Thermo Scientific
Titan3 and Target2
Chromatography Syringe Filters

Performance filtration solutions

for sample preparation

Thermo SCIENTIFIC

Titan3 and Target2
syringe filters

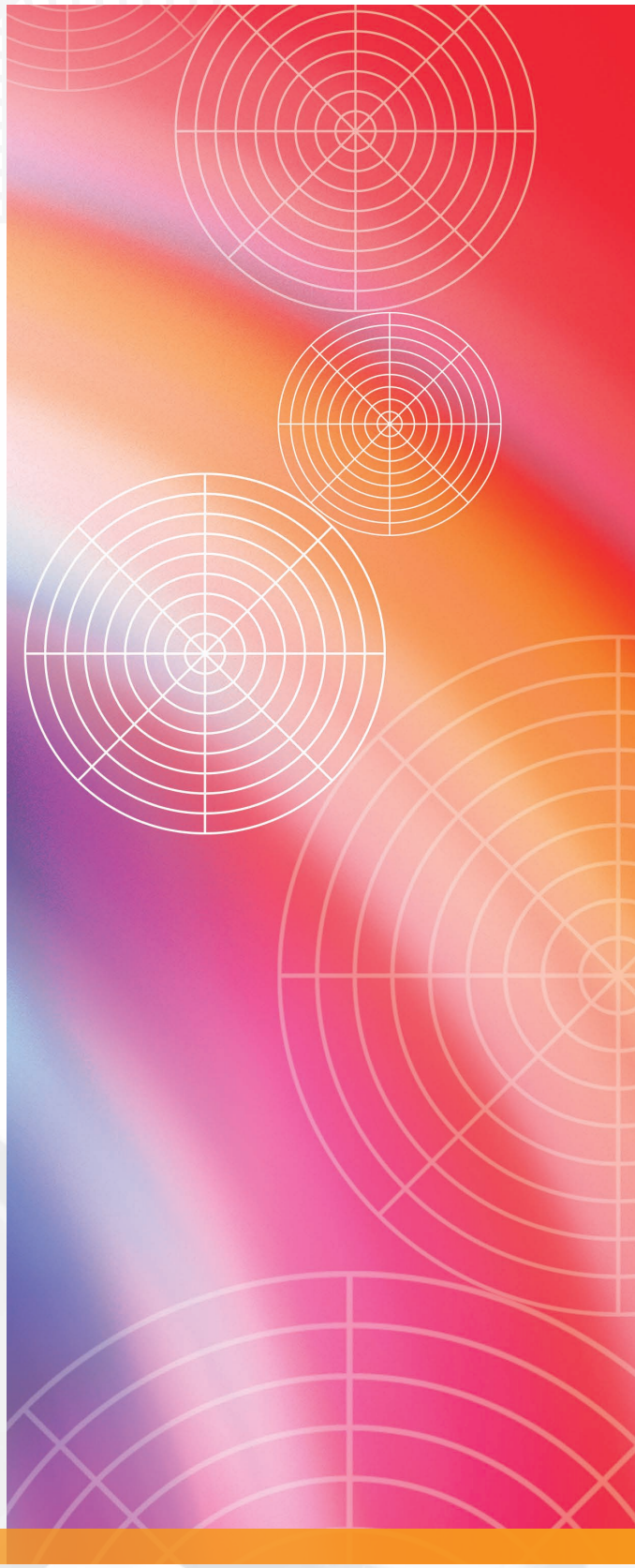
Sample preparation is a key stage in successful chromatography. Thermo Scientific Titan3 and Target2 syringe filters ensure reliable elimination of both particles and micro organisms in the sample preparation process, providing consistent and reliable experimental results for a range of samples and applications. Titan3 and Target2 syringe filters can also protect chromatography columns by preventing the cumulation of fine particles in the column, which may form premature blockages.

