Puradisc™ 13 mm

Whatman™ syringe filters

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.

Background

Description

Puradisc™ 13 mm syringe filters are designed to provide clean filtrate from small volumes up to 10 mL. The products are available in a variety of filter choices with a polypropylene housing.

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

Disposable filtration devices provide labor-saving efficiency, ensuring highly effective filtration when compared to hand-assembled reusable filter housings.

This document provides general information on Puradisc 13 mm syringe filters. The specifications in the Technical Data section are intended to provide a basis for establishing functional use, as well as for setting quality assurance test performance levels.

Typical applications

Filter media	Typical application
CA	Aqueous and some organic samples
GMF	Aqueous and/or organic; high loading capacity
NYL	Aqueous and/or organic samples; hydrophilic
PP	Aqueous and organic samples. Aqueous based samples; low protein binding membrane
PES	Aqueous sample
PTFE	Organic based samples; hydrophobic membrane
H-PTFE	Solvents, chemicals, aqueous, and non-aqueous samples; hydrophilic membrane
PVDF	Aqueous and/or organic based samples; low protein binding membrane
RC	Aqueous and/or organic based samples; very low nonspecific protein binding membrane

Filter media

The following filter media choices are available for Puradisc 13 mm syringe filters.

Cellulose Acetate (CA) Membrane

Cellulose Acetate is a common selection for filtering biological solutions. The typically low binding characteristics of the membrane allow maximum recovery of target analytes like proteins. The membrane exhibits good flow characteristics and high loading capacity, which allows fast and complete processing of the complex particle matrix found in biological samples.

Glass Microfiber Filter (GMF)

The Glass Microfiber Filter media are produced entirely from fine grade borosilicate glass microfiber and contain no binders either as manufacturing aids or as wet strengthening additives. Glass Microfiber Filters are generally resistant to weakening or disruption of the fibrous matrix by inorganic or organic solutions and have broad chemical compatibility.

Nylon (NYL) Membrane

Nylon membrane is hydrophilic and can be used for aqueous and aqueous-organic samples. The membrane offers chemical resistance to most common HPLC solvents. However, it has limited resistance to acids, bases, halogenated hydrocarbons, aldehydes and strong oxidizing agents. The most common application is HPLC sample filtration.

Polypropylene (PP) Membrane

This Polypropylene membrane provides high flow with both solvent and aqueous compatibility. This medium provides a pure, single-material-construction filter device with a broad range of solvent/chemical resistance.

Polyethersulfone (PES) Membrane

Polyethersulfone membrane provides durability, high temperature resistance, good chemical compatibility, and low protein absorption. It is particularly suitable for filtration of serum, plasma and tissue culture solutions as well as other protein containing solutions where minimal adsorptive protein loss is desired.

Polytetrafluoroethylene (PTFE) Membrane

Polytetrafluoroethylene membrane is hydrophobic and will not allow water to pass except under high pressure. Aqueous solutions can be filtered if the membrane is initially "wetted" with alcohol or another appropriate solvent. Polytetrafluoroethylene membrane will stop aqueous aerosols in gas streams.

Hydrophilic Polytetrafluoroethylene (H-PTFE) Membrane

Hydrophilic Polytetrafluoroethylene membrane can be used for both aqueous and aggressive organic solvents. This membrane is suitable for uHPLC / HPLC sample preparation as well as many other applications in a busy, high volume lab as its dual capability handles most solvents.

Polyvinylidene Difluoride (PVDF) Membrane

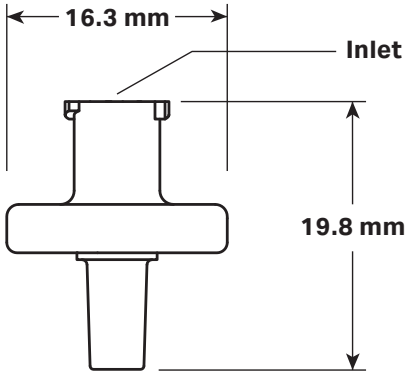
Polyvinylidene Difluoride membrane is a suitable choice for most HPLC sample preparation applications. The membrane is hydrophilic with low water breakthrough values. It offers good chemical resistance to all common HPLC solvents, has low protein binding and negligible extractables.

Regenerated Cellulose (RC) Membrane

Regenerated Cellulose is a hydrophilic membrane that is resistant to a wide range of solvents. This membrane is suitable for use with aqueous or organic solvents. This membrane has low extractables profile and very low protein binding capacity, which makes it a particularly suitable choice for protein recovery applications.

