



Membrane Solutions

Product Guidance

- Lab Filtration and Microporous Membrane

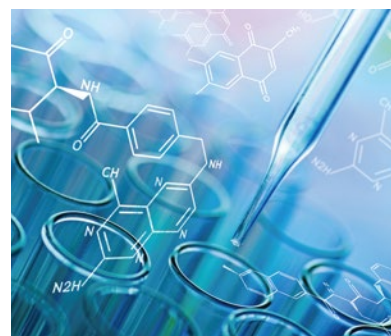


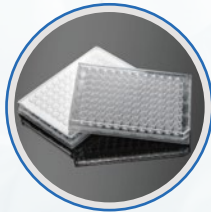
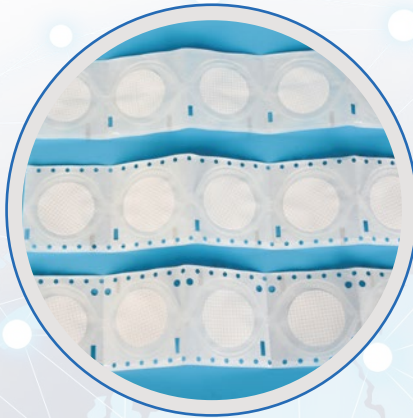
Membrane, For better Tomorrow



Membrane Solutions

*Our Membrane
for Your Solutions*





PRESENT

4 product families,
more than 1 Billion filters sold

2019

Manufacturing Cleanroom upgrade

2016

100 million pieces Syringe filter one year

2015.12

Start Assembly in USA

2014.12

- 60M pieces Syringe Filters one year
- OEM for Top 5 account in the world

2011.09

CE Certified

2009.03

ISO 9001 Certified

2008.02

Founded New and the 1st Plant
in Nantong, China

2006.06

Founded Membrane Solutions USA

Lab Filtration

Sample Preparation



The Membrane Solutions Single Use Syringe Filters which are spotless and with nice finishing, are widely using in various Laboratories for offering fast, convenient and reliable filtration. The ready-to-use filters save much time from replacing the membrane or cleaning the filter units, is applicable for various applications, e.g. the pre-filtration of samples, clarification, or the sterile filtration for liquid or gas, for sample preparation in HPLC, LC/GC/MS or QC inspection in industrial production. The available diameter is 4mm-50mm, process volume is 0.5ml-200ml.

Specification	Housing Material	Medical Class PP/PC/MBS, etc.
	Filter Material	Nylon, Hydrophilic/Hydrophobic PTFE, Mixed cellulose ester(MCE), cellulose acetate(CA), Polyethersulfone(PES) Hydrophilic/Hydrophobic PVDF, Glass Fiber (GF), Polypropylene(PP), etc.
	Diameter(mm)	4/13/17/25/30/33
	Pore Size(μm)	0.1/0.2/0.45/0.8/1.0/1.2/3/5/10
Features	<ul style="list-style-type: none"> • Low Extratables • Particle Retention Rate>99% • Stable and fast flow rate, high bubble point • High Throughout 	<ul style="list-style-type: none"> • Luer Connector • High Pressure Resistance • Broad Compatibility



The GMP filters are designed with 4 pre-filter layers for filtering high-contaminated, high particle or viscosity solutions which are difficult to filter. The processing capacity is three to four times compare to single-layer filters.

Specification	Housing Material	Medical Class PP
	Filter Material	Nylon, Hydrophilic/Hydrophobic PTFE, Mixed cellulose ester(MCE), cellulose acetate(CA), Polyethersulfone(PES), Hydrophilic/Hydrophobic PVDF, Glass Fiber (GF), Polypropylene(PP), etc.
	Diameter(mm)	25mm
	Pore Size(μm)	0.1/0.2/0.45/0.8/1/3/5μm
Features	The GMP Filters consist with pre-filter layers and microporous membrane, efficiently reduce the hand pressure required and enhance the process capacity.	



ICpure filters are consist of ultra-pure membranes, which is suitable for analysing the trace amounts of anions and cations, and the automatic pretreatment of complex samples

Specification	Housing Material	Medical Class PP
	Filter Material	Polyethersulfone(PES)
	Diameter(mm)	4/13/25mm
	Pore Size(μm)	0.1/0.2/0.45/0.8/1/3/5μm
Features	<ul style="list-style-type: none"> • Extreme Low non-specific adsorption • Extreme Low IC extractables: Cl⁻, NO₃⁻, SO₄²⁻, PO₄³⁻ <50ppb 	



The MSpure filter is applicable for applications from Proteomics to environment analysis, using in sample preparation for mass spectrometry analysis of molecules in complex mixtures.

