



# 33 mm Millex<sup>®</sup> Syringe Filters

## for Sample Preparation

- ▶ Increased surface area for faster flow and easier filtration
- ▶ Low hold-up volume delivers maximum filtrate recovery
- ▶ Different membrane types to meet multiple filtration needs
- ▶ Low extractables ensure reliable downstream analyses

### Filter Types Available:

#### Durapore<sup>®</sup> (PVDF)

Lowest protein-binding for aqueous and mild organic solutions

#### Millipore Express<sup>®</sup> PLUS (PES)

Highest flow rates and increased throughput for aqueous solutions

#### Nylon

Broad chemical compatibility for general filtration of aqueous and organic solutions.

Non-sterile 33 mm Millex syringe filters are ideal for preparing 10–100 mL samples prior to chromatography or other instrumental analyses.

Filters with 0.45  $\mu\text{m}$  pore size effectively remove fine particles that can prematurely plug chromatography columns. 0.22  $\mu\text{m}$  pore size Millex filters are UHPLC-compatible™ devices and are ideal for ultra-high pressure liquid chromatography and other techniques requiring high-purity samples. PVDF filters can be used with aqueous or mild organic solutions. Nylon filters provide broad chemical compatibility with aqueous and organic solutions.

### Faster Flow Rate, Higher Throughput

33 mm Millex filters have more surface area to increase flow rate, improve throughput, prevent clogging and reduce filtration pressure.

### Low Hold-Up Volume

The hold-up volume after air purge is less than 80  $\mu\text{L}$  to ensure maximum filtrate recovery.

### Low Extractables

The housing and membranes in 33 mm Millex syringe filters are low in extractables to improve downstream analyses.

## Available with Three Membrane Types to Meet Your Application Needs

- Millipore membranes are tested and inspected to provide the highest quality syringe filters.
- Durapore filters combine the lowest protein binding of any membrane with fast flow rates.
- Millipore Express PLUS filters deliver faster flow rates and double the throughput of standard 25 mm filters.
- Nylon membrane filters are recommended for general filtration with a wide variety of aqueous and organic solutions.

## Higher Operating Pressure

33 mm Millex filters have a maximum housing pressure of 125 psig (8.5 bar) so you can filter solutions faster than before.

## Automated Manufacturing Process

33 mm Millex filters are manufactured using a fully automated process—from membrane cutting to device assembly—to minimize the risk of contamination.

## Validation Guides Available

To download, visit [www.millipore.com/millex](http://www.millipore.com/millex).

## Chemical Compatibility

33 mm Millex filters with PVDF membrane are suitable for use with aqueous or mild organic samples. Nylon is recommended for use with a broad range of organic solutions.

See Solvent Compatibility on back page or go to [www.millipore.com](http://www.millipore.com) to view the user guide. (document PRO1599).

