# **Filtration Products**

#### Why need for filtration

Sample and mobile phase filtration are simple, economical practices to extend the life of chromatography consumable. A basic HPLC system consists of solvent reservoir, pump,injector, column, detector, and data recording system. Particles and microbial not removed by filtration interfere with nearly every system component.

#### Mobile phase filtration

Mobile phase filtration can reduce the possibility of sieve blockage, accessories pollution, valve damage, capillary occlusion, peak distortion, and the occurrence of interfering peaks and baseline noise.

#### Protection for pump

Pump is the most important single component of the HPLC system, the most common problem include check valves, pump seals, blockage, and air bubbles. Incorrect pump functioning results in increased baseline noise, irreproducible retention times and increased operating pressures. Check valves control the solvent flow direction through the pump head and ensure steady pressures when sealed properly. Particle in check valves can leak or stick causing flow and/or pressure problems. A pump seal facilitates piston movement in the pump head. Pump seals wear more quickly than other pump parts, and therefore require changing every three to six months. A failing pump seal is evident from an inability to pump at high pressures, leakage behind the pump head, and changing in sample retention. Pump seal wear can result in sloughing seals and contamination from this material.

Buffer crystals built up from evaporated mobile phase also will accelerate wear. Pump seal life can be extended by filtering the mobile phase solvents to remove the particles responsible for accelerated seal wear.

#### **Protection for injector**

The rotor and the stator rotates when injector valve working, the micro-channels on the surface converse to achieve the LOAD and INJECT function. The existence of particles may damage the surface, then results leak or blockage. Loop may be blocked, and it results in high back pressure, loop filling difficulty, and peak area decrease. Particulate-free samples are essential for auto samplers to decrease blocked sample needles. Sample, mobile phase and in-line filtration are efficient protection for injector and column.



#### In-line filters and guard columns

In-line filters are ideal because it is impossible to avoid particulate from system wear, such as polymeric seal wear from the pump and sample injector, except with an in-line filter. The normal pore hole of removable frits of in-line filters are  $0.5 \mu m$  and  $2.0 \mu m$ .

Guard columns can collect chemical and physical waste that block the main column inlet, cause column voids and degrade performance. The guard column retains irreversible and strongly retained components that degrade the column and decrease its lifetime, providing an inexpensive alternative to frequent column replacement. The frits of a guard column are typically 2.0  $\mu$ m, which is not sufficient for particulate removal. Sample and mobile phase filtration will preserve the capacity of the guard column for its intended use: chemical contamination removal.

#### Columns

Significant problems with HPLC columns are chemical absorption, blocked frits and channel voids. Chemical changes are prevented with guard columns. Voids are created by particulate matter and pressure shock. If poor peak shapes become evident by badly tailing and splitting, without a change in retention time, blocked frits or a column void has occurred.

Daily maintenances commented to protect columns and whole system include: 1.Filtering solvents through filter membrane.

- 2. Filtering samples through syringe filter.
- 3.Utilizing a 0.5 µm in-line filter to trap injector and pump particulates.

#### Quality assurance for anpel&cnw membranes and syringe filters

#### Manufacturing environment

ANPEL&CNW membranes and syringe filters are made in cleanroom. We strictly follow ISO9000 quality standard system.



#### Quality control

ANPEL&CNW filtration products undergo many quality control tests to assure the quality stability. The quality control tests include visual examination, HPLC certification, bubble point test, maximum operating pressure test, liquid flow rate and hold-up volume, etc.

#### Hplc certified (uv detector for extractables)

HPLC certification intends to evaluate the UV-detectable extractives of ANPEL&CNW filtration products in methanol and water, to ensure that analytical results will not be compromised by extractable filter materials. Methanol or water is passed through each individual syringe filter or membrane, and a first 2mL eluted sample is collected and subjected to HPLC analysis at 214 nm and 254nm, using a mobile phase of 70:30 (v/v) acetonitrile: water, then compared to a blank of methanol or water.

