Whatman 4 mm Syringe Filter

Instructions for Use

Introduction

Important

Read these instructions carefully before using the products.

Intended use

The products are intended for research use only, and shall not be used in any clinical or *in vitro* procedures for diagnostic purposes.

Safety

For use and handling of the products in a safe way, refer to the Safety Data Sheets.

When considering the special factors of your application, consult *Technical Data, on page 2* to determine correctness of use. Do not to exceed the pressure, temperature, or chemical compatibility recommendations. High pressures can be obtained when using syringes. The smaller the syringe the higher the pressure that can be generated. As a general guide, the following pressures can be obtained by hand with the syringes indicated: 20 ml, 50 psi; 10 ml, 140 psi; 5 ml, 180 psi; 3 ml, 200 psi; 1 ml, 250 psi.

Each user should determine the pressure they can generate by hand with a specific size syringe and take appropriate safety precautions not to exceed the recommended rating for the device used. If these limitations are exceeded, bursting of the device may occur resulting in loss of sample or personal injury.

Description

This literature provides general information on the Whatman™ 4 mm Syringe Filters product range, a standard protocol and the product range specifications to provide a guide for establishing functional use and setting quality assurance test performance levels.

The sterile, non-pyrogenic products are sealed in a medical grade clear blister pack, radiation sterilized and sealed in their own protective shell pack.

Each syringe filter is a single use disposable product which will reduce the labor and loss of filtering efficiency associated with reusable filter housings.

Whatman 4 mm Syringe Filter range considerations

The Whatman 4 mm Syringe Filters are available in a range of choices. Each membrane is designed to allow maximum clean filtrate recovery from limited sample volumes of 2 ml or less:

Nylon Membrane (NYL)

- Hydrophilic is a good choice for aqueous and/or aqueous-organic samples.
- Offers good chemical resistance to most common HPLC solvents, however it has limited resistance to acids, bases, halogenated hydrocarbons, aldehydes and strong oxidizing agents.
- Most common application is HPLC sample filtration.

Polytetrafluoroethylene (PTFE) Membrane

- Hydrophobic and will not allow water to pass without high pressures.
- Aqueous solutions may be filtered if the membrane is initially "wetted" with alcohol or another appropriate solvent.
- Will stop aqueous aerosols in gas streams.

Polyvinylidene Fluoride (PVDF) Membrane

- Suitable choice for most HPLC Sample Prep Applications.
- Is slightly hydrophobic with low water breakthrough values.

Operating Instructions

Efficiency

To maximize filtration throughput, use the largest pore size filter that will provide the required cleanliness. To extend filter life use low flow rates or pressures.

To use With a Syringe

Step	Action
1	Fill the syringe with the solution to be filtered.
2	Secure the syringe to the FLL (Female Luer Lock) inlet of the filter with a twisting motion.
3	With the outlet pointed upward, gradually apply thumb pressure to the plunger to initiate flow.
4	Continue applying pressure to the plunger until all the air is displaced with the solution.
5	Once the solution starts to exit the filter outlet, stop applying pressure.
6	Point the filter outlet downward and away from the user and place the outlet over a suitable receptacle.
7	Continue to apply pressure to the syringe plunger until the sample is completely filtered.

Air Locks

Seriously hamper flow rates. To eliminate, point the outlet of the filter device upward during the initiation of liquid flow.

Bubble Point (BP) Test

Step	Action
1	Flush the filter device with 1.0 ml or more of the test fluid.
2	After the filter is completely wet, with the outlet pointed upward, apply under controlled pressure to the inlet until air breaks through the filter and bubbles can be seen at the outlet. The pressure at which air passes through the wetted filter is the BP. Refer to the table below for typical BP values.

