

# THE CATALOGUE OF FILTER PRODUCTS

www.anpel.com.cn 2015/2016



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ANPEL Laboratory Technologies (Shanghai) Inc.



**中国领先的实验用品供应链管理服务商**  
The leading Laboratory Consumable SCM Service Provider in China

# FILTER PRODUCTS

## THE CATELOGUE OF ANPEL FILTER PRODUCTS

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## Why need to filter

Filter is a routine measure increase chromatography consumable parts of life, simple and economic and effective. Basic HPLC solvent system including pool, pump, injector valve, chromatographic column, detector, and data recording system. Particulate matter and the growth of microorganisms, if cannot be effectively remove by filtering, can cause interference to almost every system accessories.

### Filter the mobile phase

Through filter the mobile phase, can reduce the pollution of the sieve plate column clogging, fittings, pump valve damage, capillary congestion, poor peak deformation, impurity peak production and increase the possibility of noise.

### Protect the pump

The pump is the most important single HPLC system components, common problems including the one-way valve, pump seal, blocking and bubbles. These problems maybe caused the baseline noise increases, lead to retention time don't return and pressure. Solvent through the pump head in the direction of the one-way valve control, and ensure the stability of the pressure. The presence of particulate matter can make check valve leakage, affect the flow rate and pressure. Then the pump seal has been in a consumption and wear, relative to other accessories are more likely to loss, has to be replaced every three to six months. If the gasket appear problem, cannot provide system with high pressure pump, pump head leakage, retention time will change. And washer clastic also can produce pollution to the system. If mobile phase evaporation causes buffer salt, will accelerate pump seal wear. So, that is why filter the mobile phase can increase the life of the pump seal.



### Protect the injection valve

When the sampling valve work, valve rotating between stator and rotor surface, prompting micro channels on the surface of the conversion between, so as to realize the function of the LOAD and INJECT. The presence of particulate matter can lead to damage in the process of rotating surface design, lead to leakage or blocked. Quantitative ring may be blocked, the system pressure, difficult to sample, peak area. For automatic sampler, ensure samples without particles is very important to prevent plugging needle. Samples and mobile phase filter and filter online is the injection valve and the effective maintenance of chromatographic column.



### In-line filters vs guard column

In-line filter is the very ideal means of protection, because the system of wear is inevitable, such as pump seal, sampling valve seal wear caused by the fragment. General inline filters can change the sieve plate is 0.5  $\mu$ m and 2  $\mu$ m pore size.

Guard column can hold on the chemicals and particulate matter which can blocking the sieve plate of the columns or caused the column bed collapse and efficiency decline. To protect column to the strong retention and irreversible adsorption of compounds to intercept down, but the 2  $\mu$ m sieve plate lacks enough to remove particulate matter. Samples and mobile phase filter can maintain to protect column adsorption capacity of chemical pollutants can longer maintenance efficiency.

### Chromatographic column

Chromatographic columns mainly problem is chemical adsorption, particulate clogging and column bed collapse. Chemical adsorption can be protect by using guard column. Column bed collapse may be dissolved by the packing or pressure increases suddenly. If the peak shape serious trailing, divided, and retention time hasn't changed, so might be sieve plate blocked or stigma collapse.

**In order to protect the chromatographic column and system, the recommended daily maintenance:**

1. Filter the mobile phase using the filter membrane
2. Filter the samples using the syringe filters
3. Using 0.5  $\mu$ m in-line filters to intercept the particulate matter before sampling valve and pump

## How to choose and use the 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.

#### Chemical compatibility table

C = Compatible

LC = Limited compatibility

IC = Not compatible

\* = Not analyzed

| SOLVENT                          | PTFE | PVDF | PES | CA/<br>CN | RC | PP | GMF | Nylon 6 |
|----------------------------------|------|------|-----|-----------|----|----|-----|---------|
| <b>ACIDS</b>                     |      |      |     |           |    |    |     |         |
| Acetic, Glacial                  | C    | C    | C   | IC        | C  | C  | C   | LC      |
| Acetic acid, 90%                 | C    | C    | C   | *         | *  | C  | C   | *       |
| Acetic acid, 25%                 | C    | C    | C   | *         | C  | C  | C   | C       |
| Acetic acid, 10%                 | C    | C    | C   | LC        | *  | C  | C   | *       |
| Hydrochloric, Concentrated       | C    | C    | C   | IC        | IC | C  | C   | IC      |
| Hydrochloric, 25%                | C    | C    | C   | *         | IC | C  | C   | IC      |
| Hydrochloric acid, 1N (3.3%)     | C    | C    | C   | *         | *  | C  | C   | IC      |
| Sulfuric, Concentrated           | C    | IC   | IC  | IC        | IC | C  | C   | IC      |
| Sulfuric, 25%                    | C    | IC   | IC  | IC        | IC | C  | C   | IC      |
| Nitric, Concentrated             | C    | IC   | IC  | IC        | C  | C  | LC  | IC      |
| Nitric acid, 25%                 | C    | C    | IC  | IC        | C  | C  | LC  | IC      |
| Phosphoric acid, 25%             | C    | *    | *   | C         | LC | C  | *   | IC      |
| Formic acid, 25%                 | C    | *    | *   | LC        | C  | C  | C   | IC      |
| Trichloroacetic acid, 10%        | C    | *    | *   | C         | C  | C  | *   | IC      |
| Citric acid                      | C    | C    | C   | C         | C  | *  | C   | LC      |
| Hydrofluoric acid                | C    | C    | *   | *         | IC | LC | IC  | IC      |
| Boric Acid                       | C    | C    | C   | C         | C  | C  | C   | LC      |
| <b>ALCOHOLS</b>                  |      |      |     |           |    |    |     |         |
| Methanol, 98%                    | C    | C    | C   | IC        | C  | C  | C   | C       |
| Ethanol, 98%                     | C    | C    | C   | IC        | C  | C  | C   | C       |
| Ethanol, 70%                     | C    | C    | C   | C         | C  | C  | C   | LC      |
| Isopropanol                      | C    | C    | C   | C         | C  | C  | C   | C       |
| n-Propanol                       | C    | C    | C   | C         | C  | C  | C   | C       |
| Amyl Alcohol (Butanol)           | C    | C    | C   | LC        | C  | C  | C   | C       |
| Benzyl Alcohol                   | C    | C    | IC  | IC        | C  | C  | IC  | LC      |
| Ethylene Glycol                  | C    | C    | C   | C         | C  | C  | C   | C       |
| Propylene Glycol                 | C    | C    | C   | LC        | C  | C  | C   | C       |
| Glycerol                         | C    | C    | C   | C         | C  | C  | C   | C       |
| Isobutyl alcohol                 | C    | C    | *   | C         | C  | C  | C   | C       |
| <b>ALKALIES</b>                  |      |      |     |           |    |    |     |         |
| Ammonium Hydroxide, 25%          | C    | LC   | C   | C         | LC | C  | C   | C       |
| Sodium Hydroxide, 3N             | C    | IC   | C   | IC        | LC | C  | IC  | LC      |
| Sodium hydroxide, 6N (22%)       | C    | IC   | C   | IC        | IC | C  | IC  | IC      |
| Potassium hydroxide, 3N (15%)    | C    | IC   | C   | IC        | *  | C  | IC  | IC      |
| <b>AMINES AND AMIDES</b>         |      |      |     |           |    |    |     |         |
| Dimethyl Formamide               | C    | IC   | IC  | IC        | LC | C  | C   | C       |
| Diethylacetamide                 | C    | *    | *   | IC        | C  | *  | C   | LC      |
| Triethanolamine                  | C    | *    | *   | C         | C  | *  | *   | C       |
| Aniline                          | C    | *    | *   | IC        | C  | *  | *   | C       |
| Pyridine                         | C    | IC   | IC  | IC        | C  | IC | C   | *       |
| Acetonitrile                     | C    | C    | LC  | IC        | C  | C  | C   | C       |
| <b>ESTERS</b>                    |      |      |     |           |    |    |     |         |
| Ethyl Acetate/<br>Methyl Acetate | C    | C    | IC  | IC        | C  | LC | C   | C       |
| Amyl Acetate/Butyl<br>Acetate    | C    | IC   | IC  | LC        | C  | LC | C   | C       |

