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Vol. 14

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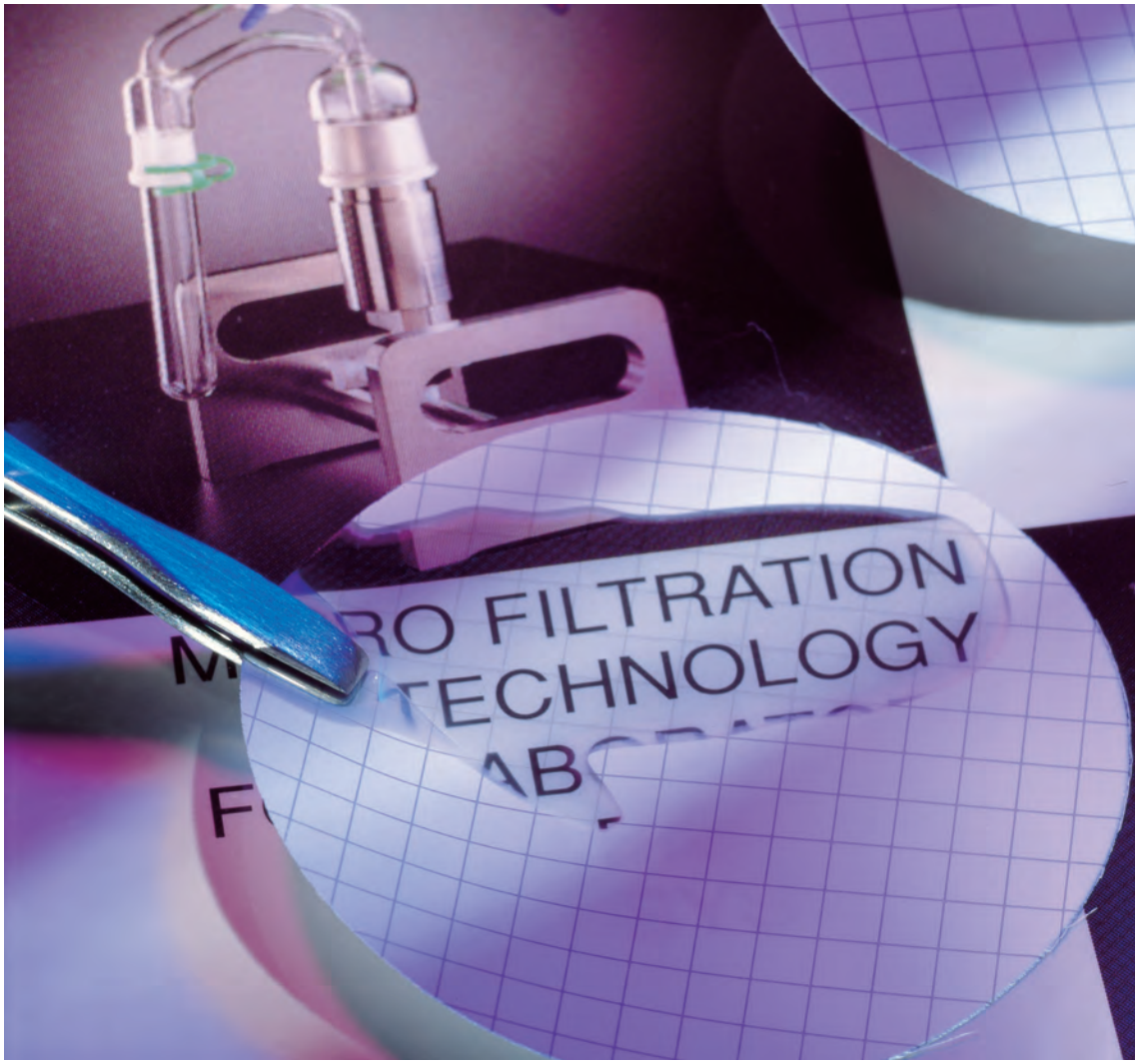
ADVANTEC MFS, Inc.



MICRO FILTRATION TECHNOLOGY FOR LABORATORY & PROCESS SYSTEMS

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Micro Filtration Technology for Laboratory & Process Systems

CATALOG • Volume 14

ADVANTEC MFS, Inc.

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Introduction

Advantec MFS, Inc. is a wholly owned subsidiary of Toyo Roshi Kaisha, Ltd. (Japan), a major producer of filtration media and related scientific products since 1916. This US-based operation was originally founded in 1979 as Toyo Roshi International, Inc., a California corporation. Two of the three original divisions (Main Office and Micro Filtration Systems) were merged in 1995 to become Advantec MFS, Inc.

We aim to serve the pharmaceutical, public health, food and beverage, health care, life sciences and electronics industries with high quality products for separation science. Our product range includes membrane filters, prefiltration media, glass fiber and cellulose filters, qualitative and quantitative filter papers, specialty test papers, and an extensive range of filter holders in stainless steel, plastic, and glass for laboratory and process applications.

Customers have the right to expect the highest quality products we can produce. We manufacture our filter products to exacting standards and have established quality control specifications to assure you of product consistency, reproducibility, uniform performance and superior product integrity. The bulk of our membrane filters, test papers, and filtration units are manufactured under a quality management system certified by Lloyd's Register QA Ltd. as ISO 9001 approved. This certification is recognized by the United Kingdom Accreditation Service (UKAS) and by the Japan Accreditation Board for Conformity Assessment (JAB).

Our Customer Service Department prides itself on its excellent service and prompt accurate deliveries. Orders will ship the same day they are placed for stock on hand. In the case of back ordered supplies, we can give you an accurate lead time and suggest alternatives that may meet your needs. Should you have any questions about any of our products, our Technical Service department will provide you with current, application-specific information. We value our customers large and small and we strive to support them in every way possible.

Our goal continues to be what we have done for over 90 years: to manufacture consistent, reproducible quality products at the lowest possible cost and to provide the best possible service in their delivery.

How to Order

Contact us for pricing and ordering information on the items in this catalog and for assistance with custom orders.

Telephone: (800) 334-7132
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Terms

FOB warehouse, Dublin, CA 94568
Net 30 days with prior approved credit
Credit cards accepted: VISA, MasterCard
COD available
Drop Shipments made without additional charge

Prices

Prices are subject to change without notice. When ordering from a quotation, please reference the quotation number. Acceptance of any order is at the sole discretion of Advantec MFS, Inc.

Returned Goods Policy

Products shipped may not be returned without proper prior authorization from Advantec MFS, Inc. and is subject to a 15% restocking fee. Authorization may be obtained by writing or calling our Customer Service Department. Goods must be in the original container, and in saleable condition to be considered for re-stocking.

Warranty

Advantec MFS, Inc. warrants its products against defects in material or workmanship for a period of one year from the date of delivery when used in accordance with the instructions provided in this catalog or with the product. The liability of Advantec MFS, Inc. is limited to replacement, or repair, at its option of any product.

Advantec MFS, Inc. makes no other warranty, expressed or implied.

Specifications listed in this catalog represent values in effect at the time of printing and are subject to change without notice.

Technical Assistance

Please contact us if you have any questions about our products or wish to request a sample. Instruction manuals are available for many of our assemblies.

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Introduction

Membrane filters or "membranes" are microporous plastic films with specific pore size ratings. Also known as screen, sieve or microporous filters, membranes retain particles or microorganisms larger than their pore size primarily by surface capture. Some particles smaller than the stated pore size may be retained by other mechanisms.

Advantec membranes are produced by three different processes. Mixed Cellulose Esters, Cellulose Acetate, and Nylon are reverse phase solvent cast membranes, where controlled evaporation or removal of the complex solvent system forms the porous structure. Both hydrophilic and hydrophobic PTFE are made by a patented process where the membranes are stretched biaxially to form the porous structure. PCTE membranes are track etched.

Performance Characteristics of Advantec Membranes

- **Strong:** Advantec membranes are monitored for both burst (longitudinal) and tensile (lateral) strength. Supported Acetate and Nylon are the strongest reverse phase membranes available from Advantec
- **Chemically and biologically clean:** As part of a comprehensive quality program, only high purity reagents and raw materials are used to produce Advantec membranes. Once cast, the membranes are handled in a class 1000 clean room to minimize ambient contamination. While some membranes require a small amount (0.1–3 weight %) of an aqueous wetting agent, Cellulose acetate has the lowest aqueous extractables (0.1 weight %) and Nylon, inherently hydrophilic, contains no added wetting agents or surfactants. All Advantec membranes are Triton-free except Nylon
- **Thin membranes with high porosity:** Uniformly thin membranes (typically 150 µm) with high porosity (about 80%) provide high gas and liquid flow per unit area. High porosity also provides high surface area for adsorption or binding
- **Thermostable:** All Advantec membranes can be sterilized by autoclaving. Operating temperatures of up to 180°C can be achieved depending upon the membrane polymer (see individual membrane specifications for details). Advantec membranes exhibit minimal shrinkage at elevated temperatures

Quick Guide to Selecting Membrane Filters

- **Determine** what liquid or gas will be filtered
- **Check** which membranes are chemically compatible (following and appendix)
- **Determine** the maximum pore size required to achieve the results you want
- **Check** the membrane specifications for any unusual process conditions that might otherwise limit your choice of membrane (e.g. temperature)

For more detailed information on how to design a filtration system see the appendix, page 120.

Properties of Membrane Filters

MEMBRANE COMPARISON

Membrane polymer	Sample applications	General compatibility	Hydrophilic	Hydrophobic	Pore size range available (µm) 0.1 0.2 0.45 0.8 1.0 3.0 5.0 8.0 10
Mixed cellulose esters (MCE)	General purpose Microbiology Particle Analysis	Aqueous solutions	✓		
Cellulose Acetate	General filtration Cytology Binding studies	Aqueous solutions	✓		
Coated Cellulose Acetate	Clarify solutions Prefilter	Aqueous solutions	✓		
Hydrophilic PTFE	HPLC solutions Clarify or sterilize aqueous/organic mixtures	Aqueous and organic solutions	✓		
Hydrophobic PTFE	Gas venting Clarify or sterilize strong acids or solvents	Non-aqueous solvents			
Hydrophobic PTFE with supported PP net				✓	
Nylon	Filter sterilization Vacuum degassing HPLC solutions	Aqueous and organic solutions	✓		
Polycarbonate	Microscopy Beverage testing	Aqueous solutions	✓		

ORDERING INFORMATION: MEMBRANE FILTER NOMENCLATURE

The membrane filter nomenclature specifies the required information for correctly ordering membranes. The nine digit code specifies type, pore size, surface/type, diameter and packaging as illustrated below.

A	020	A	293	C
Type of Filter	Membrane Pore Size (mm)	Surface/Type	Diameter (mm)	Quantity per Package

EXAMPLE

Quantity per Package

A = 100
B = 50*
C = 25
D = 10
E = 5
H = 25 with 60 mm center hole
K = HE ind pack WG, 100
J = HE ind pack WP, 100
R = 1 roll
Y = 200
W = 1000

*B = Opticlear MF, 100

Diameter (mm)

13 = 013
25 = 025
37 = 037
47 = 047
50 = 050
82 = 082
85 = 085
90 = 090
137 = 137
142 = 142
293 = 293

Sheets/Rolls (cm)

15 x 15 = 154
15 x 9.2 = 159
20 x 20 = 204
30 x 30 = 304
33 cm x 3 m = 330

Surface/Type

Packaging	Non-Sterile Packages		10 x 10-A Autoclavable		10 x 10-S		Pre-Sterilized Packages: Individually Wrapped			
Pad	No Pad	No Pad	Pad	Pad	Pad	Pad	Pad	No Pad	Pad	No Pad
Surface	Plain	Grid	Plain	Grid	Plain	Grid	Plain		Grid	
MF Color										
White	A, X**	B, X**	S	T	C	D***	E	G	F	H
White HE*	J	K								
Black	N	P						Q	M	R
Green	U	V								W

*HE = Hydrophobic Edge **Opticlear MF ***D Type: 10 x 20-S, No pad

Membrane Pore Size (mm)

5.00 = 500
3.00 = 300
1.20 = 120
1.00 = 100
0.80 = 080
0.65 = 065
0.50 = 050
0.45 = 045
0.30 = 030
0.22 = 022
0.20 = 020
0.10 = 010

CMF (nominal mm)

10 = 100
2 = 020
0.8 = 008

Type of Filter

A = Mixed Cellulose Ester
B = Cellulose pads
C = Cellulose acetate
S = Cellulose Nitrate
H = Hydrophilic PTFE
J = Hydrophobic PTFE, polypropylene backing
T = Hydrophobic PTFE
K = Polycarbonate
N = Nylon, supported
Y = Coated cellulose acetate

Mixed Cellulose Esters (MCE)

- **Composition:** Mixed cellulose esters including cellulose nitrate and cellulose acetate, also known as nitrocellulose
- **High porosity** provides superior flow rates
- **High protein binding** can be blocked by pretreatment or utilized in applications
- **High purity:** Triton-free
- **Autoclavable:** Withstands autoclaving temperatures up to 130°C without adversely affecting bubble point, flow rate or microbiological recovery
- **Rapid wetting time:** <3 seconds to wet a 47 mm diameter disc with aqueous 1% methylene blue

Applications

- Standard membranes for many laboratory applications including filter sterilizing biological fluids, microbiology, contamination analysis and air monitoring
- Can be transparentized to view collected particles
  - using compatible liquid (immersion oil, toluene),

    OR
  - select Opticlear membranes for the "hot block" acetone vapor method
- Gridded filters available for quantifying microbial growth
- Available non-sterile or sterilized by ethylene oxide (EtO)

Specifications for Mixed Cellulose Esters (MCE), Code A

Pore Size µm	Color	Surface	Bubble Point[1]		Flow Rate[2]		Porosity[3] (%)	Thickness (µm)
			MPa	psi	Water (mL/min/cm²)	Air (L/min/cm²)		
0.10	White	Plain	≥0.24	≥35.3	2.7	0.67	65	110
0.20	White	Plain	≥0.37	≥54.5	17.5	2.4	73	133
0.30	White	Plain	≥0.28	≥41.2	30	3.7	75	140
0.45	White	Plain	≥0.24	≥35.0	45	5.0	78	145
0.45	White	Grid	≥0.16	≥24.2	80	8.0	79	142
0.65	White	Plain	≥0.14	≥21.3	120	11.2	79	150
0.80	White	Plain	≥0.11	≥16.4	165	15.0	80	150
1.00	White	Plain	≥0.096	≥13.9	220	20.4	80	150
3.00	White	Plain	≥0.070	≥10.2	300	28.3	81	155
5.00	White	Plain	≥0.058	≥8.5	400	40.9	81	160
0.45	Black	Grid	≥0.22	≥32.7	50	5.0	78	135
0.80	Black	Grid	≥0.10	≥14.9	170	15	80	145
0.45	Green	Grid	≥0.22	≥32.7	50	5.0	78	135
0.80	Green	Grid	≥0.10	≥14.9	170	15	80	145

- Refractive index = 1.50
- Maximum operating temperature = 130°C
- Ash Content 2 ~ 5 µg/cm²

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water (0.1 µm membranes prewet with isopropanol)
2. Flow Rate indicates initial flow rate at 10 psi using a KGS 47 filter holder
   Water: using water prefiltered to 0.1 µm pore size
   Air: using prefiltered nitrogen at 10 psi
3. Porosity refers to the percent open area

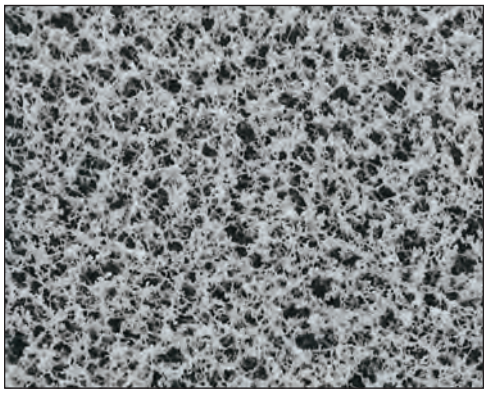
Protein Binding of Membrane Filters

Membrane	Catalog code	Protein Absorbed (µg/cm²) At pH 7.0	
		BSA*	γ-globulin
Mixed Cellulose Esters, 0.20 µm	A020…	100.8	206.2
Cellulose Acetate, 0.20 µm	C020…	26.8	24.3

*Bovine Serum Albumin

Ash Content of White Plain MCE Membrane Filters (ppm)

Al	<2.0	**K**	6.0	**Ni**	<5.0
Ca	140.0	**Li**	<1.0	**Pb**	<1.0
Cd	<0.5	**Mg**	10.0	**Si**	<20.0
Cr	8.0	**Mn**	<0.5	**Sn**	<5.0
Cu	<1.0	**Mo**	<1.0	**Ti**	<1.0
Fe	<5.0	**Na**	10.0	**Zn**	<1.0



Mixed Cellulose Esters

Ordering Information: Mixed Cellulose Esters – Nonsterile

Plain White, package of 100 disks

Pore Size (µm)	13 mm	25 mm	37mm	47 mm
0.10	A010A013A	A010A025A	A010A037A	A010A047A
0.20	A020A013A	A020A025A	A020A037A	A020A047A
0.30	A030A013A	A030A025A	A030A037A	A030A047A
0.45	A045A013A	A045A025A	A045A037A	A045A047A
0.65	A065A013A	A065A025A	A065A037A	A065A047A
0.80	A080A013A	A080A025A	A080A037A	A080A047A
1.00	A100A013A	A100A025A	A100A037A	A100A047A
3.00	A300A013A	A300A025A	A300A037A	A300A047A
5.00	A500A013A	A500A025A	A500A037A	A500A047A

Plain White, package of 25 disks

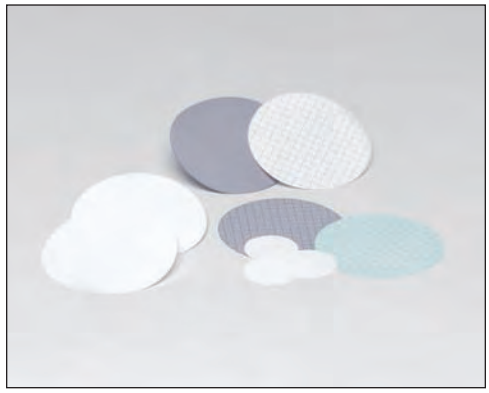
Pore Size (µm)	90 mm	142 mm	293 mm
0.10	A010A090C	A010A142C	A010A293C
0.20	A020A090C	A020A142C	A020A293C
0.30	A030A090C	A030A142C	A030A293C
0.45	A045A090C	A045A142C	A045A293C
0.65	A065A090C	A065A142C	A065A293C
0.80	A080A090C	A080A142C	A080A293C
1.00	A100A090C	A100A142C	A100A293C
3.00	A300A090C	A300A142C	A300A293C
5.00	A500A090C	A500A142C	A500A293C

Ordering Information (continued): Mixed Cellulose Esters – Nonsterile

Gridded White, package of 100 disks

Pore Size (µm)	13 mm	25 mm	37 mm	47 mm
0.45	A045B013A	A045B025A	A045B037A	A045B047A
0.80	A080B013A	A080B025A	A080B037A	A080B047A

0.8 µm MF has green grid lines on white background, 0.45 µm has black grid lines.