## Specifications

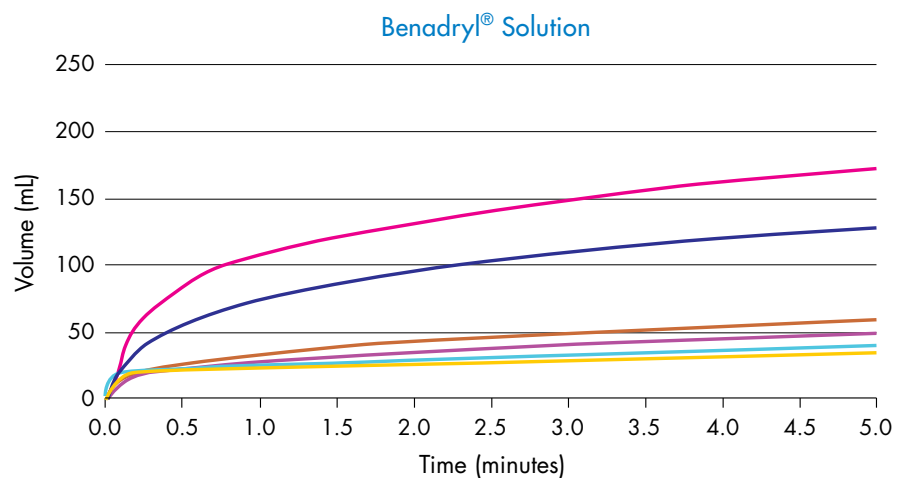
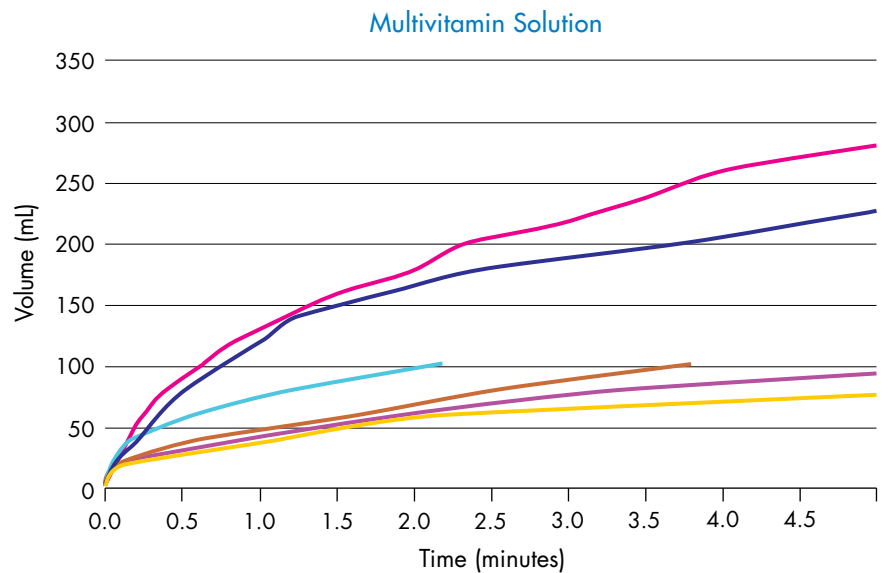
	<b>33 mm Millex Filters with Durapore Membrane</b>	<b>33 mm Millex Filters with Millipore Express PLUS Membrane</b>	<b>33 mm Millex Filters with Nylon Membrane</b>
Housing	Polypropylene	Polypropylene	Polypropylene
Filter Material	Hydrophilic PVDF	Hydrophilic PES	Hydrophilic Nylon
Inlet Fittings	Female Luer-Lok	Female Luer-Lok	Female Luer-Lok
Outlet Fittings	Male Luer® slip	Male Luer slip	Male Luer slip
<b>Dimensions</b>			
Filtration Area, cm <sup>2</sup>	4.5	4.5	4.5
Diameter, mm	33	33	33
Inlet to Outlet, mm	27	27	27
Process Volume, mL	≤100	≤200	≤100
Hold-up Volume, µL after air purge	≤80	≤80	≤80
Maximum Differential Pressure, bar (psi)	≤8.6 (125)	≤8.6 (125)	≤8.6 (125)
Maximum Operating Temperature, °C	45	45	45
<b>Bubble Point</b>			
0.22 µm	≥3.4 bar (50 psi)	≥4.3 bar (63 psi)	≥2.9 bar (43 psi)*
0.45 µm	≥1.5 bar (22 psi)	≥2.0 bar (29 psi)	≥2.2 bar (32 psi)
<b>Typical Clean Water Flow Rate, mL/min at 25 °C and 2.1 bar (30 psig) (of Milli-Q® water)</b>			
0.22 µm	40	240	92*
0.45 µm	300	480	169

\*Nylon pore size is 0.2 µm.