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.

| SOLVENT                            | PTFE | PVDF | PES | CA/<br>CN | RC | PP | GMF | Nylon 6 |
|------------------------------------|------|------|-----|-----------|----|----|-----|---------|
| Propyl Acetate                     | C    | IC   | IC  | LC        | C  | LC | *   | C       |
| Propylene Glycol Acetate           | C    | *    | IC  | IC        | C  | C  | *   | *       |
| 2-Ethoxyethyl Acetate              | C    | *    | IC  | LC        | C  | *  | *   | *       |
| Methyl Cellulose                   | C    | *    | IC  | IC        | C  | C  | C   | *       |
| Benzyl Benzoate                    | C    | *    | IC  | C         | C  | *  | *   | C       |
| Isopropyl Myristate                | C    | *    | IC  | C         | C  | *  | *   | C       |
| Tricresyl Phosphate                | C    | *    | IC  | C         | C  | *  | *   | *       |
| <b>HALOGENATED HYDROCARBONS</b>    |      |      |     |           |    |    |     |         |
| Methylene Chloride                 | C    | C    | IC  | IC        | C  | LC | C   | LC      |
| Chloroform                         | C    | C    | IC  | IC        | C  | LC | C   | C       |
| Trichloroethylene                  | C    | C    | C   | C         | C  | C  | C   | C       |
| Chlorobenzene                      | C    | C    | LC  | C         | C  | C  | C   | C       |
| Freon®                             | C    | C    | LC  | C         | C  | C  | C   | C       |
| Carbon Tetrachloride               | C    | C    | IC  | LC        | C  | LC | C   | C       |
| Butyl chloride                     | C    | C    | *   | C         | *  | IC | C   | IC      |
| <b>HYDROCARBONS</b>                |      |      |     |           |    |    |     |         |
| Hexane/Xylene                      | C    | C    | IC  | C         | C  | IC | C   | C       |
| Toluene/Benzene                    | C    | C    | IC  | C         | C  | IC | C   | C       |
| Kerosene/<br>Gasoline              | C    | C    | LC  | C         | C  | LC | *   | C       |
| Tetralin/Decalin                   | C    | C    | *   | C         | C  | *  | *   | *       |
| Nitrobenzene                       | C    | C    | IC  | C         | C  | C  | C   | LC      |
| Cyclohexane                        | C    | C    | IC  | C         | C  | C  | C   | LC      |
| Trichloroethane                    | C    | C    | C   | C         | C  | C  | C   | C       |
| Trichloroethylene                  | C    | C    | IC  | C         | C  | C  | C   | IC      |
| Perchloro Ethylene                 | C    | C    | IC  | C         | C  | C  | C   | C       |
| <b>KETONES</b>                     |      |      |     |           |    |    |     |         |
| Acetone                            | C    | IC   | IC  | IC        | C  | C  | C   | C       |
| Cyclohexanone                      | C    | IC   | IC  | IC        | C  | C  | C   | C       |
| Methyl Ethyl Ketone                | C    | LC   | IC  | IC        | C  | LC | C   | C       |
| Isopropylacetone                   | C    | IC   | IC  | C         | C  | *  | C   | C       |
| Methyl Isobutyl Ketone             | C    | LC   | IC  | *         | C  | LC | C   | *       |
| <b>ORGANIC OXIDES</b>              |      |      |     |           |    |    |     |         |
| Ethyl Ether                        | C    | C    | C   | C         | C  | LC | *   | C       |
| Dioxane                            | C    | LC   | IC  | IC        | C  | C  | C   | C       |
| Tetrahydrofuran                    | C    | LC   | IC  | IC        | C  | C  | C   | C       |
| Triethanolamine                    | C    | *    | *   | C         | C  | *  | *   | C       |
| Dimethylsulfoxide (DMSO)           | C    | IC   | IC  | IC        | C  | C  | C   | C       |
| Isopropyl Ether                    | C    | C    | C   | C         | C  | C  | *   | *       |
| <b>MIXED SOLVENTS</b>              |      |      |     |           |    |    |     |         |
| Phenol, Aqueous Solution, 10%      | C    | LC   | IC  | IC        | IC | C  | C   | *       |
| Formaldehyde Aqueous Solution, 30% | C    | C    | C   | C         | LC | C  | C   | C       |
| Hydrogen Peroxide, 30%             | C    | *    | *   | C         | C  | *  | *   | C       |
| Silicone Oil/Mineral Oil           | C    | C    | C   | C         | C  | C  | C   | *       |

※ The above data are for reference only, it is recommended that the test before use.

