Air Flow Rate[4] (L/min/cm²)	Oper. Temp. (°C)	Porosity (%)
FHLC	0.45	9.2	140	28.4	1.1	130	80

[1]Corresponds to first 4 digits of catalog number.
[2]Tested in methanol.
[3]Water Flow Rate measured with 500 mL of water at 25 °C and 27.5 in. Hg vacuum through 47 mm disc.
[4]Measured at 10 psi.

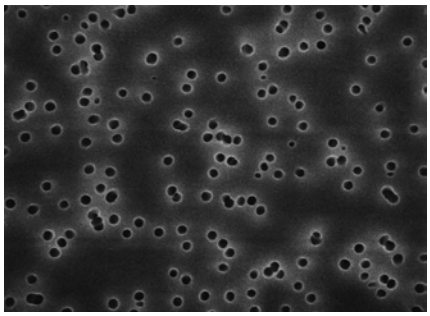
Ordering Information

Description	Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
LCR PTFE Membrane Filters	0.45	13	100	FHLC01300
		25	100	FHLC02500
		47	100	FHLC04700

For more information visit: www.merckmillipore/filterdiscs

Isopore™ Membrane Filters

Polycarbonate membrane for microscopy and visual analysis



The Isopore™ membrane is a polycarbonate, track-etched screen filter recommended for all analyses in which the sample is viewed on the surface of the membrane. Isopore™ membrane offers distinct advantages for the analysis of airborne contaminants and other particles using optical or electron microscopy. The Isopore™ membrane is composed of polycarbonate film, which has a smooth, glass-like surface for clearer sample observation. The unique manufacturing process of the membrane ensures a precise pore diameter and a consistent pore size for accurate separation of samples by size. Matched-weight filters are not usually required because of low, constant tar and ash weights.

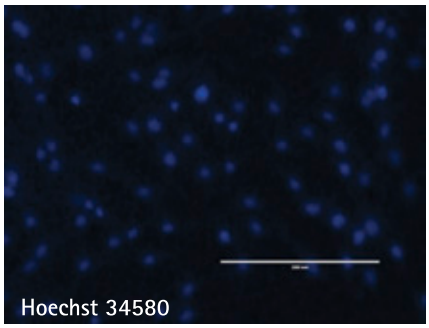
Features & Benefits

- Membrane structure retains particles on the surface, simplifying counting and analysis
- Isopore™ membranes do not stain, resulting in low background interference
- Non-hygroscopic, allowing for rapid drying and reduced sample analysis time
- Translucent material does not require clearing for transmitted light microscopy; also available in brown variety

Applications

Air Monitoring, Epifluorescent Microscopy, Chemotaxis Assays

Product Performance



Low background enables simple, accurate cell counting. NIH 3T3 cells were seeded at 25,000 cells per well of a Millicell® 24-well culture plate with 0.4 µm Isopore™ polycarbonate membrane (Cat. No. PSHT010R5). After two days, cells were fixed with 4% paraformaldehyde, nuclei were stained with Hoechst 34580 and cells counted via fluorescence microscopy. Magnification = 10X.

Specifications

Color	White or brown
Surface	Plain
Wettability	Hydrophilic
Thickness	7-27 µm
Operating Temperature	140 °C maximum
Gravimetric Extractables	<1.0%
Sterilization	Ethylene oxide, gamma irradiation, or autoclave (121 °C at 1 bar)

Detailed Specifications

Applications	Filter Code[1]	Color	Pore Size (µm)	Bubble Point[2] (psi)	Water Flow Rate[3] (mL/min/cm²)	Air Flow Rate[4] (L/min/cm²)
Chemotaxis, bioassays, cytology, air monitoring	VCTP	White	0.1	102	0.5	1.3
Chemotaxis, bioassays, cytology, air monitoring, SEM analysis, sterility testing	GTTP	White	0.2	51	6	3.5
Epifluorescent microscopy, particle monitoring, air monitoring	GTBP	Brown	0.2	51	6	-
Adsorbable organic halides (AOX), air monitoring, particle monitoring	HTTP	White	0.4	22	50	7
Epifluorescent microscopy, particle monitoring, air monitoring	HTBP	Brown	0.4	29	50	-
Reflective light microscopy, SEM analysis, gravimetric analysis, air monitoring	DTTP	White	0.6	8.7	25	8
Reflective light microscopy, SEM analysis, gravimetric analysis, air monitoring, asbestos monitoring	ATTP	White	0.8	8.7	40	14
Chemotaxis, bioassays, cytology, air monitoring	RTTP	White	1.2	8.7	110	19
	TTTP	White	2	4.4	90	23
	TSTP	White	3	0.7	180	49
Parasitology, chemotaxis, bioassays, cytology, air monitoring	TMTP	White	5	-	250	54
Chemotaxis, bioassays, cytology, air monitoring	TETP	White	8	-	250	55
	TCTP	White	10	-	250	72

[1]Corresponds to first 4 digits of catalogue number.