MCE membrane assortment

Sheets, Gridded White

Pore Size (µm)	Qty/pkg	30 mm x 30 mm
0.45	25	A045B304C

Hydrophobic Edge, 47 mm disks, package of 100 disks

Pore Size (µm)	Plain	Grid
0.20	A020J047A	A020K047A
0.45	A045J047A	A045K047A

Opticlear, package of 100 disks

Pore Size (µm)	Plain			Grid		
	25 mm	37 mm	47 mm	25 mm	37 mm	47 mm
0.80	A080X025A	A080X037A	A080X047A	A080X025B	A080X037B	A080X047B

Black, package of 100 disks

Pore Size (µm)	Surface	13 mm	25 mm	37 mm	47 mm	137 mm (25/pkg)
0.45	Plain	A045N013A	A045N025A	A045N037A	A045N047A	-
0.45	Grid	A045P013A	A045P025A	A045P037A	A045P047A	A045P137C
0.80	Plain	A080N013A	A080N025A	-	A080N047A	-
0.80	Grid	A080P013A	A080P025A	-	A080P047A	-

0.45 µm 47 mm black grid membrane also available presterilized: A045P047S

Green, package of 100 disks

Pore Size (µm)	Surface	13 mm	25 mm	47 mm
0.45	Plain	A045U013A	A045U025A	A045U047A
0.45	Grid	A045V013A	A045V025A	A045V047A
0.80	Grid	-	-	A080V047A

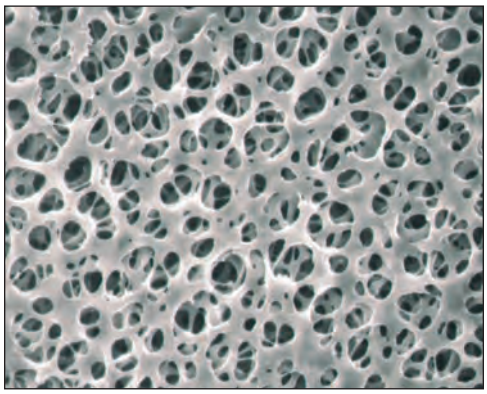
Additional sizes available by special order.
Also available in:

- Sterile packaging for microbiology.
- Disposable syringe units.

For Pure Nitrocellulose for Blotting, see page 35.
MSDS available for this product.

Cellulose Acetate

- **Composition:** Mixture of cellulose triacetate and diacetate
- **Characteristics:** Low static charge and high strength
- **Sterilizable:** May be repeatedly sterilized without loss of integrity or change in bubble point
- **Clean:** Lowest aqueous extractables (0.1 wt%) of all Advantec membranes
- Relative to MCE (Mixed Cellulose Esters, Nitrocellulose):
  - improved solvent resistance to low molecular weight alcohols
  - better heat resistance
  - lower protein binding (see page 4)



Cellulose Acetate

Applications

- Enhanced recovery of fastidious gram positive organisms
- Filtration of enzyme solutions
- Diagnostic cytology
- Receptor binding studies

Note: Should be prewet prior to loading into a holder and autoclaving.

Specifications: White Plain Cellulose Acetate, Code C

Pore Size (µm)	Bubble Point [1]		Flow Rate [2]		Porosity [3] (%)	Thickness [4] (µm)
	MPa	psi	Water (mL/min/cm²)	Air (L/min/cm²)		
0.20	≥0.25	≥37.1	16	2	66	125
0.45	≥0.17	≥25.9	35	4	68	125
0.80	≥0.068	≥10.0	160	14	72	125
3.00	≥0.034	≥5.0	500	54	78	135

- Wetting time: <3 seconds to wet a 47 mm diameter disk with aqueous 1% methylene blue
- Refractive index = 1.47
- Maximum Operating Temperature = 180°C
- Ash Content 1.5–3.5 µg/cm²

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water
2. Flow Rate indicates initial flow rate at 10 psi using a KGS 47 filter holder
   Water: using water prefiltered to 0.1 µm pore size
   Air: using prefiltered nitrogen at 10 psi
3. Porosity refers to the percent open area
4. Average thickness

Ash Content of White Plain Cellulose Acetate Membrane Filters (ppm)

Al	<5.0	**K**	2.0	**Ni**	<0.5
Ca	36.4	**Li**	<0.5	**Pb**	<0.5
Cd	<0.1	**Mg**	1.9	**Si**	7.8
Cr	2.2	**Mn**	<0.5	**Sn**	<0.5
Cu	1.2	**Mo**	<0.5	**Ti**	<5.0
Fe	1.6	**Na**	5.9	**Zn**	0.6

Ordering Information: Cellulose Acetate – Nonsterile

Plain White, package of 100 disks

Pore Size (µm)	13 mm	25 mm	37mm	47 mm
0.20	C020A013A	C020A025A	C020A037A	C020A047A
0.45	C045A013A	C045A025A	C045A037A	C045A047A
0.80	C080A013A	C080A025A	C080A037A	C080A047A
3.00	C300A013A	C300A025A	C300A037A	C300A047A

Plain White, package of 25 disks

Pore Size (µm)	90 mm	142 mm	293 mm
0.20	C020A090C	C020A142C	C020A293C
0.45	C045A090C	C045A142C	C045A293C
0.80	C080A090C	C080A142C	C080A293C
3.00	C300A090C	C300A142C	C300A293C

Rolls, Plain White, 33 cm x 3 m

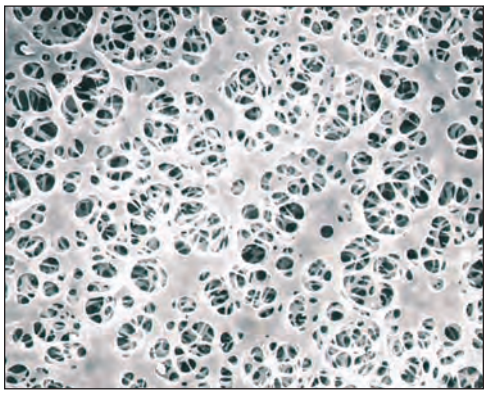
Pore Size (µm)	Roll
0.20	C020A330R
0.45	C045A330R
0.80	C080A330R

Also available in:

- Cartridge format (TCR)
- Disposable syringe filter units

Coated Cellulose Acetate

- **Composition:** Cellulose acetate cast onto a non-woven polyester support
- **Characteristics:** Non-fiber releasing
- **Low protein binding** relative to nitrocellulose
- **Low static charge** matrix with enhanced chemical compatibility to low molecular weight alcohols



Coated Cellulose Acetate

Application

- Use as a clarifying filter or prefilter

Specifications: Coated Cellulose Acetate (CMF), Code Y

Nominal Rating (µm)	Bubble Point[1]		Flow Rate[2]		% Latex Particle Retention (particle size in µm)							
	MPa	psi	Water (mL/min/cm²)	Air (L/min/cm²)	0.48	0.65	0.80	1	2	3	5	10
0.80	≥0.088	≥12.8	100	10	99	99	>99.9	-	-	-	-	-
2.00	≥0.049	≥7.1	290	32	96	99	99	99	>99.9	-	-	-
10.00	≥0.017	≥2.6	750	80	-	-	-	-	98	99.9	99.9	>99.9

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water.
2. Flow Rate indicates initial flow rate at 10 psi using a KGS 47 filter holder.
   Water: using water prefiltered to 0.1 µm pore size
   Air: using prefiltered nitrogen at 10 psi

Ordering Information: Coated Cellulose Acetate – Nonsterile

Plain White, package of 100 disks

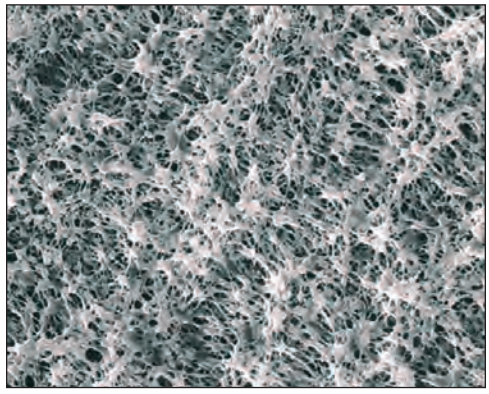
Nominal Rating (µm)	35 mm	47 mm	76 mm	90 mm	124 mm	142 mm	257 mm	293 mm
0.80	Y008A035A	Y008A047A	Y008A076A	Y008A090A	Y008A124A	Y008A142A	Y008A257A	Y008A293A
2.00	Y020A035A	Y020A047A	Y020A076A	Y020A090A	Y020A124A	Y020A142A	Y020A257A	Y020A293A
10.00	Y100A035A	Y100A047A	Y100A076A	Y100A090A	Y100A124A	Y100A142A	Y100A257A	Y100A293A

Also available in:

- Cartridge format (TCY and TCYE)

Hydrophilic PTFE

- **Characteristics:** Maximum chemical and pH resistance
- **High flow rates** with minimal aqueous extractables (<0.3 wt%)
- **Optically clear** when wet with water
- **Non-supported**



Hydrophilic PTFE

Application

- Ideal for HPLC and other mixtures of aqueous and organic solvents

Note: Hydrophilic PTFE membrane filters are not autoclavable.

Specifications: Hydrophilic PTFE Membrane, Code H

Pore Size (µm)	Bubble Point [1]		Flow Rates [2]		Porosity [3] (%)	Thickness (µm)	Maximum Operating Temperature (°C)
	MPa	psi	Water (mL/min/cm²)	Air (L/min/cm²)			
0.10	≥0.38	≥55.1	14	1.6	71	35	100
0.20	≥0.24	≥34.8	21	2.1	71	35	100
0.50	≥0.14	≥20.3	39	2.9	79	35	100
1.00	≥0.083	≥12.0	73	5.7	83	35	100

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water
2. Flow rate indicates initial flow rate at 10 psi using a KGS 47 filter holder
   Water: using water prefiltered to 0.1 µm pore size
   Air: using prefiltered nitrogen at 10 psi
3. Porosity refers to the percent open area

Trace Metal Content (ppm)

Al	15	**K**	8
Ca	13	**Mg**	1
Cr	<1	**Mn**	0.1
Cu	0.5	**Na**	20
Fe	<10	**Ni**	0.9

Ordering Information: Hydrophilic PTFE – Nonsterile

Plain White disks

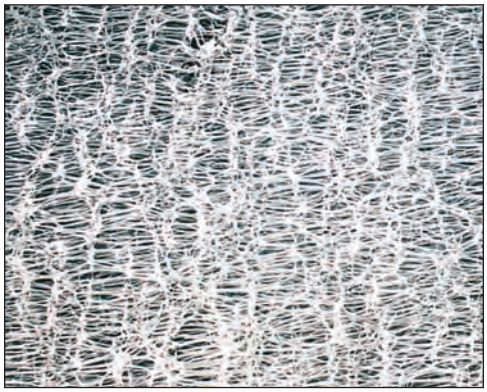
Pore Size (µm)	13 mm	25 mm	47 mm	90 mm	142 mm	293 mm
	package of 100			package of 25		package of 10
0.10	H010A013A	H010A025A	H010A047A	H010A090C	H010A142C	H010A293D
0.20	H020A013A	H020A025A	H020A047A	H020A090C	H020A142C	H020A293D
0.50	H050A013A	H050A025A	H050A047A	H050A090C	H050A142C	H050A293D
1.00	H100A013A	H100A025A	H100A047A	H100A090C	H100A142C	H100A293D

Also available in:

- Cartridge format
- Capsule format
- Disposable syringe filter units

Hydrophobic PTFE

- **Properties:** Thin, highly porous, behaves as an absolute retentive membrane
- **Inert** to most chemically aggressive solvents, strong acids and bases
- Operating Temperature Range -120 – 260ºC


Hydrophobic PTFE

Applications

- Sterilize gases: traps aqueous aerosols
- Air and gas venting: allows gases to pass freely while blocking aqueous liquids, protect vacuum pumps and critical samples
- Sterilize and clarify strong acids and many other solvents incompatible with other membranes

Specifications: Hydrophobic PTFE Membrane, Code T

Pore Size (µm)	Bubble Point [1]		Flow Rates [2]		Porosity [3] (%)	Maximum Operating Temperature (°C)	Thickness (µm)
	MPa	psi	Acetone (mL/min/cm²)	Air (L/min/cm²)			
0.10	≥0.12	≥17.4	27.0	-	68	260	70
0.20	≥0.091	≥13.2	55.0	-	74	260	80
0.50	≥0.063	≥9.1	100	-	78	260	75
0.80	≥0.039	≥5.7	200	-	76	260	75
1.00	≥0.031	≥4.5	300	-	79	260	75
3.00	≥0.013	≥1.9	750	-	83	260	75

Definitions:
1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with isopropylalcohol
2. Flow rates determined under constant vacuum 0.7 kg/cm² (10 psi)
3. Porosity refers to the percent open area

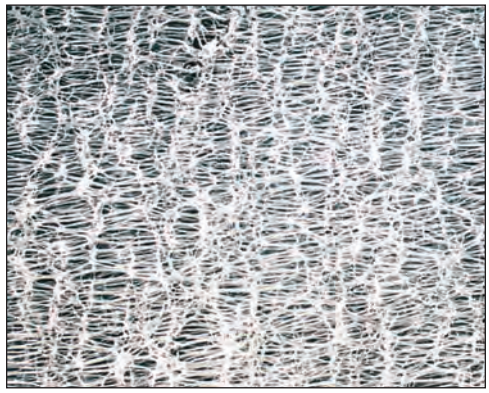
Ordering Information: Hydrophobic PTFE – Nonsterile

Plain White disks

Pore Size (µm)	13 mm	25 mm	47 mm	90 mm	142 mm	293 mm
	Package of 100			Package of 25		Package of 10
0.10	T010A013A	T010A025A	T010A047A	T010A090C	T010A142C	T010A293D
0.20	T020A013A	T020A025A	T020A047A	T020A090C	T020A142C	T020A293D
0.50	T050A013A	T050A025A	T050A047A	T050A090C	T050A142C	T050A293D
0.80	T080A013A	T080A025A	T080A047A	T080A090C	T080A142C	T080A293D
1.00	T100A013A	T100A025A	T100A047A	T100A090C	T100A142C	T100A293D
3.00	T300A013A	T300A025A	T300A047A	T300A090C	T300A142C	T300A293D

Hydrophobic PTFE with Supported PP Net

- **Properties:** Thin, highly porous, behaves as an absolute retentive membrane
- **Supported:** polypropylene laminated to one side to improve handling
- **Inert** to most chemically aggressive solvents, strong acids and bases
- **Thermostable:** can be used up to 100°C



Hydrophobic PTFE

APPLICATIONS:

- **Sterilize gases:** traps aqueous aerosols
- **Air and gas venting:** allows gases to pass freely while blocking aqueous liquids, protect vacuum pumps and critical samples
- **Sterilize and clarify** strong acids and many other solvents incompatible with other membrane

SPECIFICATIONS: HYDROPHOBIC PTFE MEMBRANE, SUPPORTED, CODE J

Pore Size (µm)	Bubble Point [1]		Flow Rates [2]		Porosity [3] (%)	Maximum Operating Temperature (°C)	Water Break Through		Thickness (µm)
	MPa	psi	Acetone (mL/min/cm²)	Air (L/min/cm²)			MPa	psi	
0.10	≥0.14	≥20.3	39.1	2.5	72	120	>0.40	>58.0	130
0.20	≥0.097	≥14.1	61.4	4.5	72	120	0.28	40.0	130
0.50	≥0.058	≥8.5	110	7.5	74	120	0.14	20.1	120
1.00	≥0.029	≥4.3	445	17	76	120	0.05	7.0	90

Definitions:
1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with isopropylalcohol
2. Flow rates determined under constant vacuum 0.7 kg/cm² (10 psi)
3. Porosity refers to the percent open area

ORDERING INFORMATION: HYDROPHOBIC PTFE, SUPPORTED – NONSTERILE

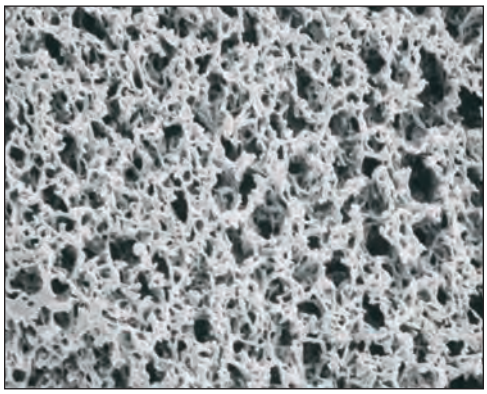
Plain White disks

Pore Size (µm)	13 mm	25 mm	47 mm	90 mm	142 mm	293 mm
	Package of 100			Package of 25		Package of 10
0.10	J010A013A	J010A025A	J010A047A	J010A090C	J010A142C	J010A293D
0.20	J020A013A	J020A025A	J020A047A	J020A090C	J020A142C	J020A293D
0.50	J050A013A	J050A025A	J050A047A	J050A090C	J050A142C	J050A293D
1.00	J100A013A	J100A025A	J100A047A	J100A090C	J100A142C	J100A293D

Also available in:
- Cartridge format
- Capsule format
- Disposable syringe filter units

Nylon

- **Composition:** Very strong, heat resistant membranes are manufactured by impregnating a polyester web with the nylon polymer
- **Inherently hydrophilic**
- **Compatible** with aqueous and alcoholic solutions and solvents
- **Pure:** negligible organic extractables
- **Binds** proteins, DNA and RNA



Nylon

Applications

- Suitable for HPLC sample preparation
- Filter sterilize and clarify aqueous and organic solvent solutions including buffers, microbiological and tissue culture solutions
- Vacuum degassing

Specifications: Nylon Membrane, Code N

Pore Size (µm)	Bubble Point [1]		Flow Rates [2]	
	MPa	psi	Water (mL/min/cm²)	Air (L/min/cm²)
0.10	≥0.48	≥70	4.0	0.6
0.22	≥0.34	≥50	9.9	1.7
0.45	≥0.20	≥30	26.9	3.2
0.65	≥0.12	≥18	59.3	4.5
0.80	≥0.089	≥13	80.5	14
1.20	≥0.075	≥11	180	18
5.00	≥0.041	≥6	331	34

- Wetting time: <3 seconds to wet a 47 mm diameter disk with aqueous 1% methylene blue
- Maximum Operating Temperature =180°C
- Thickness: 65–125 µm
- Extractables: <0.2%
- BSA Protein Binding 120µg/cm²

Definitions:

1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with water
2. Flow rate indicates initial flow rate at 10 psi

Ordering Information: Nylon – Nonsterile

Plain White disks

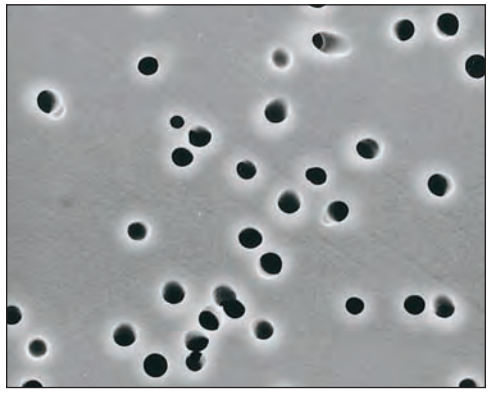
Pore Size (µm)	13 mm	25 mm	47 mm	90 mm	142 mm	293 mm
	100 per package			25 per package		
0.10	N010A013A	N010A025A	N010A047A	N010A090C	N010A142C	N010A293C
0.22	N022A013A	N022A025A	N022A047A	N022A090C	N022A142C	N022A293C
0.45	N045A013A	N045A025A	N045A047A	N045A090C	N045A142C	N045A293C
0.65	N065A013A	N065A025A	N065A047A	N065A090C	N065A142C	N065A293C
0.80	N080A013A	N080A025A	N080A047A	N080A090C	N080A142C	N080A293C
1.20	N120A013A	N120A025A	N120A047A	N120A090C	N120A142C	N120A293C
5.00	N500A013A	N500A025A	N500A047A	N500A090C	N500A142C	N500A293C

Also available in:

- Disposable syringe filter units

Polycarbonate

- **Characteristics:** Low non-specific binding and optically translucent, extremely uniform, cylindrical pores
- **Thin screen-type membranes** minimize entrapment within the filter structure; resulting in surface capture of particles on the membrane
- **Stable:** excellent chemical resistance, good thermal stability, non-hygroscopic and extremely weight stable
- **Autoclavable:** at 121° C, 30 min.