## Effective Filtration Area

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

## Throughput & Flow Rate

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

## Hold-up Volume

| Filtration Volume | Diameter | Hold-up Volume |
|-------------------|----------|----------------|
| 10mL              | 13mm     | 25 $\mu$ L     |
| 120mL             | 25mm     | 100 $\mu$ L    |

## 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.

## 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

1. Before filling with sample, draw approximately 1 mL of air into the syringe. This will minimize fluid retention.
2. 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.
3. 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.
5. ANPEL & CNW filtration products are disposable consumables, and not recommended for reuse.



## Quality assurance from ANPEL

### Production environment

ANPEL&CNW Membrane filter and syringe filter are all manufactured in the clean room. We strictly carry out 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)

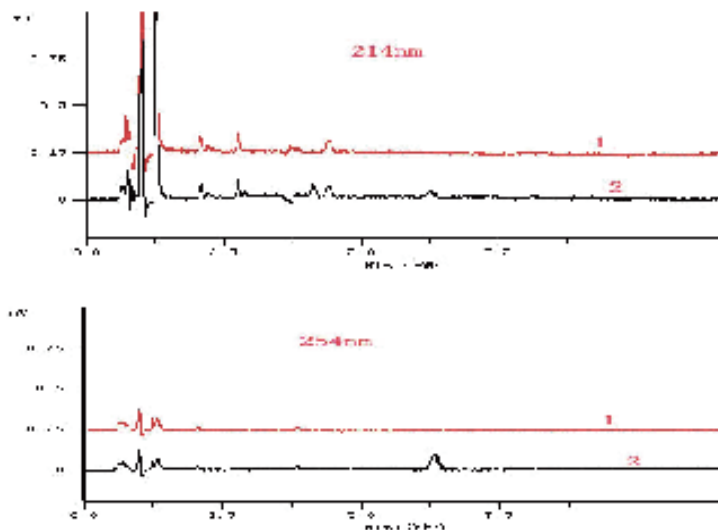
HPLC certification intends to evaluate the UV-detectable extractives of ANPEL&CNW filtration products in methanol and water, to ensure that analytical results will not be compromised by extractable filter materials. Methanol or water is passed through each individual syringe filter or membrane, and a 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.

### Chromatographic test

HPLC test condition  
 Sample: 2 ml methanol filtered  
 Column: Athena C18,4.6x150mm  
 Flow rate: 1.5mL/min  
 Detector: UV 254 and 214 nm  
 Mobile phase: 70:30 (v/v)  
 Acetonitrile/water  
 Temperature: 40.0°C  
 Injection volume: 10uL

1. Methanol blank
2. Methanol filters

To prove the low solubility of the diaphragm, every batch of products before they go out commonly used for HPLC solvent compatibility test



### Bubble point of different materials

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

### 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.

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 design pressure.

Liquid flow rate

Liquid flow-rate tests are performed to ensure that ANPEL&CNW filtration product meets minimum specified flow-rate.

Hold-up volume

Test purpose: to evaluate the pure water (hydrophilic polyether sulfone, nylon, PTFE and hydrophilic PVDF) or anhydrous ethanol (hydrophobic PTFE and hydrophobic PVDF) residues in the filter, filter with solution after applying pressure flushing, above the bubble point pressure of residual volume called detention volume.

Test will filter before weighing, use a syringe injection water or ethanol, guarantee the import and export of the ruhr joint solution. Weighing again. With syringe injection of dry air, discharge solution, requires no more than bubble point pressure, weighing again. Finally, filter filled with solution, again with dry syringes from solution, keep a few seconds, let solution extrusion export ruhr joint, dry filter, is weighed. The last time the weight minus the weight of the dry filter is the detention volume.

Regulation: 13 mm filter, hold-up volume less than or equal to 25 ul;  
25 mm filter, retention volume less than or equal to 100 ul;

Period of validity

General as long as the sealed in a cool, dry and environmental pollution-free gas preservation, can guarantee the service life of 2 years.

COA template

**Certificate of Analysis**

PRECLEANTM 13mm Syringe Filter, welded, PTFE membrane(Hydrophilic), 0.45µm, pink  
Art Number: 2.EF6101.0001  
Lot Number: O1600098

| Test Results                       |                                 |                                   |         |
|------------------------------------|---------------------------------|-----------------------------------|---------|
| Syringe Filter Lot Characteristics |                                 |                                   |         |
| Properties                         | Results                         | Properties                        | Results |
| Membrane material                  | PTFE                            | Pore Size (µm)                    | 0.45    |
| Wettability                        | Hydrophilic                     | Filtration Area(cm <sup>2</sup> ) | 0.83    |
| Thickness (mm)                     | 0.12                            | 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 slip | Bubble Point (Mpa)                | 0.09    |
| Test Liquid                        | Pure Water                      |                                   |         |

**Chromatography Test**

HPLC Conditions:  
Sample: 2 mL Methanol filtered  
Column: Athena C18, 4.6×150 mm  
Flow Rate: 1.5 mL/min  
Detector: UV 254 and 214 nm  
Mobile Phase: 70:30 (v/v) Acetonitrile /Water  
Temperature: 40.0 °C  
Injection Volume: 10 µL

