

Filtration Introduction

Filter Membrane Chemical Compatibility

C	=	Compatible
L	=	Limited Compatibility
N	=	Not Compatible
—	=	No Data Available

Filter Membrane Chemical Compatibility Chart				
Chemical	Nylon	PTFE	PVDF	Regenerated Cellulose
<i>Acids</i>				
Acetic, 25%	L	C	C	C
Acetic, Glacial	L	C	C	C
Formic, 25%	N	C	C	C
Hydrochloric, 25%	L	C	C	C
Hydrochloric, Concentrated	N	N	C	C
Sulfuric, 25%	N	C	C	C
Sulfuric, Concentrated	N	C	L	L
Nitric, 25%	N	C	L	C
Nitric, Concentrated	N	C	L	N
Phosphoric, 25%	N	C	C	C
Trichloroacetic, 10%	L	C	C	C
<i>Bases</i>				
Ammonium Hydroxide, 25%	C	C	L	—
Sodium Hydroxide, 3 Normal	C	C	C	—
<i>Alcohols</i>				
Amyl Alcohol	C	C	C	C
Benzyl Alcohol	C	C	C	C
Butyl Alcohol	C	C	C	C
Ethanol, 70%	C	C	C	C
Ethanol, 98%	C	C	C	C
Ethylene Glycol	C	C	C	C
Glycerine (Glycerol)	C	C	C	C
Isopropanol	C	C	C	C
Methanol, 98%	C	C	C	C
n-Propanol	C	C	C	C
Propylene Glycol	C	C	C	C
<i>Hydrocarbons</i>				
Benzene	C	C	C	C
Hexane, Xylene	C	C	C	C
Kerosene, Gasoline	C	C	C	C
Tetralin, Decalin	C	C	C	—
Toluene	C	C	C	C
<i>Halogenated Hydrocarbons</i>				
Carbon Tetrachloride	C	C	C	C
Chlorobenzene (Mono)	C	C	C	C
Chloroform	L	C	C	C
Freon	C	C	C	C
Methylene Chloride	L	C	C	C
Trichloroethane	C	C	C	C
Trichloroethylene	C	C	C	C

Filter Membrane Chemical Compatibility Chart				
Chemical	Nylon	PTFE	PVDF	Regenerated Cellulose
<i>Ketones</i>				
Acetone	C	C	N	C
Cyclohexanone	C	C	N	C
Isopropylacetone	C	C	N	—
Methyl Ethyl Ketone	C	C	L	C
Methyl Isobutyl Ketone (MIBK)	C	C	N	C
<i>Esters</i>				
2-Ethoxyethyl Acetate	L	L	L	C
Amyl Acetate	C	C	C	C
Benzyl Benzoate	C	C	—	C
Butyl Acetate	C	C	C	C
Ethyl Acetate	C	C	C	C
Isopropyl Myristate	C	C	—	C
Methyl Acetate	L	C	L	C
Propyl Acetate	L	N	C	C
Propylene Glycol Acetate	L	C	—	C
Methyl Cellosolve Acetate	C	C	C	C
Tricresyl Phosphate	—	C	—	C
<i>Oxides — Ethers</i>				
Acetonitrile (Methyl Cyanide)	C	C	C	C
Aniline	L	C	C	C
Diethyl Acetamide	C	C	C	C
Dimethyl Formamide	C	C	N	L
Dimethyl Sulfoxide (DMSO)	L	C	C	L
Dioxane	C	C	L	L
Ethyl Ether	C	C	C	C
Isopropyl Ether	C	C	N	—
Pyridine	C	C	L	C
<i>Solvents with Nitrogen</i>				
Tetrahydrofuran	C	C	L	L
Triethanolamine	C	C	C	C
<i>Miscellaneous</i>				
Formaldehyde Solution, 30%	C	C	C	L
Hydrogen Peroxide, 30%	N	C	C	C
Phenol, Aqueous, 10%	N	C	L	C
Silicone Oil and Mineral Oil	C	C	C	C

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This is only a guide. Users should verify compatibility under actual use conditions.

Filtration Introduction

Filter Device Selection

Consider the number of samples, the sample volume, and the filtering mechanism you prefer to use.

Syringe Filters

Filtration is achieved by pushing the sample through the membrane with a syringe or other luer-connection device. Syringe filters allow you to control the rate of flow, which can be critical with delicate samples. Syringe filters also allow you to filter into nearly any tube, vial, or column that represents the next step in your analysis.