Polycarbonate

Applications

- Epifluorescence microscopy: available in black for this method
- Electron microscopy: smooth surface is ideal for observing captured particles
- Light microscopy: easily transparentized for optical illumination
- Beverage and sterility testing

Specifications: Polycarbonate Membrane, Code K

Pore Size (µm)	Bubble Point [1]		Flow Rate [2]		Nominal Thickness (µm)
	MPa	psi	Water (mL/min/cm²)	Air (L/min/cm²)	
0.10	≥0.21	≥30	2.5	1.5[3]	6
0.20	≥0.14	≥20	10	3[3]	10
0.40	≥0.083	≥12	33	7.5[3]	10
0.80	≥0.048	≥7	90	18[3]	9
1.00	≥0.041	≥6	130	20[4]	11
3.00	≥0.014	≥2	440	37.5[4]	9
8.00	≥0.0048	≥0.7	1000	30[4]	7

Maximum operating temperature = 140°C

Definitions:
1. Bubble point is the minimum pressure required to force air through a membrane which has been prewet with isopropylalcohol
2. Initial flow rates using prefiltered water at 10 psid (0.7 kg/cm²)
3. Initial flow rates using prefiltered air at 10 psid (0.7 kg/cm²)
4. Initial flow rates using prefiltered air at 5 psid (0.35 kg/cm²)

Ordering Information: Polycarbonate – Nonsterile

Plain White, package of 100 disks

Pore Size (µm)	13 mm	25 mm	47 mm
0.10	K010A013A	K010A025A	K010A047A
0.20	K020A013A	K020A025A	K020A047A
0.40	K040A013A	K040A025A	K040A047A
0.80	K080A013A	K080A025A	K080A047A
1.00	-	-	K100A047A
3.00	-	-	K300A047A
8.00	K800A013A	K800A025A	K800A047A

Plain Black, package of 100 disks

Pore Size (µm)	25 mm	47 mm
0.20	K020N025A	K020N047A
0.40	K040N025A	K040N047A

Please ask customer service for other pore size (0.60, 2.00, 5.00, 10.0, 12.0 µm) and disk diameter (37, 43, 76, 90, 142 mm).

Disposable Syringe Filter Units – DISMIC/LABODISC

- **Minimum sample hold-up:** Unit housings are specifically designed to maximize sample recovery
- **High purity:** Non-pigmented housing and integral filter sealing assure that filtrates will not be adulterated due to pigment, dye, or adhesives leaching into the filtrate
- **Convenient:** Each unit is clearly marked with an identifying code to denote pore size, membrane material and housing polymer
- **Sterile:** Units can be purchased presterilized and individually packaged, or nonsterile in bulk pack
- All polypropylene can be autoclaved
  Acrylic can not be autoclaved

3, 13, 25, and 50 mm disposable syringe filter units.

SPECIFICATIONS

		DISMIC					LABODISC
		3 mm	**13 mm**	**25 mm**		**30 mm**	**50 mm**
Housing material	-	PP	PP	PP	Acrylic	PP	PP
Housing Diameter	mm	3	13	25	25	30	50
Filtration Area	cm^2	0.06	0.9	4.0	4.0	4.8	19.6
Hold-up Volume	mL	≤0.01	≤0.03	≤0.1	≤0.1	≤0.1	≤3.0
Suggested capacity per filter unit	mL	<2 mL	<10 mL	<100 mL	<100 mL	<120 mL	>100 mL
Pressure limit	MPa	0.51	0.51*	0.51*	0.51	0.88	0.34
	psi	74	74*	74*	74	128	49
Maximum Operating Temperature	°C	60	60	60	45	180	60
	°F	140	140	140	113	356	140
Connections	-	inlet: female luer-lock outlet: male luer slip					7–13.5 mm hose barb

*13HP, 25HP; Pressure Limit = 0.39 MPa (57 psi)

Mixed Cellulose Esters (MCE, Nitrocellulose)
- Properties: A hydrophilic membrane
- Higher protein binding than cellulose acetate for most proteins
- High porosity provides a high flow rate

Nylon
- Properties: Strong, hydrophilic membrane
- Compatible with aqueous and alcoholic solutions, as well as most HPLC solvents.
- Convenient: Prewetting not required
- Pure: Minimal extractables
- High binding capacity for proteins, DNA and RNA

Cellulose Acetate (Acetate)
- Standard: A commonly used hydrophilic membrane
- Low protein binding, suitable for aqueous protein solutions
- Nitrate-free, suitable for groundwater filtration
- Housing material: polypropylene (3, 13, 50 mm) or styreneacrylonitrile (25 mm)

PTFE, hydrophilic
- Versatile: Good chemical resistance
- Compatible with many solvent mixtures used in HPLC, e.g. Acetonitrile/Water

PTFE, hydrophobic
- Application: use as vent

For ordering information, see page 16.

Ordering Information: Disposable Syringe Filter Units

DISMIC

Diam.	Membrane material	Pore size (µm)	Housing material	Quantity per package	Nonsterile	Sterile
3	Nylon	0.22	Polypropylene	200	03NP022AN	-
		0.45	Polypropylene	200	03NP045AN	-
		5.00	Polypropylene	100	03NP500AN	-
	Cellulose Acetate	0.20	Polypropylene	100	03CP020AN	03CP020AS
		0.45	Polypropylene	100	03CP045AN	03CP045AS
	PTFE, Hydrophobic	0.50	Polypropylene	100	03JP050AN	-

3mm

13	Nylon	0.22	Polypropylene	100	13NP022AN	-
		0.45	Polypropylene	100	13NP045AN	-
	Cellulose Acetate	0.20	Polypropylene	100	13CP020AN	13CP020AS
		0.45	Polypropylene	100	13CP045AN	13CP045AS
	PTFE, Hydrophilic	0.20	Polypropylene	100	13HP020AN	-
		0.50	Polypropylene	100	13HP050AN	-
	PTFE, Hydrophobic	0.20	Polypropylene	100	13JP020AN	-
		0.50	Polypropylene	100	13JP050AN	-

13mm

25	MCE	0.20	Acrylic	50	25AS020AN	25AS020AS
		0.45	Acrylic	50	25AS045AN	25AS045AS
	Nylon	0.10	Polypropylene	100	30NP010AN*	-
		0.10	Acrylic	100	-	25NS010AS
		0.22	Polypropylene	100	30NP022AN*	-
		0.22	Acrylic	100	-	25NS022AS
		0.45	Polypropylene	100	30NP045AN*	-
		0.45	Acrylic	100	-	25NS045AS
		1.20	Polypropylene	100	30NP120AN*	-
		1.20	Acrylic	100	-	25NS120AS
		5.00	Polypropylene	100	30NP500AN*	-
	Cellulose Acetate	0.20	Acrylic	50	25CS020AN	25CS020AS
		0.45	Acrylic	50	25CS045AN	25CS045AS
		0.80	Acrylic	50	25CS080AN	25CS080AS
	PTFE, Hydrophilic	0.20	Polypropylene	100	25HP020AN	-
		0.50	Polypropylene	100	25HP050AN	-
	PTFE, Hydrophobic	0.20	Polypropylene	50	25JP020AN	-
		0.50	Polypropylene	50	25JP050AN	-

25mm PP

25mm Acrylic

* Nylon nonsterile type 30 mm diameter only

LABODISC

50	Cellulose Acetate	0.20	Polypropylene	10	50CP020AN	50CP020AS
		0.45	Polypropylene	10	50CP045AN	50CP045AS
	PTFE, Hydrophobic	0.20	Polypropylene	10	50JP020AN	-
		0.50	Polypropylene	10	50JP050AN	-

50mm

Microbiology Supplies

Membranes for Microbiology – Introduction	18
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Black Mixed Cellulose Esters	20
Green Mixed Cellulose Esters	20
Cellulose Acetate (White)	20
Petri Dishes	21
Presterilized Absorbent Pads	21
Filterceps	21
Culture Media	22
Whirl-Pak® Sampling Bags	22

Membranes for Microbiology – Introduction

- **Made from Mixed Esters of Cellulose (MCE) or Cellulose Acetate:** MCE is a mixture of nitrocellulose and other cellulose esters. MSDS available upon request
- **Available with grid lines:** Contrasting grid lines facilitate counting colonies on the filter surface and are tested to assure freedom from grid line inhibition. 3.1 mm squares represent 1/100 of the filtration area of a 47 mm diameter filter (9.6 cm^2)
- **Convenient packaging:** Membranes are available individually wrapped for optimum sterility and also in 10-packs
- **Specially tested for microbiology:** All 0.45 µm white gridded membranes are tested for Coliform, Fecal Streptococci and *Serratia marcescens*. All 0.65 µm white gridded membranes are tested for complete retention and optimal recovery of Fecal Coliform and *Saccharomyces cerevisieae*. Black and Green membranes are tested for optimal recovery of yeast and total bacteria. All membranes are also tested for uniform wetting, freedom from grid line inhibition and optimal color reactions on appropriate test media
- **Membrane certification** for individual lot numbers is available on request. Advantec membranes were developed and are manufactured to comply with the provisions of the National Interim Primary Drinking Water Regulations, Guidelines for Establishing Test Procedures for the Analysis of Pollutants, Standard Methods for the Examination of Water and Wastewater and the ASTM

APPLICATIONS

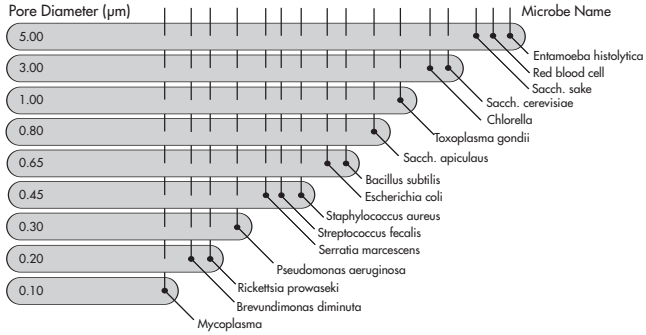
- **Applications** include microbiological analysis of water, wastewater, pharmaceuticals and beverages

Recommended Product Compatibility (Diameters in mm)

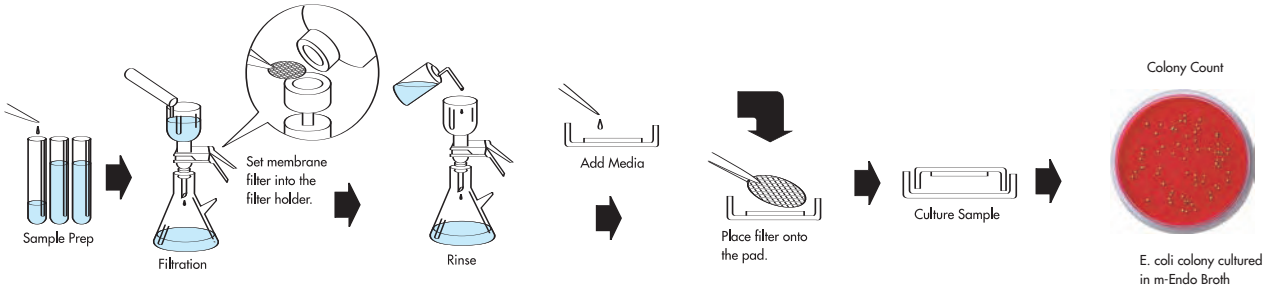
Membrane	Filter Holder	Petri Dish
47	47	50
82	90	92 or 93
85	90	≥100
137	142	≥150

MF Color	Pore size	Grid Line Color
White	≥0.65 µm	Black
White	≤0.80 µm	Green
Black	0.45, 0.80 µm	Black
Green	0.45, 0.80 µm	Green

Relationship of Pore Size and Microbe Retention to Membrane Filters

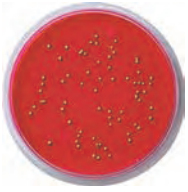


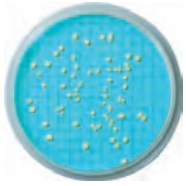
Sample Filtration and Growth Procedures



Sample Growth Results

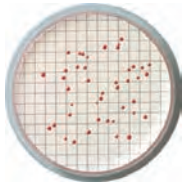
A045H047A
E. coli cultured in m-Endo Broth

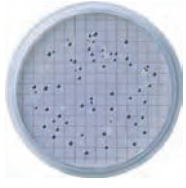




A045W047A
Lactic acid bacteria cultured in growth media

A045H047A
Fecal *Streptococcus* cultured in KF-Agar





A045F047A
Fecal *E. coli* cultured in m-FC media

A080R047A
Saccharomyces cultured in m-Green Yeast and Mold Broth

White Mixed Cellulose Esters

- **Standard** for microbiological analysis of water, wastewater, and beverages
- **Convenient:** Available in individual or 10-pack, presterilized by EtO or autoclavable

Available in plain or gridded circles, package of 100 (except where noted)

Pore Size (µm)	Diameter (mm)	Plain or Grid	Individual Pack with pad (presterilized)	Individual Pack without pad (presterilized)	Multipack 10 packs of 10 membranes per pack with pad (presterilized)	Multipack 20 packs of 10 membranes per pack without pad (presterilized)	Multipack 10 packs of 10 membranes per pack with pad (autoclavable)
0.20	47	Plain	-	A020G047A	A020C047A	-	A020S047A
		Grid	A020F047A	A020H047A	-	-	-
0.45	47	Plain	A045E047A	A045G047A	A045C047A	-	A045S047A
		Plain-HE	-	A045G047J	-	-	-
		Grid	A045F047A A045F047W (1000/pk)	A045H047A A045H047Y (200/pk) A045H047W (1000/pk)	A045D047A	A045D047Y	A045T047A
		Grid-HE	-	A045H047K	-	-	-
	50	Plain	-	A045G050A	-	-	-
		Grid	-	A045H050A	-	-	-
	82	Grid	-	A045H082A	-	-	-
	85	Grid	-	A045H085A	-	-	-
0.65	47	Plain	-	A065G047A	-	-	-
		Grid	A065F047A	A065H047A	-	-	-
0.8	47	Plain	-	A080G047A	-	-	-
		Grid	A080F047A	A080H047A	-	-	-
1.0	47	Grid	-	A100H047A	-	-	-
3.0	50	Plain	-	A300G050A	-	-	-

Black Mixed Cellulose Esters – Sterile

- **Maximum** contrast between colonies and the filter without counterstaining
- **Applications:** Use to enumerate yeast and bacteria in carbonated beverages, wines and water

Available in plain or gridded circles, package of 100

Pore Size (µm)	Diameter (mm)	Plain or Grid	Individual Pack with pad	Individual Pack without pad
0.45	47	Plain	-	A045Q047A
		Grid	A045M047A	A045R047A
	70	Grid	-	A045R070A
0.80	47	Plain	-	A080Q047A
		Grid	A080M047A	A080R047A

Green Mixed Cellulose Esters – Sterile

- **Pale green background** enables viewing of black, white, and colorless particles on one filter
- **Minimizes eye fatigue**

Available in gridded 47 mm circles, package of 100

Pore Size (µm)	Diameter (mm)	Individual Pack without pad
0.45	47	A045W047A

Cellulose Acetate (White) – Sterile

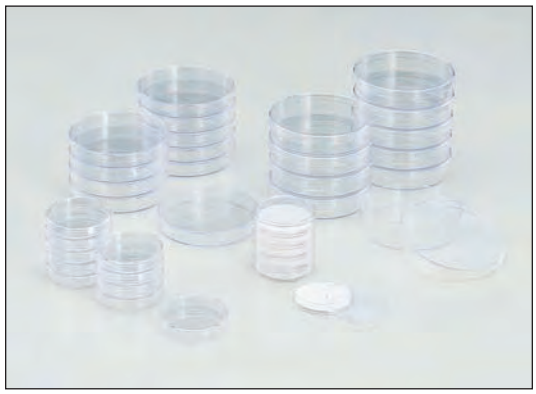
- **Lower protein binding** (relative to MCE)
- **Improved solvent resistance** to low molecular weight alcohols (relative to MCE)
- **Application:** May enhance recovery of fastidious gram positive organisms in culture

Available in plain circles, package of 100

Pore Size (µm)	Diameter (mm)	Individual Pack without pad
0.20	47	C020G047A
0.45	47	C045G047A
	82	C045G082A
	85	C045G085A

Petri Dishes

- **Polystyrene dishes** suitable for culturing microorganisms on 47 mm diameter membrane filters
- **Convenient:** Snug fit prevents drying during incubation. Squared edges and a raised ridge for ease of handling and secure stacking
- **Sterile:** sterilized by gamma irradiation (50 x 11) or by EtO (larger sizes)
- **Standard sizing:** 50 x 11 mm polystyrene dishes fit all commercially available aluminum block incubators
- **Available with or without pad:** 47 mm absorbent cellulose pad (0.85 ± 0.17 mm thick, absorbs 1.8-2.2 mL liquid)
- **Manufacturer's certification of compliance** available upon request



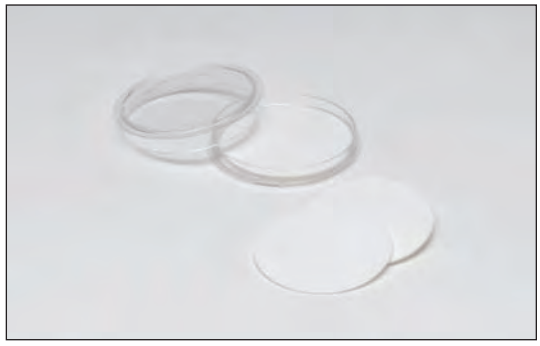
Petri dishes

Model	Description	100/pack (5 sleeves of 20)		500/pack (Cube) (25 sleeves of 20)	
		Catalog No.	Weight	Catalog No.	Weight
PD-1	Sterile Petri Dishes	800100	2 lbs	800500	10 lbs
PD-2	Sterile Petri Dishes with Pads	800101	2.2 lbs	800501	11 lbs

Presterilized Absorbent Pads

- **Cellulose pads:** 47 mm plain white circles fit into standard petri dishes
- **Routinely tested** for absorption of 1.8 – 2.2 mL of Endo media, pH neutral
- **Convenient Packaging:** 100 individual presterilized packages per box

	Catalog No.
Box of 100 individual sterile packages	B200G047A



Presterilized Absorbent Pads

Filterceps

- **Forceps** of polished type 304 stainless steel are ideally designed for handling membranes
- **Tips are beveled and unserrated** to minimize the risk of damaging membrane filters
- **Non-slip handle** allows Filterceps to be held securely and flamed without risk of burning one's fingers

	Length	Weight	Catalog No.
Filterceps	4.5 inches	14 g (0.5 oz)	800000

Filterceps

Culture Media

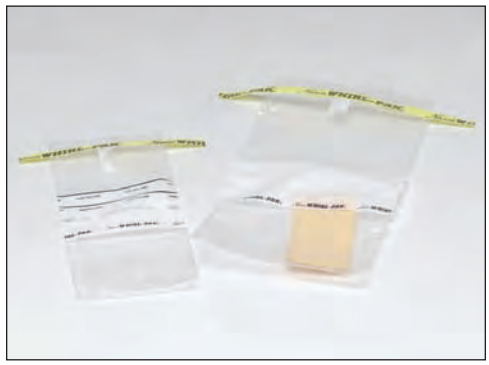
- **Applications:** Used with membrane filters to culture bacteria, yeasts, and molds
- **Available Ready-to-Use:** 2 mL ampoules contain enough media to saturate one standard absorbent pad in a petri dish. 50 mL bottles contain enough media for 25 tests
- **Sterile:** Bottles can be aseptically opened and closed repeatedly. Single use ampoules assure sterility
- **High Quality:** Each product is lot tested and certified to comply with established test criteria. Quality certificates are included with each shipment and packages are clearly marked with an expiration date

Sterile media is available in 2 mL ampoules and 50 mL bottles.

Ready to Use Media		Catalog No.	
Media	Target Organism	2 mL Ampoules (50/box)	50 mL Bottles (8/box)
m-Endo	Total Coliform Bacteria, Water	COLI200	COLI50MLPK
m-FC	Fecal Coliform Bacteria	MFC200	-
m-FC with Rosolic Acid	Fecal Coliform Bacteria	MFCR200	-
m-PA	Pseudomonas aeruginosa	MPA200	-
m-TGE	Total Bacteria	TCM200	-
m-TGE with indicator	Total Bacteria	TCI200	-
m-Green Yeast and Mold	Yeast and Mold, pH 4.6	YMM200	-
m-HPC	Heterotrophic organisms with indicators	MHPC200	-

Whirl-Pak® Sampling Bags

- **Sterile** sampling bags for collecting and transporting liquid, semi-solid, and solid samples
- **Composition:** Blended polyethylene contains ethyl vinyl acetate for transparency and strength
- **Convenient:** Bags close easily and securely by whirling or folding, use puncture-proof tabs to seal
- **Approved** by the FDA and USDA for food sampling


Sterile Whirl-Pak sampling bags.