Chromatographic Identification  
1. Methanol blank  
2. Methanol filtered

*L. Shaw*  
Quality Control Supervisor      2015-05-29      Approval Date



## Regula syringe filters

### 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.



### Regula syringe filters

| Description  | Packaging             | Cat. No.      |
|--|-----------------------|---------------|
| PRECLEANTM 13 mm Syringe Filter PES membrane, 0.45 μ m, blue           | 100 pcs per cartridge | 2.CF1101.0001 |
| PRECLEANTM 13 mm Syringe Filter PES membrane, 0.22 μ m, yellow         | 100 pcs per cartridge | 2.CF1102.0001 |
| PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.45 μ m, white        | 100 pcs per cartridge | 2.CF2101.0001 |
| PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.22 μ m, green        | 100 pcs per cartridge | 2.CF2102.0001 |
| PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.45um, orange          | 100 pcs per cartridge | 2.CF3101.0001 |
| PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.22 um, purple         | 100 pcs per cartridge | 2.CF3102.0001 |
| PRECLEANTM 13mm Syringe Filter PVDF membrane, 0.45 μ m, red            | 100 pcs per cartridge | 2.CF4101.0001 |
| PRECLEANTM 13 mm Syringe Filter PVDF membrane, 0.22 μ m, black         | 100 pcs per cartridge | 2.CF4102.0001 |
| PRECLEANTM 25 mm Syringe Filter PES membrane, 0.45 μ m, blue           | 100 pcs per cartridge | 2.CF1201.0001 |
| PRECLEANTM 25 mm Syringe Filter PES membrane, 0.20 μ m, yellow         | 100 pcs per cartridge | 2.CF1202.0001 |
| PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.45 μ m, white        | 100 pcs per cartridge | 2.CF2201.0001 |
| PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.20 μ m, green        | 100 pcs per cartridge | 2.CF2202.0001 |
| PRECLEANTM 25mm Syringe Filter, PTFE membrane, 0.45um, orange          | 100 pcs per cartridge | 2.CF3201.0001 |
| PRECLEANTM 25mm Syringe Filter, PTFE membrane, 0.2 um, purple          | 100 pcs per cartridge | 2.CF3202.0001 |
| PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.45 μ m, red           | 100 pcs per cartridge | 2.CF4201.0001 |
| PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.22 μ m, black         | 100 pcs per cartridge | 2.CF4202.0001 |
| PRECLEANTM 13mm Syringe Filter PP membrane, 0.45 μ m, light blue       | 100 pcs per cartridge | 2.CF5101.0001 |
| PRECLEANTM 13 mm Syringe Filter PP membrane, 0.22 μ m, invisible green | 100 pcs per cartridge | 2.CF5102.0001 |
| PRECLEANTM 25 mm Syringe Filter PP membrane, 0.45 μ m, light blue      | 100 pcs per cartridge | 2.CF5201.0001 |
| PRECLEANTM 25 mm Syringe Filter PP membrane, 0.22 μ m, invisible green | 100 pcs per cartridge | 2.CF5202.0001 |





## Welded hydrophilic PTFE Syringe Filters

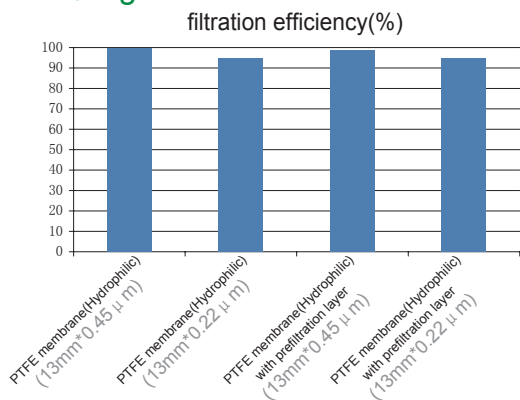


One kind of material instead of all varieties!  
Suitable for filter contains strong acid, strong alkali aqueous solution, and the organic mixed solution of acid and alkali.

Made in clear room!  
packed in easy-open can,  
ensure non-contamination  
during delivery  
Can be reseal after open.

### 1 Excellent particle intercept performance

Hydrophilic PTFE syringe filter to remove particles efficiency higher than 90%



Test conditions:

Filter solution: 300, 500 - nm polystyrene ball, concentration of Triton dilute aqueous solution with 0.1% to 0.1%,

Filtration efficiency (%) = (before filtering solution absorbance value - the filtered solution absorbance value before/filter solution absorbance value) x100%

### 3 Very low dissolution

Membrane filter and filter the dissolution may come from the diaphragm, the shell material, the introduction of the composition of the production, and so on. With samples to filter the dissolution may be caused by many reasons, such as dissolution, particulate matter to replace, chemistry or diffusion and so on. Polymer resin, solvents, the pore system as well as the shell material has the chance of solvent dissolution, associated with chemical solvent resistance, influenced by the factors such as temperature, concentration, contact time, so you can through the difference between material properties to choose.

### 2 Lower adsorption of compounds

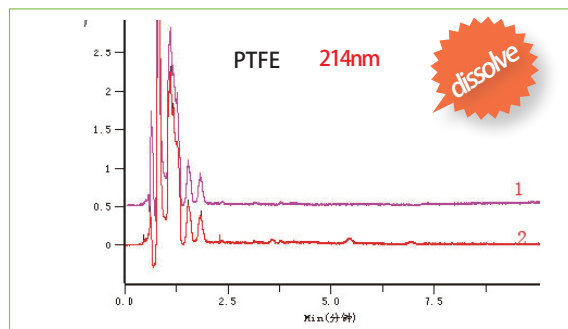
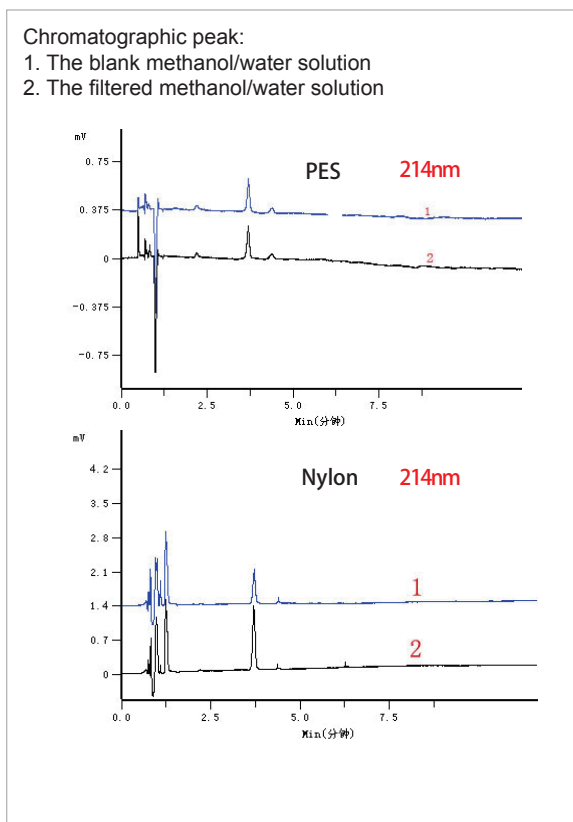
Customers surveyed the different material and brand pin type filter adsorption of aflatoxins, the results are as follows:

| test samples             | recovery rate (%) |       |       |       |       |
|--------------------------|-------------------|-------|-------|-------|-------|
|                          | AFTB1             | AFTB2 | AFTG1 | AFTG2 | AFTM1 |
| Hydrophobic PTFE (ANPEL) | 95.47             | 97.17 | 96.39 | 96.38 | 96.91 |
| Nylon (ANPEL)            | 90.35             | 95.01 | 95.85 | 97.66 | 96.61 |
| PVDF (competitor)        | 91.87             | 95.9  | 95.9  | 96.61 | 94.84 |
| Hydrophilic PTFE (ANPEL) | 98.26             | 97.45 | 94.62 | 99.11 | 95.69 |