[2]Bubble point tested in water at 20 °C.

[3]Water flow rate tested at 10 psi.

[4]Air flow measured at 10 psi. Values represent typical performance and are not established specifications.

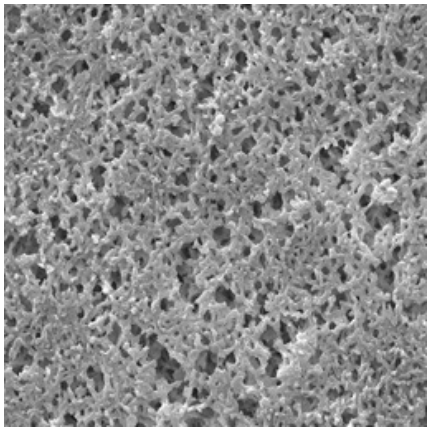
Ordering Information

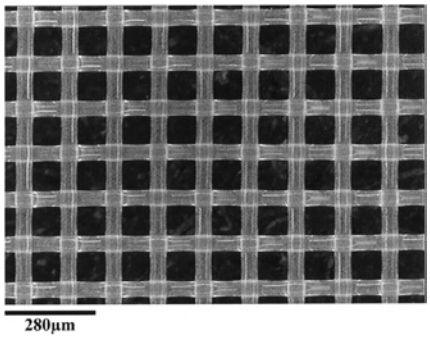
Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
White Membrane Filters			
0.1	13	100	VCTP01300
	25	100	VCTP02500
	47	100	VCTP04700
	142	50	VCTP14250
0.2	13	100	GTTP01300
	25	100	GTTP02500
	37	100	GTTP03700
	47	100	GTTP04700
	90	30	GTTP09030
	142	50	GTTP14250
0.4	13	100	HTTP01300
	25	100	HTTP02500
	37	100	HTTP03700
	47	100	HTTP04700
	90	30	HTTP09030
0.6	13	100	DTTP01300
	25	100	DTTP02500
	47	100	DTTP04700
0.8	13	100	ATTP01300
	25	100	ATTP02500
	37	100	ATTP03700
	47	100	ATTP04700
	142	50	ATTP14250
1.2	13	100	RTTP01300
	25	100	RTTP02500
	47	100	RTTP04700
	142	50	RTTP14250
2.0	25	100	TTTP02500
	47	100	TTTP04700
3.0	13	100	TSTP01300
	25	100	TSTP02500
	47	100	TSTP04700
	142	50	TSTP14250
5.0	13	100	TMTP01300
	25	100	TMTP02500
	47	100	TMTP04700
	90	30	TMTP09030
	142	50	TMTP14250
8.0	13	100	TETP01300
	25	100	TETP02500
	47	100	TETP04700
	142	50	TETP14250
10.0	13	100	TCTP01300
	25	100	TCTP02500
	47	100	TCTP04700
	142	50	TCTP14250
Brown Membrane Filters			
0.2	13	100	GTBP01300
	25	100	GTBP02500
	47	100	GTBP04700
0.4	13	100	HTBP01300
	25	100	HTBP02500
	47	100	HTBP04700

For more information visit: www.merckmillipore/filterdiscs

Nylon Membrane and Net Filters

Broad chemical compatibility





Nylon filters are compatible with a broad range of solvents. Two types are available: membrane filters with pore sizes ranging from 0.20 to 1.2 µm and woven net filters with mesh openings ranging from 10 to 180 µm.