Centrifuge Filter Tubes

Filtration is achieved by pulling the sample through the membrane with centrifugal force. This allows you to simultaneously filter as many samples as your centrifuge can hold, and captures your filtrate in a clean microtube.

Pre-Cut Membranes

Multiple diameters offer a wide range of sample capacities, up to multiple liters. You need a filtration apparatus, such as a filter funnel or other vacuum-driven filtration device.



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Device Capacities	
Description	Sample Volume
Syringe Filter Capacities	
4mm Syringe Filter	≤1mL
13mm Syringe Filter	≤5mL
17mm Syringe Filter	≤50mL
25mm Syringe Filter	≤50mL
30mm Syringe Filter	≤100mL
Centrifuge Filter Tube Capacities	
2mL Tubes	20µL to 500µL
50mL Tubes	1mL to 25mL
Pre-Cut Membrane Capacities	
13mm Pre-Cut Membranes	up to 20mL
25mm Pre-Cut Membranes	up to 100mL
47mm Pre-Cut Membranes	multi-liter

Membrane Selection

Choose a filter membrane based on the size and amount of particulate in the sample, the membrane's chemical compatibility with the sample matrix, and potential interactions (binding) between the membrane and the sample components. This table offers general guidelines on membrane characteristics and applications.

Membrane Selection Guide					
Membrane Type	Features	Common Uses	Hydrophilic	Solvent Resistance	Protein Binding
Nylon	Good chemical compatibility and very low extractables	General filtration sterilization, HPLC sample prep	Yes	Good	Medium
Polytetrafluoroethylene (PTFE)	Compatible with strong acids and aggressive solvents	Gas, air, and solvent filtration	No	High*	High
Polyvinylidene Fluoride (PVDF)	Good flow rate characteristics. Ideal for chromatography applications.	HPLC sample preparation and general filtration	Yes	High	Low
Regenerated Cellulose	Universal membrane with excellent chemical resistance and low extractables. Use for aqueous and organic samples.	HPLC sample prep general filtration	Yes	High	Very Low**

*Highest solvent resistance.
**Lowest protein binding.

related products
Looking for mobile inlet phase filters?
See pages 123–124.



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Syringe Filters

Nylon and PVDF Syringe Filters

Nylon and PVDF syringe filters are available in a variety of diameters to address different sample sizes.

Syringe Filter Specifications				
Diameter	Max. Temp.	Max. Pressure	Hold-Up Volume	Typical Sample Volume
4mm	100°C	75psig	Less than 15µL	Up to 1mL
13mm	60°C	100psig	Less than 10µL	Up to 5mL
17mm	100°C	115psig	Less than 25µL	Up to 50mL
25mm	60°C	100psig	Less than 50µL	Up to 50mL
30mm	100°C	90psig	Less than 115µL	Up to 100mL



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Choose Nylon Membranes for General Filtration Needs

Nylon is hydrophilic and has generally good solvent resistance.

Nylon Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	2091
4mm	0.45µm	100	2092
13mm	0.2µm	100	2166
13mm	0.45µm	100	2167
17mm	0.2µm	100	62163
17mm	0.45µm	100	62177
25mm	0.2µm	100	2045
25mm	0.45µm	100	2047
30mm	0.2µm	100	62145
30mm	0.45µm	100	62147

related products

Looking for HPLC column prefilters?

See page 111.



Choose PVDF Membranes for HPLC Sample Preparation

PVDF is hydrophilic, highly solvent resistant, and low protein binding.

PVDF Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	2227
4mm	0.45µm	100	2228
13mm	0.2µm	100	2647
13mm	0.45µm	100	2648
17mm	0.2µm	100	62130
17mm	0.45µm	100	62209
25mm	0.2µm	100	2223
25mm	0.45µm	100	2224
30mm	0.2µm	100	62193
30mm	0.45µm	100	62195

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Need vials?

We offer a full selection of vials, caps, and septa for all chromatography needs. See pages 348–378.



related products

Need syringes?

See pages 336–347 for our offering of high-quality Hamilton®, VICI®, and SGE® syringes.



Syringe Filters

PTFE and Regenerated Cellulose Syringe Filters

PTFE and Regenerated Cellulose syringe filters are available in a variety of diameters to address different sample sizes.