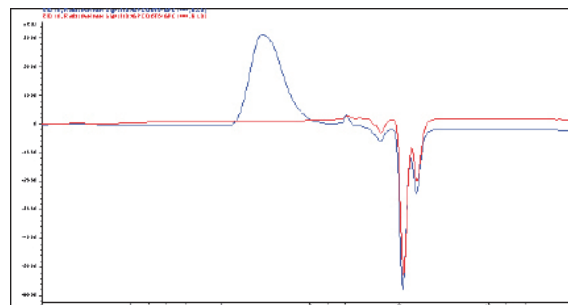
Through data comparison shows that Ann spectrum PTFE needle filter is smaller to five aflatoxins adsorption, nylon membrane and another brand of PVDF membrane pin type filter for aflatoxin B1 adsorption slightly. This experiment USES 20% acetonitrile solution, a hydrophobic membrane when you need to use a little force to press in the past, and hydrophilic membrane can easily enough pressure in the past, the hydrophilic membrane performance is better than hydrophobic membrane.

# FILTER PRODUCTS

According to the result of HPLC background tests, compared with other material, PTFE material pin type filter the dissolution of the smallest.



Tetrahydrofuran dissolved of commonly used plastic material, when the samples for the GPC analysis, need to consider tetrahydrofuran dissolution of needle type filter shell materials. Below as an actual case, the red line is map of ANPEL needle filter dissolution and the blue line is another brand map of PTFE needle filter dissolution and the difference is that the latter is more a dissolution peak, shows that there are some around the similar molecular weight compounds by dissolution, is likely to be caused by the shell material.



## Hydrophilic PTFE syringe filters

| Description  | Packaging             | Cat. No.      |
|--|-----------------------|---------------|
| PRECLEANTM 13mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.45 μm, pink   | 100 pcs per cartridge | 2.EF6101.0001 |
| PRECLEANTM 13mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.22 μm, golden | 100 pcs per cartridge | 2.EF6102.0001 |
| PRECLEANTM 25mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.45 μm, pink   | 100 pcs per cartridge | 2.EF6201.0001 |
| PRECLEANTM 25mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.22 μm, golden | 100 pcs per cartridge | 2.EF6202.0001 |

## Syringe filters with prefiltration layer

This serial syringe filters with PP filter layer, pore size 5 μm, specially designed for high particle content of the sample, pre filter eliminates most of the particles, the sample that is difficult to filter operation resistance smaller, filtration velocity faster!



| Description  | Packaging             | Cat. No.      |
|--|-----------------------|---------------|
| PRECLEANTM 13mm Syringe Filter,with prefiltration layer, PTFE membrane (Hydrophilic), 0.45 μm,pink     | 100 pcs per cartridge | 2.CF6101.0D01 |
| PRECLEANTM 13mm Syringe Filter, with prefiltration layer, PTFE membrane (Hydrophilic), 0.22 μm, golden | 100 pcs per cartridge | 2.CF6102.0D01 |
| PRECLEANTM 25mm Syringe Filter,with prefiltration layer, PTFE membrane (Hydrophilic), 0.45 μm,pink     | 100 pcs per cartridge | 2.CF6201.0D01 |
| PRECLEANTM 25mm Syringe Filter,with prefiltration layer, PTFE membrane (Hydrophilic), 0.22 μm,golden   | 100 pcs per cartridge | 2.CF6202.0D01 |

## 0.02um PVDFsyringe filter

Hydrophilic PVDF 0.02 μ m syringe filter

Application in EN 71-13 (E) his toy safety - part 3: migration of certain elements

EN 71-13 (E) ask to use 0.45um or 0.22 um syringe filters to filter the samples. But some small particles can pass through the 0.45 um or 0.22 um syringe filter, (for example, some cloudy solution or colored filtrate, etc.). Which may lead to migration in some cases measurement values are not accurate, because the measuring result is not only including migration elements, also includes some elements of the chemical adsorption in the suspended particles. If you have this kind of circumstance happening, using aperture 0.02 um pin type filter to filter the solution. If we can't filter again, repeat the migration process and separation process, final reoccupy aperture 0.02 μ m filter.

In view of the present market only a little manufacturer can provide 0.02 um syringe filter, and the price also is very expensive, and may not be the masses of customers, We spectrum in order to meet the needs of customers, reduce customer costs, offer you the pore size of 0.02 um hydrophilic PVDF filter with the reasonable price.

- made in clean room
- strict quality control
- Products through the bubble point tests, background tests, the velocity or air flux, etc. Various tests, to ensure the quality

| Description  | Packaging             | Cat. No.      |
|--|-----------------------|---------------|
| PRECLEANTM 13 mm Syringe Filter, PVDF membrane(Hydrophilic), 0.02 μ m, natural | 100 pcs per cartridge | 2.CF7103.0001 |

### COA template

**Certificate of Analysis**

**PRECLEANTM 13 mm Syringe Filter, PVDF membrane(Hydrophilic), 0.02 μ m, natural**  
**Art Number: 2.CF7103.0001**  
**Lot Number: H4630020**

**Test Results**

| Syringe Filter Lot Characteristics |                                 |                                   |         |
|------------------------------------|---------------------------------|-----------------------------------|---------|
| Properties                         | Results                         | Properties                        | Results |
| Membrane material                  | PVDF                            | Pore Size (μm)                    | 0.02    |
| Wettability                        | Hydrophilic                     | Filtration Area(cm <sup>2</sup> ) | 0.83    |
| Thickness (mm)                     | 0.213                           | 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 slip | Bubble Point (Mpa)                | 0.26    |
| Test Liquid                        | Pure Water                      |                                   |         |