HPLC Conditions: Sample 2 mL Metha Column: Athena C11 Flow Rate: 1 5 mL m Detector: UV 254 en Mobile Phase: 70 30 Temperature: 40.0 L Hypecton Volume: 10	anol filtered 1, 4, 8= 150 mm, vin d 214 mm (viv) Acetonityliel Wiater glu
Chromatographic 1. Methanol blank 2. Methanol filtered	Mentification





#### **Bubble point**

The bubble point test is to confirm pore size and integrity of the membrane seal. A bubble point is the measure of the amount of air pressure required to force an air bubble through a wetted pore and is in inverse proportion to the size of the hole, the larger the pore, the less pressure required to form the bubble, and it relates to the surface tension of the liquid wetted the membrane. First, the membranes must be completely wetted, PES, Nylon, Hydrophilic PTFE and Hydrophilic PVDF membranes should be wetted with water, while Hydrophobic PTFE and Hydrophobic PVDF membranes should be wetted with absolute ethyl alcohol. Then the air pressure is slowly increased until a steady stream of bubbles is observed downstream of the filter. This pressure is recorded as the bubble point, it is expressed in psi, bar, etc.

#### Bubble point of different materials

Membrane Material	Bubble Point (Mpa)
Nylon	0.3
PES	0.2
PTFE	0.08
PVDF	0.09

#### Maximum operation pressure

Each batch of syringe filters must undergo maximum operating pressure test to ensure the syringe filter housings will not rupture at the pressure of xxx psi.

#### COA MODEL

#### Liquid flow rate

Liquid flow-rate tests are performed to ensure that ANPEL&CNW filtration product meets minimum specified flow-rate. Different materials have different flow rate: PES  $\geq$  27mL/min.

#### Hold-up volume

The objective of this test is to evaluate the amount of water (for PES, Nvlon, Hvdrophilic PTFE and Hvdrophilic PVDF membranes) or Absolute ethyl alcohol (for Hydrophobic PTFE and Hydrophobic PVDF membranes) remaining in the unit after performing an air flush at a pressure below the bubble point (dead volume) and above the bubble point (hold up volume). The filter unit is weighed dry before the test, then filled with water or Absolute ethyl alcohol using a syringe, ensuring that both the female (inlet) and male (outlet) Luer fittings are filled with fluid. The units are then weighed again. The fluid in the female Luer inlet fitting is expelled using the air from a dry syringe, without exceeding the bubble point, and the units are weighed again. Finally, the units are wetted again using another water or methanol filled syringe, then purged with air from a dry syringe. The air is passed through the filter unit for a few seconds, in order to drive the fluid out of the filter unit and the male Luer outlet fitting. The units are wiped dry, then weighed. The weight of the dry unit is subtracted from weight of the unit after the final flush to obtain the hold-up volume.

Specification: Less than or equal to 100 µL hold up volume

#### **Certificate of Analysis**

PRECLEAN 13mm Syringe Filter, Nylon membrane, 0.22µm, Green Part Number: 2.CF2102.0001 Lot Number: 2G020150

Properties	Results	Properties	Results
Membrane material	Nylon	Pore Size (µm)	0.22
Wettability	Hydrophilic	Filtration Area(cm <sup>2</sup> )	0.83
Thickness (mm)	0.06	Housing Material Cleanliness Test	Pass
Housing Material	Polypropylene	Volume Throughput (mL)	<10
Hold-Up Volume (µL)	<25	Maximum Operating Pressure (psi)	90
Inlet/Outlet	Female luer lock/Male luer silp	Bubble Point (Mpa)	0.32
Test Liquid	Pure Water		
	Chromatogra	aphy Test	
Flow Rate: 1.5 mL/min Detector: UV 254 and 214 nm Mobile Phase: 70:30 (v/v) Aceto Temperature: 40.0°C Injection Volume: 10 μL <b>Chromatographic Identificat</b> 1. Methanol blank 2. Methanol filtered	nitrilel /Water	25	4nm 1 2

Quality Control Supervisor

Approval Date

#### How to choose a filter

#### **Filter Chemical Compatibility**

Different materials have different chemical tolerance, The primary concern when choosing a solvent filter is solvent compatibility with the filter material.