Features & Benefits

- Wide range of pore sizes available
- Resistant to aggressive solvents

Applications

Particle Removal and Clarification; Solvent Filtration; Particle Analysis; Paint Monitoring

Specifications

Applications	Filter Code*	Pore Size (µm)	Bubble Point (psi)	Thickness (µm)	Water Flow Rate** (mL/min/cm²)	Open Area (%)
Nylon Membrane Filters						
Sterilizing filtration, bioassays, solvent filtration	GNWP	0.20	42	170	8.0	–
Clarification of solutions, particle removal and analysis	HNWP	0.45	30	170	14.6	–
Air monitoring, particle removal and analysis	ANWP	0.8	8	170	18.6	–
Clarification of aqueous and organic solutions	RNWP	1.2	6	170	21.2	–
Nylon Net Filters						
Collection of algae and cells, particle analysis, large particulate filtration, toxicology and drug screening on *C. Elegans* and zebrafish, background filter for automated particle imaging systems, prefiltration of solvents, paint monitoring	NY10	10	NA	45	–	4
	NY11	11	NA	65	–	6
	NY20	20	NA	55	–	14
	NY30	30	NA	65	–	17
	NY41	40	NA	50	–	31
	NY60	60	NA	50	–	41
	NY80	80	NA	75	–	41
	NY1H	100	NA	80	–	44
	NY2H	120	NA	80	–	49
	NY4H	140	NA	120	–	43
	NY6H	160	NA	100	–	53
	NY8H	180	NA	135	–	47

*Corresponds to first 4 digits of catalogue number

**Represent typical values

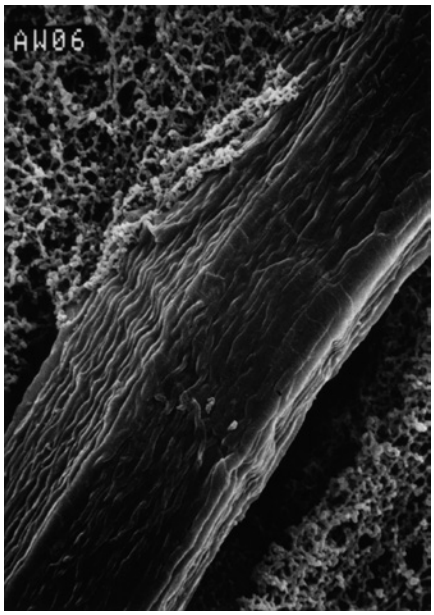
Ordering Information

Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Nylon Membrane Filters			
0.2	25	100	GNWP02500
	47	100	GNWP04700
0.45	25	100	HNWP02500
	47	100	HNWP04700
0.8	25	100	ANWP02500
	47	100	ANWP04700
1.2	25	100	RNWP02500
	47	100	RNWP04700
Nylon Net Filters			
10.0	25	100	NY1002500
	47	100	NY1004700
	90	50	NY1009000
11.0	25	100	NY1102500
	47	100	NY1104700
	90	50	NY1109000
	30 cm x 3 m	1	NY1100010
20.0	25	100	NY2002500
	47	100	NY2004700
	90	50	NY2009000
	30 cm x 3 m	1	NY2000010
30.0	25	100	NY3002500
	47	100	NY3004700
	90	50	NY3009000
41.0	25	100	NY4102500
	47	100	NY4104700
	90	50	NY4109000
	30 cm x 3 m	1	NY4100010
60.0	25	100	NY6002500
	47	100	NY6004700
	90	50	NY6009000
	30 cm x 3 m	1	NY6000010
80.0	25	100	NY8002500
	47	100	NY8004700
	90	50	NY8009000
100.0	25	100	NY1H02500
	47	100	NY1H04700
	90	50	NY1H09000
	30 cm x 3 m	1	NY1H00010
120.0	25	100	NY2H02500
	47	100	NY2H04700
	90	50	NY2H09000
140.0	25	100	NY4H02500
	47	100	NY4H04700
	90	50	NY4H09000
160.0	25	100	NY6H02500
	47	100	NY6H04700
	90	50	NY6H09000
	30 cm x 3 m	1	NY6H00010
180.0	25	100	NY8H02500
	47	100	NY8H04700
	90	50	NY8H09000
Accessory			
Filter Forceps, blunt end, stainless steel		3	XX6200006P

For more information visit: www.merckmillipore/filterdiscs

Reinforced Prefilter Membrane

Mixed cellulose ester with polyester support



Reinforced prefilter membranes can be used to remove contaminants from a variety of liquids and gases. The filters have a high dirt-holding capacity and a low pressure drop, which makes them ideally suited for reducing contaminant levels in advance of sterilizing-grade filters. Reinforced prefilter membranes are made from non-shedding materials. The filters retain contaminants on the surface of the cellulose membrane.