Capacity		Dimensions	Qty/box	Catalog No.
Ounces	mL			
4	120	3 x 7.25 inches	500	WP006ZWS
18	540	4.5 x 9 inches	500	WP018ZWS
27	810	5 x 12 inches	500	WP027ZWS
Whirl-Pak with Sponge: sterile sponge free from growth inhibitors				
18	540	4.5 x 9 inches	100	WP1254WSP
ThioBag®: contains a sodium thiosulfate tablet for use when sampling chlorinated water				
4	120	3 x 7.25 inches	100	WP100MWT

Prefilters/Depth Type Media

Prefilters/Depth Type Media – Introduction	24
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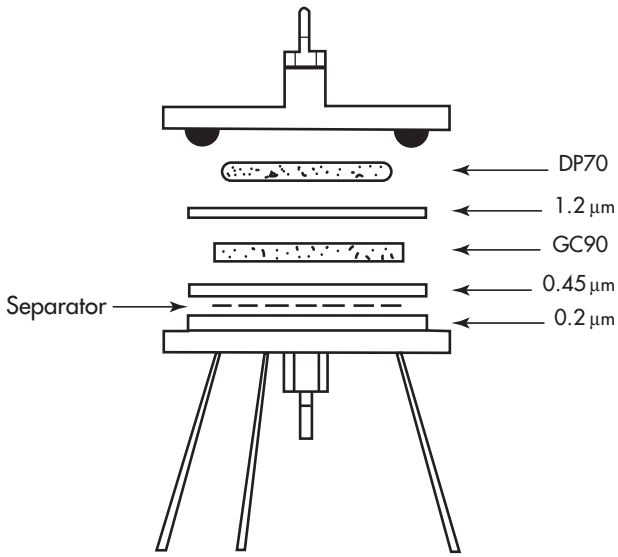
Prefilters/Depth Type Media – Introduction

The term "prefilter" refers to any type of filter that precedes the final barrier. This type of filter is often prepared from depth-type media, a random matrix of glass, cellulose, quartz or PTFE fibers. This fiber matrix may or may not include binder to maintain integrity. Because these filters trap particles within the matrix, they have a very high particle loading capacity. However, this type of filter does not have a clearly defined pore rating, only a nominal designation.

Not all depth-type filters are used as prefilters: these can be used in a wide variety of applications, such as water and air pollution analysis, liquid clarification, and cell harvesting.

Generally, a prefilter should be slightly smaller than the membrane filter it is preceding, but full sized prefilters are recommended if used alone.

Filter Holder Model	Recommended Prefilter Diameter (mm)	
	used upstream of membrane	used alone
Vacuum Type:		
KG 25, KGS 25	16	25
KG 47, KGS 47, KSF 47, KGS 47 TF	35	47
KG 90, KGS 90	70	90
Pressure Type:		
KS 13	8	13
KS 25, KS 25 F, PP 25	21	25
KS 47, KST 47, KS 47 F	35	47
PP 47, PFA 47	42	47
LS 25	25	25
LS 47	47	47
LS 47 HP	38	47



A typical serial stack incorporating Prefilters, Membranes and Polyester Mesh Separators.

Cellulose Fiber Filters

- **Cellulosic:** Random matrix of cellulose fibers
- **Inert** to organic solvents
- **No binder**
- **Thermostable:** To 180°C in a non-reactive oil, 120°C maximum in air

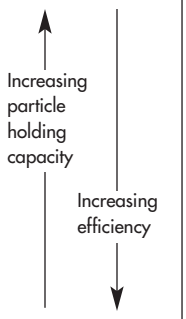
APPLICATIONS

- Clarify fluids containing coarse particles
- Preliminary prefilter, prolongs membrane life

Note: Not suitable for hot dilute or cold concentrated acids. Caustic liquids cause fibers to swell. Also not recommended for viscous material.

SPECIFICATIONS AND APPLICATIONS

Grade	Thickness (mm)	Applications
No. 27	0.68	Filtration of soft drinks and other beverages Clarification of oils and fats Filtration of paints and petroleum products
No. 1640	0.40	Remove activated charcoal from alcohol containing beverages Polishing filter for water treatment Clarifying filtration of fine particulates
No. 1650	0.57	Remove activated charcoal from alcohol containing beverages Polishing filter for water treatment Clarifying filtration of fine particulates Withstands higher pressures and flow rates than No. 1640



ORDERING INFORMATION: CELLULOSE FIBER FILTERS

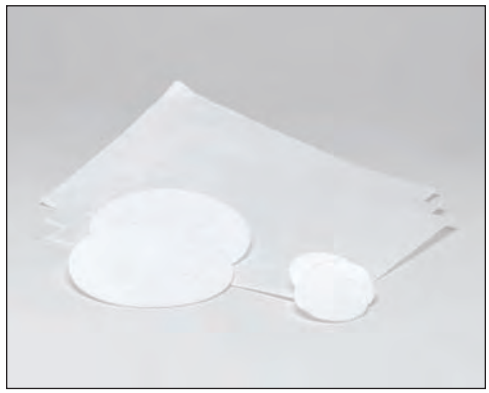
- Available in disks in the following diameters (mm): 76, 124, 257
- Package of 100
- Order by specifying first the grade of filter then the diameter, e.g. N01650257MM, N02776MM

Glass Fiber Filters

- **Dense**
- **Highly resistant** to chemical attack, biologically inert
- **Easily sterilized:** Can be baked or autoclaved
- **Store indefinitely:** Unaffected by humidity

Applications

- Use as a prefilter to extend membrane life
- Water/air pollution analysis
- Liquid clarification
- Cell harvesting



Twelve grades of glass fiber filters are available in diameters from 10–293 mm.

Ordering Information: Glass Fiber Filters

Grade	DP70	GA55	GA100	GA200	GB100R	GB140	GC50	GC90	GD120	GF75	GS25
	Quantity/package										
10–150 mm diameter disks	50	100	100	50	100	100	100	100	50	100	100
257–293 mm diameter disks	50	50	50	50	50	50	50	50	50	50	50
8 x 10 inch sheets	S	100	S	S	50	S	S	S	S	S	S

S = Special order

Available in disks in the following diameters (mm): 10, 13, 16, 20, 21, 22, 24, 25, 26, 35, 37, 45, 47, 50, 55, 70, 75, 90, 102, 110, 124, 125, 150, 257, 293.

Order by specifying first the grade of filter then the diameter, e.g. GC5090MM, GA558X10IN.

Quartz Fiber Filters

- **Highly resistant** to chemical attack, biologically inert
- **High Purity:** Very low trace metal content, does not adsorb nitrous and sulfur dioxides; Grade QR100 is prefired at 1000°C for 2 hours to reduce organic contamination
- **Easily sterilized:** Can be baked or autoclaved
- **Store indefinitely:** Unaffected by humidity

APPLICATIONS

- Sample acidic gases at high (>500°C) temperatures
- Air pollution analysis

ORDERING INFORMATION: QUARTZ FIBER FILTERS

Grade	QR200	QR100
	Quantity/package	
21 – 150 mm diameter disks	50	100
8 x 10 inch sheets	S	50

S = Special order

Available in disks in the following diameters (mm): 21, 24, 26, 37, 45, 47, 55, 70, 90, 110, 125, 150.

Order by specifying first the grade of filter then the diameter, e.g. QR200125MM, QR10021MM.

Specifications: Glass/Quartz Fiber

Grade	Applications/Characteristics	Weight (g/m^2)	Thickness (mm)	Nominal Rating (µm)	Water Flow Time[1] (sec)
GA55	General purpose paper Air pollution monitoring	55	0.21	0.6	23
GF75	Most retentive grade offered Collection of IgC or other very fine protein precipitates Clarifying chemically aggressive solutions TCLP (EPA method 1311) – use with KST 142	75	0.35	0.3	84
GA100	General purpose paper Filtration of precipitated proteins or cells Air pollution monitoring	110	0.44	1.0	11
GA200	Thick filter recommended for filtering viscous fluids such as liquid sugars and gels	175	0.74	0.8	15
GB100R	High and low volume aerosols for airborne dust and metal contaminants Low trace metal content of As, Pb and Cd DNA/RNA and protein precipitates	95	0.40	0.6	15
GB140	Compared to GB-100R: thicker, greater wet strength, slower filtration speed Industrial waste analysis Low absorption, limited wet strength and loading capacity	140	0.56	0.4	58
GC50	Prefilter for membrane filter (0.45 µm or smaller) Scintillation counting Suspended solids analysis of industrial waters and wastewater	48	0.19	0.5	28
GC90	High wet strength Clinical screening	100	0.30	0.5	20
GD120	Prefilter for membrane filter (1.2 µm or smaller) High wet strength, very high loading capacity	123	0.51	0.9	14
GS25	Limited dirt holding capacity High wet strength Prefilter for 0.65 µm or smaller membrane	70	0.22	0.6	15
DP70	High wet strength Very high loading capacity Dust measurement	170	0.52	0.6	20
QR200	Filtration at elevated temperatures Low adsorption Monitor airborne particulates	200	1.0	-	-
QR100	Superior chemical resistance, does not absorb acid gases	85	0.38	-	-

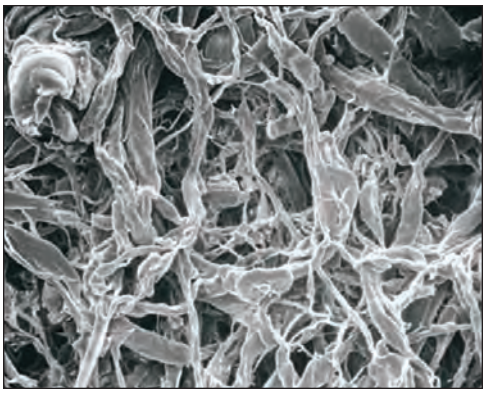
1. Flow time is the time in seconds to filter 100 mL of distilled water at 20°C under pressure supplied by a 10 cm water column through a 10 cm^2 section of filter.

Gas Collection Efficiency (%) at 0.3 µm DOP	Pressure Drop (mm H_2O/ 5 cm/sec)	Binder*	Maximum Operating Temperature (°C)			Conversion		
				Whatman	Schleicher & Schuell	Pall	Millipore	Ahlstrom
99.9	34	None	500	GF/A	31		APFA	111
99.999	170	None	500	GF/F	20		APFF	151
96	20	None	500					
99.9	36	None	500					
99.99	31	None	500	EPM2000	1HV	A/E (Use for air)		
99.99	113	None	500	GF/B	32		APFB	121
99.99	53	None	500	GF/C 934 AH	30/25	A/E (Use for water)	AP-40/ APFC	131
99.99	43	Organic	120				AP15	
97	17	None	500	GF/D	40		APFD	141
99.9	33	Organic	120				AP20	164
-	53	Organic	120					
99.9	35	Inorganic	1000					
99.99	46	None	1000	QM-A		Micro Quartz		

*Binder 1. Organic – Acrylic Acid Ester Emulsion
2. Inorganic – Alumina

PTFE Filters

- **Pure PTFE fibers are sintered** to improve handling characteristics and to minimize fiber slough-off for minimal downstream contamination
- **Hydrophobic**
- **Porosity:** High air permeability with minimal pressure drop
- **Thermostable:** maximum operating temperature 260 °C



PTFE Filter

Applications

- Aqueous and nonaqueous filtration
- Filter hot acids and strong solvents
- Venting air and gases

Specifications

Grade	Weight (g/m^2)	Thickness (mm)	Porosity (%)	Pressure Drop (kPa)	Pressure Drop (psi)	DOP retention (%, 0.3 µm)	Retentive pore, liquid (µm)
PF100	500	1.00	77	0.059	0.00856	70	10
PF060	240	0.50	75	0.069	0.01001	75	6
PF050	210	0.36	73	0.26	0.0377	85	5
PF040	500	0.95	75	0.21	0.03045	95	4
PF020	500	0.54	54	1.6	0.232	99.9	2

Ordering Information: PTFE Filters

Grade	PF100	PF060	PF050	PF040	PF020
	Quantity/package				
10 – 90 mm diameter disks	10*	10*	10*	10	10
110 – 150 mm diameter disks	10	10	10	5	5
8 x 10 inch sheets	10	10	10	10	10

*55, 70, 90 mm are 20 disks per package.

- Disks: Available in the following diameters (mm): 13, 25, 37, 47, 55, 70, 90, 110, 125, 150
- Sheets: Available in 8 x 10 inch sheets
- Additional sizes available upon request
- Order by specifying first the grade of filter then the size, e.g. PF100257MM, PF04025MM

See also Phase Separating Filters on page 38.

Polyester Mesh Separators

- **Prevent pore blinding** by placing a polyester mesh separator between two membranes in series
- **Improve performance:** Increase liquid flow rate and throughput
- **Mesh Size:** 28 mesh

Note: Order same size recommended for prefilters.

Ordering Information: Polyester Mesh Separators

Diameter (mm)	10	16	22	26	35	37	76	124	257
Quantity per package	50	50	50	50	50	50	25	25	25

Specify code DS followed by diameter, e.g. DS124MM, DS16MM.

Specialty Products

Qualitative Filter Papers	32
Quantitative Filter Papers	33
Pure Nitrocellulose	35
Blotting/Chromatography Paper	36
Products for Food Analysis	37
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Phase Separating Filters	38
Products for Air Pollution Monitoring	39
37 mm Monitors	40
Products for Industrial Hygiene	41
Extraction Thimbles	42
Nobuto Blood Filter Strips	43
Filter Badges – NO_2	43
pH Paper	44
Blaine Test Paper	44
Disposable Ultrafiltration Units	45
Centrifugal Filter Holders	46

Qualitative Filter Papers

- **100% alpha cotton cellulose**
- **pH tolerant** 0 to 12
- **Temperature maximum** 120°C
- **Wide selection** – seven types
- **Ash Content:** 0.1%

Applications

- Clarify and remove precipitates
- Preparation for qualitative analysis

Ordering Information

See page 34.

Seven grades of qualitative filter papers are available.

Characteristics and Applications: Conversions – Qualitative Papers

Grade	Comments	Weight (g/m^2)	Thickness (mm)	Flow Time[1] (sec)	Absorption speed[2] (cm)	Wet Strength[3] (cm H_2O)	Retention Characteristic (µm)	Collection Efficiency (%, 0.3 µm DOP)	Conversion[4]	
									Whatman	Schleicher & Schuell
No. 1	Retains large crystalline particles and gelatinous precipitates. Fast flow rate, smooth surface, normal hardness	90	0.20	45	9.0	14.3	6 Coarse	65	1	410 or 1450cv
No. 2	Retains medium crystalline precipitates, fast flow rate, smooth surface, normal hardness	125	0.26	80	8.0	17.3	5 Medium	80	2	604
No. 231	Retains crystalline precipitates, moderate flow rate, smooth surface, normal hardness	95	0.18	130	7.5	-	Medium	-	1	-
No. 232	Retains medium to medium-fine particulates, slow flow rate, smooth, normal hardness	90	0.18	250	5.0	-	Med./ Med.-Fine	-	-	-
No. 131	High retention efficiency for fine crystalline precipitates like barium sulfate, slow flow rate, smooth surface, normal hardness	140	0.25	240	6.0	19.4	3 Med.-Fine	90	3 or 6	597
No. 235	Highest retention efficiency, retains very fine particulates, very slow flow rate, smooth	95	0.17	1200	4.0	-	Very Fine	-	5	-
No. 101	Seed germination, retains large particles	80	0.21	50	8.0	14.3	6-7 Coarse and gelatinous	-	4	-

1. Flow time is the time in seconds required to filter 100 mL of distilled water at 20°C under pressure supplied by a 10 cm water column through a 10 cm^2 section of filter paper.
2. Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in ten (10) minutes at 20°C.
3. Wet strength is the height in cm of a water column that will rupture a 10 cm^2 section of filter paper.
4. Conversions between manufacturers are not absolute. Use these conversions as a guideline.

Quantitative Filter Papers

- **Highest quality** alpha cotton cellulose
- **Ash Content:** 0.01%
- **Acid washed**: Double acid washed in hydrochloric then hydrofluoric acid (No. 3, 5A, 5B, 5C, 6), then rinsed with ultrapure water to neutralize. No. 4A is further treated with nitric acid before washing

Applications

- Gravimetric analysis
- Environmental monitoring

Seven quantitative filter papers are available.

Characteristics and Applications: Conversions – Quantitative Papers

Grade	Comments	Weight (g/m^2)	Thickness (mm)	Flow Time[1] (sec)	Absorption speed[2] (cm)	Wet Strength[3] (cm H_2O)	Retention Characteristic (µm)	Collection Efficiency (%, 0.3 µm DOP)	Conversion[4]	
									Whatman	Schleicher & Schuell
No. 3 Ashless	Medium retention (5-10 µm), fast flow rate Analysis of soils, fertilizers, cement, and minerals	113	0.23	130	7.5	19.4	5 Medium	80	6	593-A
No. 5A Ashless	Fast flow rate, retains coarse particulates and gelatinous precipitates (>10 µm). Filter hydroxides and metallic aerosols, environmental monitoring, determine silica content in steel	97	0.22	60	9.5	14.3	7 Coarse and gelatinous	75	41	589-IH
No. 5B Ashless	Retains medium particles (5-10 µm) such as $CaCO_3$, $PbSO_4$, $CaCO_4$, $MnCO_3$, $ZnCO_3$, ZnS, AgCl	108	0.21	195	7.0	19.4	4 Medium	90	40	598 Green
No. 5C Ashless	Collect fine precipitates (<5 µm) such as $SrSO_4$, $BaSO_4$, $HgCrO_4$, and colloidal dispersions; gravimetric analysis	118	0.22	570	6.0	24.5	1 Fine	93	42	589 Blue
No. 6 Ashless	Retains medium-fine particulates (2-10 µm), trace and precious metals	103	0.20	300	6.0	14.3	3 Medium Fine	90	42	589 White
No. 7 Ashless	Highest purity for retaining medium particles (5-10 µm), precise gravimetric analysis	87	0.18	200	7.0	11.2	4 Medium	85	40, 43 or 540	-
No. 4A Hardened Ashless	High wet strength, suitable for use under high pressure, high chemical and pH resistance, retains fine crystalline precipitates (<5 µm), slow flow	96	0.12	915	4.0	89.7	1 Very Fine	90	50	-

Footnotes: See facing page

Ash content of Quantitative Papers (mg per disk)

cm	No.3	No.5A	No.5B	No.5C	No.6	No.7
5.5	0.03	0.02	0.03	0.03	0.02	0.02
7.0	0.04	0.04	0.04	0.05	0.04	0.03
9.0	0.07	0.06	0.07	0.08	0.07	0.06
11.0	0.11	0.09	0.10	0.11	0.10	0.08
12.5	0.14	0.12	0.13	0.15	0.13	0.11
15.0	0.20	0.17	0.19	0.21	0.18	0.15
18.5	0.30	0.26	0.29	0.32	0.28	0.23

Metal Content

(µg/g)	Si	Na	K	Ca	Mg	Fe	Pb	Cu	Mn	Ni	Al	Zn	Cd
Qualitative	46	62	3	140	17	<5	<1	<1	<1	<1	<2	1	<0.5
Quantitative	32	<10	<2	<10	<1	8	<1	<1	<0.5	<1	2	<1	<0.5

Ordering Information: Qualitative Papers

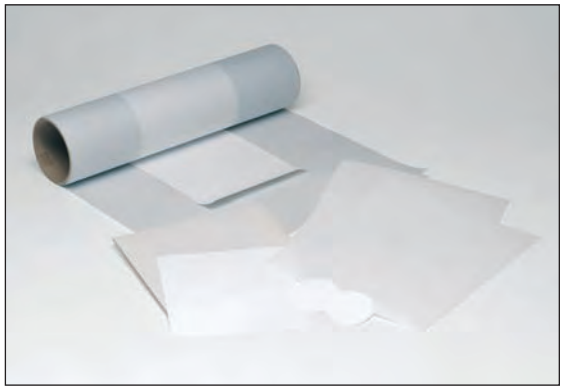
Available in disks in the following diameters (cm): 4.25, 5.5, 7.0, 9.0, 11.0, 12.5, 15.0, 18.5, 24.0, 28.5, 30.0, 33.0, 36.0, 40.0, 50.0, 60.0
Additional sizes available upon request.
Order by specifying first the grade of filter then the diameter, e.g. N0112.5CM (No.1, 12.5 cm), N02325.5CM (No.232, 5.5 cm)
Package of 100

Ordering Information: Quantitative Papers

Available in disks in the following diameters (cm): 5.5, 7.0, 9.0, 11.0, 12.5, 15.0, 18.5
Additional sizes available upon request.
Order by specifying first the grade of filter then the diameter, e.g. N05A12.5CM (No.5A,12.5 cm), N065.5CM (No.6, 5.5 cm)
Package of 100

Pure Nitrocellulose for Blotting and Hybridization

- **Pure esters of nitrocellulose**, free of acetate and other esters
- **Maximal protein/nucleic acid binding**, up to 80-100 µg/cm²
- **Low background**
- **Two pore sizes** available: 0.45 µm is suitable for most blotting applications, 0.20 µm sizes for lower molecular weights



Pure Nitrocellulose and Blotting Paper.