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C = Compatible
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- IC = Not compatible
- Not analyzed =

o compatible		Ve,			à			
LC = Limited compa	tibility	Jeth,	ø	<sup>6</sup> ne	etate te	D	e	<sup>ib</sup> er
IC = Not compatible	e i	20m	loer,	Sul	Tit a	die .	Mer	Stoff
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SOLVENT	4 DTEE		للا DES				CME	
SOLVEINI	FIFL	FVDF		S	nu	- FF	GIMF	NyIOITO
Acetic Glacial	С	С	C		С	С	С	LC
Acetic acid, 90%	C	C	C	*	*	C	C	*
Acetic, 25%	C	C	C	*	С	C	C	С
Acetic acid, 10%	C	C	C	LC	*	C	C	*
Hydrochloric,	С	С	С	IC	IC	С	С	IC
Hydrochloric 25%	C	C	C	*	IC	C	C	IC
Hydrochloric acid, 1N (3.3%)	C	C	C	*	*	C	C	IC
Sulfuric, Concentrated	С	IC	IC	IC	IC	С	С	IC
Sulfuric, 25%	С	IC	IC	IC	IC	С	С	IC
Nitric, Concentrated	С	IC	IC	IC	С	С	LC	IC
Nitric, 25%	С	С	IC	IC	С	С	LC	IC
Phosphoric, 25%	С	*	*	С	LC	С	*	IC
Formic, 25%	С	*	*	LC	С	С	С	IC
Trichloroacetic, 10%	С	*	*	С	С	С	*	IC
Citric acid	С	С	С	С	С	*	С	LC
Hydrofluoric acid	С	С	*	*	IC	LC	IC	IC
Boric Acid	С	С	С	С	С	С	С	LC
		A	LCOH	OLS				
Methanol	С	С	С	IC	С	С	С	С
Ethanol	С	С	С	IC	С	С	С	С
Ethanol, 70%	С	С	С	С	С	С	С	LC
Isopropanol	С	С	С	С	С	С	С	С
n-Propanol	С	С	С	С	С	С	С	С
Amyl Alcohol (Butanol)	С	С	С	LC	С	С	С	С
Benzyl Alcohol	С	С	IC	IC	С	С	IC	LC
Ethylene Glycol	С	С	С	С	С	С	С	С
Propylene Glycol	С	С	С	LC	С	С	С	С
Glycerol	С	С	С	С	С	С	С	С
Isobutyl alcohol	С	С	*	С	С	С	С	С
		/	ALKAL	IES				
Ammonium	С	LC	С	С	LC	С	с	С
Sodium Hydroxide, 3N	С	IC	С	IC	LC	С	IC	LC
Sodium hydroxide, 6N (22%)	С	IC	С	IC	IC	С	IC	IC
Potassium hydroxide_3N (15%)	С	IC	С	IC	*	С	IC	IC
		AMINE	SAND	) AMID	FS			
Dimethyl Formamide	С	IC	IC	IC	LC	С	С	С
Diethvlacetamide	C	*	*	IC	С	*	C	LC
Triethanolamine	C	*	*	C	C	*	*	C
Aniline	С	*	*	IC	С	*	*	С
Pyridine	С	IC	IC	IC	С	IC	С	*
Acetonitrile	С	С	LC	IC	С	С	С	С
			ESTE	RS				
Ethyl Acetate/ Methyl Acetate	С	С	IC	IC	С	LC	С	С
Amyl Acetate/Butyl Acetate	С	IC	IC	LC	С	LC	С	С
Propyl Acetate	С	IC	IC	LC	С	LC	*	С
Propylene Glycol Acetate	С	*	IC	IC	С	С	*	*
2-Ethoxyethyl Acetate	C	*	IC	LC	С	*	*	*