## Millipore Express PLUS PES Membranes, Typical Performance

### Flow Comparison

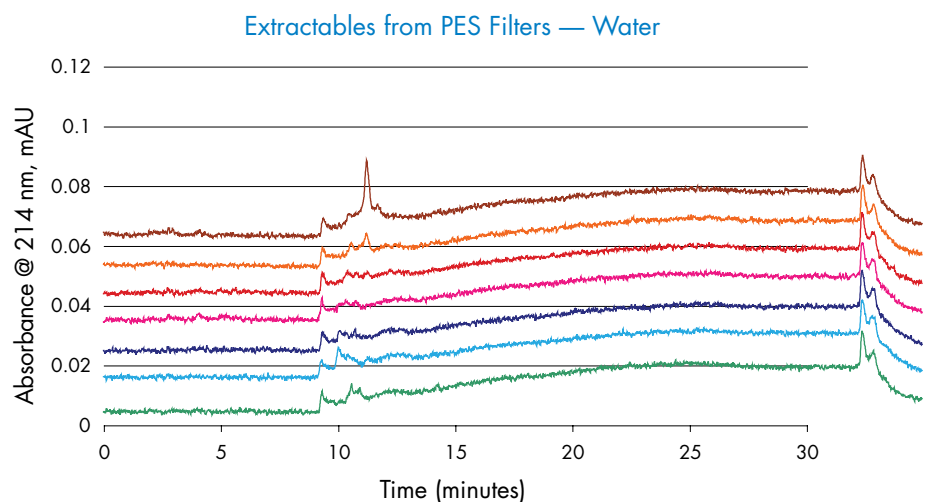
Three devices from each manufacturer were tested at 20 psi (approx. 1.3 bar) and the results for each device were averaged. The results show that 33 mm Millex syringe filters with PES membrane have higher flow rates and greater throughput than comparable devices.



- 33 mm Millex-HP (0.45 µm)
- 33 mm Millex-GP (0.22 µm)
- 25 mm Brand W (0.45 µm)
- 25 mm Brand P (0.45 µm)
- 25 mm Brand P (0.2 µm)
- 25 mm Brand W (0.2 µm)

### Water Extractables

Three devices were tested and the results for each device were averaged. The HPLC results show that Millex syringe filters with PES membrane have low extractables with aqueous solutions. Baselines were offset to facilitate comparison.



- 25 mm Competitor W, 0.45 µm
- 25 mm Competitor W, 0.2 µm
- 25 mm Competitor P, 0.45 µm
- 25 mm Competitor P, 0.2 µm
- 33 mm Millex HP, 0.45 µm
- 33 mm Millex GP, 0.22 µm
- Control, (Blank)