Ordering Information: Nitrocellulose

	Quantity per package	0.20 µm	0.45 µm
Sheets (Dimensions in cm)			
20 x 20	10	S020A204D	S045A204D
30 x 30	10	S020A304D	S045A304D
Rolls			
33 cm x 3 M	1	S020A330R	S045A330R
Disks (Diameter in mm)			
82	25	S020A082C	S045A082C
137	25	-	S045A137C

Blotting/Chromatography Paper

- **High quality papers** are carefully tested for spot formation, capillary action, water flow rate and absorption speed to assure uniformity and reproducibility
- **Better resolution** with slower flow rate papers

APPLICATIONS

- Chromatography
- Electrophoresis and blotting
- Separation of heavily loaded solutes

SPECIFICATIONS AND CONVERSION GUIDE

Grade	Weight (g/m^2)	Thickness (mm)	Absorption Speed[1] (cm)	Wet Strength (cm H_20)	Ash (%)	Whatman equivalent
No. 50	140	0.25	6.0	19.3	0.1	20 Chr
No. 51A	87	0.18	7.5	14.3	0.01	4 Chr
No. 151B	87	0.17	7.0	14.3	0.06	1 Chr
No. 1514A	185	0.32	7.5	24.5	0.06	3MMChr
No. 526	325	0.70	11.0	50.0	0.1	17 Chr

1. Absorption speed is the distance in cm that water will travel in an upright strip of filter paper in ten (10) minutes at 20°C.

ORDERING INFORMATION

All grades above are available in the following dimensions (cm) and quantities:

2 x 40	100/pkg
20 x 20	50/pkg
46 x 57	100/pkg
60 x 60	50/pkg

Order by specifying first the grade of paper then the dimensions, e.g. N051A20X20CM (No. 51A, 20 cm x 20 cm), N01514A33CMX3M (No. 1514A, 33 cm x 3 m Roll).

Products for Food Analysis

Sugar Paper

- **Fast flow rate**
- **Creped surface** available

Application

- Clarify sugar and syrup solutions prior to polarimetric determination of sucrose concentration

Specifications

Grade	Weight (g/m^2)	Thickness (mm)	Water Flow Time [1] (sec)	Dry Burst Strength		Wet Burst Strength		Ash content	Surface	Wet Strengthened
				MPa	psi	MPa	psi	(%)		
No. 106	60	0.14	42.5	0.10	14.2	0.03	4.3	0.1	Creped	No

1. Flow time is the time in seconds required to filter 100 mL of distilled water at 20°C under pressure supplied by a 10 cm water column through a 10 cm^2 section of filter paper.

Ordering Information

- Available in disks in the following diameters (cm): 15.0, 18.5, 20.0
- Available in sheets: 8 x 8 inches, 60 x 60 cm
- Packages of 100 or 1000
- Order by specifying first the grade of paper then the diameter, e.g. N010615.0CM (No. 106, 15.0 cm)

Milk Sediment Disk

- Made of long, refined cellulose fibers

Application

- Detection of contaminants in dairy products

Grade	Diameter	Color	Package
No. 1026	33 mm	White	50
No. 1026-B	33 mm	Black	50

Milk Sediment Disks.

Thimbles for Soxhlet Type Extractions

Grade No. 84 is often used for food analysis including Soxhlet-type gravimetric determinations of fats and oils from foods, feeds, or oil seeds. It is also used to extract and concentrate non-aqueous chemicals or additives from a solid sample for analysis (such as HPLC or gas chromatography for PCB and pesticides).

Ordering information and specifications on page 42.

Thimble for Soxhlet.

Products for Food Analysis (continued)

Phase Separating Filters

- **Separate** aqueous and non-aqueous phases of mixtures
- **Hydrophobic** filters retain aqueous phase while non-aqueous phase passes through
- **Choice of materials**: Grade No. 2S is silicone treated cellulose
  Grade PF is pure PTFE

Specifications

Grade	Substrate	Weight (g/m^2)	Thickness (mm)	Retentive Particle (µm)	Collection Efficiency (%, 0.3 µm DOP)
No. 2S	Silicone treated cellulose	120	0.26	5	-
PF020	PTFE	500	0.54	2	99.9
PF040	PTFE	500	0.95	4	95.0
PF050	PTFE	210	0.36	5	85.0
PF060	PTFE	240	0.50	6	75.0
PF100	PTFE	500	1.00	10	70.0

Ordering Information

Grade No. 2S:

- Available in disks in the following diameters (cm): 5.5, 7.0, 9.0, 11.0, 12.5, 15.0, 18.5, 24.0, 27.0
- Available in sheets: 28 x 46 cm
- Packages of 100
- Order by specifying first the grade of paper then the diameter, e.g. N02S11.0CM (No. 2S, 11.0 cm)

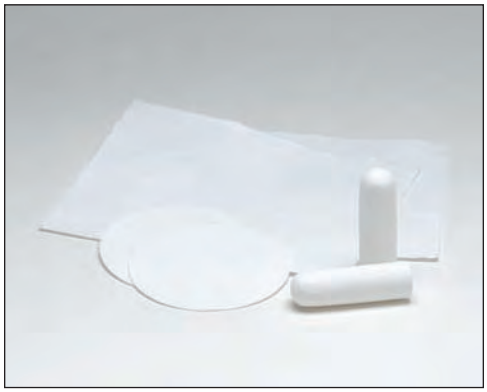
PTFE Filter – all grades:

- Available in disks in the following diameters (mm): 13, 25, 47, 55
- Available in sheets: 8 x 10 inches

Order by specifying first the grade of paper then the diameter, e.g. PF04025MM.

Products for Air Pollution Monitoring

Several products from Advantec have been developed especially to meet the needs of persons concerned with air pollution monitoring.



Four grades of fibrous filter media are available in sheets, disks, and thimble form for air pollution monitoring.

Quartz Fiber Filter – QR100

- Increased chemical and thermal resistance compared to GB100R
- Prefired at 1000°C for 2 hours to reduce organic contamination
- Available in sheets and disks

Specifications and ordering information on pages 27-29.

Pure Fibrotic PTFE Filters – PF050

- PTFE filters neither adsorb acid gases nor do they contribute any trace metal contamination during assay procedures
- Superior handling characteristics compared to either glass or quartz
- Available in sheets and disks

Specifications and ordering information on page 38.

Thimbles

Material	Grade
Cellulose	No. 84
Glass	No. 86R
Silica	No. 88R
Heat-treated Silica	No. 88RH
PTFE	No. 89
PTFE/Silica	No. 89S

For detailed specifications and ordering information, see page 42.

Composite Filter

- **Composite Filter PG60** is specially developed for the measurement of dust concentration in the air
- **PTFE coated:** Naturally hydrophobic and unaffected by humidity

Applications

- Air pollution analysis
- Air dust analysis

Note: Cannot be used for liquid filtration

Ordering Information

Grade	Quantity/package
21 – 70 mm diameter disks	100
90 – 150 mm diameter disks	50
300 x 300 mm sheets	10

Available in disks in the following diameters (mm): 21, 24, 25, 26, 37, 45, 47, 55, 70, 90, 110, 125, 150

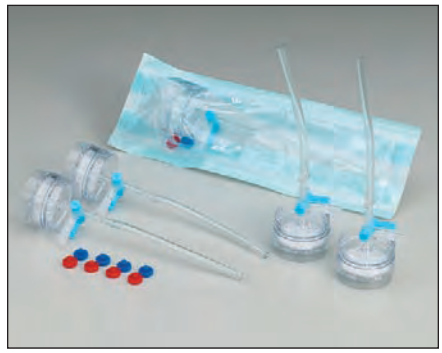
Order by specifying first the grade of filter then the diameter, e.g. PG6090MM, PG60125MM.

37 mm Monitors for Microbial and Contamination Analysis

Pre-assembled 2- and 3-piece units contain a built-in membrane filter and a support pad. Monitors are suitable for field collection and transportation of samples as well as analysis in the laboratory. Samples collected on the press-fit membrane can then be cultured in place or removed for further analysis.

Monitor Sets include a 2-piece monitor, plugs, sampling tube, and 3-way connector. Individually packaged sets are pre-sterilized and are ideal for field sampling.

37 mm Monitors.



37 mm Monitor Sets.

Specifications

Monitor Type	2-piece	3-piece
Housing	Styrene Acrylonitrile	
Membrane	Mixed Cellulose Ester (Nitrocellulose)	
Support Pad	Pure Cotton Cellulose	
Internal Dimensions	ø34 x 9 mm	ø34 x 18 mm
External Dimensions	ø42 x 29 mm	ø42 x 39 mm
Filtration Area	9.0 cm^2 (6.7 cm^2 for hydrophobic edge type)	
Internal Volume	8 mL	16 mL
Maximum Temperature	45°C	

Applications

Test Type	Recommended Product	
	Housing	Membrane
Bacterial Analysis	2- or 3-piece	0.45 µm white/black gridded
Yeast/Mold Analysis	2- or 3-piece	0.80 µm white/black gridded
Aerosol Analysis	2-piece	0.45 µm white plain
Contamination Analysis	2- or 3-piece	0.45 µm white plain/ gridded

Ordering Information

3-Piece Monitors

Pore Size (µm)	Color	Surface	Quantity	Sterile	Non-Sterile
0.45	White	Plain	50/pk	-	37AS345AN
0.45	White	Gridded	50/pk	37AS345BS	-
0.45	Black	Gridded	50/pk	37AS345PS	-
0.80	White	Plain	50/pk	-	37AS380AN
0.80	White	Gridded	50/pk	37AS380BS	37AS380BN
0.80	Black	Gridded	50/pk	-	37AS380PN

2-Piece Monitors

Pore Size (µm)	Color	Surface	Quantity	Sterile	Sterile w/ Hydrophobic Edge
0.45	White	Gridded	50/pk	37AS245BS	37AS245BS-HE
0.45	Black	Gridded	50/pk	37AS245PS	37AS245PS-HE

2-Piece Monitor Sets

Pore Size (µm)	Color	Surface	Quantity	Sterile w/ Hydrophobic Edge
0.45	White	Gridded	20/pk	37ASA45BS-HE
0.45	Black	Gridded	20/pk	37ASA45PS-HE

Products for Industrial Hygiene

Advantec provides a selection of products for industrial hygiene applications including asbestos monitoring. Mixed Cellulose Esters can be used with cellulose support pads in standard 25 and 37 mm Monitor type filter holders. Fully assembled 37 mm monitors are available in addition to the units without membrane, see page 40.

Cellulose Support Pads

Type 25S cellulose support pads fit standard 25 and 37 mm Monitor type filter holders.

Ordering Information

- Available in disks in the following diameters (mm): 25, 37
- Packages of 100

Order by specifying first the grade then the diameter, e.g. TYPE25S37MM

MCE (Mixed Cellulose Ester) Membrane

- **Standard** 0.8 µm pore size, white plain membrane fits standard 25 and 37 mm Monitor type filter holders
- **High quality:** Cutting and packaging operations are carried out under clean room conditions to keep non-asbestos fiber contamination to an absolute minimum

Note: Filters may be cleared using either the acetone vapor method or the dimethylpthalate diethyloxalate method.

Description	Diameter	Surface	Qty/Pkg	Catalog No.
0.80 µm MCE	25 mm	White Plain	100	A080X025A
	25 mm	White Grid	100	A080X025B
	37 mm	White Plain	100	A080X037A
	37 mm	White Grid	100	A080X037B
Cellulose Pads	25 mm	White Plain	100	TYPE25S25MM
	37 mm	White Plain	100	TYPE25S37MM
Monitor, 2-piece	37 mm	Without Membrane	50	370S200ON
Monitor, 3-piece	37 mm	Without Membrane	50	370S300ON

Advantec continually works with customers to develop special filter media to suit their specific application needs. Direct inquiries to our Technical Services Department.

Extraction Thimbles

High purity, seamless filters with a characteristic thimble shape. Applications include analysis of fats, oils, grease, pesticides, pollutants, other organics and additives in plastics and rubber materials.

Cellulose Thimbles – No. 84
- Suitable for Soxhlet extractions of organic components
- Dust sampling
- Lipid content <0.1% by weight

Glass Fiber Thimbles – No. 86R
- Borosilicate glass
- High temperature extractions or dust monitoring (≤500°C)
- Acid resistant (except hydrofluoric)
- Acid washed for minimum trace metal content

Silica Fiber Thimbles – No. 88R and 88RH
- Use up to 1000°C
- No. 88RH is treated at 900°C for 4 hours to stabilize the weight prior to use
- Both 88R and 88RH are tapered for ease in loading into stack samplers

PTFE Fiber and PTFE/Silica Fiber Thimbles – No. 89 and 89S
- Durable, temperature-resistant
- Non-adsorptive with respect to acid gases
- PTFE is inherently hydrophobic
- Little or no trace metal contamination

Thimbles

SPECIFICATIONS

Grade	Material	Nominal Rating (µm)	Thickness (mm)	Weight (g per 25 x 90 thimble)	Pressure drop (mm H_2O /5 cm /sec)	Collection Efficiency (%, 0.3 µm DOP)	Max. operating temp (°C)	Heating loss rate (%)	Conversion	
									Whatman	S & S
No. 84	Cellulose	8	1.5	3.6	25	89	120	-	2800	603
No. 86R	Glass Fiber	1	1.6	1.8	30	>99.9	500	0.2	2814	603G
No. 88R	Silica Fiber	-	2.2	1.6	45	>99.9	1000	-	-	-
No. 88RH	Silica Fiber	-	2.2	1.6	45	>99.9	1000	0.1	2812	-
No. 89	PTFE Fiber	-	1.8	11.0	450	>99.9	260	-	-	-
No. 89S	PTFE/Silica Fiber	-	1.6	6.0	55	>99.9	400	0.07	-	-

ORDERING INFORMATION

Sizes are expressed as internal diameter (± 3%) x height (± 1.5%).

No. 84 (diameter x height, mm), 25 thimbles per package

-	22 x 65	25 x 60	-	-	-	-
-	22 x 80	25 x 80	-	30 x 80	33 x 80	-
19 x 90	-	25 x 90	-	-	-	-
-	-	25 x 100	28 x 100	30 x 100	33 x 100	43 x 123

No. 86R (diameter x height, mm), 25 thimbles per package

19 x 90	-	25 x 90	-	30 x 80	-	43 x 123
-	-	25 x 100	-	30 x 100	-	-

No. 88R (diameter x height, mm), 25 thimbles per package

19 x 90	-	25 x 100	30 x 80	30 x 100

Sizes are expressed as outer diameter.

No. 86R, 88R, 88RH, 89 and 89S (diameter x height mm), 10 thimbles per package

-	-	25 x 90	-

Nobuto Blood Filter Strips

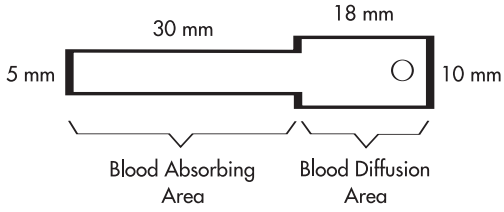
- Collect blood on the narrow end of the strip and allow to dry on the convenient drying rack for easy and efficient sample handling
- Strip holds approximately 0.1 mL of blood or 0.04 mL of serum
- High purity cellulose paper yields a fine, textile like structure ideal for uniform sampling
- Dried samples can be analyzed, stored, or mailed without refrigeration

Nobuto Blood Filter Strips and Drying Rack.

Typical blood collection applications:

- Toxoplasmosis (HA)
- Hanta Virus
- New Castles Disease (HI)
- Canine Distemper (VN)
- Measles (Rubeola) (HI)
- Japanese Encephalitis (HI, VN)
- Mycoplasmosis (AG)
- Hog Cholera (VN)

Nobuto Strip: Actual Size



Ordering Information

		Catalog No.
Nobuto Blood Filter Strips	100/package	800700
Filter Strip Drying Rack	Each	800701

Filter Badges – NO_2

- Monitor ambient levels of nitrogen with this passive, portable sampler
- Attach to clothing or mount on stationary objects
- Use enclosed foil pouch or other hermetic container to transport badges back to the lab for analysis

Filter Badge – NO_2

Specifications

NO_2 Badges

- Sampling: Passive Diffusion
- Analysis: Spectrophotometry
- Sensitivity: 66 ppb/hour
- Accuracy: ±30%
- Maximum Exposure: 1 month
- Dimensions: 5 x 4 x 1 cm
- Weight: 16 g

Ordering Information

	Quantity	Catalog No.
Filter Badge – NO_2	1	800600

Nobuto Blood Filter Strips

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Nobuto Blood Filter Strips and Drying Rack.

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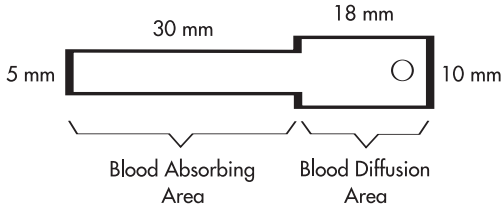
Nobuto Strip: Actual Size



Ordering Information

		Catalog No.
Nobuto Blood Filter Strips	100/package	800700
Filter Strip Drying Rack	Each	800701

Filter Badges – NO_2

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- Sensitivity: 66 ppb/hour
- Accuracy: ±30%
- Maximum Exposure: 1 month
- Dimensions: 5 x 4 x 1 cm
- Weight: 16 g

Ordering Information

	Quantity	Catalog No.
Filter Badge – NO_2	1	800600

pH Indicator and Acid Alkali Test Papers

- Determine pH easily and inexpensively, without instrumentation
- Color changes instantaneously, compare to chart for determination
- Two convenient formats:
  Booklet of 20 strips, 7 x 70 mm
  Roll, 9 mm wide in dispenser

pH and Test Paper

Ordering Information

Type	pH range	Packaging	Catalog No.
Universal	1 – 11	Booklet	UNIV-B
Universal	1 – 11	Roll (9 mm x 6 m)	UNIV-R
Whole Range	0 – 14	Roll (9 mm x 5.5 m)	W-R
Litmus Blue	Qualitative	Booklet	07020010
Litmus Red	Qualitative	Booklet	07020020

Blaine Test Paper

- Standard for testing cement using the Blaine air permeation test
- 12.7 mm diameter disks

Blaine Test Papers

Ordering Information

		Catalog No.
Blaine Test paper	250/package	01511012

Disposable Ultrafiltration Units

- **Concentrate** samples with built-in polysulfone ultrafilter
- **Easy to use** units require only syringe pressurization and do not require a centrifuge
- **Clear** housings enable visual confirmation of the filtration process
- **Low adsorption** for maximum sample recovery
- **Disposable** units for simple operation and clean-up

Unit diagram on page 46.