**Chromatography Test**

**HPLC Conditions:**  
 Sample: 2 mL Methanol filtered  
 Column: Athena C18, 4.6x150 mm  
 Flow Rate: 1.5 mL/min  
 Detector: UV 254 and 214 nm  
 Mobile Phase: 70:30 (v/v) Acetonitrile /Water  
 Temperature: 40.0°C  
 Injection Volume: 10 μL

**Chromatographic Identification**  
 1. Methanol blank  
 2. Methanol filtered

*L. Shaw*      2013-08-29

Quality Control Supervisor      Approval Date

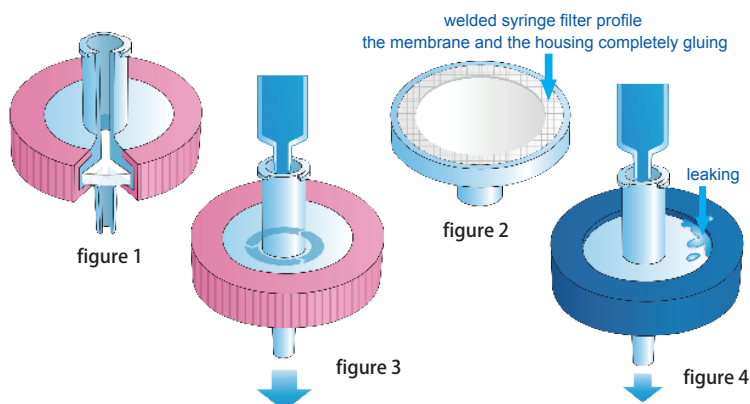
Shanghai ANPEL Scientific Instrument Co., Ltd. Shanghai, China  
 Tel: +86 21 54890099, Fax: +86 21 54897742, www.anpel.com.cn/cnw



### Other related products recommendation:

| Description  | Packaging                   | Brand | Cat. No.      | Memo                  |
|--|-----------------------------|-------|---------------|-----------------------|
| Anpelclean PA SPE cartridge  | 1g/6mL, 30支/盒               | ANPEL | SBAA-1410006  | Used for detection of |
| CNWBOND HC-C18 SPE Cartridge, 1g, 6mL  | 1g, 6mL, 30 pcs. per box    | CNW   | 2.CA0855.0001 | hexavalent chromium   |
| Poly-Sery PSD SPE Cartridge, 500mg, 6mL  | 500mg, 6mL, 30 pcs. per box | CNW   | 2.CA3554.0001 | leather               |
| PRECLEANTM 25mm Syringe Filter<br>Nylon membrane, 0.45 μ m, white                      | 100 pcs per cartridge       | CNW   | 2.CF2201.0001 |                       |
| PRECLEANTM 25mm Syringe Filter, welded,<br>PTFE membrane (Hydrophilic), 0.45 μ m, pink | 100 pcs per cartridge       | CNW   | 2.EF6201.0001 |                       |

## Welded syringe filters



### Advantage of welded syringe filters:

1. 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.
2. If the samples solution sticky or turbidity, pressure will force the solution from a crack in the non-welded type syringe filter to caused leak even burst (figure 4), but welded syringe filters completely don't have to worry about this problem (figure 3).
3. The male luer fitting a littler longer then common, so it is easy to on-line joining the Ion Chromatograph
4. The surface of the shell we designed the grain to increase the friction, this make the operator easy to install to eh syringes.

### Material Features

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

| Description  | Packaging             | Cat. No.      |
|--|-----------------------|---------------|
| PRECLEANTM 13mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.45 μm, pink   | 100 pcs per cartridge | 2.EF6101.0001 |
| PRECLEANTM 13mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.22 μm, golden | 100 pcs per cartridge | 2.EF6102.0001 |
| PRECLEANTM 25mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.45 μm, pink   | 100 pcs per cartridge | 2.EF6201.0001 |
| PRECLEANTM 25mm Syringe Filter, welded, PTFE membrane (Hydrophilic), 0.22 μm, golden | 100 pcs per cartridge | 2.EF6202.0001 |
| PRECLEANTM 13mm Syringe Filter, welded, PVDF membrane (Hydrophilic), 0.45 μm, gray   | 100 pcs per cartridge | 2.EF7101.0001 |
| PRECLEANTM 13mm Syringe Filter, welded, PVDF membrane (Hydrophilic), 0.22 μm, brown  | 100 pcs per cartridge | 2.EF7102.0001 |
| PRECLEANTM 25mm Syringe Filter, welded, PVDF membrane (Hydrophilic), 0.45 μm, gray   | 100 pcs per cartridge | 2.EF7201.0001 |
| PRECLEANTM 25mm Syringe Filter, welded, PVDF membrane (Hydrophilic), 0.22 μm, brown  | 100 pcs per cartridge | 2.EF7202.0001 |

### Replaceable membrane syringe filters

| Description  | Diameter | Cat. No. |
|--|----------|----------|
| 25mm Replaceable membrane syringe filters (made from PP) | 25mm     | SCBB-321 |
| 13mm Replaceable membrane syringe filters (made from PP) | 13mm     | SCBB-322 |
| 50mm Replaceable membrane syringe filters (made from PP) | 50mm     | SCBB-323 |



## laboratorial needleless syringes

Conventional medical syringe with black rubber seals, when in contact of the organic solvent can be induced chemical precipitation, this will pollute the samples. Our products are all made of high quality polypropylene (PP) material, organic solvent tolerance is good, to eliminate the pollution of the sample. The product itself for medical syringe without sterilization can be widely used in HPLC and GC samples pretreatment and elemental analysis.



### ANPEL laboratorial needleless syringes

| Description                                      | Packaging          | Cat. No.         |
|--|--------------------|------------------|
| 2mL laboratorial needleless syringes             | 100 pieces per bag | QBAA-002012      |
| 2mL laboratorial needleless syringes unassembled | 100 pieces per bag | QBAA-002012S-100 |
| 5mL laboratorial needleless syringes             | 100 pieces per bag | QBAA-002013      |
| 5mL laboratorial needleless syringes unassembled | 100 pieces per bag | QBAA-002013S-100 |
| 10mL laboratorial needleless syringes            | 50 pieces per bag  | QBAA-002014-50   |
| 20ml laboratorial needleless syringes            | 25 pieces per bag  | QBAA-002015      |

### Different syringe background test

The background interference for ANPEL laboratorial needleless syringes without the black rubber is little than the syringes with black rubber.