Both Titan3 and Target2 provide high-quality filtration solutions

- Low extractable membranes and housing
- HPLC performance tested
- Plain polypropylene housing
- 30 mm products pressure rated to 100 psi
- Enhanced Luer Lock inlet which provides secure attachment to syringes
- Range of filter sizes 4 mm – 30 mm
- Low hold-up volume allows for the treatment of small sample volumes with minimal sample loss

The premium Titan3 range provides even higher levels of confidence

- Integral ring provides greater strength to the housing, preventing leakage and bursting
- 30 mm products pressure rated to 120 psi
- Most 30 mm devices are provided with a 1 mm boro silicate glass pre-filter (delivering increased filtrate volumes)
- Color coding for easy identification and selection of the correct membrane and pore size



Syringe filter membrane selection

The following is a general guide when selecting the appropriate membrane for your application. The following should be considered:

1 Membrane compatibility with sample type and technique

Aggressive and nonpolar solvents	**PTFE**
Organic/Aqueous Solvents	**PTFE-L**
Biological sample preparation	**RC**
Capillary electrophoresis	**PES**
High solid samples	**GMF/pre-filter**
HPLC	**PVDF/Nylon/RC/ PTFE-L**
Ion-chromatography	**PES/PVDF**
Protein analysis	**PVDF**
Trace metals	**PES**
UV-Vis spectophotometry	**PVDF**

For more detailed information on individual membrane specifications, please see pages 5 - 9.

2 Compatibility of membrane with solvent

Water / Soluble	Organic
CA	**PTFE**
Nylon	**PTFE-L**
PES	**PVDF**
PTFE-L	**RC**

3 Filter size is dependent on sample volume

<2 mL	**4 mm**
<10 mL	**17 mm**
<100 mL	**30 mm**

4 Porosity depends on the amount of particles to be removed from the sample

>5 µm	**GF pre-filter**
<2 µm	**0.45 µm**
<0.5 µm	**0.2 µm**

Titan3 Syringe filter unit specification

	4 mm Titan3	17 mm Titan3	30 mm Titan3
Housing	Polypropylene with integral colour-coded sealing ring	Polypropylene with integral colour-coded sealing ring	Polypropylene with integral colour-coded sealing ring
Filtration area	0.125 cm^2	1.6 cm^2	4.9 cm^2
Maximum pressure	5.5 BAR	8 BAR	10 BAR
Residual volume	<15 µL with air purge	<35 µL with air purge	<157 µL with air purge
Dimensions	8 mm × 20.7 mm	20.5 mm × 24.5 mm	34 mm × 24.5 mm
Flow direction	Inlet-outlet only	Inlet-outlet only	Inlet-outlet only
Inlet	Female luer lock tab	Female luer screw	Female luer screw
Outlet	Male luer slip	Male luer slip	Male luer slip
Pre-filter	N	Selected membranes	Selected membranes

Target2 Syringe filter unit specification

	4 mm Target2	17 mm Target2	30 mm Target2
Housing	Polypropylene	Polypropylene	Polypropylene
Filtration area	0.125 cm^2	1.6 cm^2	4.9 cm^2
Maximum pressure	5.5 BAR	8 BAR	10 BAR
Residual volume	<15 µL with air purge	<35 µL with air purge	<157 µL with air purge
Dimensions	8 mm × 20.7 mm	20.5 mm × 24.5 mm	34 mm × 24.5 mm
Flow direction	Inlet-outlet only	Inlet-outlet only	Inlet-outlet only
Inlet	Female luer lock tab	Female luer screw	Female luer screw
Outlet	Male luer slip	Male luer slip	Male luer slip
Pre-filter	N	N	Selected membranes

Syringe filter membrane specification

Nylon

Membrane of choice for analytical applications.

- Naturally hydrophilic with broad chemical resistance
- Excellent flow rates and high-throughput loading
- HPLC recommended

Hydrophillic nylon is extremely well suited for aqueous or organic sample preparation and HPLC, GC or dissolution sample analysis. Due to its excellent flow characteristics and mechanical stability, nylon offers the best combination of physical parameters to meet the most stringent analytical needs.

Specifications

Membrane:	HPLC certified nylon
Max. operating temperature:	100°C
Housing:	Medical grade, virgin polypropylene
Porosities:	0.2 µm, 0.45 µm, 1.5 µm, 5 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes

Applications

- HPLC and organic solvent sample preparation and clean up
- Dissolution sample analysis
- General sample preparation prior to analytical analysis
- Mixed sample matrix of aqueous or organic dissolved analytes

Chemical Incompatibilities

- Acids >1N

  Halogenated solvents
- Proteineous samples with high non-specific binding affinities

Polypropylene

Chemically resistant membrane with low protein binding.