Syringe Filter Specifications

Diameter	Max. Temp.	Max. Pressure	Hold-Up Volume	Typical Sample Volume
4mm	100°C	75psig	Less than 15µL	Up to 1mL
13mm	60°C	100psig	Less than 10µL	Up to 5mL
17mm	100°C	115psig	Less than 25µL	Up to 50mL
25mm	60°C	100psig	Less than 50µL	Up to 50mL
30mm	100°C	90psig	Less than 115µL	Up to 100mL



Choose PTFE Membranes for Aggressive Filtration Needs Such as Gas and Solvent Filtration

PTFE is hydrophobic with exceptional solvent resistance.

PTFE Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	2394
4mm	0.45µm	100	2395
13mm	0.2µm	100	2164
13mm	0.45µm	100	2165
17mm	0.2µm	100	62118
17mm	0.45µm	100	62136
25mm	0.2µm	100	2089
25mm	0.45µm	100	2090
30mm	0.2µm	100	62189
30mm	0.45µm	100	62191

Choose Regenerated Cellulose Membranes for HPLC Sample Preparation and General Filtration Needs

Regenerated Cellulose is hydrophilic with exceptional solvent resistance and very low protein binding.

Regenerated Cellulose Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	656100
4mm	0.45µm	100	656102
17mm	0.2µm	100	62119
17mm	0.45µm	100	62125
30mm	0.2µm	100	62199
30mm	0.45µm	100	62167

related products

Need syringes?

See pages 336–347 for our offering of high-quality Hamilton®, VICI®, and SGE® syringes.



related products

Accessories for your system. Grace has an assortment of Accessories Quick Reference guides available for many popular instruments.

- Waters® Alliance® System Accessories – Request M202

- Agilent 1100 and 1200 System Accessories – Request M203

- Waters® Acquity® System Accessories – Request M204



2mL Centrifuge Filter Tubes

- For up to 850µL sample volume
- Economical alternative to brand name filter tubes
- Includes a glass support membrane

Quickly and easily remove particulates and clarify small sample volumes. Less than 5µL hold-up volume provides near quantitative volumetric recovery. Maximum G-Force: 10,000xG.



4817

Alltech® 2mL Filter Tubes

Membrane Type, Pore Size	Qty.	Part No.
<i>Cellulose Acetate</i>		
0.20µm	100	24126
0.45µm	100	24133
<i>Nylon</i>		
0.20µm	100	24137
0.45µm	100	24139
<i>PVDF (Hydrophobic)</i>		
0.20µm	100	24142
0.45µm	100	24144
<i>Regenerated Cellulose</i>		
0.20µm	100	24148
0.45µm	100	24150

50mL Centrifuge Filter Tubes

- For up to 25mL sample volume
- Use with fixed-angle rotor centrifuge
- All tubes include a glass support membrane

Alltech® 50mL Centrifuge Filter Tubes remove particulates from larger sample sizes with any centrifuge that holds 50mL conical tubes. They should only be used with a fixed-angle rotor centrifuge to prevent premature clogging of the membrane. Maximum operating temperature: 50°C. Maximum G-force: 2500xG.



4784

Alltech® 50mL Filter Tubes

Membrane Type, Pore Size	Qty.	Part No.
<i>Cellulose Acetate</i>		
0.20µm	50	24152
0.45µm	50	24154
<i>Nylon</i>		
0.20µm	50	24156
0.45µm	50	24158
<i>PVDF (Hydrophobic)</i>		
0.20µm	50	24160
0.45µm	50	24162

Forensic Spin Tubes

- 600µL capacity
- Extract biological fluids from cloth samples

The 1.4mm mesh filter basket acts as a sieve to retain cloth samples and pass fluids to the receiver tube. The spin tube includes a 600µL filter basket and a 2mL microcentrifuge receiver tube with attached cap.



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Forensic Spin Tubes

Description	Qty.	Part No.
Forensic Spin	100	2566
Forensic Spin	250	2567

Pre-Cut Filter Membranes

- Variety of pore sizes and membrane types
- Non-sterile



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Cellulose Acetate Membranes

Cellulose Acetate Membranes are hydrophilic and exhibit very low protein retention. Use for general biological filtration, sterilization, and filtration of aqueous solutions.

Nylon Membranes

Nylon Membranes are hydrophilic and resistant to many solvents. Use for filtration and clarification of aqueous or organic solutions.

PTFE Membranes

PTFE Membranes are hydrophobic and highly solvent resistant. Use for filtration of air, gases, and non-aqueous solutions. Pre-treat with methanol before using with aqueous solutions.