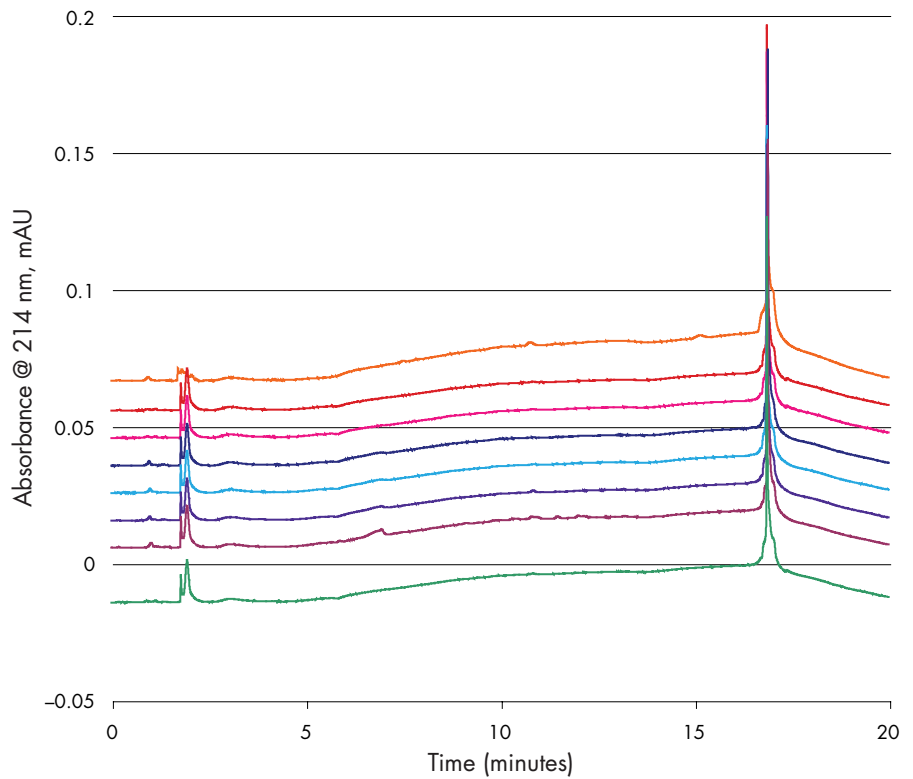
## Nylon, Typical Performance

### Extractables

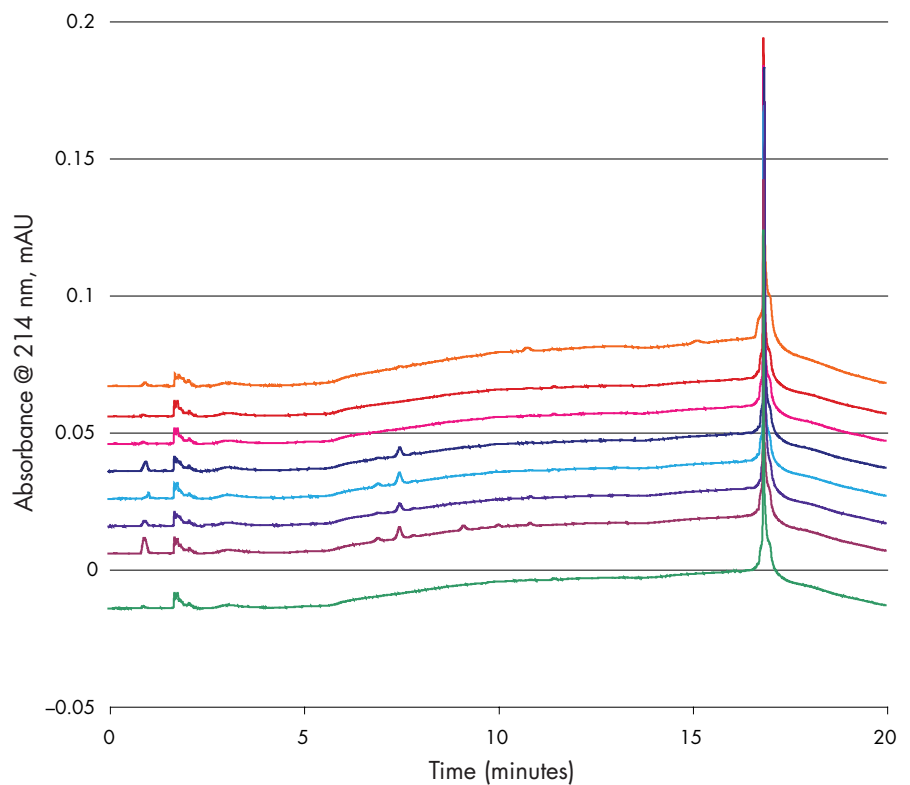
Three filter units with nylon membranes were tested. For each sample, the second milliliter was collected from the filtrate. The results for each device were averaged. The chromatograms below demonstrate the low levels of extractables typical of 33 mm Millex syringe filters with nylon membranes. The baselines were offset to facilitate comparison.

The low level of extractables with methanol and acetonitrile indicate that Millex filters with nylon membranes are ideal for sample preparation using organic solvents.

