Whatman 25mm GD/X Syringe Filters

Product Information sheet

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.

Description

The Whatman™ 25 mm GD/X Syringe Filters are designed to enable the filtration of viscous, hard-to-filter samples greater than 10 mL. They are available in a wide variety of filter choices with a polypropylene housing.

Each unit contains a prefiltration stack of Whatman Multigrade GMF 150 (10 & 1 µm) and GF/F. The combination of this pre-filtration stack and filter housing design enables you to filter highly particular loaded samples.

Disposable filtration devices provide labor saving efficiency while ensuring consistent filter performance when compared to hand assembled reusable filter housings.

This document provides general information on the products listed below. 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.

Whatman 25 mm GD/X Syringe Filters

Whatman 25 mm GD/X Syringe Filters are designed to enable the filtration of hard-to-filter samples greater than 10 mL.

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

Cellulose Acetate (CA) Membrane Considerations:

The Cellulose Acetate membrane utilized in these devices is "surfactant free." This minimizes the risk of filtrate contamination from aqueous based extractables associated with the membrane. Cellulose Acetate is a good membrane for biological solutions where high loading capacity and low protein binding are important concerns.

Glass Microfiber Filter (GMF) Considerations:

The Glass Microfiber Filter media are produced entirely from the finest grade of borosilicate glass microfibers 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 Membrane (NYL) Considerations:

Nylon membrane is hydrophilic and is a good choice for aqueous and/or aqueous organic samples. The membrane offers good 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. GD/X is offered with two different types of nylon membrane; a normal membrane and a highly positively charged membrane.

Polypropylene (PP) Membrane Considerations:

This specially selected 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 Considerations:

This carefully selected Polyethersulfone membrane meets the special filtration requirements of durability, high temperature resistance, good chemical compatibility, and low protein adsorption. 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 Considerations:

Polytetrafluoroethylene membrane is 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. Polytetrafluoroethylene membrane will stop aqueous aerosols in gas streams.

Polyvinylidene Fluoride (PVDF) Membrane Considerations:

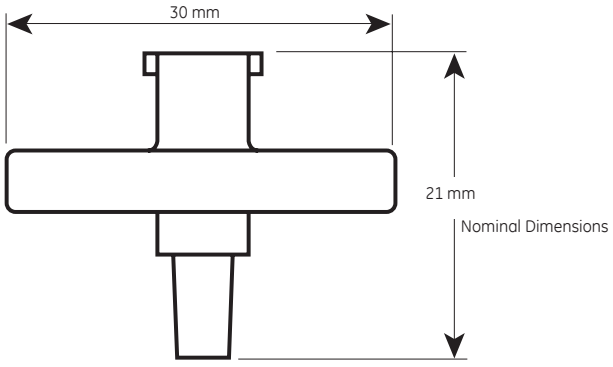
Polyvinylidene Fluoride membrane is a suitable choice for most HPLC Sample Prep applications. In comparison to PTFE, the PVDF membrane is less hydrophobic with lower water breakthrough values. It offers good chemical resistance to common HPLC solvents, has low protein binding and negligible extractables.

Regenerated Cellulose (RC) Membrane Considerations:

The Regenerated Cellulose membrane is naturally hydrophilic and is a good choice for aqueous and organic samples. The membrane offers very good chemical resistance to a broad range of solvents including all common solvents used in HPLC (methanol, acetonitrile, water). It also exhibits low levels of non specific protein binding.

Technical Data

Whatman 25 mm GD/X Syringe Filters



Dimensions:	30 mm × 21 mm
Weight:	Approximately 3 grams
Filtration Area:	4.6 cm^2
Maximum Pressure:	75 psi (5.2 bar)
Housing:	Polypropylene
Hold Up Volume:	Full housing 1.4 mL
	with air purge 250 µL (approx)
Flow Direction:	Flow should enter from the inlet
Connectors:	Inlet - Female Luer Lock (FLL)
	Outlet - Male Slip Luer (MSL)s
Autoclaving:	Autoclave at 121°C max at 15 psi for 20 minutes
	(Not recommended for Nylons)
Glass Microfiber:	100% Borosilicate
Prefiltration Media:	GMF 150 10 µm: 1 µm
	GMF/F 0.7 µm
Filter Media:	Please refer to the Integrity Test Data table.