Cellulose Acetate Pre-Cut Membranes

Diameter	Pore Size	Qty.	Part No.
13mm	0.20µm	100	2125
13mm	0.45µm	100	2126
25mm	0.20µm	100	2128
25mm	0.45µm	100	2129
47mm	0.20µm	100	2133
47mm	0.45µm	100	2135

Nylon Pre-Cut Membranes

Diameter	Pore Size	Qty.	Part No.
13mm	0.20µm	100	2046
13mm	0.45µm	100	2044
25mm	0.20µm	100	2050
25mm	0.45µm	100	2048
47mm	0.20µm	100	2034
47mm	0.45µm	100	2024

PTFE Pre-Cut Membranes

Diameter	Pore Size	Qty.	Part No.
13mm	0.20µm	100	2013
13mm	0.45µm	100	2015
25mm	0.20µm	100	2023
25mm	0.45µm	100	2029
25mm	1.00µm	100	2056
47mm	0.20µm	100	2057
47mm	0.45µm	100	2058
47mm	1.00µm	100	2059



4777

more info

Need help selecting the correct membrane?

See pages 317–318 for membrane specifications and suggested use/applications.



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related product

Looking for solvent filtration apparatus?
See page 127.

TITAN²
 SYRINGE FILTERS

Polypropylene Syringe Filters

Chemically resistive
membrane with low
protein binding



- Hydrophilic membrane for aqueous or organic sample matrices
- Use with protein or peptide based assays

Specifications:

Membrane: Hydrophilic Polypropylene	Max. Operating Temp.	110°C
Housing: Medical Grade, Virgin Polypropylene	Max. Operating Pressure:	17mm - 115 psi 30mm - 90 psi
Connections: Enhanced Female Luer-Lok Inlet Male Slip Outlet	Retention Volumes:	17mm - <29µL 30mm - <137µL

Applications:

Protein or peptide based assays, general HPLC analysis

Chemical Incompatibilities:

Hexane, Toluene, Benzene, limited resistance to MeCl and Chloroform

Identifying Color Code	Catalog Number	Porosity	Std 1µm Prefilter	Recommended Sample Vol.	Qty	Price
17mm						
ROYAL BLUE	42213-PP	0.20µm	N	<30mL	200/PKG	\$185.30
ROYAL BLUE	42213-PPC	0.20µm	N	<30mL	200/PKG	\$425.35
WHITE	44513-PP	0.45µm	N	<30mL	200/PKG	\$185.30
WHITE	44513-PPC	0.45µm	N	<30mL	200/PKG	\$425.30
30mm						
ROYAL BLUE	42225-PP	0.20µm	N	<150mL	100/PKG	\$146.55
WHITE	44525-PP	0.45µm	N	<150mL	100/PKG	\$145.15

SUN-SRi Technical Note:

Maintain the purity of your sample extracts.

TITAN
 FILTRATION SYSTEMS

Power Filtration System

Optimized speed, power and
efficiency in filtration procedures

- Applies three times greater force compared to manual filtration methods
- Samples that are difficult to filter manually are now easily processed
- Speeds filtration applications compared to manual method, perfect for processing multiple samples
- Certified for chromatographic performance with an actual HPLC analytical standards run

Hot Shot
 from TITAN
 FILTRATION SYSTEMS


Laboratory tested and proven

Hot Shot has been laboratory tested by an independent engineering firm to confirm the force and speed advantage the Hot Shot System produces compared to manual filtration with a syringe. Hot Shot was found to produce the following results:

1. Force applied advantage of 3.009 over manually applied pressure
2. P HotShot = 87 psi vs. P manual = 25 psi (5 mL syringe)
3. Elapsed time to fully empty, >6x for test solutions (10mL cartridge)

A unique system approach, but easy to operate;

The Hot Shot System is built around the permanent filter processor and utilizes disposable filter cartridges, which come preassembled with a 30mm filter attached to either a 5mL or 10mL sample reservoir. Simple to operate, the user fills the preassembled filter cartridge then applies the piston cap. The reservoir piston cap and filter are disposable to eliminate cross contamination between samples. The filled cartridge is then attached to the processor and the trigger is depressed to filter the sample. The unit's built-in safety features release the cartridge before the pressure rating of the filter unit is exceeded. The result is no filter bursting or filter "blow-off". The user and lab work area are protected from contamination by sample leakage from over-pressurized filters. Multiple samples are processed quickly without causing user fatigue.



Catalog No.	Size	Porosity	Qty	Price
Nylon				