#### chromatographic conditions:

Column: AthenaC18, 5µm, 4.6mm\*150mm  
Flow rate: 1.5mL/min

Mobile phase: 70%Acetonitrile:30%water  
Detector: 254 nm  
Injection volume: 10µL  
Temperature: 40°C

#### Chromatogram

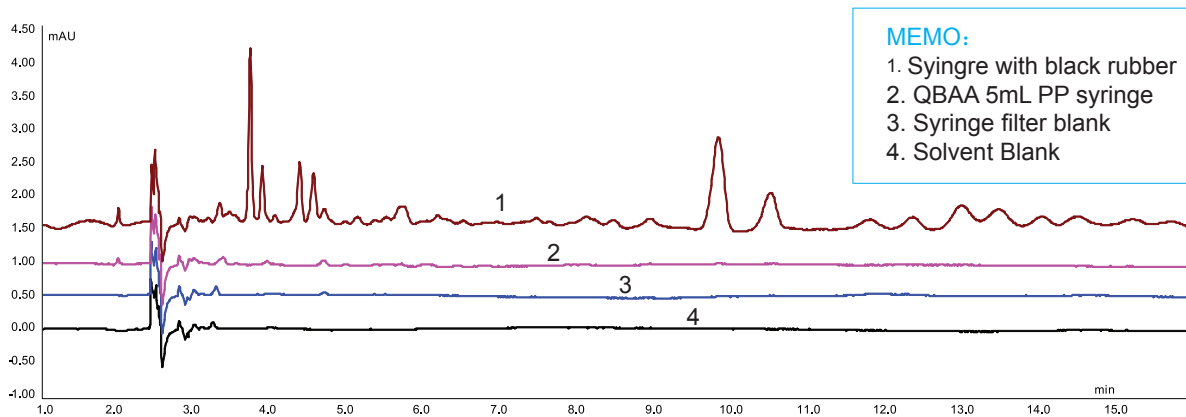


Figure 1: Background interference test between ANPEL syringe and other brand with black rubber (solvent: methanol)

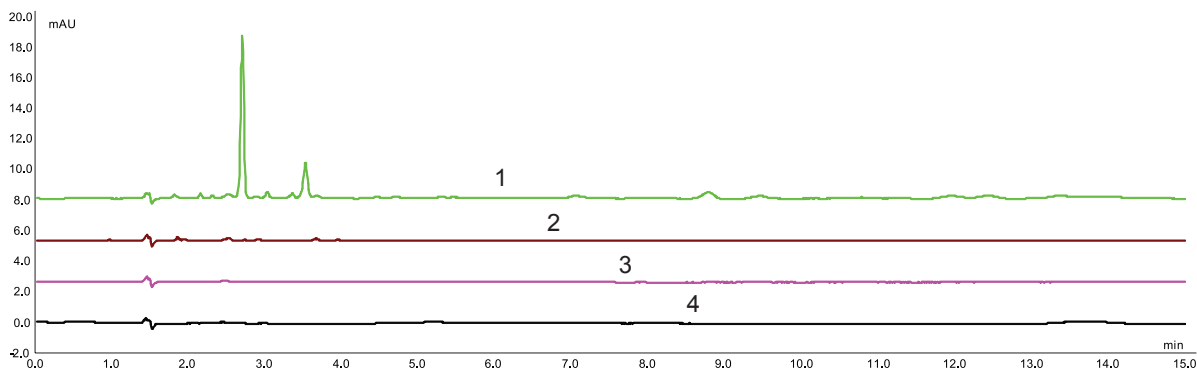


Figure 1: Background interference test between ANPEL syringe and other brand with black rubber (solvent: acetonitrile)

### CNW

High-quality membrane products, Through bubble point test, background interference test, flow rate or air flux testing etc.



#### Attentions

1. When using the double layer membrane, ensure positive on the up and opposite down. The lining form have the effect of support, so if turn it the lining form can not give the support this will caused the membrane easy to broken, can not proof pressure.

2. If you use the Organic phase membrane to filter water, please using ethanol or other organic solvents to madefaction the membrane, then after clean the membrane with clean water you can use it.



Sampling tweezers include  
Make it easy to use for you

We insert one green paper between  
each membrane to avoid static.

| Description  | Packaging                       | Cat. No.      |
|--|---------------------------------|---------------|
| Polyethersulfone(PES) Membrane                     | 47mm, 0.45 μ m, 100 pcs per box | 2.CM0111.0001 |
|  | 47mm, 0.22 μ m, 100 pcs per box | 2.CM0112.0001 |
| Nylon Membrane                                     | 47mm, 0.45 μ m, 100 pcs per box | 2.CM0211.0001 |
|  | 47mm, 0.22 μ m, 100 pcs per box | 2.CM0212.0001 |
| Hydrophobic Polytetrafluoroethylene(PTFE) Membrane | 47mm, 0.45 μ m, 50 pcs per box  | 2.CM0311.0001 |
|  | 47mm, 0.22 μ m, 50 pcs per box  | 2.CM0312.0001 |
| Hydrophobic polyvinylidene fluoride(PVDF) Membrane | 47mm, 0.45 μ m, 50 pcs per box  | 2.CM0411.0001 |
|  | 47mm, 0.22 μ m, 50 pcs per box  | 2.CM0412.0001 |
| Hydrophilic Polytetrafluoroethylene(PTFE) Membrane | 47mm, 0.45 μ m, 50 pcs per box  | 2.CM0611.0001 |
|  | 47mm, 0.22 μ m, 50 pcs per box  | 2.CM0612.0001 |
| Hydrophilic polyvinylidene fluoride(PVDF) Membrane | 47mm, 0.45 μ m, 50 pcs per box  | 2.CM0711.0001 |
|  | 47mm, 0.22 μ m, 50 pcs per box  | 2.CM0712.0001 |
| Mixed Cellulose Ester(MCE) Membrane                | 47mm, 0.45 μ m, 100 pcs per box | 2.CM0811.0001 |
|  | 47mm, 0.22 μ m, 100 pcs per box | 2.CM0812.0001 |