Specification	Housing Material	Ultra-clean Medical Class PP
	Filter Material	Pure Nylon/PTFE
	Diameter(mm)	4/13/25/30mm
	Pore Size(μm)	0.1/0.2/0.45/0.8/1/3/5μm
Features	Extreme Low non-specific adsorption Extreme Low extractables from the Pure Nylon or PTFE, no interfere for LC/MS Result.	



The Microporous Membrane is one of the most widely use membrane in the membrane filtration field. It gives simple, convenient usage, for using in Scientific research, Food analysis, Chemical engineering, Nanotechnology, Energy, Environmental protection and other fields. The membrane filter discs create nature physical barrier from the pore structure, is able to obstruct the particles or microorganism on the surface of the membrane.

Specification	Filter Material	Nylon, Hydrophilic/Hydrophobic PTFE, Mixed cellulose ester(MCE), cellulose acetate(CA), Polyethersulfone(PES) Hydrophilic/Hydrophobic PVDF, Glass Fiber (GF), Polypropylene(PP), etc.
	Diameter(mm)	7/13/25/37/47/90/142/293mm, or customized size
	Pore Size(μm)	0.1/0.2/0.45/0.8/1.0/1.2/3/5/10μm
Features	<ul style="list-style-type: none"> • PP, GF: Widely use for pre-filtration, remove particles or impurities • PTFE: Resistant for organic solvent, especially for strong acids or bases • Nylon: Suitable for aqueous solution • PES: Applicable for Biochemical, inspection, pharmaceutical and sterilization filtration • MCE, CA, CN: Suitable for the detection of water pollution index and the analysis or determination of oil insoluble • PVDF: Suitable for Sterilization Filtration of protein solution, tissue culture media, antibiotics and ethanol, etc. Clarification, and gas filtration 	

Sample Vial

Description	Volume	Type of Glass	Dimension
1ml Insert Vial Compatible for: Waters®(WISP96), Shimadzu, Gilsonm Agilent(7693)			
Insert Vial	1ml	Type I borosilicate glass	8 × 40mm

2ml HPLC/GC Autosample Vial Compatible for Waters®, Agilent, Beckman®, Thermo®, Dynatech®, Gilson®, Hitachi®, Perkin-Elmer™, Varian®, Spark®			
8-425 screw top	2ml	Type I borosilicate glass	32 × 11.6mm
9-425 screw top			
10-425 screw top			
11mm crimp top			
11mm snap top			

Insert Vial			
8-425 screw top	100μL bevelled bottom with assembled plastic spring	Type I borosilicate glass	29×5mm
9-425 screw top	200μL bevelled bottom		31×5mm
10-425 screw top	300μL flat bottom		31×5mm
11mm crimp top	250μL bevelled bottom with assembled plastic spring		29×6mm
11mm snap top	300μL bevelled bottom		31×6mm
	400μL flat bottom		31×6mm

Headspace Vial			
18 mm screw top	10ml	Type I borosilicate glass	46 × 22.5mm
	20ml		75 × 22.5mm
20 mm crimp top	10ml	Type I borosilicate glass	46 × 22.5mm
	20ml		75 × 22.5mm

Storage Vial			
13-425 Screw Top	4ml	Type I borosilicate glass	45 × 15mm
	8ml		61 × 16.6mm
	12ml		66 × 18mm
15-425 Screw Top	20ml		57 × 27.5mm
	30ml		72.5 × 27.5mm
	40ml		95 × 27.5mm
24-400 Screw Top	60ml		140 × 27.5mm

EPA, TOC Vial			
24-400 Screw Top	20ml	Type I borosilicate glass	57 × 27.5mm
	40ml		95 × 27.5mm
	40ml, TOC <20ppb		



Description	Material	Septa
Caps for 1ml Insert Vial		
1ml 8 x 40mm	Polypropylene	

Caps/Septa for 2ml HPLC/GC Autosample Vial		
8-425 Screw Top	Polypropylene	PTFE/Silicone
9-425 Screw Top		Pre-slit PTFE/Silicone
10-425 Screw Top		Cap+Septa PTFE/Silicone
11mm Crimp Top		PTFE/Silicone Pre-slit PTFE/Silicone
11mm Snap Top	Polypropylene	PTFE/Silicone Pre-slit PTFE/Silicone