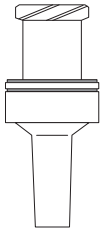
Order Details

Product code	Description	Qty per box
6786-0402	0.2 µm NYL, sterile	50
6789-0402	0.2 µm NYL	100
6790-0402	0.2 µm NYL	500
6789-0404	0.45 µm NYL	100
6790-0404	0.45 µm NYL	500
6784-0402	0.2 µm PTFE	100
6783-0402	0.2 µm PTFE	500
6784-0404	0.45 µm PTFE	100
6783-0404	0.45 µm PTFE	500
6777-0402	0.2 µm PVDF w/tube tip	50
6791-0402	0.2 µm PVDF , sterile	50
6779-0402	0.2 µm PVDF	100
6792-0402	0.2 µm PVDF	500
6777-0404	0.45 µm PVDF w/tube tip	50
6791-0404	0.45 µm PVDF sterile	50
6779-0404	0.45 µm PVDF	100
6792-0404	0.45 µm PVDF	500

Note: *Other sizes and/or specials are available upon request. Please contact your local Cytiva Technical Service Department at the for more information.*

Technical Data

Whatman 4 mm Syringe Filter



Dimensions	24 mm × Ø 10 mm
Weight	Approximately 0.75 grams
Filtration Area	0.125 cm^2
Maximum Pressure	200 psi (13.789 bar)
Housing	Polypropylene
Volume "Hold-up"	Full Housing 0.15 mL With Air Purge <0.01 mL
Flow direction	Flow should enter from the Inlet
Connectors	Inlet - Female Luer Lock (FLL) Outlet - Male Slip Luer (MSL) Outlet - Male Tube Tip (MTT)

Table 1. Filter Media

Integrity Test Data Description	Pore Size (Microns)	Minimum Bubble Point [1] (psi)
Nylon	0.2	40
Nylon	0.45	25
Polytetrafluoroethylene	0.2	13
Polytetrafluoroethylene	0.45	7
Polyvinylidene Fluoride	0.2	30
Polyvinylidene Fluoride	0.45	20

[1] Bubble point determined with Methanol, all others determined with water

Typical Application

NYL	Aqueous and/or organic samples; hydrophilic.
PTFE	Organic based samples. Hydrophobic membrane.
PVDF	Aqueous and/or organic based samples; low protein binding membrane.

Chemical Compatibility of Membrane

Solvent	NYL	PTFE	PVDF
Acetic Acid 5%[1]	R	R	R
Acetic Acid, Glacial	L	R	R
Acetone	R	R	NR
Acetonitrile	R	R	R
Ammonia, 6N	R	R	L
Amyl Acetate	R	R	L
Amyl Alcohol	R	R	R
Benzene[2]	L	R	R
Benzyl Alcohol [2]	L	R	R
Boric Acid	L	R	R
Butyl Alcohol	R	R	R
Butyl Chloride[2]	NR	R	R
Carbon Tetrachloride [2]	L	R	R
Chloroform [2]	NR	R	R
Cyclohexanone	NR	R	R
Chlorobenzene	[2]	R	R
Citric Acid	R	R	R
Cresol	NR	R	NR
Cyclohexane	R	R	R
Diethyl Acetamide	R	R	NR
Dimethyl Formamide	R	R	NR
Dioxane	R	R	L
DMSO	R	R	L
Ethanol	R	R	R
Ethers	R	R	L
Ethyl Acetate	R	R	L
Ethylene Glycol	R	R	R
Formaldehyde	R	R	R
Freon TF	R	R	R
Formic Acid	NR	R	R
Hydrochloric Acid (Conc)	NR	R	R
Hydroflouric Acid	NR	R	R
Hexane	R	R	R
Isobutyl Alcohol	R	R	R
Isopropyl Acetate	R	R	R
Methanol	R	R	R
Methyl Ethyl Ketone	R	R	L
Methylene Chloride[2]	NR	R	R
Nitric Acid (Conc)	NR	R	NR
Nitric Acid, 6N	NR	R	L
Nitrobenzene[2]	L	R	R
Pentane	R	R	R
Perchloro Ethylene	R	R	R
Pyridine	L	R	R
Phenol (0.5%)	R	R	R
Sodium Hydroxide, 6N	L	R	NR
Sulfuric Acid (Conc)	NR	R	NR
Tetrahydrofuran	R	R	R
Toluene [2]	L	R	R
Trichloroethane [2]	L	R	R
Trichloroethylene [2]	NR	R	R
Water	R	R	R
Xylene[2]	L	R	R

[1] Insufficient Data;

[2] Short term resistance of housing

(R = Resistant; LR = Limited Resistance; NR = Non Resistant)

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For local office contact information, visit cytiva.com/contact

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