Features & Benefits

- Prefilter with high dirt-loading capacity for greater throughput
- Non-shedding substrate will not unload fibers downstream

Applications

Prefiltration Ahead of Sterilizing-Grade Filters

Specifications

Thickness	200 µm
Porosity	70%
Wettability	Hydrophilic
Operating Temperature	70 °C maximum
Sterilization	Ethylene oxide or autoclave (121 °C at 1 bar)
Bacterial Endotoxins	<20 EU/mL
Gravimetric Extractables	<0.5%

Detailed Specifications

Applications	Filter Code*	Retention Rating (µm)	Water Flow Rate (mL/min/cm²)	Protein Binding (µg/cm²)
Prefiltration before 0.22 µm membrane filtration	RW03	0.2	50	120
Prefiltration before 0.45 µm membrane filtration	RW06	0.5	150	80
Prefiltration before 1.2 µm membrane filtration	RW19	1.2	260	20

*Corresponds to first 4 digits of catalogue number

Ordering Information

Description	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Reinforced Membrane Type RW03	47	100	RW0304700
	90	100	RW0309000
Reinforced Membrane Type RW06	47	100	RW0604700
	90	100	RW0609000
	142	50	RW0614250
Reinforced Membrane Type RW19	47	100	RW1904700
	142	50	RW1914250
Accessory			
Filter Forceps, blunt end, stainless steel		3	XX6200006P

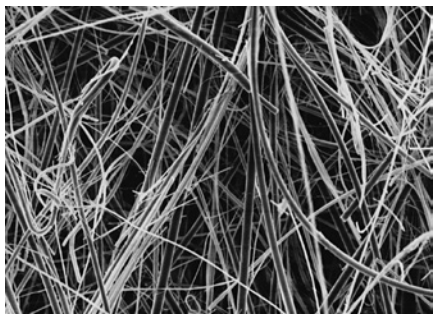
For more information visit: www.merckmillipore/filterdiscs

Glass & Quartz Fiber Filters

For contamination analysis

Glass fiber disc filters are available in a wide range of flow rates and throughput capacities. Glass fiber filters are available with or without binder resins and can be sterilized by ethylene oxide, gamma irradiation or autoclaving.

Our pure quartz fiber filters have a composition that prevents the filters from reacting with acidic gases. This makes quartz filters well-suited for measuring heavy metal concentrations and small amounts of particles (such as the US EPA PM 10 ambient air monitoring method).



Specifications

Filter Code[1]	Retention Rating (µm)	Thickness (µm)	Water Flow Rate (mL/min/cm²)	Air Resistance[2] (mm of H_2O)	Air Flow[3] (L/min/cm²)	DOP Penetration[4]	Protein Binding (µg/cm²)	Weight (g/m²)	Max. Temp. (°C)
Glass Fiber Filters with Binder Resin									
AP15	0.2 - 0.6	790	1.6	210	10.6	0.10	100	50	–
AP20	0.8 - 8.0	380	1.3	48	46.4	0.08	60	59	–
AP25	0.8 - 8.0	1200	5.8	35	63.6	0.03	110	140	–
Glass Fiber Filters without Binder Resin									
APFA	1.6	230	5.0	33	67.5	0.002	–	55	500
APFB	1.0	700	2.2	95	23.4	0.002	–	140	500
APFC	1.2	240	1.2	54	41.2	0.002	–	52	500
APFD	2.7	470	2.7	16	139	0.1	–	120	500
APFF	0.7	380	1.4	120	18.6	0.002	–	75	500
AP40	–	475	6.0	50	44.5	0.002	–	65	550
Quartz Fiber Filters									
AQFA	–	430	1.6	50	44.5	0.002	–	85	950

[1]Corresponds to first 4 digits of catalogue number
[2]Measured at 10.5 fpm or 5.3 cm/s
[3]Meaured at 10 psi
[4]Dioctyl phthalate percentage at 10.5 fpm

Ordering Information

Filter Type	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Glass Fiber Filters with Binder Resin			
AP15	25	100	AP1502500
	37	100	AP1503700
	42	100	AP1504200
	47	100	AP1504700
	75	100	AP1507500
	90	100	AP1509000
	124	50	AP1512450
	142	50	AP1514250
AP20	13	100	AP2001300
	25	100	AP2002500
	42	100	AP2004200
	47	100	AP2004700
	55	100	AP2005500
	75	100	AP2007500
	90	100	AP2009000
	124	50	AP2012450
	142	50	AP2014250

Filter Type	Filter Diameter (mm)	Qty/Pk	Catalogue No.
AP25	10	100	AP2501000
	13	100	AP2501300
	22	100	AP2502200
	25	100	AP2502500
	42	100	AP2504200
	47	100	AP2504700
	90	100	AP2509000
	124	50	AP2512450
	142	50	AP2514250
Glass Fiber Filters without Binder Resin			
APFA	47	100	APFA04700
APFB	25	100	APFB02500
	37	100	APFB03700
	47	100	APFB04700
APFC	25	100	APFC02500
	47	100	APFC04700
	90	50	APFC09050