Caps/Septa for Headspace Vial		
18mm Screw top	Magnetic Cap	PTFE/Silicone
20mm Crimp top	Aluminium Cap/Magnetic Cap	

Caps/Septa for Storage Vial, EPA, TOC Vial		
13-425 Screw Top	Polypropylene	PTFE/Silicone
15-425 Screw Top	White or Black Gap	
24-400 Screw Top	with or without hole	



Crimping & Decapping Tool		
Description	Material	Features
11mm Crimp Top	High polymer material	2 in 1 design for crimping & decapping tool, Curved high-strength handles & rigid light-weight plastic-easy to use
20mm Crimo Top		

MS® Sterile Syringe Filter



Material	MCE/CA/PES/Nylon/PVDF/PTFE/GF/PP
Diameter (mm)	4/13/25/30/33
Pore Size (µm)	0.1/0.22/0.45/1.0/3.0/5.0, etc.
Features	The housing material is medical grade polypropylene to ensure the high strength and good stability of the product; the easy-to-tear paper-plastic individual packaging is convenient to use; The lot number is traceable. The filters are pre-sterilized by γ-radiation, is pyrogen-free, endotoxin-free, DNase-free and RNase-free; all products are certified by the ISO 9001 quality system. a wide range of filter membrane are available to meet different filtration needs

MS® Vacuum Filter



Material	PES/PVDF/CA/Nylon/PTFE	
Diameter (mm)	50/90	Applications
Pore Size (µm)	0.1/0.22/0.45/1.0/3.0/5.0, etc.	Sterilization or Clarification of large volumes of bio-fluids, buffers, culture media, and additives
Volume (mL)	250/500/1000	
Features	<ul style="list-style-type: none"> Pyrogen, Nuclease and endotoxin free GF membrane prefilter is ideal for difficult-to-filter biological fluids 	

MS® Blotting Membrane



Filter Media	Nylone- PVDF and NC	
Pore Size (µm)	0.2/0.45/0.8	
Applications	<ul style="list-style-type: none"> Northern, Southern, and Western transfers Colony and plaque imprinting DNA fingerprinting Protein sequencing Solid phase ELISA Gene chip Microarray analysis 	
Features	<ul style="list-style-type: none"> High protein/nucleic acid molecular binding rate Low background, high resolution A variety of materials and aperture to meet the needs of different biological samples 	

MS® SteriBell50™ Filtration Device



Material	PES/MCE/Nylon etc.
Diameter (mm)	50
Pore Size (µm)	0.1/0.22/0.45/1.0/3.0/5.0 etc.
Filtration Area (cm²)	20
Features	Globulin adsorption <10ug/cm² Inlet, Outlet: Stepped Hose Barb(6-12mm) Bio-safety
Application	<ul style="list-style-type: none"> Sterilization or Clarification for small or Medium volume of culture media, buffer, or other chemical & biological fluids, Up to 5L process volume. Suitable for low concentration protein solutions, preservative or other valuable ingredients. Optional glass fiber prefilter layer offer superior throughput and reduce device quantity required.

MS® Sterile Gridded Membrane Filter



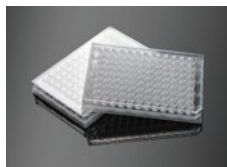
Material	Mixed cellulose ester(MCE), cellulose acetate(CA), cellulose nitrate (CN)
Pore Size (µm)	0.22/0.45/0.80
Color	White Membrane with Black Grid, Black Membrane with White Grid
Wettability	Hydrophilic
Application	Colony Counting(Microbial enumeration) Sterility test
Features	<ul style="list-style-type: none"> Clear printed grid with microbiological-"friendly" ink which promote growth on grids to maximize recovery Pre-sterilized by gamma irradiation and aseptically sealed Available in Individual or continuous package. Easy to open with blue separation paper Compatible with MS Automatic Membrane Dispenser