Extractables from Nylon Filters — Acetonitrile



Extractables from Nylon Filters — Methanol



- 25 mm Competitor W, 0.2  $\mu\text{m}$
- 25 mm Competitor P, 0.45  $\mu\text{m}$
- 25 mm Competitor P, 0.2  $\mu\text{m}$
- 33 mm Millex HN, 0.45  $\mu\text{m}$
- 33 mm Millex GN, 0.2  $\mu\text{m}$
- 25 mm Millex HN, 0.45  $\mu\text{m}$
- 25 mm Millex GN, 0.2  $\mu\text{m}$
- Control, (Blank)

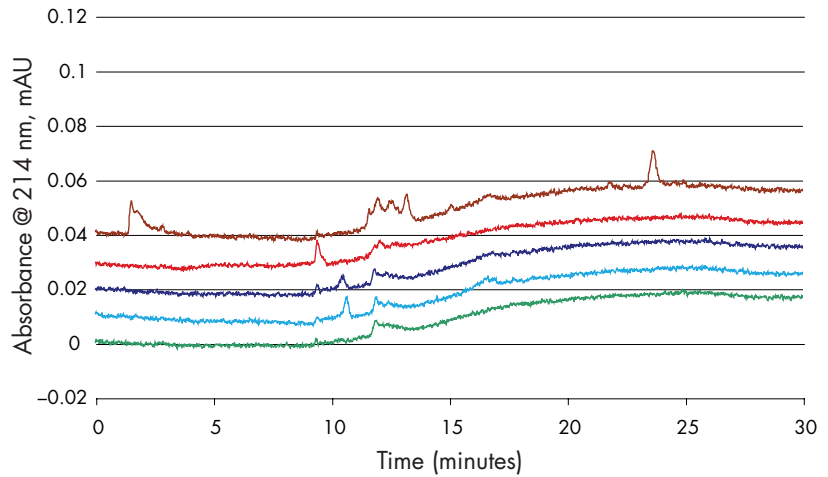
## Durapore PVDF Membranes, Typical Performance

### Extractables

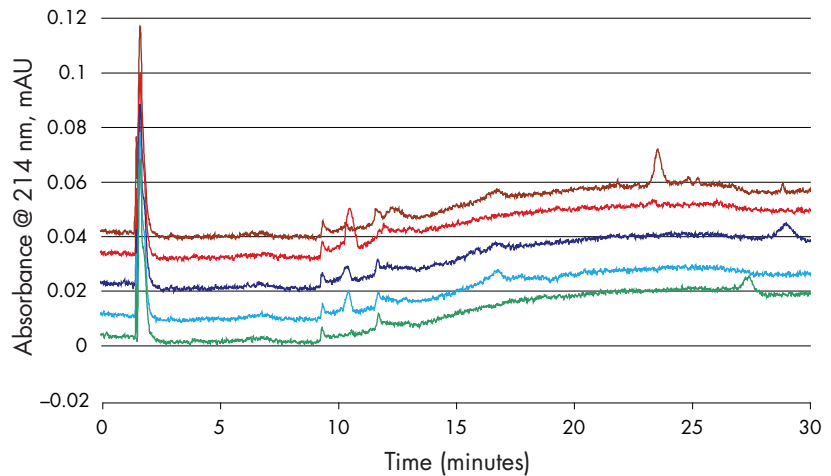
Three filters from each manufacturer were tested. Extracts were pooled and then analyzed under gradient mobile phase conditions. Baselines were offset to facilitate comparison. Data show that 33 mm Millex syringe filters with PVDF have low extractables.

Low water extractables indicate that Millex filters are ideal for dissolution studies and other aqueous-based sample prep protocols. Low extractables are also observed with organic solvents.