Ordering Information – Continued

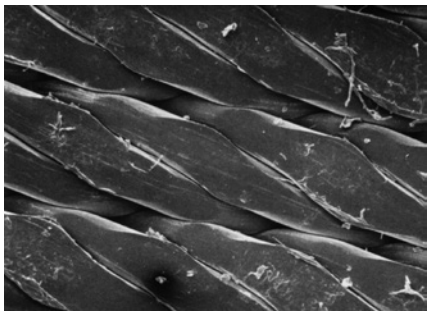
Filter Type	Filter Diameter (mm)	Qty/Pk	Catalogue No.
APFD	25	100	APFD02500
	47	100	APFD04700
	90	50	APFD09050
APFF	25	100	APFF02500
	47	100	APFF04700
	90	50	APFF09050
	142	50	APFF14250
AP40	10	100	AP4001000
	24	500	AP4002405
	25	100	AP4002500
	37	500	AP4003705
	70	100	AP4007000
	90	100	AP4009000
	142	50	AP4014250

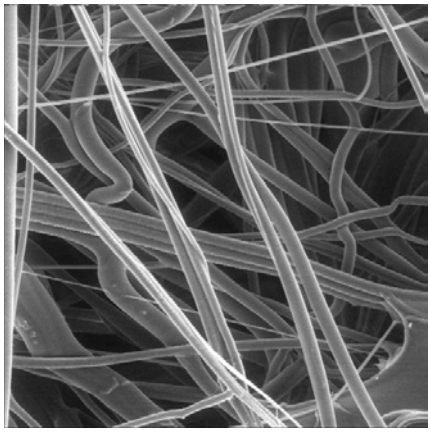
Filter Type	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Quartz Fiber Filters			
AQFA	37	100	AQFA03700
	47	100	AQFA04700
	90	50	AQFA09050
	8 in. x 10 in.	50	AQFA8X105
Accessory			
Filter Forceps, blunt end, stainless steel		3	XX6200006P

For more information visit: www.merckmillipore/filterdiscs

Polypropylene Prefilters and Membranes

Broad thermal compatibility





Polypropylene filters are constructed of 100% virgin polypropylene media. They are designed for general clarification and prefiltration of solvents, deionized water and bioburden reduction. They also provide broad thermal compatibility. The prefilters provide high particle retention, high dirt-holding capacity and low pressure drop. They are designed for filtration of organic solvents, but they can also be used, once properly wetted with alcohol, for the filtration of aqueous solutions.

Features & Benefits

- Compatible with aggressive solvents
- Prefilters have high dirt-holding capacity

Applications

General Prefiltration and Clarification, Suitable for Organic Solvents

Specifications

Applications	Filter Code*	Pore Size (µm)	Thickness (µm)	Max. Temp. (°C)
Polypropylene Prefilters				
Clarification of aqueous solutions, prefiltration upstream of membrane filters with pore sizes of 0.2 – 0.6 µm	AN06	0.6	140	90
Clarification of aqueous solutions, prefiltration upstream of membrane filters with pore sizes of 0.5 – 2.0 µm	AN12	1.2	140	90
Clarification of aqueous solutions, prefiltration upstream of membrane filters with pore sizes of 0.8 – 8.0 µm	AN25	2.5	140	90
Collection of cells and precipitates	AN50	5	110	90
	AN1H	10	150	90
Clarification of aqueous and nonaqueous solutions	AN3H	30	200	90
Polypropylene Net Filters				
Collection of cells and protein precipitates	PP25	25	360	100
Large particle removal, contamination analysis	PP45	45	430	100
	PP80	80	450	N/A

*Corresponds to first 4 digits of catalogue number

Ordering Information

Description	Pore Size (µm)	Filter Diameter (mm)	Qty/Pk	Catalogue No.
Polypropylene Prefilter	0.6	47	100	AN0604700
	1.2	47	100	AN1204700
	2.5	47	100	AN2504700
	5	47	100	AN5004700
	10	47	100	AN1H04700
	30	47	100	AN3H04700
Polypropylene Net Filter	25	25	100	PP2502500
		47	100	PP2504700
	45	25	100	PP4502500
		47	100	PP4504700
		90	100	PP4509030
Accessory				
Filter Forceps, blunt end, stainless steel			3	XX6200006P

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