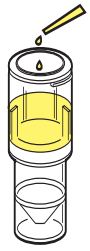
USY Series Ultrafilter Units

Specifications

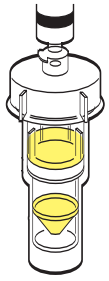
- Housing: Acrylic
- Filter: Polysulfone
- Effective filtration area: 2 cm^2
- Cell Capacity: 2 mL
- Minimum recovery volume: 0.5 mL
- Sterilization: 25% Ethanol, 5% Formalin

Operation Information

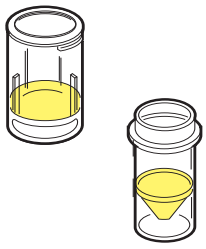
1. Prepare unit for use. Dispense sample (approx. 1-2 mL) into the retentive cell by pipet.



2. Place cap on the retentive cell. Using a syringe, pressurize the unit with air.



3. Disassemble unit when filtration is complete: concentrated sample and/or filtrate can be analyzed.



Sample Collection Data

Grade		USY-1	USY-5	USY-20
Molecular Weight Cut Off of Ultra filter				
Solute	Molecular weight	10,000	50,000	200,000
Lysozyme	14,800	>98	50	-
Myoglobin	16,800	>95	40	-
α-Chymotrypsin	24,500	>98	85	-
β-Lactoglobulin	35,000	>98	85	10
Ovalbumin	44,000	>98	95	60
Albumin (0.01%)	64,000	>98	>98	-
Bovine Albumin	67,000	>98	>90	60
β-Globulin	110,000	>98	>98	>95
γ-Globulin	160,000	>98	>98	>90

Ordering Information

Grade	USY-1	USY-5	USY-20
Filter Rating	10,000 Da	50,000 Da	200,000 Da
Quantity per package*	24	24	24

*Each package contains 24 filter cells, 24 retention cells, and 4 reusable cell caps.

Accessories

Grade	USY-CAP
Quantity per package	4

Centrifugal Filter Holders

- **Durable, reusable** unit for concentrating, desalting or purifying samples by centrifuge
- **Compatible** with most ø13 mm filters and ø30 mm centrifuge tubes (both sold separately)
- **Easy to use** units assemble quickly for repeated use

Unit diagram below.

UHP-13C Ultrafilter Unit

Specifications

- Housing: Acrylic, Polyacetal, Polypropylene
- Effective filtration area: 0.65 cm^2
- Maximum sample volume: 2 mL
- Minimum sample volume: 0.15 mL
- Maximum RCF: 19.6 x $10^3 m/s^2$ (2,000 x g)
- Dead Volume: 0.01 mL

Ordering Information

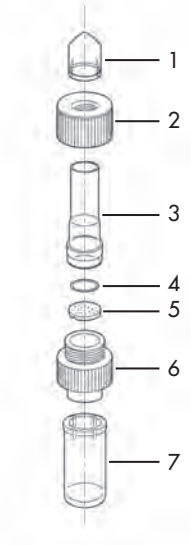
Grade	UHP-13C
Compatible filter size	ø13 mm
Quantity per package*	1

*Each unit includes 1 main body assembly, 12 cell caps, 12 filtrate caps, and 3 silicone O-rings.

Accessories

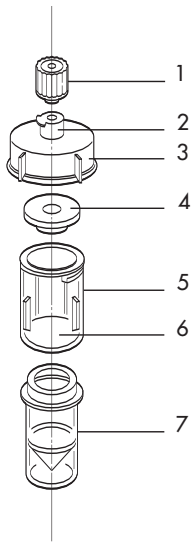
FPM O-ring	UHP-13C-FPM
Quantity per package	1

UHP-13C Unit Assembly



1. Cell Cap
2. Locking Nut
3. Filter Cell
4. Filter Holder O-ring
5. Support Screen
6. Base Body
7. Filtrate Cup

USY Series Unit Assembly



1. Luer Cap
2. Luer Lock Inlet
3. Cell Cap
4. Silicone Check Valve
5. Retentive Cell
6. Ultrafilter
7. Filtrate Cell

Capsules and Cartridges

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Capsules – Introduction

- All-polypropylene housing is sturdy and chemically compatible
- Three membrane-type media and two depth-type media
- Wide range of retentive pore sizes
- All types available in three different lengths
- Diameter is a standard 78 mm
- Selected media available presterilized by ethylene oxide (EtO)

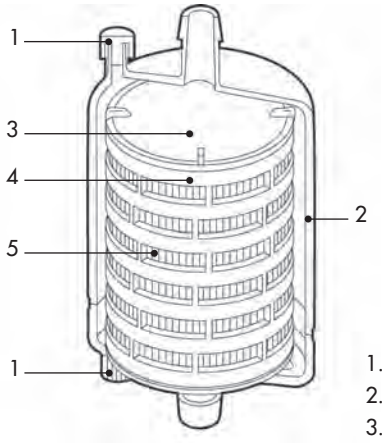
APPLICATIONS

- Filter tissue culture media, fermentation broth, and ground water
- Can be set in serial mode to maximize throughput volumes
- Point-of-use sterile filtration
- Use capsules for pilot/prototype studies, scale up to the same media in the cartridge format
- Not recommended for air filtration

Five different filter media are available in the capsule format.

Media	Code	Characteristic	Media type	Pore Size or Nominal Rating (µm)	Membrane layers	Filtration area per capsule (cm^2)
PES	CCS	hydrophilic	membrane	0.20 – 0.45	double	up to 1800
PTFE	CCF	hydrophobic	membrane	0.05 – 1.0	single/double	up to 3600
PTFE	CCFH	hydrophilic	membrane	0.20	single	up to 3600
Polypropylene	CCP	hydrophobic	depth-type	0.8 – 30	N/A	up to 2600
Glass	CCG	-	depth-type	0.45 – 1.0	N/A	up to 1200

For detailed chemical compatibility information, see page 116.
When ordering length code "C", end fixture code "D" is not available.



1. Vent/drain (1/8" NPT)
2. Housing
3. End cap
4. Outer sleeve
5. Pleated filter media

B
1/4" NPTM

D
1/2" NPTM

H
3/8" hose barb

N
1-1/2" sanitary fitting

PES Capsule Filter (CCS)

- Can be sterilized by autoclaving (121°C, 30 min) or treatment with ethylene oxide (EtO)
- Available presterilized (EtO) or pre-rinsed (recommended when filtering high purity water)

APPLICATIONS

- Filter pure water, high purity chemicals, pharmaceuticals, cosmetics, and tissue culture media
- Remove bacteria or sub-micron particulates

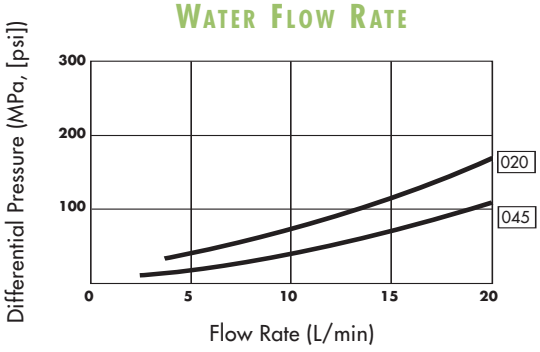
SPECIFICATIONS

Maximum Inlet Pressure	0.39 MPa (57 psi)
Maximum Operating Temperature	60°C (140°F)

		CCS-020	CCS-045
Layers		Double	Double
Pore Size (µm)		0.20	0.45
Minimum bubble point (water)		≥0.39 MPa (57 psi)	≥0.29 MPa (43 psi)
LRV / Organism		≥7 B. diminuta	≥7 S. marcescens
Length Code	Length (mm)*	Filtration Area (cm^2)	
C	102	450	
D	129	900	
E	201	1800	

*Length given is for capsule with end fixture H.

WATER FLOW RATE



Typical water flow rate for CCS-____-D1B at 25°C

ORDERING INFORMATION

CCS - □□□ - □ 1 □ (S)[1] (R)[2]

Pore size (µm)	Pore Size Code
0.20	**020**
0.45	**045**

Length (mm)	Length Code
102	**C**
129	**D**
201	**E**

End fixture (Inlet and Outlet)	End Fixture Code
1/4" NPTM	**B**
1/2" NPTM	**D**
3/8" hose barb	**H**
1 1/2" sanitary fitting	**N**

1. When ordering sterile units, specify "S" in the last position of the catalog number.
2. When ordering Pre-rinsed units, specify "R" in the last position of the catalog number.

PTFE Capsule Filters – Hydrophobic (CCF) and Hydrophilic (CCFH)

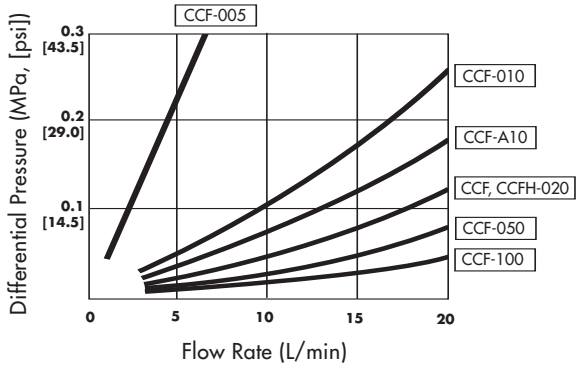
- Compatible: solvent and pH-resistant
- Hydrophobic:
  - Supported membrane except CCF-A10 and CCF-005
  - Single layer except CCF-A10 and CCF-005 which has double layer
  - 5 pore sizes
  - Can be sterilized by autoclaving (121ºC, 30 min) or treatment with ethylene oxide (EtO).
- Hydrophilic:
  - Polyester membrane support
  - Single layer
  - 0.2 µm pore size

Note: Autoclaving or allowing membrane to dry will render it hydrophobic.

APPLICATIONS

- Use serially as prefilter and final filter
- Corrosive fluids and gases, photoresists, and both alkalis and acids
- Hydrophobic:
  - Solvent filtration
- Hydrophilic:
  - Solvents with higher surface tension
  - Heterogeneous fluid mixtures

WATER FLOW RATE



Typical water flow rate for CCF/CCFH-___-D1B at 25°C

SPECIFICATIONS

Maximum Inlet Pressure	0.39 MPa (57 psi)
Maximum Operating Temperature	60°C (140°F)

	CCF-005	CCF-A10	CCF-010	CCF-020	CCF-050	CCF-100	CCFH-020
	Hydrophobic						Hydrophilic
Layers	Double	Double	Single	Single	Single	Single	Single
Pore size (µm)	0.05	0.10	0.10	0.20	0.50	1.0	0.20
Min. bubble point (IPA) MPa (psi)	≥0.16 (23)	≥0.15 (22)	≥0.13 (20)	≥0.09 (13)	≥0.05 (7)	≥0.03 (4)	-
Length Code / Length* (mm)	Filtration Area (cm^2)						
C 102	900	900	570	570	570	570	900
D 129	1800	1800	1150	1150	1150	1150	1800
E 201	3600	3600	2300	2300	2300	2300	3600

*Length given is for capsule with end fixture H.

ORDERING INFORMATION

CCF - ☐☐☐ - ☐ 1 ☐ (S)[1]
CCFH - ☐☐☐

Pore Size (µm)	Pore Size Code
0.05	**005**
0.10	**A10**
0.10	**010**
0.20	**020**
0.50	**050**
1.00	**100**

Pore Size (µm)	Pore Size Code
0.2	020

Length (mm)	Length Code
102	**C**
129	**D**
201	**E**

End Fixtures (Inlet and Outlet)	End Fixture Code
1/4" NPTM	**B**
1/2" NPTM	**D**
3/8" hose barb	**H**
1 1/2" sanitary fitting	**N**

1. When ordering sterile units, specify "S" in the last position of the catalog number.

Polypropylene Capsule Filter (CCP)

- Depth-type matrix: high dirt holding capacity, superior retention
- Compatible with aqueous solutions and solvents
- Thermally welded to prevent fiber slough-off and minimize changes in pore size during filtration
- Wide range of particle size cut-offs
- Can be sterilized by autoclaving (121°C, 30 min) or treatment with ethylene oxide (EtO).

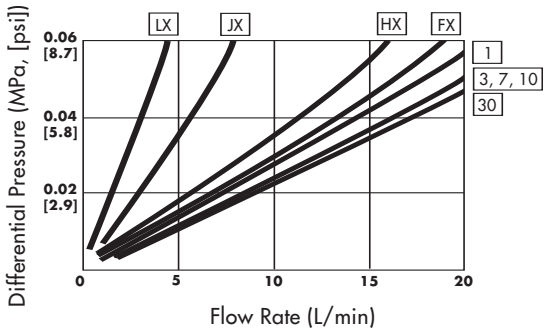
APPLICATIONS

- High purity water filtration
- Prefiltration to a final membrane filter such as PES or PTFE (CCS, CCF, or CCFH)
- Ultracleaning
- Filtration of process chemicals

SPECIFICATIONS

Maximum Inlet Pressure	0.39 MPa (57 psi)
Maximum Operating Temperature	60°C (140°F)

WATER FLOW RATE



Typical water flow rate for CCP-____-D1B at 25°C.

		CCP-								
		LX	**JX**	**HX**	**FX**	**1**	**3**	**7**	**10**	**30**
Particle size (µm)		0.8	1.0	2.0	3.0	2 – 5	5 – 10	10 – 20	10 – 20	20 - 30
% Particle retention		>99	>99	>99	>99	94	98	98	92	97
Length Code	Length* (mm)	Filtration Area (cm^2)								
C	102	400	500	500	550	500	600	500	550	650
D	129	800	1000	1000	1100	1000	1200	1000	1100	1300
E	201	1600	2000	2000	2200	2000	2400	2000	2200	2600

*Length given is for capsule with end fixture H.

ORDERING INFORMATION

CCP - ☐☐ - ☐ 1 ☐

Retention Characteristic Code
LX
JX
HX
FX
1
3
7
10
30

Length (mm)	Length Code
102	**C**
129	**D**
201	**E**

End Fixtures (Inlet and Outlet)	End Fixture Code
1/4" NPTM	**B**
1/2" NPTM	**D**
3/8" hose barb	**H**
1 1/2" sanitary fitting	**N**

Glass Microfiber Capsule Filter (CCG)

- Depth-type matrix of borosilicate glass microfiber
- Large dirt holding capacity
- Resistant to most fluids except strong acids
- Contains a small amount of acrylic resin binder to enhance wet strength
- Can be sterilized by autoclaving (121ºC, 30 min) or treatment with ethylene oxide (EtO).

APPLICATIONS

- Sea water filtration
- Aquaculture
- Prefiltration to a final membrane filter such as PES or PTFE (CCS, CCF, or CCFH)

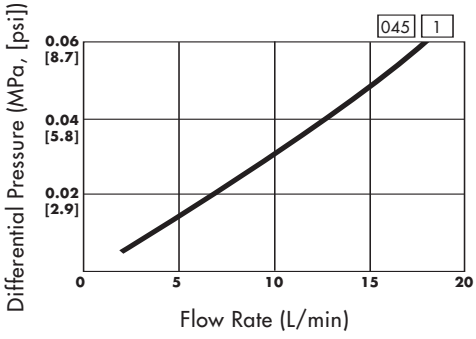
SPECIFICATIONS

Maximum Inlet Pressure	0.29 MPa (43 psi)
Maximum Operating Temperature	60°C (140°F)

	CCG-045	CCG-1
Nominal Pore Size (µm)	1 – 1.5 µm	1.5 – 2.0 µm
Length Code	Length* (mm)	Filtration Area (cm^2)
C	102	300
D	129	600
E	201	1200

*Length given is for capsule with end fixture H.

WATER FLOW RATE



Typical water flow rate for CCG-____-D1B at 25°C.

ORDERING INFORMATION

CCG - □□□ - □ 1 □

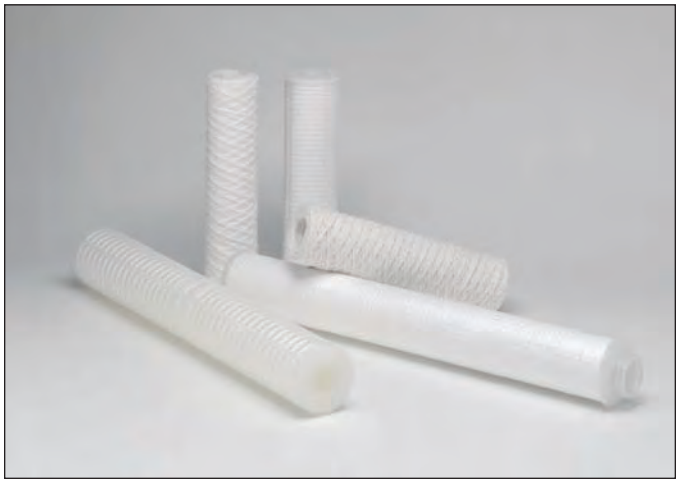
Nominal Pore Size (µm)	**Nominal Pore Size Code**
0.45	**045**
1.0	**1**

Length (mm)	**Length Code**
102	**C**
129	**D**
201	**E**

End Fixtures (Inlet and Outlet)	**End Fixture Code**
1/4" NPTM	**B**
1/2" NPTM	**D**
3/8" hose barb	**H**
1 1/2" sanitary fitting	**N**

Cartridges – Introduction

- Available in a wide variety of media and end fixture configurations
- Media can be mixed and configured in serial format to maximize throughput volumes, flow rates, and cartridge life
- Fit many commercially available filter housings



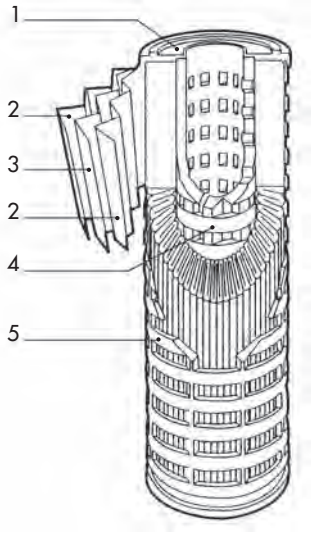
Eleven different filter media are available in cartridge format.

Applications

- Large surface area permits large throughput volumes and higher flow rates
- Suitable for both prefiltration and final filtration of fluids in pharmaceutical, food, beverage, and electronics industries
- Wide choice of media and core enables use in many chemical and thermal conditions

Specifications

Media	Code	Media type	Format	Absolute/ Nominal	Pore Size or Rating (µm)	Metric/ English lengths
Cellulose acetate	TCR	Membrane	Pleated, internal prefilter	Absolute	0.20 – 0.80	Metric
Polyethersulfone (PES)	TCS	Membrane	Pleated, internal prefilter	Absolute	0.20 – 0.45	Metric
Polyethersulfone (PES)	TCS-G	Membrane	Pleated, internal prefilter	Absolute	0.20 – 0.65	Metric
Polyethersulfone (PES)	TCS-E	Membrane	Pleated, internal prefilter	Absolute	0.20 – 0.45	Metric
Hydrophobic PTFE	TCF	Membrane	Pleated	Absolute	0.05 – 1.0	Metric
Hydrophilic PTFE	TCFH	Membrane	Pleated	Absolute	0.10 – 1.0	Metric
Coated cellulose acetate	TCY	Membrane	Pleated, dual layer	Nominal	0.21 – 2.0	Metric
Coated cellulose acetate	TCYE	Membrane	Pleated, single layer	Nominal	0.21 – 10	Metric
Polypropylene	TCP	Bonded fiber	Pleated, multiple layers	Nominal	0.8 – 3.0	Metric
Polypropylene	TCP/TCPE	Bonded fiber	Pleated, single layer	Nominal	1 – 30	Metric
Polypropylene, multigrade	TCPD	Depth-type	Spirally wound	Nominal	1 – 70	Metric
Epoxy cellulose	TC	Depth-type	Pleated	Nominal	1 – 30	Metric
Glass fiber	TCG	Depth-type	Pleated, dual layer	Nominal	0.45 – 1	Metric
All-polypropylene	OH	Bonded fiber	Graded density	Nominal	1 – 75	English
String (11 types of media)	W	String fiber	String wound	Nominal	0.5 – 200	English



1. End cap
2. Support media
3. Final membrane
4. Core tube
5. Outer sleeve

Gasket/O-ring Polymer	Gasket/O-ring Code	Autoclavable	Max Temp. (°C)
EPR	E	O	150
EPDM	D	O	150
Chloroprene	N	X	120
NBR	B	X	130
Silicone	S	O	230
FPM	V	O	260
PTFE (Gasket only)	H	O	260
FEP Encapsulated (O-ring only)	F	O	260

O – Recommended X – Not recommended

For detailed chemical compatibility information, see page 126.
Filter housings are available – call to discuss your particular needs.