chemical compatibility table

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		affilia Lice	И <sup>ю</sup>	ers,	2 mil	6	ňa	lich 3
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SOLVENT	PTFE	PVDF	PES	CA/CN	RC	PP	GMF	Nvlon 6
Methyl Cellusolve	С	*	IC	IC	С	С	С	*
Benzvl Benzoate	C	*	IC	C	C	*	*	С
Isopropyl Myristate	С	*	IC	C	С	*	*	C
Tricresyl Phosphate	С	*	IC	C	С	*	*	*
,	HALO	GENAT	ED HY	DROC	ARBO	NS		
Methylene Chloride	С	С	IC	IC	С	LC	С	LC
Chloroform	С	С	IC	IC	С	LC	С	С
Trichloroethylene	С	С	С	С	С	С	С	С
Chlorobenzene	С	С	LC	С	С	С	С	С
Freon <sup>®</sup>	С	С	LC	С	С	С	С	С
Carbon Tetrachloride	С	С	IC	LC	С	LC	С	С
Butyl chloride	С	С	*	С	*	IC	С	IC
· ·		HYD	ROCA	RBONS	3			
Hexane/Xylene	С	С	IC	С	С	IC	С	С
Toluene/Benzene	С	С	IC	С	С	IC	С	С
Kerosene/Gasoline	С	С	LC	С	С	LC	*	С
Tetralin/Decalin	С	С	*	С	С	*	*	*
Nitrobenzene	С	С	IC	С	С	С	С	LC
Cyclohexane	С	С	IC	С	С	С	С	LC
Trichloroethane	С	С	С	С	С	С	С	С
Trichloroethylene	С	С	IC	С	С	С	С	IC
Perchloro Ethylene	С	С	IC	С	С	С	С	С
	С	С	IC	С	С	IC	С	С
		ł	KETON	IES				
Acetone	С	IC	IC	IC	С	С	С	С
Cyclohexanone	С	IC	IC	IC	С	С	С	С
Methyl Ethyl Ketone	С	LC	IC	IC	С	LC	С	С
Isopropylacetone	С	IC	IC	С	С	*	С	С
Methyl Isobutyl Ketone	С	LC	IC	*	С	LC	С	*
		ORG	ANIC (	DXIDE	S			
Ethyl Ether	С	С	С	С	С	LC	*	С
Dioxane	С	LC	IC	IC	С	С	С	С
Tetrahydrofuran	С	LC	IC	IC	С	С	С	С
Triethanolamine	С	*	*	С	С	*	*	С
Dimethylsulfoxide (DMSO)	С	IC	IC	IC	С	с	С	С
Isopropyl Ether	С	С	С	С	С	С	*	*
		MISC	CELLA	NEOUS	S			
Phenol,Aqueous Solution,10%	С	LC	IC	IC	IC	С	С	*
Formaldehyde Aqueous Solution,30%	С	С	С	С	LC	С	С	С
HydrogenPeroxide,30%	С	*	*	С	С	*	*	С
SiliconeOil/MineralOil	С	С	С	С	С	С	С	*

This chart is intended only as a guide. We recommend that you confirm compatibility with the liquid you want to filter by performing a trial filtration run before you start your actual filtration.

This information was developed from technical publications, materials suppliers, laboratory tests, and field evaluations, etc., and is believed to be accurate and reliable. However, because of variability in temperature, concentrations, exposure time, and other factors outside of our control that may affect the use of the unit, we do not provide or imply a warranty with respect to such information. Users should verify chemical compatibility with a specific filter under actual use conditions.

ANPEL



#### **Effective Filtration Area**

Increasing the effective filtration area can lengthen the life of a filter.

#### **Optimal Pore Size Rating**

When an HPLC column has a packing size of 3  $\mu m$  or smaller,you should use a 0.2  $\mu m$  filter because a 0.45  $\mu m$  filter may let particles through that will plug the column.

#### **Throughput & Flow Rate**

Choose suitable product according to different materials and diameter s to meet the required volume capacity and flow rate.

#### **Hold-up Volume**

Filtration Volume	Diameter	Hold-up Volume
10mL	13mm	25µL
120mL	25mm	100uL

#### Surface Tension

Choose suitable membrane material according to the hydrophobic and hydrophilic of solvents, to avoid the filtration resistance is too large.