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

The hydrophilic polypropylene membrane is easily wetted with water and does not require pre-treatment with alcohols. Compatible with biological samples. Do not use with strong organic solvents, especially aromatic and chlorinated solvents.

Specifications

Membrane:	Hydrophilic polypropylene
Max. operating temperature:	110°C
Housing:	Medical grade, virgin polypropylene
Porosities:	0.2 µm, 0.45 µm

Applications

- Protein or peptide-based assays
- General HPLC analysis

Chemical Incompatibilities

- Hexane, toluene, benzene, limited resistance to dichloromethane and chloroform

PES - Ion chromatography (IC) certified

Precise results in sensitive analysis of ionic analytes.

- Certified for low-level IC interference by ICP analysis
- Hydrophilic membrane provides excellent flow rates and low binding coefficients
- Low affinity for binding drugs, ideal for dissolution testing procedures

This hydrophilic polymer has excellent cleanliness and is compatible with a wide range of solvents. It is the membrane of choice for ion chromatography applications.

Specifications

Membrane:	ICP Certified PES (PolyEtherSulfone)
Max. operating temperature:	100°C
Housing:	Medical grade, virgin polypropylene
Pre-filter:	Binder-free glass microfiber pre-filter (0.2 µm only)
Porosities:	0.2 µm, 0.45 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes

Applications

- IC sample preparation and analysis
- Dissolution testing

Chemical Incompatibilities

- Protein-based samples in aqueous solutions
- Concentrated acids, chloromethane, chloroform, hexane, acetone, MEK, THF, DMSO

Analysis results (ppb)

Analyte	Method detection level (ppb)	0.2µm PES	0.45µm PES
Bromide	< 100	< MDL	< MDL
Chloride	20	< MDL	< MDL
Fluoride	20	< MDL	< MDL
Nitrate as N	50	< MDL	< MDL
Orthophosphate as P	< 100	< MDL	< MDL
Sulfate	< 100	< MDL	< MDL
Barium	2	< MDL	< MDL
Calcium	10	39.9	58.9
Potassium	50	80	70
Magnesium	20	< MDL	< MDL
Sodium	20	80.6	63

Cellulose acetate

For filtering of aqueous solutions or biological samples.

- Hydrophilic membrane provides excellent flow rates and extremely low protein-binding coefficients
- Superior choice for biological assays, gel capsule dissolution testing, protein sample matrixes
- Recommended for aqueous HPLC

A physically strong membrane which can be used with heated liquids.

Specifications

Membrane:	HPLC certified cellulose acetate
Max. operating temperature:	110°C
Protein binding:	<24 µg/cm^2
Porosities:	0.2 µm, 0.45 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes

Applications

- Protein-based samples with high non-specific binding
- Sample analysis which require maximum recoveries

Chemical Incompatibilities

- Acids, NaOH, dichloromethane, chloroform, ketones, DMSO, THF

PTFE

Excellent chemical resistance for use with organic matrices.

- Naturally hydrophobic membrane provides excellent flow rates and high loading capacities
- Exceptional temperature stability
- Organic solvent recommended

PTFE syringe filters are applicable for filtration of gaseous or organic solvent-based samples. The natural hydrophobic membrane exhibits broad chemical resistance and unsurpassed temperature stability to address aggressive sample matrixes and extreme temperature situations. Due to the membrane's hydrophobic nature, PTFE filters can be utilized as a moisture barrier in venting applications.

PTFE membranes require pre-treatment with alcohol before being suitable for aqueous or high aqueous/organic samples. Do not use directly with aqueous solutions.

Specifications

Membrane:	HPLC certified PTFE, w/polypropylene support
Max. operating temperature:	110°C
Housing:	Medical grade, virgin polypropylene
Porosities:	0.2 µm, 0.45 µm, 1 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes

Applications

- HPLC and organic solvent sample preparation and clean up
- Dissolution sample analysis
- General sample preparation prior to analytical analysis
- Elevated temperature samples, caustic or acidic solutions

Chemical Incompatibilities

- Perchloric acid
- Methylene chloride (limited exposure)
- Dioxane, DMF, formic acid >50%
- Aqueous-based sample matrix (unless filter is pre-wetted with an alcohol)

Hydrophilic PTFE

Excellent chemical resistance for use with organic and aqueous matrices.