### Other products

No support layer of membrane products, thin and fast flow. membrane with strong static, so when you pickup please prevent two film overlapping. If there is a wrinkle at the membrane surface, as long as it don't be broken, shall not affect the effect.

| Description            | Packaging                    | Cat. No. |
|------------------------|------------------------------|----------|
| Organic phase membrane | 13mmx0.22um, 200 pcs per box | SCBB-220 |
|                        | 13mm*0.45um, 200 pcs per box | SCBB-213 |
|                        | 25mm*0.45um, 200 pcs per box | SCBB-212 |
|                        | 50mm*0.22um, 100 pcs per box | SCBB-210 |
|                        | 50mm*0.45um, 100 pcs per box | SCBB-211 |
| Water phase membrane   | 25mm*0.22um, 200 pcs per box | SCBB-236 |
|                        | 50mm*0.22um, 100 pcs per box | SCBB-207 |
|                        | 50mm*0.45um, 100 pcs per box | SCBB-206 |
| Nylon membrane         | 50mm*0.22um, 100 pcs per box | SCBB-246 |
|                        | 50mm*0.45um, 100 pcs per box | SCBB-225 |



ANPEL Vacuum Filter Holder

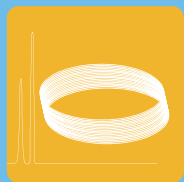
Vacuum Filter Holder Is designed to solvent rapid filtration and degassing, suitable for filtering and degassing of the HPLC mobile phase solvent, Can prolong the service life of instrument and the chromatographic column, improve the detection accuracy,Used in gravimetric analysis, trace analysis, trace analysis, colloid separation and sterile in the laboratory.



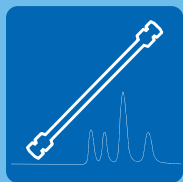
| Description                 | Packaging | Cat. No.      |
|-----------------------------|-----------|---------------|
| 1000mL Vacuum Filter Holder | 1 set     | SCAA-SF1000   |
| 300mL Filter Upper Cups     | 1 piece   | SCAA-SF1000-1 |
| 1000mL Solvent filter cores | 1 piece   | SCAA-SF1000-2 |
| 1000mL filter flask         | 1 piece   | SCAA-SF1000-3 |

Q&A

| Problem                                | Probable cause   | Solution   |
|--|--|--|
| solvent can not pass the membrane      | Selection error, not applicable  | <ol style="list-style-type: none"> <li>1. Choose organic phase membrane for organic solution</li> <li>2. Choose water phase membrane for aqueous solution</li> </ol>   |
| After filtration solvent remains murky | <ol style="list-style-type: none"> <li>1. The pore size for membrane is not appropriate</li> <li>2. Emulsion, it seems that is not transparent</li> </ol>  | <ol style="list-style-type: none"> <li>1. Change the correct pore size membrane</li> <li>2. If it is micellar solution, there is no complete miscibility, there is no particulate matter, if want to transparent solution should choose appropriate solvent to dilution</li> </ol>   |
| membrane broken                        | <ol style="list-style-type: none"> <li>1. Material of membrane cannot tolerate the sample solvent, were dissolved</li> <li>2. The pressure surpass the designed</li> </ol>   | <ol style="list-style-type: none"> <li>1. Change correct material of membrane, please check the condition also include operate temperature, pressure etc.</li> <li>2. Confirm the correct operate pressure, especially for using the syringe filter with small diameter(design flux no more than 5mL), pressure no more than 75psi. or try the syringe filters with pre-layer</li> </ol>   |
| Low flow rate                          | <ol style="list-style-type: none"> <li>1. High particle content in the samples</li> <li>2. The viscosity is too large of the sample</li> <li>3. The diameter of the syringe filter is too small</li> </ol>   | <ol style="list-style-type: none"> <li>1. High speed centrifugal, remove the part of the particulate matter or try the syringe filters with pre-layer</li> <li>2. Select the appropriate solvent dilution to the samples</li> <li>3. Using a larger diameter of filter, the effective area increase flux</li> </ol> <p>From the perspective of the security, if the membrane pore size was blocked and results in the decrease of flow velocity, it is recommended to replace a filter, rather than increasing pressure.</p> |
| Adsorption of the target               | <ol style="list-style-type: none"> <li>1. Membrane adsorption target compound</li> </ol>   | <ol style="list-style-type: none"> <li>1. Change the membrane to ensure it is low adsorption or no adsorption the target compound. For example, If analysis of proteins and DNA we suggest using PES or PVDF not Nylon membrane.</li> <li>2. If filter pigment samples, please do not use Nylon membrane.</li> <li>3. If doubt membrane has adsorption to the samples, please filter the a known concentrations standard, then analysis by instrument to contrast.</li> </ol>  |
| Dissolve out                           | <ol style="list-style-type: none"> <li>1. Chemical resistance of the membrane is limited, some components by solvent dissolving</li> <li>2. Some pollutant been introduced during manufacture or packing etc.</li> <li>3. Using the syringe with black rubber</li> </ol> | <ol style="list-style-type: none"> <li>1. Dissolve the extent and the solvent, temperature, pressure, and soak time, so try to change these Condition to reduce the dissolve. if confirm the material of membrane can not tolerate, please directly change to the correct material.</li> <li>2. Please using the sample solvents do the precleaning. If the volume of samples is enough, can be directly given to the front -5mL</li> <li>3. Change to the syringe without black rubber</li> </ol>                           |



GC



HPLC



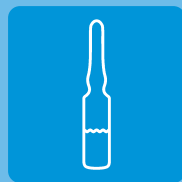
SPE



Sample Vials



Chemical Reagents



Reference Standards



Laboratory Equipments

# ANPEL

上海安谱实验科技股份有限公司

ANPEL Laboratory Technologies (Shanghai) Inc.



The leading manufacturer and supplier of chromatography and lab consumables in P.R.C.  
The leading Laboratory Consumable SCM Service Provider from P.R.C

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1. All products' quality conform to the specifications and standards which their manufacturer declared.
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Customer Service Supervisor

Tel: 86-21-64684886      E-mail: service@anpel.com.cn

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## Grand Stable Analysis Technics (Shanghai) Co., Ltd. (Manufacturer)

Address: No.260, PuTing Road, Yexie Town, Songjiang District Shanghai 201608,P.R.C.

## Shanghai Grand Stable Impt & Expt Trading Co., Ltd. (Import and Export)

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## General Agent