#### **Extractables**

A syringe tip filter extractable may be a membrane or housing formulation component, or a component introduced during the manufacturing or packaging process. There are several mechanisms (solubility, particle displacement, chemical interaction, and diffusion) whereby extractable materials may leach into the sample during sample preparation. The polymeric resins, solvents, pore formers and other chemical components such as housing materials utilized during device manufacturing may potentially extract. Solubility relates to chemical compatibility. As membrane and/or housing components become more soluble with sample fluid components, extractable materials will increase. To determine whether a syringe filter is compatible with the sample fluid, all sample constituents (both major and minor components) require consideration. Because solubility is dependent on temperature, concentration, and exposure time, all of these parameters are significant in determining chemical compatibility.

If the sample volume is enough, a first 3 -5mL flush can be discarded to reduce extractables to an acceptable level.

#### Adsorption

Unwanted adsorption as well as the presence of possible extractables eluted from the filter during routine pharmaceutical sample analysis can be a serious problem to the results. No single analytical method can provide reliable information on comparative filter properties and the full range of extractables for all filters. We suggest you consider the adsorption when choosing the syringe filters to ensure the HPLC analysis result.

#### Applications for reference

HPLC, UHPLC, LC/MS	Polyethersulfone, PTFE (Hydrophilic & Hydrophobic)
GC	Nylon, PTFE(Hydrophobic)
ICP-MS	PTFE(Hydrophilic)
CE	Nylon
Organic Solvents	PTFE(Hydrophobic), Nylon
Culture Media	PES, PVDF(Hydrophilic)
Protein Sequencing, Western Blot	PVDF(Hydrophobic)
High Particulate Loaded Samples -Organic Phase	Welded PTFE (Hydrophobic), with prefiltration
High Particulate Loaded Samples -Aqueous Phase	Welded PTFE (Hydrophilic), Welded Nylon

#### Instructions for use& Cautions

- Before filling with sample, draw approximately 1 mL air into the syringe. This will minimize fluid retention.
- Draw your sample into the syringe, then connect the syringe to the syringe filter using a luer connection. Twist gently to ensure a secure seal.



- Filter syringe contents into a vial. Afterwards, remove the syringe filter, draw air into the syringe, re-attach the syringe filter, and press the plunger to filter the residual sample. This will maximize sample recovery.
- 4. Use caution with syringes smaller than 10mL, otherwise the pressure they generated may exceed the maximum operating pressure.
- ANPEL&CNW filtration products are disposable consumables, and not recommended for reuse.

#### **Product Introduction:**

#### **Material Features**

Polyethersulfone(PES): Hydrophilic membranes, high flow rate and high throughputs, low protein binding, low in extractables, and can be used to remove small particles, bacteria, viruses and fungi from aqueous phase. Normally used with pH range 3-12.

Nylon: Excellent chemical stability and flexibility, durable, hard to tear, can be sterilized in 121 °C. Suitable for filtration of aqueous and most organic solvents, such as the water filtration of electronic, microelectronic, semiconductor industry, and also the filtration of culture media, drugs, drinks, and high-purity chemical. Normally used with pH range 3-14.

Hydrophobic Polytetrafluoroethylene (PTFE): Broad solvent chemical compatibility, excellent particle retention, and compatibility with various sterilizing methods. Suitable for both liquid and gas filtration. Normally used with pH range 1-14.

Hydrophobic Polyvinylidene fluoride (PVDF): High mechanical and tensile strength, and have broad chemical and temperature resistance. Not suitable for the filtration of acetone, DMSO, THF, etc. suitable for the filtration of gas, steam and high temperature liquids. Normally used with pH range 2-13.

Hydrophilic Polytetrafluoroethylene (PTFE): Broad chemical resistance, excellent particle retention, and compatibility with various sterilizing methods. Suitable for the filtration of aggressive organic solvents, water solution containing strong acids or alkalis, and mixed solution of both. Normally used with pH range 1-14.

Hydrophilic Polyvinylidene fluoride (PVDF): Low protein binding, and have broad chemical and temperature resistance. The chemical compatibility of the membrane includes aggressive acids and alcohols. We do not recommend using this membrane for the filtration of acetone, DMSO, or bases > 6N. The filtration of dilute protein samples is recommended. Normally used with pH range 2-13.