End Fixture Configurations

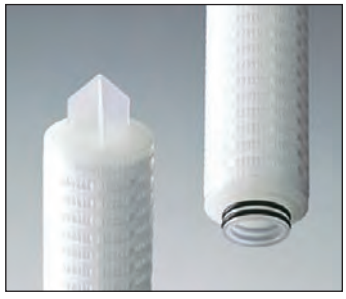
Twelve different end configurations are pictured below; see the individual cartridge listings for availability. All-polypropylene (OH) and string wound (W) cartridges have a compression seal (not pictured), eliminating the need for gaskets or O-rings.

H Size 222 heat-resistant O-ring, flat closed
Standard O-ring: Silicone
Note: Autoclavable

M Size 222 O-ring, flat closed
Standard O-ring: EPR
Note: Non-Autoclavable

L Size 222 O-ring with internal stainless steel support, flat closed
Available for TCR-type only
Note: Autoclavable

K Size 222 heat-resistant O-ring, spear closed
Standard O-ring: Silicone
Note: Autoclavable

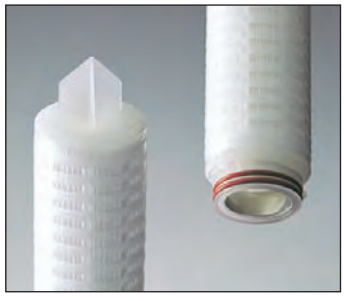


R Size 222 O-ring, spear closed
Standard O-ring: EPR
Note: Non-Autoclavable

S Size 222 O-ring with tabs and internal stainless steel support, spear closed
Available for TCR-type only
Note: Autoclavable

J Size 226 heat-resistant O-ring with tabs, spear closed
Standard O-ring: Silicone
Note: Autoclavable

P Size 226 O-ring with tabs, spear closed
Standard O-ring: EPR
Note: Non-Autoclavable



Q Size 226 O-ring with tabs and internal stainless steel support, spear closed
Available TCR-type only
Note: Autoclavable

F Flat Gasket
Standard Gasket: EPR
Note: Non-Autoclavable

N 120 size O-ring
Standard O-ring: Silicone
Note: Autoclavable

C Flat Gasket
Standard Gasket: Chloroprene (for PP) or NBR (for SS)
Available for TC-type only
Note: Non-Autoclavable

Cellulose Acetate (TCR)

- Dual cellulose acetate membranes provide internal prefiltration by placing a larger pore size membrane upstream of final rated pore size membrane
- Polyester membrane support is non-fiber releasing
- Low protein binding

APPLICATIONS

- Filter ultra-pure water, rinse waters, cosmetics, pharmaceuticals, and beverages (beer and wine)

SPECIFICATIONS

	TCR-020	TCR-045	TCR-080
Pore size	0.20 µm	0.45 µm	0.80 µm
Dual membranes:			
Upstream	0.80 µm	0.80 µm	5.0 µm
Downstream	0.20 µm	0.45 µm	0.80 µm
Challenge organism	B. diminuta	S. marcescens	S. cerevisiae
LRV (Log reduction value)	≥7	≥7	≥7
Bubble Point (MPa)	≥0.294	≥0.235	≥0.088
Filtration area per single length	4200 cm^2		
Max. differential pressure (25°C)	0.39 MPa (57 psi)		
Max. operating temperature	80°C (176°F)		

Materials:

End cap	Polybutyleneterephthalate (PBT)
Sealing material	Medical grade polyurethane
Support media	Polyester
Prefilter membrane	Cellulose acetate
Final membrane	Cellulose acetate
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCR - □□□ - □ B □□

Pore Size (µm)	Pore Size Code
0.20	020
0.45	045
0.80	080

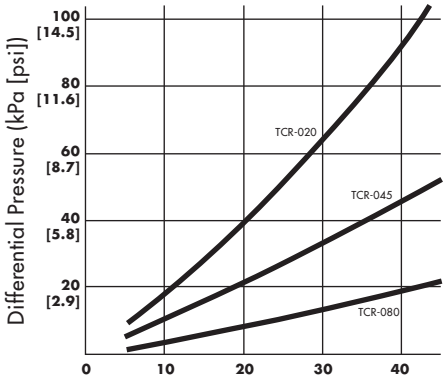
Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
N	S
M	P
L	Q

Note: Codes N, L, Q, and S are autoclavable at 121°C, 30 min.

Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V

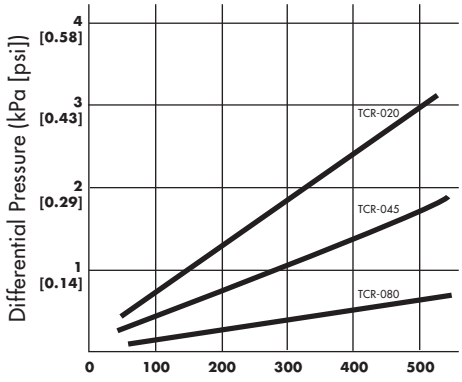
TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (N L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Polyethersulfone (PES) Membrane (TCS)

- Dual Polyethersulfone (PES) membranes provide internal prefiltration by placing a larger pore size membrane upstream of final rated pore size membrane
- Low extractables
- Enhanced chemical compatibility
- Quick rinse down
- Low protein binding
- 100% integrity tested during manufacturing
- Non-fiber releasing

APPLICATIONS

- Filtration for electronics, cosmetics, pharmaceuticals and beverage Industries

SPECIFICATIONS

	TCS-020	TCS-045
Pore size	0.20 µm	0.45 µm
Dual membranes:		
Upstream	0.45 µm	0.65 µm
Downstream	0.20 µm	0.45 µm
Challenge organism	B. diminuta	S. marcescens
LRV (Log reduction value)	≥7	≥7
Filtration area per single length	4000 cm^2	
Max. differential pressure (25°C)	0.39 MPa (57 psi)	
Max. operating temperature	80°C (176°F)	

Materials:

End cap	Polypropylene
Support media	Polypropylene
Prefilter membrane	Polytethersulfone (PES)
Final membrane	Polytethersulfone (PES)
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCS - □□□ - □ 1 □□

Pore Size (µm)	Pore Size Code
0.20	020
0.45	045

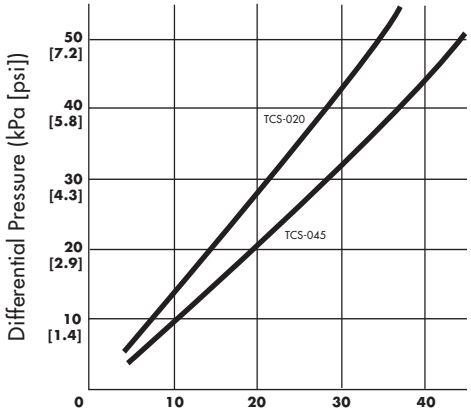
Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
N	K
M	P
H	J

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min.

Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V

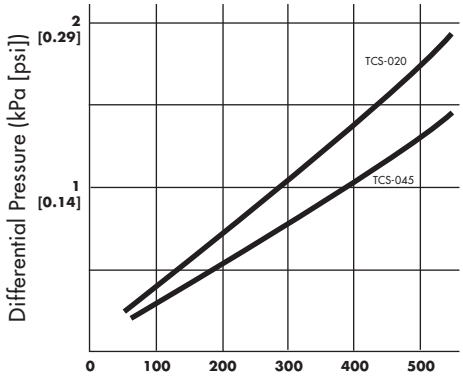
TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (N L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Polyethersulfone (PES) Membrane for the Food and Beverage Industries (TCS-G)

- Dual Polyethersulfone (PES) membranes provide internal prefiltration by placing a larger pore size membrane upstream of final rated pore size membrane
- Low extractables
- Enhanced chemical compatibility
- Quick rinse down
- Low protein binding
- 100% integrity tested during manufacturing
- Non-fiber releasing
- Selected types may be hot water sanitized

APPLICATIONS

- Food and beverage Industries

SPECIFICATIONS

	TCS-G020	TCS-G045	TCS-G065
Pore size	0.20 µm	0.45 µm	0.65 µm
Challenge Organism LRV (Log reduction value)	B.diminuta ≥7	S.marcescens ≥7	S.cerevisiae ≥7
Max. differential pressure (25°C)	0.39 MPa [57 psi]		
Max. operating temperature	80°C (176°F)		
Filtration area (with 250 mm)	6600 cm^2		
Diffusion Rate (with 250 mm)	≤55 mL/min at 0.326 MPa	≤53 mL/min at 0.206 MPa	≤40 mL/min at 0.100 MPa

Materials:

End cap	Polypropylene
Support media	Polypropylene
Prefilter membrane	Polytethersulfone (PES)
Final membrane	Polytethersulfone (PES)
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCS-G - □□□ - □ 1 □□

Pore Size (µm)	Pore Size Code
0.20	020
0.45	045
0.65	065

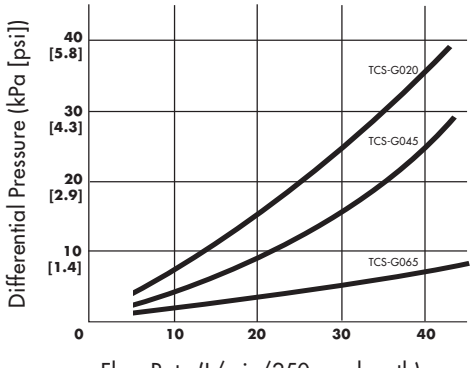
Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
	K
M	P
H	J

Note: Codes H, K, and J may be hot water sanitized at 85°C for 30 min, up to 100 times.

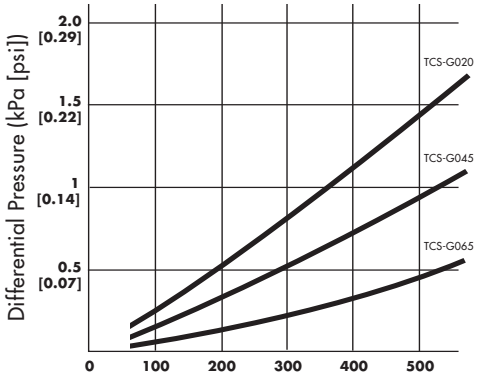
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E
EPDM	D
Chloroprene	N
NBR	B
Silicone	S (standard)
FPM	V

TYPICAL WATER FLOW RATE



Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Polyethersulfone (PES) Membrane for the Electronics Industry (TCS-E)

- Dual Polyethersulfone (PES) membranes provide internal prefiltration by placing a larger pore size membrane upstream of final rated pore size membrane
- Low extractables
- Enhanced chemical compatibility
- Quick rinse down
- 100% integrity tested during manufacturing
- Non-fiber releasing
- Superior recovery of resistivity and TOC since cartridges are individually flushed with pure water in the manufacturing process

APPLICATIONS

- Filtration for electronics Industry

SPECIFICATIONS

	TCS-E020	TCS-E045	TCS-E045S
Pore size	0.20 µm	0.45 µm	0.45 µm
Filtration area (with 250 mm)	6700 cm^2		8800 cm^2
Max. differential pressure (25°C)	0.39 MPa [57 psi]		
Max. operating temperature	80°C (176°F)		

Materials:

	TCS-E-020/045	TCS-E-045S
End cap	Polypropylene	Polypropylene
Support media	Polypropylene	Polypropylene
Prefilter membrane	Polytethersulfone (PES)	-
Final membrane	Polytethersulfone (PES)	Polyethersulfone (PES)
Core tube	Polypropylene	Polypropylene
Outer sleeve	Polypropylene	Polypropylene

ORDERING INFORMATION

TCS-E - □□□ - □ 1 □□

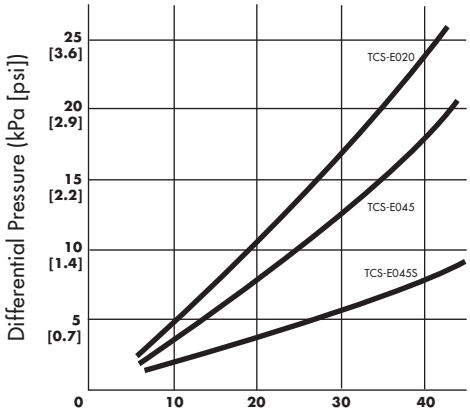
Pore Size (µm)	Pore Size Code
0.20	020
0.45	045
0.45	045S

Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
M	P

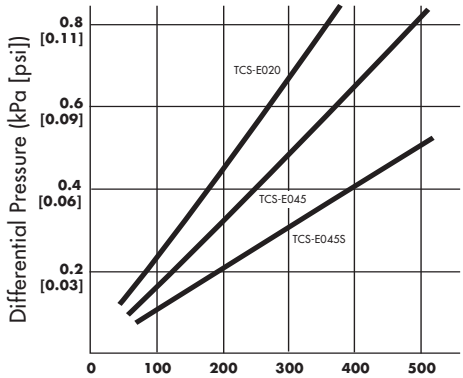
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V

TYPICAL WATER FLOW RATE



Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Hydrophobic PTFE (TCF)

- PTFE membrane supported on a non-fiber releasing polypropylene backing
- Enhanced chemical resistance
- Selected types may be in-line steam sterilized (126°C, 30 min) or autoclaved (121°C, 30 min)

APPLICATIONS

- Filtration of photo resists and organic solvents
- Uses in the electronics industry and in chemical manufacturing
- Filtering gases and venting tanks

Note: Process fluids must have a surface tension of ≤32 mN/m (dyne/cm) to properly wet the filter and to achieve optimized flow rates and performance characteristics. For fluids with a surface tension ≥32 mN/m (dyne/cm), use hydrophilic PTFE (TCFH-type cartridges).

SPECIFICATIONS

	TCF-005	TCF-010	TCF-020	TCF-050	TCF-100	TCF-020L
Pore size	0.05 µm	0.10 µm	0.20 µm	0.50 µm	1.00 µm	0.20 µm
Filtration area per single length	9200 cm^2	9200 cm^2	7000 cm^2	7000 cm^2	7000 cm^2	16,400 cm^2
Max. differential pressure (25°C)	0.39 MPa (57 psi)					0.25 MPa (36 psi)
Max. operating temperature	80°C (176°F)					40°C (104°F)

Materials:

End cap	Polypropylene
Support media	Polypropylene
Membrane	PTFE
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCF - 020L - *1 3 *2
TCF - ☐☐☐ - ☐ 1 ☐☐

Pore Size (µm)	Pore Size Code
0.05	005
0.10	010
0.20	020
0.50	050
1.00	100

Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

*1 Available with length codes S, D, and T.

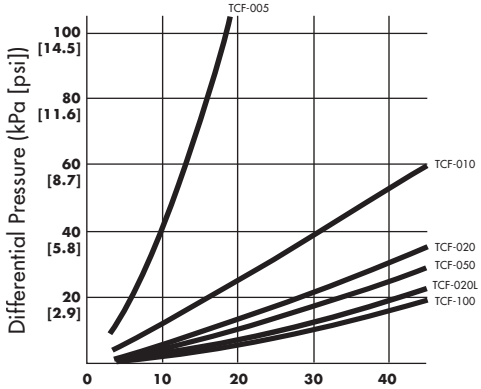
End Fixture Code	
F	R
N	K
M	P
H	J

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min, or can be steam sterilized at 126°C for 30 min.

*2 Available with end fixture codes F, M, R, and P.

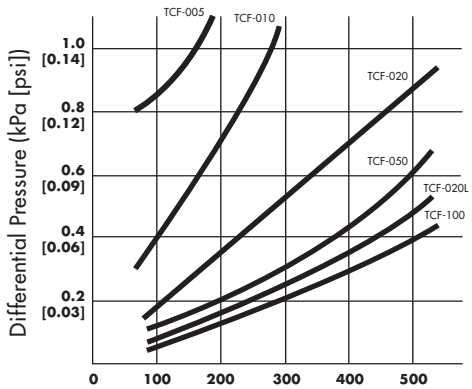
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V
PTFE	H (Gasket only)
FEP Encapsulated	F (O-ring only)

TYPICAL WATER FLOW RATE



Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Hydrophilic PTFE (TCFH)

- Unsupported PTFE membrane has been treated to render the matrix hydrophilic
- Polypropylene support is non-fiber releasing

Note: This cartridge is not autoclavable.

APPLICATIONS

- Strong acid and strong alkali solutions
- Photo resists
- Chemically aggressive liquids with a surface tension ≥32 mN/m (dyne/cm)

SPECIFICATIONS

	TCFH-010	TCFH-020	TCFH-050	TCFH-100	TCFH-020L
Pore size	0.10 µm	0.20 µm	0.50 µm	1.00 µm	0.20 µm
Filtration area per single length	9800 cm^2				21,600 cm^2
Max.differential pressure (25°C)	0.39 MPa (57 psi)				0.39 MPa (57 psi)
Max. operating temperature	80°C (176°F)				60°C (140°F)

Materials:

End cap	Polypropylene
Support media	Polypropylene
Membrane	Hydrophilic PTFE
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCFH - □□□ - □ 1 □□

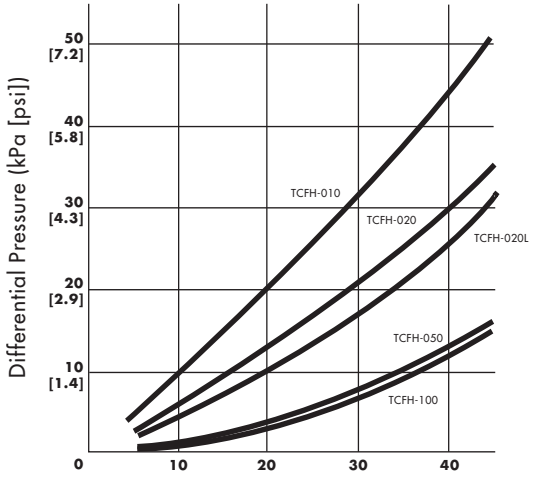
Pore Size (µm)	Pore Size Code
0.10	**010**
0.20	**020/020L**
0.50	**050**
1.00	**100**

Length (mm)	Length Code
250 (single)	**S**
500 (double)	**D**
750 (triple)	**T**
1000 (quad)	**Q**

End Fixture Code	
F	**R**
N	
M	**P**

Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	**E (standard)**
EPDM	**D**
Chloroprene	**N**
NBR	**B**
Silicone	**S**
FPM	**V**
PTFE	**H (Gasket only)**
FEP Encapsulated	**F (O-ring only)**

TYPICAL WATER FLOW RATE



Conditions: Pipe dia. 3/4 in., Water temp. 20°C

Coated Cellulose Acetate (TCY)

- Dual layer of coated cellulose acetate membrane
- Low protein binding
- Excellent dirt holding characteristics, superior particle retention
- Excellent water and air flow rates
- Non-fiber releasing

APPLICATIONS

- Use as a prefilter to a final membrane cartridge
- Filter protein-containing solutions for the food, cosmetic and pharmaceutical industries
- Purify process waters

SPECIFICATIONS

	TCY-ND, -LD, -HD
Filtration area per single length	5500 cm^2
Max. differential pressure (25°C)	0.49 MPa (71 psi)
Max. operating temperature	80°C (176°F)

Materials:

End cap	Polypropylene
Support media	Polypropylene
Prefilter membrane	Coated cellulose acetate
Final membrane	Coated cellulose acetate
Core tube	Polypropylene
Outer sleeve	Polypropylene

Retention Characteristic Code	Particle Size						
	0.21µm	0.3 µm	0.48 µm	0.65 µm	0.8 µm	1.0 µm	2.0 µm
	% Particle Retention						
TCY-ND	99.9	99.9	99.9	>99.9			
TCY-LD		99	99.9	99.9	>99.9		
TCY-HD			99	99.9	99.9	99.9	>99.9

Test Criteria: Single length (250 mm) cartridge, flow rate 10 L/min.