- Modified hydrophilic membrane provides excellent flow rates and high loading capacities
- Exceptional temperature stability up to 130°C
- Aqueous/organic solvent recommended

Hydrophilic PTFE (PTFE-L) syringe filters are applicable for filtration of gaseous or organic solvent-based samples. The modified membrane exhibits broad chemical resistance and unsurpassed temperature stability to address aggressive sample matrixes and extreme temperature situations.

Low protein binding membrane

The hydrophilic PTFE membranes are suitable for filtration of aqueous or highly aqueous/organic samples. There is no need for pre-treatment of the membrane prior to use with aqueous samples.

The membrane has extremely low levels of ionic extractibles and may be used for Ion chromatography analysis of inorganic and organic ions.

Specifications

Membrane:	HPLC certified Hydrophilic PTFE, w/polypropylene support
Max. operating temperature:	130°C
Housing:	Medical grade, virgin polypropylene
Porosities:	0.22 µm, 0.45 µm
Autoclave:	Sterilize at heat setting 121°C for 15 minutes

Applications

- HPLC aqueous and organic solvent sample preparation and clean up
- Dissolution sample analysis
- General sample preparation prior to analytical analysis
- Elevated temperature samples, caustic or acidic solutions

Chemical Incompatibilities

- Perchloric acid
- Methylene chloride (limited exposure)
- Dioxane, DMF, formic acid >50%

PVDF

Superior membrane quality for HPLC.

- Low non-specific binding with exceptional chemical resistance
- Hydrophilic membrane provides excellent flow rates and low binding coefficients
- Certified for chromatographic performance
- Compatible with a wide range of aqueous and organic-based sample environments
- Recommended for HPLC and UHPLC

PVDF syringe filters have a well defined pore structure, giving effective retention of particles without excessive pore blockage. Compatible with aqueous and most organic solvents. They are excellent general filters for HPLC and organic solvent sample clean up.

Specifications

Membrane:	HPLC certified PVDF
Max. operating temperature:	100°C
Housing:	Medical grade, virgin polypropylene
Pre-filter:	Binder-free glass microfiber 1 µm (0.2 µm only)
Porosities:	0.2 µm, 0.45 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes

Applications

- HPLC and organic solvent sample preparation and clean up
- Protein based samples with high non-specific binding
- Environmental water samples

Chemical Incompatibilities

- DMF, DMSO, MEK, acetone and most caustic solutions >6N

Regenerated cellulose

Superior chemical resistance, optimized for biological sample recoveries.

- Hydrophilic membrane provides excellent flow rates and extremely low binding coefficients
- Superior choice for biological assays, gel capsule dissolution testing, protein sample matrixes
- Compatible with a wide range of aqueous and organic-based sample environments
- Recommended for reverse phase and normal phase HPLC

Regenerated cellulose syringe filters are ideally suited for almost any laboratory procedure, from HPLC sample preparation to dissolution sample testing. Regenerated cellulose possesses superior chemical resistance in either aqueous or organic-based sample environments. Its extremely low biological-based binding coefficient is ideally suited for maximum sample recoveries of biological-based assays. Regenerated cellulose contains no binders, surfactants or wetting agents to assure minimal extractables in analytical procedures.

Specifications

Membrane:	HPLC certified regenerated cellulose
Protein binding:	<5 µg/cm^2
Porosities:	0.2 µm, 0.45 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes
Pre-filter (if fitted)	GMF 1 µm

Applications

- HPLC and organic solvent sample preparation and clean up
- Dissolution sample analysis, especially high-binding tablets or capsules
- Protein-based samples with high non-specific binding
- Sample analysis which require maximum recoveries
- Analysis requiring low non-specific binding over a wide pH range

Chemical Incompatibilities

- Sulfuric acid, hydrochloric acid, phosphoric acid or nitric acid >25%, DMF, phenol

Glass microfiber (GMF)

For large particulate removal.