#### **Welded Syringe Filters**



# CN

#### The advantage of welded syringe filters.

In comparison to an un-welded filter (figure 2), welded syringe filter (figure 1), which membrane and housing are weld together, can prevent bursting, ensure sample integrity, and guarantee better filtration effect.

If the solution is viscous and muddy, the pressure is too high to extrude sample out of the housing, see figure 3, while this cannot happen using welded syringe filter.

### **Filtration products**

Desci	ribtior

Sample Preparation

Description	Packaging	Cat. No.
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PET jar	2.CF1101.0001
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PE bag	2.CF1101.B001
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.22 µm, yellow	100 pcs per PET jar	2.CF1102.0001
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.22 µm, yellow	100 pcs per PE bag	2.CF1102.B001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PET jar	2.CF1201.0001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PE bag	2.CF1201.B001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.20 µm, yellow	100 pcs per PET jar	2.CF1202.0001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.20 µm, yellow	100 pcs per PE bag	2.CF1202.B001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PET jar	2.CF2101.0001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PE bag	2.CF2101.B001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.22 µm, green	100 pcs per PET jar	2.CF2102.0001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.22 µm, green	100 pcs per PE bag	2.CF2102.B001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PET jar	2.CF2201.0001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PE bag	2.CF2201.B001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.20 µm, green	100 pcs per PET jar	2.CF2202.0001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.20 µm, green	100 pcs per PE bag	2.CF2202.B001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PET jar	2.CF3101.0001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PE bag	2.CF3101.B001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.22 um, purple	100 pcs per PET jar	2.CF3102.0001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.22 um, purple	100 pcs per PE bag	2.CF3102.B001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PET jar	2.CF3201.0001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PE bag	2.CF3201.B001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.2 um, purple	100 pcs per PET jar	2.CF3202.0001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.2 um, purple	100 pcs per PE bag	2.CF3202.B001
PRECLEANTM 13mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PET jar	2.CF4101.0001
PRECLEANTM 13mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PE bag	2.CF4101.B001
PRECLEANTM 13 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PET jar	2.CF4102.0001
PRECLEANTM 13 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PE bag	2.CF4102.B001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PET jar	2.CF4201.0001
PRECLEAN I M 25 mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PE bag	2.CF4201.B001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PET jar	2.CF4202.0001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PE bag	2.CF4202.B001
PRECLEAN I M 13mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PET jar	2.CF5101.0001
PRECLEAN I M 13mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PE bag	2.CF5101.B001
PRECLEAN I M 13 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PET jar	2.CF5102.0001
PRECLEAN I M 13 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PE bag	2.CF5102.B001
PRECLEAN I M 25 mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PET jar	2.CF5201.0001
PRECLEAN I M 25 mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PE bag	2.CF5201.B001
PRECLEAN I M 25 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PET jar	2.CF5202.0001
PRECLEAN I M 25 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PE bag	2.CF5202.B001
PRECLEAN I M 13mm Syringe Filter, welded, PTFE membrane(Hydrophilic), 0.45µm, pink	100 pcs per PE bag	2.EF6101.0001
PRECLEAN IM 13mm Syringe Filter, welded, PTFE membrane(Hydrophilic), 0.22 µm, golden	100 pcs per PE bag	2.EF6102.0001
PRECLEAN IM 25mm Syringe Filter, welded, PTFE membrane(Hydrophilic), 0.45µm, pink	100 pcs per PE bag	2.EF6201.0001
PRECLEAN IM 25mm Syringe Filter, welded, PTFE membrane(Hydrophilic), 0.22 µm, golden	100 pcs per PE bag	2.EF6202.0001
PRECLEAN IN ISTIM Syringe Filter, weided, PVDF membrane(Hydrophilic), 0.45 µm, gray	100 pcs per PE bag	2.EF/101.0001
PRECLEAN I M 13 mm Syringe Filter, welded, PVDF membrane(Hydrophilic), 0.22 µm, brown	TUU pcs per PE bag	2.EF/102.0001