MS® 15mL Centrifugal filter



Material	PES	
Maximum Sample Volume	15ml	
MWCO	5KD, 10KD, 30KD, 50KD, 100KD	
Effective Filtration Area	7.2 cm²	
Application	<ul style="list-style-type: none"> Concentrate and desalt proteins and nucleic acids Buffer exchange or salt removal of chromatography fractions Virus concentration or removal Crude fractionation of protein mixtures 	
Features	<ul style="list-style-type: none"> Fast filtration flow rate and high sample recovery rate Low biomolecular binding rate and high chemical compatibility Anti-filtration dry locking design to avoid excessive centrifugal damage to the sample Various aperture specifications to meet the requirements of different MWCOs 	

MS® 96-Well Filter Plates



Material	PTFE, PVDF, MCE	
Recommended Working Volume	50~250µL	
Pore Size (µm)	0.22/0.45	
Well-Bottom Area	0.38 cm²	
Application	Protein kinase/phosphatase analysis, protein purification, receptor binding analysis, protein binding assay, ELISPOT analysis, sample preparation, sample filtration before mass spectrometry analysis, fluorescent dye removal.	
Features	<ul style="list-style-type: none"> Sterilized and non-sterile are available; Suitable for filtration above micron level; No dead space volume, high recovery rate; Each micropore is packaged with a filter membrane separately, with good stability between wells/plates and no mutual interference; Removable deflector and unique filter plate design. 	

MS® Sterile Venting Filter



Diameter(mm)	50
Pore Size(µm)	0.1/0.22/0.45 etc
Package	Pre-sterile or non-sterile pack
Material	PTFE specific for sterile venting
Application	Sterile Venting for incubator, fermentation or bio-reactors, etc.
Features	lightweight design prevents tube pinching in carboy venting applications, Optimized PTFE membrane provides superior flow rates in a compact device Meet USP <88> Biological Reactivity test for Class VI Plastics

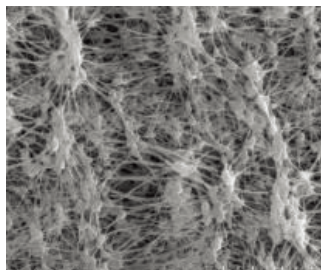
Membrane

PTFE Membrane

	Hydrophobic PTFE	Hydrophilic PTFE
Description	MS® PTFE hydrophobic membrane is used in high purity vent, air/gas and aggressive solvent applications. Available in supported and unsupported.	MS® PTFE hydrophilic membrane is used in aqueous solution and high purity applications. Available in supported and unsupported.
Features	<ul style="list-style-type: none"> Superior hydrophobicity High porosity Superior flow rates Broad chemical compatibility High thermal resistance Non-fiber releasing Low extractable level Suitable for sterile filtration Absolute filtration 	<ul style="list-style-type: none"> High porosity High flow rates Broad chemical compatibility High thermal resistance Non-fiber releasing Low extractable level Hydrophilic - no pre-wetting required Resistant to strong acids and bases Suitable for sterile filtration
Applications	<ul style="list-style-type: none"> Semiconductor and microelectronics Ultrapure chemicals Vent filters Air and gas filtration Dust collection Textiles Bio-reactors Membrane distillation 	<ul style="list-style-type: none"> High purity electronic grade chemicals Clarifying acids, bases, and cryogenic fluids Ultrapure and deionized water Wet etching and cleaning chemicals



0.22µm Hydrophilic PTFE Water contact angle



0.22µm Hydrophilic PTFE SEM



PTFE Membrane

Data Sheet:

Material	Hydrophobic PTFE									
Membrane Name	PTFE					PTFE				
Support Material	PP					PET				
Pore Size (µm)	0.1	0.22	0.45	1	3	0.1	0.22	0.45	1	3
60% Isopropanol Bubble Point (MPa)	0.19 -0.26	0.14 -0.20	0.07 -0.11	0.04 -0.07	0.02 -0.04	0.19 -0.27	0.32 -0.5	0.16 -0.3	0.1 -0.16	0.06 -0.07
Ethanol Flow Rate (mL/min/cm²/10psi)	7-15	15-30	30-60	60-100	150-200	6-8	10-25	25-65	70-100	310-430
Air Velocity (L/min/cm)	1	2	4	8	10	1	2	4	8	10

Material	Hydrophilic PTFE									
Membrane Name	PTFE					PTFE				
Support Material	PP					PET				
Pore Size (µm)	0.1	0.22	0.45	1	3	0.1	0.22	0.45	1	3
Water Bubble Point (Mpa)	0.2 -0.24 (60% IPA)	0.13 -0.16	0.07 -0.11	0.03 -0.05	0.02 -0.04	0.02 -0.04	0.35 -0.5	0.18 -0.3	0.07 -0.11	0.06 -0.07
Water Flow Rate (mL/min/cm²@10psi)	8-10	11-25	30-55	60-100	170-210	6-9	9-24	35-50	70-85	150-200