- Increased sample throughput
- Low extraction neutral borosilicate glass
- For use with viscous or particle-laden samples

GMF filters are available in a range of porosities.

Specifications

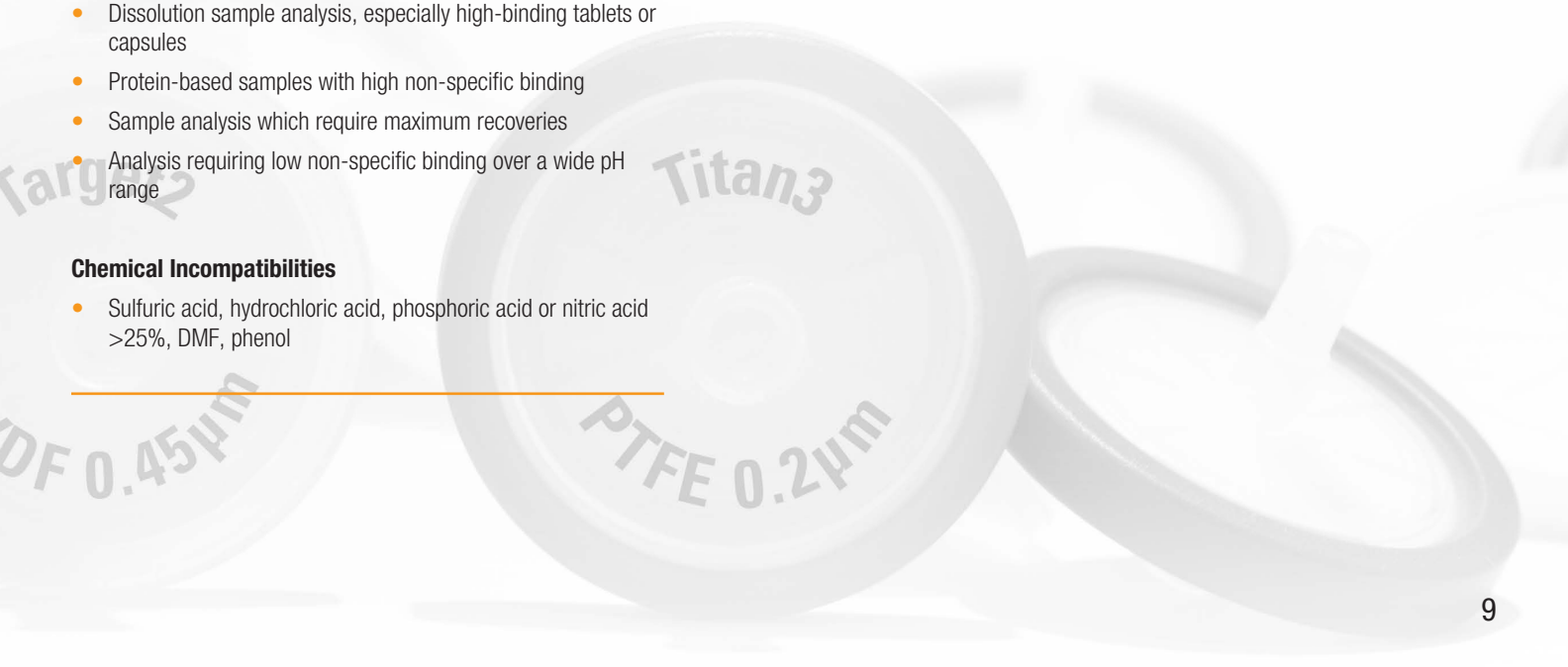
Membrane:	Binder free glass microfiber
Max. operating temperature:	110°C
Housing:	Medical grade, virgin polypropylene
Porosities:	0.7 µm, 1.2 µm, 3.1 µm
Autoclave:	Sterilize by dry heat at 121°C for 15 minutes