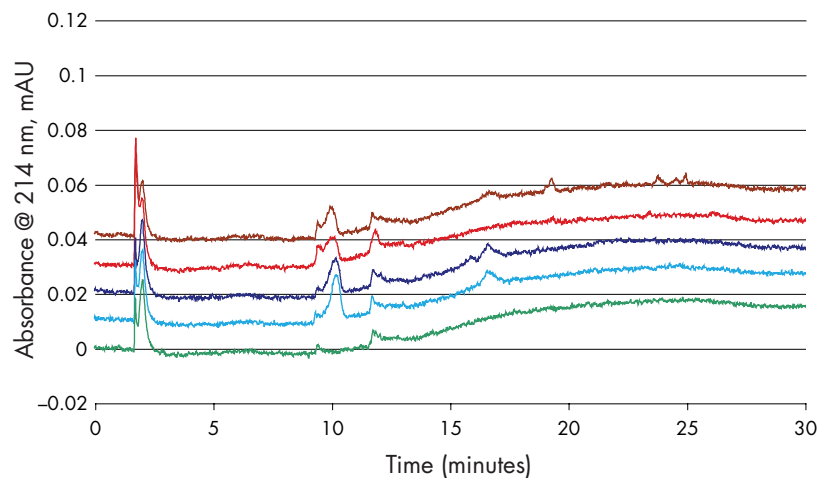
Extractables from PVDF Filters — Water



Extractables from PVDF Filters — Methanol



Extractables from PVDF Filters — Acetonitrile



- 25 mm Competitor W, 0.45  $\mu$ m
- 25 mm Competitor P, 0.45  $\mu$ m
- 33 mm Millex HV, 0.45  $\mu$ m
- 33 mm Millex GV, 0.22  $\mu$ m
- Control, (Blank)

## Ordering Information

### 33 mm Millex Syringe Filters

Description	Pore Size, $\mu\text{m}$	Color	Qty/Pk	Catalogue No.
<b>Durapore (PVDF) Membrane</b>				
<b>Millex-HV Filters</b>				
	0.45	Yellow	50	SLHV 033 NS
			250	SLHV 033 NB
			1000	SLHV 033 NK
<b>Millex-GV Filters</b>				
	0.22	Yellow	50	SLGV 033 NS
			250	SLGV 033 NB
			1000	SLGV 033 NK
<b>Millipore Express PLUS (PES) Membrane</b>				
<b>Millex-HP Filters</b>				
	0.45	Green	50	SLHP 033 NS
			250	SLHP 033 NB
			1000	SLHP 033 NK
<b>Millex-GP Filters</b>				
	0.22	Green	50	SLGP 033 NS
			250	SLGP 033 NB
			1000	SLGP 033 NK
<b>Nylon Membrane</b>				
<b>Millex-HN Filters</b>				
	0.45	Purple	50	SLHN 033 NS
			250	SLHN 033 NB
			1000	SLHN 033 NK
<b>Millex-GN Filters</b>				
	0.2	Purple	50	SLGN 033 NS
			250	SLGN 033 NB
			1000	SLGN 033 NK

## Solvent Compatibility

PVDF	Nylon
Acetic acid	Acetonitrile
Ammonium hydroxide, 1 N	Ammonium Sulfate (saturated)
Benzene	Benzene
Carbon tetrachloride	5% Boric Acid
Chloroform	Cyclohexanone
Ethanol	Dimethylformamide
Ethyl ether	DMSO
Hexane	Ethyl Acetate
Hydrogen peroxide, 30%	Ethyl Ether
Isopropyl alcohol	Hexane
Methanol	Methanol
Nitric acid, 6 N	Methylethyl Ketone
Water	Tetrahydrofuran
	Water

PES is recommended for use with aqueous solutions. For more detailed compatibility information go to [www.millipore.com](http://www.millipore.com).

## To Place an Order or Receive Technical Assistance

For additional information call your nearest Millipore office:

In the U.S. and Canada, call toll-free  
**1-800-MILLIPORE (1-800-645-5476)**

In the U.S., Canada and Puerto Rico,  
fax orders to **1-800-MILLIFX (1-800-645-5439)**  
Outside of North America, contact your local office.

To find the office nearest you:

[www.millipore.com/offices](http://www.millipore.com/offices)

Internet: [www.millipore.com](http://www.millipore.com)

Tech Service: [www.millipore.com/techservice](http://www.millipore.com/techservice)

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Lit. No. DS1745EN00 Rev. – 5/07 Printed in U.S.A. 07-171

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