PVDF Membrane

	Hydrophobic PVDF	Hydrophilic PVDF
Description	MS® hydrophobic PVDF membrane can be used in the field of solvent solutions, air/gas filtration, sample preparation of HPLC and GC, having wide applications and excellent heat and oxidation resistance.	MS® PVDF hydrophilic membrane is used in aqueous solution and high purity applications. Available in supported and unsupported
Features	<ul style="list-style-type: none"> Broad chemical compatibility Low extractable level High thermal resistance Non-fiber releasing High tensile strength Suitable for sterile filtration Absolute filtration 	<ul style="list-style-type: none"> High porosity High flow rates Broad chemical compatibility High thermal resistance Non-fiber releasing Low extractable level Hydrophilic-no pre-wetting required Resistant to strong acids and bases Suitable for sterile filtration High tensile strength Low protein binding
Applications	<ul style="list-style-type: none"> Solvent filtration Air/Gas purification and venting HPLC sample preparation 	<ul style="list-style-type: none"> High purity electronic grade chemicals Clarifying acids, bases, and cryogenic fluids Ultrapure and deionized water Wet etching and cleaning chemicals

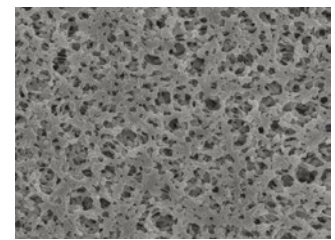
Data Sheet:

Material	Hydrophobic PVDF		Hydrophilic PVDF	
Membrane Name	PVDF			
Support Material	None			
Structure	Asymmetric			
Pore Size (µm)	0.22	0.45	0.22	0.45
Retention Rate	> 99%			
Bubble Point(Mpa)*	0.11-0.15	0.06-0.10	0.35-0.45	0.16-0.25
Flow Rate (mL/min/cm²/10psi)*	6-10	20-40	7-12	30-60
Thickness (µm)	100-130			

*Hydrophobic PVDF is Ethanol Bubble Point and Ethanol Flow Rate,
Hydrophilic PVDF is Water Bubble Point and Water Flow Rate



Ultra hydrophilic

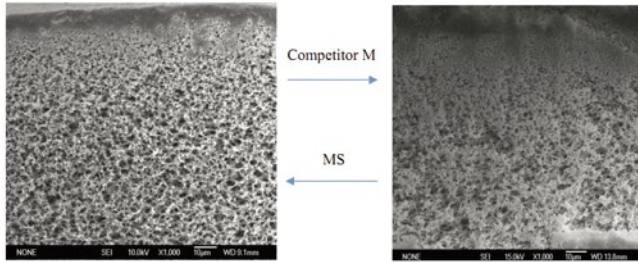


High Porosity



Nylon & PES Membrane

	Nylon	PES
Description	MS® Nylon membrane is naturally hydrophilic making it suitable for aqueous solutions without the need of wetting agents. And, it has excellent compatibility with most organic solvents (alcohols/hydrocarbons/ethers/esters/ketones/benzene). It is suitable for the retention of various microorganisms and bacteria.	MS® PES membrane is inherently hydrophilic. It's asymmetric pore structure and high porosity provide superior flow rates and throughputs over other membranes. PES exhibits very low protein binding. It's suitable for many applications from sample preparation to sterile filtration
Features	<ul style="list-style-type: none"> Naturally hydrophilic Good chemical compatibility Low chemical extractable level High strength (PET supported) pH compatibility: 2-13 Absolute filtration Autoclavable at 121 C for 30 min (0.1MPa, 14.5 PSI) 	<ul style="list-style-type: none"> High flow rate High throughput Very low extractable level Low protein and drug binding pH compatibility: 1-14 Absolute filtration
Applications	<ul style="list-style-type: none"> HPLC sample preparation Aqueous and organic solvents filtration Sterile filtration or clarification of media and buffers 	<ul style="list-style-type: none"> HPLC sample preparation Aqueous and solvents filtration Sterile filtration or clarification of media and buffers