Applications

- Clarification
- Pre-filtering of suspensions

Chemical Incompatibilities

- Limited resistance with ammonia, NaOH and KOH solutions



Cross reference syringe filter units

	Thermo Scientific Titan3 Product code	Ring color	Thermo Scientific Target2 Product code
4 mm syringe filter 0.45 µm nylon	44504-NN	Transparent Green	F2504-1
4 mm syringe filter 0.2 µm polypropylene		N/A	F2504-10
4 mm syringe filter 0.45 µm cellulose acetate		N/A	F2504-15
4 mm syringe filter 0.2 µm cellulose acetate	44502-CA	Light Green	F2504-16
4 mm syringe filter 0.2 µm nylon	42204-NN	Opaque Medium Yellow	F2504-2
4 mm syringe filter 0.45 µm PTFE	44504-NP	Transparent Yellow	F2504-3
4 mm syringe filter 0.2 µm PTFE	42204-NP	Transparent Blue	F2504-4
4 mm syringe filter 0.45 µm PVDF	44504-PV	Red	F2504-5
4 mm syringe filter 0.2 µm PVDF	42204-PV	Black	F2504-6
4 mm syringe filter 0.45 µm regenerated cellulose	54504-RC	Light Brown	F2504-7
4 mm syringe filter 0.2 µm regenerated cellulose	52204-RC	Granite	F2504-8
4 mm syringe filter 0.45 µm polypropylene		N/A	F2504-9
17 mm syringe filter 0.45 µm nylon	44513-NN	Transparent Green	F2513-1
17 mm syringe filter 0.2 µm polypropylene	42213-PP	Royal Blue	F2513-10
17 mm syringe filter 0.45 µm PES for Ion chromatography	44513-PS	Orange/Yellow	F2513-14
17 mm syringe filter 0.45 µm cellulose acetate	44513-CA	Transparent Orange	F2513-15
17 mm syringe filter 0.2 µm cellulose acetate	42213-CA	Light Green	F2513-16
17 mm syringe filter 0.2 µm PES for Ion chromatography	42213-PS	Dark Gray	F2513-17
17 mm syringe filter 0.2 µm nylon	42213-NN	Light Purple	F2513-2
17 mm syringe filter 0.45 µm PTFE	44513-NP	Transparent Yellow	F2513-3
17 mm syringe filter 0.2 µm PTFE	42213-NP	Transparent Blue	F2513-4
17 mm syringe filter 0.45 µm hydrophilic PTFE	44513-NPL	Purple	
17 mm syringe filter 0.2 µm hydrophilic PTFE	42213-NPL	Green	
17 mm syringe filter 0.45 µm PVDF	44513-PV	Red	F2513-5
17 mm syringe filter 0.2 µm PVDF	42213-PV	Black	F2513-6
17 mm syringe filter 0.45 µm regenerated cellulose	54513-RC	Light Brown	F2513-7
17 mm syringe filter 0.2 µm regenerated cellulose	52213-RC	Granite	F2513-8
17 mm syringe filter 0.45 µm polypropylene	44513-PP	White	F2513-9
30 mm syringe filter 0.45 µm nylon with pre-filter	44525-NN	Transparent Green	F2500-1
30 mm syringe filter 0.2 µm polypropylene	42225-PP	Royal Blue	F2500-10
30 mm syringe filter 5.0 µm PTFE		N/A	F2500-11
30 mm syringe filter 1.25 µm nylon	41225-NN	Opaque Medium Yellow	F2500-12
30 mm syringe filter 1.0 µm PTFE	41025-NP	Dark Blue	F2500-13
30 mm syringe filter 0.45 µm PES for Ion chromatography	44525-PS	Orange/Yellow	F2500-14
30 mm syringe filter 0.45 µm cellulose acetate	44525-CA	Transparent Orange	F2500-15
30 mm syringe filter 0.2 µm cellulose acetate	42225-CA	Light Green	F2500-16
30 mm syringe filter 0.2 µm PES for Ion chromatography with pre-filter	42225-PS	Dark Gray	F2500-17
30 mm syringe filter 0.7 µm glass micro fiber	40725-GM	Amber	F2500-18
30 mm syringe filter 1.2 µm glass micro fiber	41225-GM	Orange	F2500-19
30 mm syringe filter 0.25 µm nylon	45025-NN	Pink	F2500-2
30 mm syringe filter 3.1 µm glass micro fiber	42725-GM	Dark Purple	F2500-20
30 mm syringe filter 0.45 µm PTFE with pre-filter	44525-NP	Transparent Yellow	F2500-3
30 mm syringe filter 0.2 µm PTFE with pre-filter	42225-NP	Transparent Blue	F2500-4
30 mm syringe filter 0.45 µm PVDF	44525-PV	Red	F2500-5
30 mm syringe filter 0.45 µm nylon	44526-NN	White	F2500-50
30 mm syringe filter 0.2 µm PVDF	42225-PV	Black	F2500-6
30 mm syringe filter 0.45 µm regenerated cellulose	54525-RC	Light Brown	F2500-7
30 mm syringe filter 0.2 µm regenerated cellulose	52225-RC	Granite	F2500-8
30 mm syringe filter 0.45 µm polypropylene	44525-PP	White	F2500-9
30 mm syringe filter 0.45 µm nylon	44525-NN	Transparent Green	F2502-1
30 mm syringe filter 0.2 µm nylon	42225-NN	Light Purple	F2502-2
30 mm syringe filter 0.20 µm polypropylene	42225-PP	Royal Blue	F2502-10
30 mm syringe filter 0.45 µm PTFE	44525-NP	Transparent Yellow	F2502-3
30 mm syringe filter 0.45 µm hydrophilic PTFE	44525-NPL	Purple	
30 mm syringe filter 0.2 µm hydrophilic PTFE	42225-NPL	Green	
30 mm syringe filter 0.45 µm polypropylene	44525-PP	White	F2502-9