Technical information

Illustration of Puradisc 13 mm syringe filters



Technical data

Connectors:	Inlet - Female Luer Lock (FLL) Outlet - Male Slip Luer (ML) Outlet - Male Tube Tip (MTT)
Dimensions:	45.2 mm x 16.3 mm with tube tip extension 19.8 mm x 16.3 mm without tube tip extension
Weight:	Approximately 0.95 grams
Filtration Area:	1.3 cm^2
Maximum Pressure:	0.5 MPa (5.2 bar, 75 psi)
Housing:	Polypropylene
Hold-Up Volume:	Full housing 0.13 mL with air purge < 25 µL
Flow Direction:	Flow should enter from the inlet
Sterilization:	Autoclave at 121°C (131°C max) at 0.1 MPa (1.0 bar, 15 psi) for 20 minutes
Biosafe:	All materials pass USP Class VI

Operating instructions

Safety

When considering the specific factors of your application, see *Technical data* for correct use. Do not 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 general guideline, the following pressures can be obtained by hand with the syringes indicated:

Syringe size	20 mL	10 mL	5 mL	3 mL	1 mL
Pressure obtained by hand	0.6 MPa (5.5 bar, 80 psi)	1.0 MPa (9.7 bar, 140 psi)	1.2 MPa (12.4 bar, 180 psi)	1.4 MPa (14 bar, 200 psi)	1.7 MPa (17 bar, 250 psi)

Determine the pressure generated by hand with a specific size syringe and take appropriate safety precautions not to exceed the recommended rating for the device used.

CAUTION
If the Maximum operating pressure is exceeded, bursting of the device can occur resulting in loss of sample or personal injury.

Efficiency

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

Air locks

Air locks can seriously limit flow rates. To eliminate air locks, point the outlet of the filter device upward during the initiation of liquid flow.

To filter a solution with a syringe

Follow these steps to filter a solution with a syringe.

Step	Action
1	Fill the syringe with the solution to be filtered.
2	Secure the filled syringe to the FLL inlet of the syringe filter with a twisting motion.
3	With the outlet pointed upward, gradually apply thumb pressure to the syringe plunger to initiate flow.
4	Continue thumb pressure until all the air in the syringe is displaced with liquid.
5	Once liquid starts to exit the syringe filter from the outlet, stop applying pressure, point the syringe downward and away from the user.
6	Orient the syringe filter over a suitable collection container or other apparatus and apply pressure again to filter the sample.

Integrity test

Bubble point test

Follow these steps to perform a bubble point test if required for your application.

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 air under controlled pressure to the inlet until air breaks through the filter and bubbles can be seen at the outlet.
3	The pressure at which air passes through the wetted filter is the bubble point.

Refer to the table for typical bubble point values.

Bubble point data

Description	Pore size	Minimum bubble point		
	(µm)	(MPa)	(bar)	(psi)
CA	0.45	0.2	2.0	29
GF/A	1.6	N/A	N/A	N/A
GF/B	1.0	N/A	N/A	N/A
GF/C	1.2	N/A	N/A	N/A
GF/D	2.7	N/A	N/A	N/A
GF/F	0.7	N/A	N/A	N/A
GMF	0.45	N/A	N/A	N/A
934-AH™	1.5	N/A	N/A	N/A
NYL	0.1	0.3	3.4	50
NYL	0.2	0.3	3.2	46
NYL	0.45	0.2	2.0	29
PP[1]	0.2	0.1	1.0	15
PP[1]	0.45	0.1	0.8	11
PES	0.2	0.2	2.5	36
PES	0.45	0.2	1.5	22
PTFE[1]	0.1	0.2	1.6	23
PTFE[1]	0.2	0.1	1.0	15
PTFE[1]	0.45	0.06	0.6	8.5
PTFE[1]	1.0	0.03	0.3	5
PTFE[1]	5.0	0.01	0.1	1
H-PTFE	0.2	0.3	3.4	49
H-PTFE	0.45	0.2	1.9	28
PVDF	0.2	0.2	2.3	33.5
PVDF	0.45	0.1	1.4	21
PVDF	1.0	0.1	1.0	14
RC	0.2	0.3	3.4	50
RC	0.45	0.2	2.5	36

[1] Bubble point determined with isopropanol, all others determined with water.

Chemical compatibility of membrane and housing

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

[1] Short term resistance of housing.

Legend: R = Resistant; LR = Limited Resistant; NR = Non Resistant.

PTFE membrane may need pre-wetting with isopropanol/methanol if filtering a polar liquid.

The above data is to be used as a guide only. Testing prior to application is recommended.

Ordering information

For ordering information, visit *cytiva.com*.

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