# **Filtration Products**

Description	Packaging	Cat. No.
PRECLEANTM 25mm Syringe Filter, welded, PVDF membrane(Hydrophilic), 0.45 µm, gray	100 pcs per PE bag	2.EF7201.0001
PRECLEANTM 25 mm Syringe Filter, welded, PVDF membrane(Hydrophilic), 0.22 µm, brown	100 pcs per PE bag	2.EF7202.0001
PRECLEANTM 13mm Syringe Filter, with prefiltration layer, PTFE membrane(Hydrophilic), 0.45µm, pink	100 pcs per PET jar	2.CF6101.D001
PRECLEANTM 13mm Syringe Filter, with prefiltration layer, PTFE membrane(Hydrophilic), 0.22 µm, golden	100 pcs per PET jar	2.CF6102.D001
PRECLEANTM 25mm Syringe Filter, with prefiltration layer, PTFE membrane(Hydrophilic), 0.45µm, pink	100 pcs per PET jar	2.CF6201.D001
PRECLEANTM 25mm Syringe Filter, with prefiltration layer, PTFE membrane(Hydrophilic), 0.22µm, golden	100 pcs per PET jar	2.CF6202.D001

# Membranes



The green papers between the membranes can avoid franklinism.

High-quality membranes undergo several tests, such as bubble point, back ground, flow rate or volume throughput, to ensure the quality.

#### Cautions:

- 1. When using two-layer membrane, the face should be upward and the back should be downward. The film is just a support of membrane. If reversed, the membrane is without support, so it is easy to break, and can't withstand pressure.
- 2. When filter aqueous solution by organic membranes, before use, the membranes can be wetted by organic solvent such as ethanol first, and then rinsed by clean water.

Description	Packaging	Cat.No.
Polyethersulfone(PES) Membrane,47mm,0.45µm	100 pcs per box	2.CM0111.0001
Polyethersulfone(PES) Membrane,47mm,0.22µm	100 pcs per box	2.CM0112.0001
Nylon Membrane,47mm,0.45µm	100 pcs per box	2.CM0211.0001
Nylon Membrane,47mm,0.22µm	100 pcs per box	2.CM0212.0001
Nylon Membrane,25mm,0.45µm	200 pcs per box	2.CM0221.0001
Nylon Membrane,25mm,0.22µm	200 pcs per box	2.CM0222.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.45µm	50 pcs per box	2.CM0311.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.22µm	50 pcs per box	2.CM0312.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.45µm	100 pcs per box	2.CM0321.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.22µm	100 pcs per box	2.CM0322.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,47mm,0.45µm	50 pcs per box	2.CM0411.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,47mm,0.22µm	50 pcs per box	2.CM0412.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,25mm,0.45µm	100 pcs per box	2.CM0421.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,25mm,0.22µm	100 pcs per box	2.CM0422.0001
Polypropylene(PP) Membrane,47mm,0.45µm	50 pcs per box	2.CM0511.0001
Polypropylene(PP) Membrane,47mm,0.22µm	50 pcs per box	2.CM0512.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.45µm	50 pcs per box	2.CM0611.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.22µm	50 pcs per box	2.CM0612.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.45µm	100 pcs per box	2.CM0621.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.22µm	100 pcs per box	2.CM0622.0001
Hydrophilic polyvinylidene fluoride(PVDF) Membrane,47mm,0.45µm	50 pcs per box	2.CM0711.0001
Hydrophilic polyvinylidene fluoride(PVDF) Membrane,47mm,0.22µm	50 pcs per box	2.CM0712.0001
Mixed Cellulose Ester(MCE) Membrane,47mm,0.45µm	100 pcs per box	2.CM0811.0001
Mixed Cellulose Ester(MCE) Membrane,47mm,0.22µm	100 pcs per box	2.CM0812.0001
Mixed Cellulose Ester(MCE) Membrane,25mm,0.45µm	200 pcs per box	2.CM0821.0001
Mixed Cellulose Ester(MCE) Membrane,25mm,0.22µm	200 pcs per box	2.CM0822.0001