Alternative parts are based on a direct technical comparison.

Part number alternatives are based upon closest pack quantity.

Inclusion of parts is no guarantee of identical performance.

GE Healthcare/Whatman	GE Healthcare/Whatman		Millipore	PALL	Sartorius
GD/X	**Puradisc**	**Spartan**	**Millex**	**Acrodisc**	**Minisart**
	6789-0404		SLHNR04NL	4484	
	6788-0402				
	6789-0402		SLGNR04NL		
	6783-0404		SLFHR04NL	4472	17820-K
	6783-0402		SLFGR04NL		17573-K2
	6779-0404		SLHVR04NL		
	6779-0402		SLGVR04NL	4415	
					17822-K
					17821-K
	6788-0404				
6870-1304	6789-1304		SLHN013NL	4426	17762-K
	6788-1302			4567	
	6782-1304				
6880-1304					
6880-1302					
6876-1302	6782-1302				
6870-1302	6789-1302		SLGN013NL	4427	1776B-K
6874-1304	6783-1304		SLFH013NL	4422	17574-K
6874-1302	6783-1302		SLFG013NL	4423	
			SLCRT13NL		
			SLLGH13NK	MS-3301	
6872-1304	6779-1304		SLHV013NL	4457	
6872-1302	6779-1302		SLGV013NL	4455	
					17762-K
					17761-N
6784-1304	6788-1304			4563	
6870-2504	6750-2502	6710-2504	SLHN025NS	4438	1784C-K
6785-2502				4564	
6878-2504	6780-2504	6716-2504	SLHP033NS	4584	
6880-2504					17598-K
6880-2502					17597-K
6878-2502	6780-2502		SLGP033NS		
6890-2507					
6886-2512					
6870-2502	6750-2502		SLGN025NS	4436	1784B-K
6888-2527					
6874-2504	6784-2504	6714-2504	SLFH025NS	4219	17576-K
6874-2502	6784-2502		SLFG025NS	4225	17575-S
6872-2504		6712-2504	SLHV033NS	4408	
6872-2502			SLGV025NB	4406	
					17765-K
					17764-S
		6718-2504		4560	
6870-2504				4549	
6871-2502				4436	1784B-K
6878-2502				4307	
6874-2504				4303	
			SLCR025NB		
			SLLGDZ5NK	MS-3201	
6878-2504				4559	

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for Chromatographers

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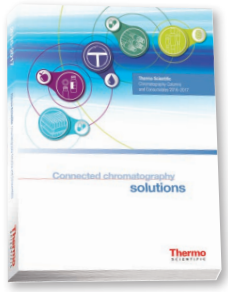

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