Integrity Test Data

Description	Pore Size Microns	Minimum Bubble Point psi
Cellulose Acetate	0.2	46
Cellulose Acetate	0.45	29
Polytetrafluoroethylene[1]	0.2	15
Polytetrafluoroethylene[1]	0.45	9
Nylon	0.2	46
Nylon	0.45	29
Polypropylene[1]	0.2	15
Polypropylene[1]	0.45	11
Polyethersulfone	0.2	46
Polyethersulfone	0.45	30
Polyvinylidene Fluoride	0.2	45
Polyvinylidene Fluoride	0.2	21
GF/A	1.6	N/A
GF/B	1.0	N/A
GF/C	1.2	N/A
GF/D	2.7	N/A
GF/F	0.7	N/A
934-AH	1.5	N/A
GMF	0.45	N/A
RC	0.2	40
RC	0.45	21

[1] Bubble point determined with IPA. All others determined with water.

Chemical Compatibility of Membrane

Solvent	CA	GMF	NYL	PP	PES	PTFE	PVDF	RC
Acetic Acid, 5%	LR	R	R	R	R	R	R	R
Acetic Acid, Glacial	NR	R	LR	R	R	R	R	NR
Acetone	NR	R	R	R	NR	R	NR	R
Acetonitrile	NR	R	R	R	NR	R	R	R
Ammonia, 6N		LR	R	R	R	R	LR	LR
Amyl Acetate	NR	R	R	R	LR	R	LR	R
Amyl Alcohol	LR	R	R	R	NR	R	R	R
Benzene*	R	R	LR	NR	R	R	R	R
Benzyl Alcohol*	LR	R	LR	R	NR	R	R	R
Boric Acid	R	R	LR	R		R	R	R
Butyl Alcohol	R	R	R	R	R	R	R	R
Butyl Chloride*		R	NR	NR		R	R	
Carbon Tetrachloride*	NR	R	LR	NR	NR	R	R	R
Chloroform*	NR	R	NR	LR	NR	R	R	R
Chlorobenzene*		R	NR	LR	NR	R	R	R
Citric Acid		R	LR	R	R	R	R	R
Cresol*	NR	R	NR	NR	NR	R	NR	R
Cyclohexanone	NR	R	NR	R	NR	R	R	R
Cyclohexane*	NR	R	NR	NR	NR	R	R	R
Diethyl Acetamide	NR	R	R	R		R	NR	R
Dimethyl Formamide	NR	R	R	R	NR	R	NR	LR
Dioxane	NR	R	R	R	LR	R	LR	R
DMSO	NR	R	R	R	NR	R	LR	LR
Ethanol	R	R	R	R	R	R	R	R
Ethers*	LR	R	R	NR	R	R	LR	R

Solvent	CA	GMF	NYL	PP	PES	PTFE	PVDF	RC
Ethyl Acetate	NR	R	R	R	NR	R	NR	R
Ethylene Glycol	LR	R	R	R	R	R	R	R
Formaldehyde*	LR	R	R	LR	R	R	R	LR
Freon TF*	R	R	NR	NR	R	R	R	
Formic Acid	LR	R	NR	R	R	R	R	LR
Hexane	R	R	R	R	R	R	R	R
Hydrochloric Acid, Conc*	NR	R	NR	LR	R	R	R	NR
Hydrofluoric Acid*	NR	NR	NR	LR		R	R	NR
Isobutyl Alcohol	LR	R	R	R		R	R	R
Isopropyl Alcohol	R	R	R	R		R	R	R
Methanol	R	R	R	R	R	R	R	R
Methyl Ethyl Ketone	LR	R	R	R	NR	R	NR	R
Methylene Chloride*	NR	R	NR	LR	NR	R	R	R
Nitric Acid, Conc*	NR	R	NR	NR	NR	R	R	NR
Nitric Acid, 6N*	LR	R	NR	LR	LR	R	R	LR
Nitrobenzene*	NR	R	LR	R	NR	R	R	R
Pentane*	R	R	R	NR	R	R	R	R
Perchloro Ethylene*	R	R	LR	NR	NR	R	R	R
Phenol 0.5%	LR	R	NR	R	NR	R	R	R
Pyridine	NR	R	LR	R	NR	R	NR	R
Sodium Hydroxide, 6N	NR	NR	LR	R	R	R	NR	NR
Sulfuric Acid, Conc*	NR	R	NR	NR	NR	R	NR	NR
Tetrahydrofuran*	NR	R	R	LR	NR	R	R	R
Toluene*	LR	R	LR	LR	NR	R	R	R
Trichloroethane*	NR	R	LR	LR	NR	R	R	R
Trichloroethylene*		R	NR	LR	NR	R	R	R
Water	R	R	R	R	R	R	R	R
Xylene*	R	R	LR	LR	LR	R	R	R