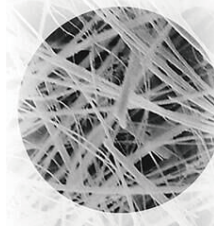
High Asymmetric Structure

Data Sheet:

Material	Nylon							
Membrane Name	Nylon 66							
Support Material	PET							
Structure	Synnetrical							
Pore Size (µm)	0.1	0.22	0.45	0.8	1.0	3.0	5.0	
Retention Rate	> 99%							
Water Bubble Point (Mpa)	0.36-0.42	0.28-0.34	0.18-0.22	0.08-0.04	0.06-0.1	0.04-0.06	0.03-0.04	
Flow Rate (mL/min/cm²/10psi)	2-6	4-10	12-20	35-60	60-90	80-100	120-170	
Thickness (µm)	100-130	100-140	100-130	100-120	100-120	100-120	100-120	

Material	Hydrophilic PES		
Membrane Name	PES		
Support Material	None		
Structure	Asymmetric		
Pore Size (µm)	0.1	0.22	0.45
Retention Rate	>99%	>99%	>99%
Bacterial Retention Rate	—	>7 log reduction value (Brevundimonas diminuta)	>7 log reduction value (Serratia marcescens)
Water Bubble Point (Mpa)	0.2-0.28 (60%IPA)	0.35-0.5	0.24-0.35
Flow Rate (mL/min/cm²/10psi)	10-18	20-35	45-75
Thickness (µm)	100-120	100-120	100-120

Glass Fiber



Membrane Solutions' Glass Fibers are consisted of Capillary fiber structure, which are able to absorb more water compare to other fibers, and due to the features of non-absorbent and bioinertia, they are resistant to most of solvents and reagents except hydrofluoric acid or the acid and base solutions in high concentration. They are suitable for sample analysis, the Liquid scintillation counting, and the transparent glass fiber is suitable for the following microexamination. Membrane Solution supply different grade of glass fiber, available in: GF/A, GF/B, GF/C, GF/D, GF/F, GF10.

The Glass Fibers are manufactured from 100% borosilicate glass, are available with adhesive or without adhesive which show chemical inertness. The type with adhesive has enhanced mechanical strength, are using in filtering large particles (e.g. macromolecular substance, dust), is suitable for filtering inorganic substances. In order to avoid chemical reaction with the solvent, the Glass fiber with adhesive-free is more suitable for filtering organic substance. These depth filters combine fast flow rate with high loading capacity and retention of fine particulates (up to subfine particle range). The glass fiber is resistant up to 500 C, is able to use in the densimetric analysis which required burning, and the high temperature gas filtration.

Features

Grade GF/A	1.6µm, Resist fine particles, Fast flow rate, High pressure assistance
Grade GF/B	1.0µm, 3 times thickness of GF/A, Higher wet strength, higher pressure assistance
Grade GF/C	1.2µm, Resis fine particles, Fast flow rate
Grade GF/D	2.7µm, In the condition of same particle retention rate, has faster filter speed compare to other filters. Thicker membrane, with excellent pressure assistance.
Grade GF/F	0.7µm, Higher retention rate for fine particles, fast flow rate, ultra-high pressure assistance Due to the strict retention of 0.6µm-0.8µm particles and pure borosilicate structure, the EPA TCLP 1311 toxicity filtration method is created based on GF/F.
Grade GF10	High Mechanical stability, High temperature resistance up to 180 C



Data Sheet:

Grade	Pore Size (µm)	Air Flow Rate (s/100min)	Thickness (µm)	Weight (g/m²)
GF/A	1.6	4.3	250-310	53
GF/B	1.0	12	710-830	143
GF/C	1.2	6.7	260-320	53
GF/D	2.7	2.2	580-620	121
GF/F	0.7	19	450-520	75
GF10	--	--	360-440	70

COMPANY PROFILE

Membrane Solutions is a high-tech company focusing on membrane (research) and the development of the membrane casting technology. (We are committed to be) the supplier of the (most completed lines of membrane and filters that cover the application of) liquid and air filtration, separation and purification, serving the diverse needs of customers across the broad spectrum of Lab, industry (ial) and residential (sectors) with over 600 employees and several branches worldwide.

ADVANTAGES

- ✓ ISO9001, CE, FDA, NSF certificated
- ✓ 100,000 Class Clean Room
- ✓ Available in OEM, cost effective products with consistent quality

★ Qualification(ISO9001, CE, SGS, FDA...)



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