(R = Resistant; LR = Limited Resistance; NR = Non Resistant; * = Short term resistance of housing. ** = membrane may need pre-wetting with isopropanol/methanol if filtering a polar liquid

Ordering Information – GD/X Syringe Filters

25mm GDX - Non Sterile

Product code	Membrane	Pore Size (µm)	Quantity/ Pack
6869-2502	Nylon High Charge (Positive)	0.2	150
6869-2504	Nylon High Charge (Positive)	0.45	150
6870-2502	Nylon	0.2	150
6871-2502	Nylon	0.2	1500
6871-2504	Nylon	0.45	1500
6870-2504	Nylon	0.45	150
6870-2550	Nylon	5.0	150
6871-2550	Nylon	5.0	1500
6872-2502	PVDF	0.2	150
6873-2502	PVDF	0.2	1500
6872-2504	PVDF	0.45	150
6873-2504	PVDF	0.45	1500
6874-2502	PTFE	0.2	150
6875-2502	PTFE	0.2	1500
6874-2504	PTFE	0.45	150
6875-2504	PTFE	0.45	1500
6876-2502	PES	0.2	150
6905-2502	PES	0.2	1500
6876-2504	PES	0.45	150
6905-2504	PES	0.45	1500
6878-2502	PP	0.2	150
6880-2502	CA	0.2	150
6880-2504	CA	0.45	150
6881-2504	CA	0.45	1500
6882-2516	GF/A*	1.6*	150
6883-2516	GF/A*	1.6*	1500
6884-2510	GF/B*	1.0*	150
6886-2512	GF/C*	1.2*	150
6888-2527	GF/D*	2.7*	150
6890-2507	GF/F*	0.7*	150
6891-2507	GF/F*	0.7*	1500
6892-2515	934-AH[1]	1.5*	150
6894-2504	GMF*	0.45*	150
6895-2504	GMF*	0.45*	1500
6887-2502	RC	0.2	150
6888-2502	RC	0.2	1500
6882-2504	RC	0.45	150
6883-2504	RC	0.45	1500

25mm GDX - Sterile

Product code	Membrane	Pore Size (µm)	Quantity/ Pack
6900-2502	PVDF	0.2	50
6900-2504	PVDF	0.45	50
6896-2502	PES	0.2	50
6896-2504	PES	0.45	50
6897-2502	PES	0.2	500
6897-2504	PES	0.45	500
6901-2502	CA	0.2	50
6901-2504	CA	0.45	50
6902-2504	GMF[1]	0.45*	50

PP – Polypropylene, **PVDF** – Polyvinylidene difluoride, **CA** – Cellulose Acetate, **PES** – Polyethersulfone, **PTFE** – Polytetrafluoroethylene, **GF** – Glass microfiber, **GMF** - Glass Microfiber, *Glass microfiber particle retention rating, **RC** - Regenerated Cellulose [1] Contains GMF 150 without the GF/F prefilter

Operating Instructions

Safety: When considering the special factors of your application, consult the Technical Data to determine correctness of 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 a general guide, the following pressures can be obtained by hand with the syringes indicated: 20 mL; 30 psi (2 bar); 10 mL, 50 psi (3.4 bar); 5 mL, 75 psi (5.2 bar); 3 mL, 100 psi (6.9 bar); 1 mL, 150 psi (10.3 bar). 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.

Pre-filter Media: The Whatman 25 mm GD/X Syringe Filters contain a prefiltration stack of Whatman Multigrade GMF-150 (10:1 µm) and Grade GF/F prefilters. Multigrade GMF-150 is a combination of two glass microfiber filters in one. Manufactured from 100% Borosilicate glass, its construction consists of a coarse layer on top, meshed with a fine layer below. The Grade GF/F Filter will retain fine particles down to 0.7 µm. This combination of pre filters allows you to filter even the most difficult samples with reduced hand force. Compared to an unprotected membrane, the volume of sample filtered can be three to seven times greater.

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 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 device is displaced with liquid.
5	Once liquid starts to exit syringe filter outlet, stop applying-pressure, point the device downward and away from user.
6	Position syringe filter over suitable collection container or other apparatus and apply pressure again to filter sample. Change filters when flow becomes to slow or resistance becomes excessive.

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: Flush the filter device with 1.0 mL or more of the test fluid. After the filter is completely wet and with the outlet pointed upward, apply air under controlled pressure to the inlet until air breaks through the filter and bubbles can be seen exiting the outlet. The pressure at which air passes through the wetted filter is the BP. Refer to *Integrity Test Data, on page 2* for typical BP values.

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