ORDERING INFORMATION

TCY - □□ - □ 1 □□

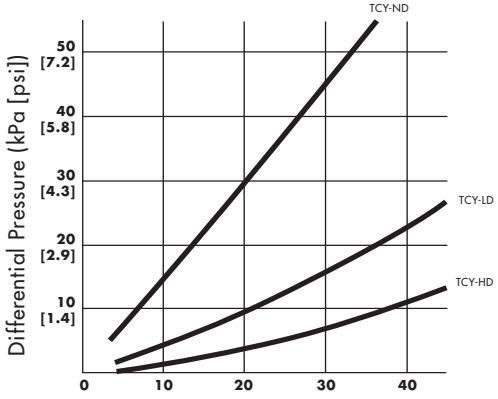
Retention Characteristic Code	Length (mm)	Length Code
ND	250 (single)	S
LD	500 (double)	D
HD	750 (triple)	T
	1000 (quad)	Q

End Fixture Code	
F	R
N	K
M	P
H	J

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min.

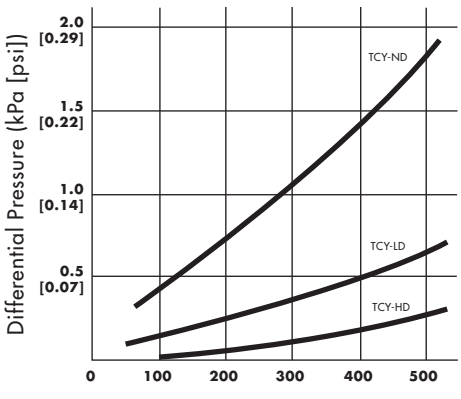
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V

TYPICAL WATER FLOW RATE



Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Single Layer Coated Cellulose Acetate (TCYE)

- High efficiency single layer of coated cellulose acetate
- Economical
- Excellent particle retention
- Low protein binding, non-fiber releasing
- Excellent water and air flow rates

APPLICATIONS

- Filter process waters
- Filter protein-containing solutions for the food, cosmetic and pharmaceutical industries

SPECIFICATIONS

	TCYE-NS, -LS, -HS, -BS
Filtration area per single length	6200 cm^2
Max. differential pressure (25°C)	0.49 MPa (71 psi)
Max. operating temperature	80°C (176°F)

Materials:

End cap	Polypropylene
Support media	Polypropylene
Membrane	Coated cellulose acetate
Core tube	Polypropylene
Outer sleeve	Polypropylene

Retention Characteristic Code	Particle Size									
	0.21µm	0.3 µm	0.48 µm	0.65 µm	0.8 µm	1.0 µm	2.0 µm	3.0 µm	5.0 µm	10 µm
	% Particle Retention									
TCYE-NS	99	99.9	99.9	>99.9						
TCYE-LS		98	99	99	>99.9					
TCYE-HS			96	99	99	99	>99.9			
TCYE-BS							98	99.9	99.9	>99.9

Test Criteria: Single length (250 mm) cartridge, flow rate 10 L/min.

ORDERING INFORMATION

TCYE - □□ - □ 1 □□

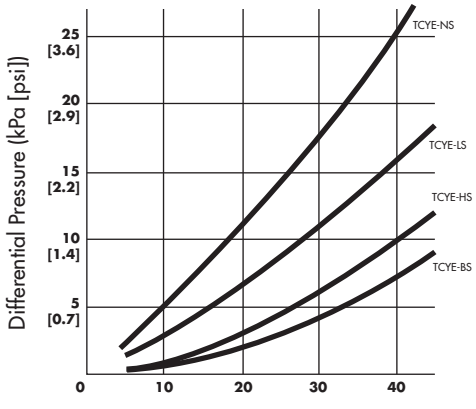
Retention Characteristic Code	Length (mm)	Length Code
NS	250 (single)	S
LS	500 (double)	D
HS	750 (triple)	T
BS	1000 (quad)	Q

End Fixture Code	
F	R
N	K
M	P
H	J

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min.

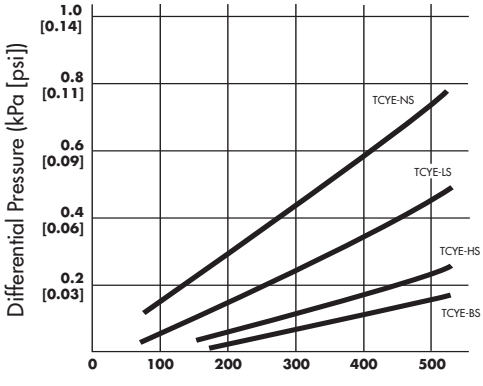
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V

TYPICAL WATER FLOW RATE



Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Polypropylene (TCP)

- Multiple layers of nonwoven polypropylene maximize filtration efficiency
- Maximal throughput volumes and retention ratings
- Thermally bonded to prevent fiber slough-off, minimize extractables
- Supported both upstream and downstream (TCP-HX, FX only)

APPLICATIONS

- Filter process waters
- Filter protein-containing solutions for the food, cosmetic and pharmaceutical industries

SPECIFICATIONS

	TCP-LX	TCP-JX	TCP-HX	TCP-FX	TCP-02AM
Filtration area per single length	3300 cm^2	4500 cm^2	4200 cm^2	5100 cm^2	2900 cm^2
Max. differential pressure (25°C)	0.49 MPa (71 psi)				
Max. operating temperature	80°C (176°F)				

Materials:

End cap	Polypropylene
Support media	Polypropylene
Membrane	Polypropylene
Core tube	Polypropylene
Outer sleeve	Polypropylene

Retention Characteristic Code	Particle Size							% Retention (0.3 µm DOP)
	0.2 µm	0.48 µm	0.65 µm	0.8 µm	1.0 µm	2.0 µm	3.0 µm	
	% Particle Retention							
TCP-LX	45	90	98	>99				99.9999
TCP-JX		60	80	94	>99			99.999
TCP-HX				70	93	>99		99.99
TCP-FX				30	60	95	>99	99.84
TCP-02AM				43	77	>99		-

Test Criteria: Single length (250 mm) cartridge, flow rate 10 L/min.

ORDERING INFORMATION

TCP - [ ][ ] - [ ] 1 [ ][ ]

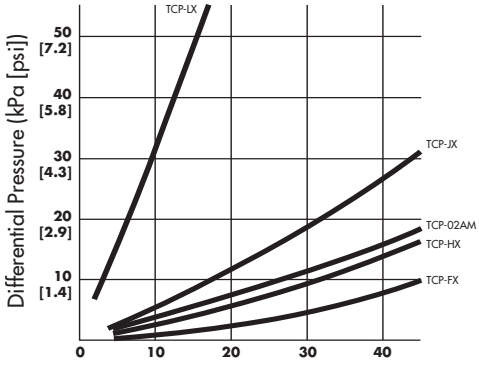
Retention Characteristic Code	Length (mm)	Length Code
LX	250 (single)	**S**
JX	500 (double)	**D**
HX	750 (triple)	**T**
FX	1000 (quad)	**Q**
02AM		

End Fixture Code	
F	**R**
N	**K**
M	**P**
H	**J**

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min.

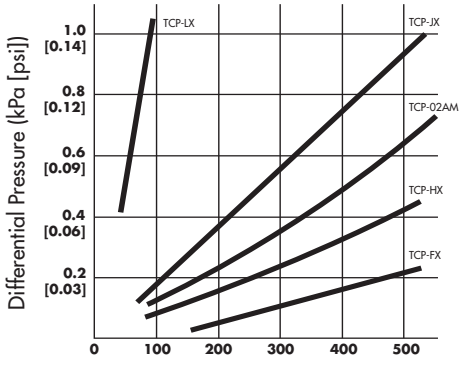
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	**E (standard)**
EPDM	**D**
Chloroprene	**N**
NBR	**B**
Silicone	**S**
FPM	**V**
PTFE	**H (Gasket only)**
FEP Encapsulated	**F (O-ring only)**

TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)
Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (L/min/250 mm length)
Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Single Layer Polypropylene (TCP/TCPE)

- All-polypropylene construction, medium is single layer of thermally bonded polypropylene
- Pore size range 1 – 30 µm
- TCP – Upstream and downstream support
  – Larger effective filtration area
- TCPE – Thicker grade of polypropylene is stronger and does not require support
  – Less effective filtration area

APPLICATIONS

- Use as a prefilter in series upstream of a final membrane to clarify solutions
- Applications that require chemical resistance and chemical cleanliness

SPECIFICATIONS

	TCP-1	TCP-3	TCP-7	TCP-10	TCP-30	TCPE-3	TCPE-10	TCPE-30
Nominal pore size	1 µm	3 µm	7 µm	10 µm	30 µm	3 µm	10 µm	30 µm
Filtration area per single length	4200 cm^2	5600 cm^2	4200 cm^2	5000 cm^2	6200 cm^2	3700 cm^2		
Max. differential pressure (25°C)	0.49 MPa (71 psi)							
Max. operating temperature	80°C (176°F)							

Materials:

End cap	Polypropylene
Support Media (TCP)	Polypropylene
Membrane	Polypropylene
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCP - □□ - □ 1 □□

TCPE - □□ - □ 1 □□

Nominal Pore Size Code (TCP)
1
3
7
10
30

Nominal Pore Size Code (TCPE)
-
3
-
10
30

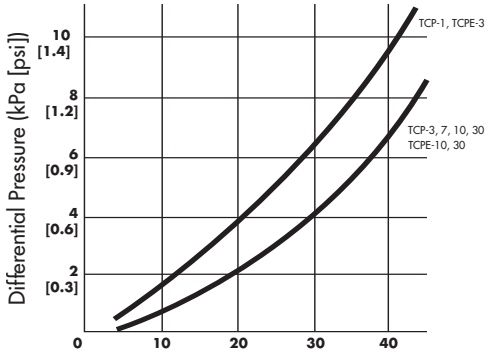
Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
N	K
M	P
H	J

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min

Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V
PTFE	H (Gasket only)
FEP Encapsulated	F (O-ring only)

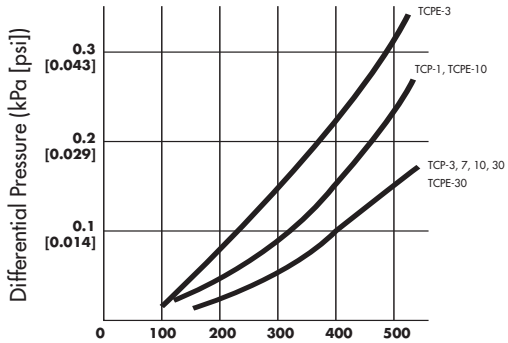
TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (N L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Multigrade Polypropylene (TCPD)

- Spirally wound multigrade all-polypropylene construction
- Increasing depth retention gradient: as fluid flows through the cartridge, retention efficiency increases
- Maximal chemical compatibility

APPLICATIONS

- Ideal for viscous fluids and fluids that have a heterogeneous particle population
- Prefilter or clarifying filter
- Filtration of pure or rinse waters, magnetized paint coatings, synthetic resins, high viscosity resins, plating solutions, etching solutions and strong alkali solutions

SPECIFICATIONS

	TCPD-01A, -02A, -03A, -05A, -1, -3, -7, -10, -30
Max. differential pressure (25°C)	0.49 MPa (71 psi)
Max. operating temperature	80°C (176°F)

Materials:

End cap	Polypropylene
Support media	Polypropylene net
Filter	Polypropylene
Core tube	Polypropylene

Retention Characteristic Code	Particle Size									
	0.6 µm	1.0 µm	2 µm	3 µm	5 µm	10 µm	20 µm	30 µm	40 µm	70 µm
	% Particle Retention									
TCPD-01A	90	>99.9								
TCPD-02A		>99	>99.9							
TCPD-03A		95	>99	>99.9						
TCPD-05A			95	>99	>99.9					
TCPD-1			90	95	>99					
TCPD-3				70	90	>99				
TCPD-7					40	80	>99			
TCPD-10						60	90	95	>99	
TCPD-30							60	90	95	>99

ORDERING INFORMATION

TCPD - □□□ - □ 1 □□

Nominal Pore Size Code	
01A	1
02A	3
03A	7
05A	10
	30

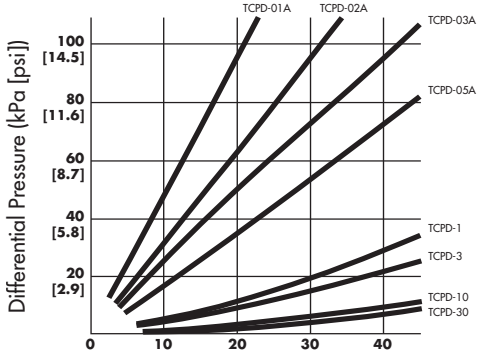
Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
N	K
M	P
H	J

Note: Codes H, J, K, and N are autoclavable at 121°C, 30 min.

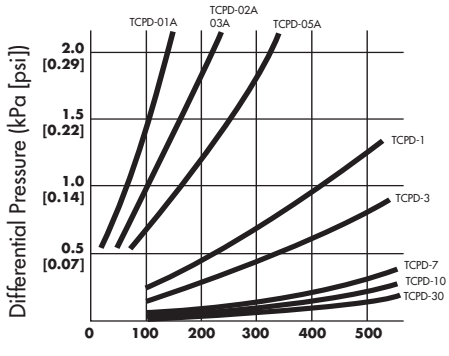
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E (standard)
EPDM	D
Chloroprene	N
NBR	B
Silicone	S
FPM	V
PTFE	H (Gasket only)
FEP Encapsulated	F (O-ring only)

TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)
Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (N L/min/250 mm length)
Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Epoxy Cellulose (TC)

- 100% cellulose wet strengthened with epoxy resin to minimize fiber release
- Available with standard polypropylene core or with stainless steel core (type 304, single length only) for high temperature applications
- See Glass Fiber (TCG) for smaller nominal pore sizes

Note: TC-type are not autoclavable.

APPLICATIONS

- Filter high viscosity liquids such as syrups
- Filter fuels, oils, cutting oils and resins
- Purify industrial and rinse waters

SPECIFICATIONS

	TC type				TC- _ -S4C_			
Molded Material	Polypropylene				Stainless steel			
	1	**3**	**10**	**30**	**1**	**3**	**10**	**30**
Nominal pore size	1 µm	3 µm	10 µm	30 µm	1 µm	3 µm	10 µm	30 µm
Filtration area per single length	4000 cm^2				3400 cm^2			
Max. differential pressure (25°C)	0.49 MPa (71 psi)				0.49 MPa (71 psi)			
Max temperature	80°C (176°F)				150°C (302°F)			

Materials:

End cap	Polypropylene Stainless steel (seal material: silicone)
Filter	Epoxy Cellulose
Core tube	Polypropylene or stainless steel

ORDERING INFORMATION

Polypropylene molded material

Nominal Pore Size (µm)	**Nominal Pore Size Code**
1	**1**
3	**3**
10	**10**
30	**30**

Length (mm)	**Length Code**
250 (single)	**S**
500 (double)	**D**
750 (triple)	**T**
1000 (quad)	**Q***

End Fixture Code	
F	**R**
N	**P**
M	**C**

Gasket/O-ring Polymer	**Gasket/O-ring Code**
EPR	**E**
Chloroprene	**N (standard)**
NBR	**B**
Silicone	**S**
FPM	**V**

*Quad length (1000 mm) not available in end fixture Code C.

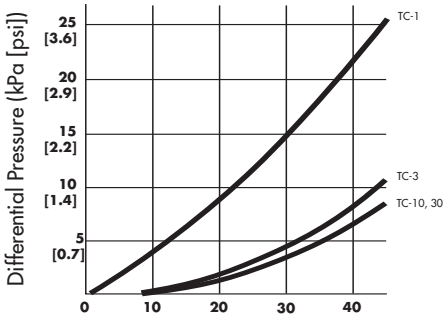
ORDERING INFORMATION

Stainless steel molded material

TC- □□ -S4C □

Nominal Pore Size (µm)	**Nominal Pore Size Code**	Gasket/O-ring Polymer	**Gasket/O-ring Code**
1	**1**	NBR	**B (standard)**
3	**3**	EPR	**E**
10	**10**	Silicone	**S**
30	**30**	FPM	**V**

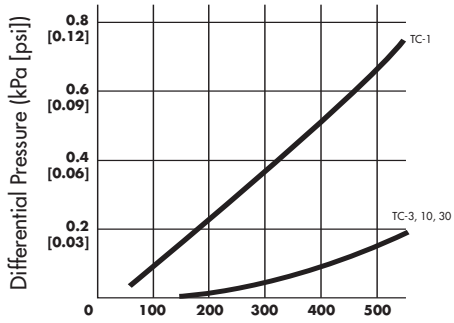
TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (N L/min/250 mm length)

Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

Glass Fiber (TCG)

- Upstream polypropylene followed by a glass fiber layer that is wet strengthened with acrylic resin
- For larger pore size retention see Epoxy Cellulose (TC)

Note: TCG-type cartridges are not autoclavable.

APPLICATIONS

- Filter high viscosity liquids such as syrups
- Filter fuels, oils, cutting oils and resins
- Purify industrial and rinse waters

SPECIFICATIONS

	TCG-045	TCG-1
Nominal pore size	0.45 µm	1 µm
Filtration area per single length	3300 cm^2	
Max. differential pressure (25°C)	0.49 MPa (71 psi)	
Max. operating temperature	80°C (176°F)	

Materials:

End cap	Polypropylene
Upstream support	Polypropylene
Filter	Glass Fiber
Downstream support	Polypropylene
Core tube	Polypropylene
Outer sleeve	Polypropylene

ORDERING INFORMATION

TCG - ☐☐☐ - ☐ 1 ☐☐

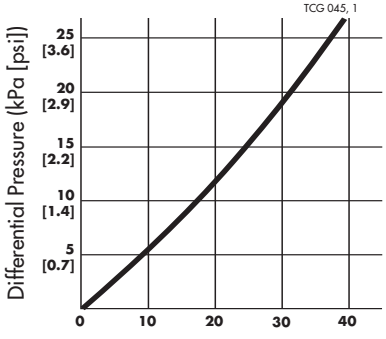
Nominal Pore Size (µm)	Nominal Pore Size Code
0.45	045
1	1

Length (mm)	Length Code
250 (single)	S
500 (double)	D
750 (triple)	T
1000 (quad)	Q

End Fixture Code	
F	R
N	
M	P

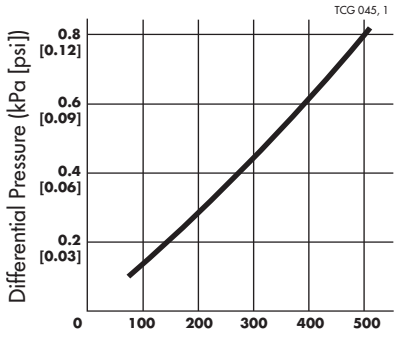
Gasket/O-ring Polymer	Gasket/O-ring Code
EPR	E
EPDM	D
Chloroprene	N (standard)
NBR	B
Silicone	S
FPM	V

TYPICAL WATER FLOW RATE



Flow Rate (L/min/250 mm length)
Conditions: Pipe dia. 3/4 in., Water temp. 20°C

TYPICAL AIR FLOW RATE



Flow Rate (N L/min/250 mm length)
Conditions: Pipe dia. 3/4 in., Air 0.49 MPs, 25°C

All Polypropylene (OH)

- All-polypropylene construction: melt blown polypropylene filaments are spun into a gradient density media, maximizing particle retention
- Excellent flow rates
- Double open end: Compression seal eliminates the need for O-rings or gaskets

APPLICATIONS

- Prefilter upstream of a final pleated cartridge
- Moderate differential pressures and temperatures

SPECIFICATIONS

	OH
Nominal pore size	1 – 75 µm
Max. operating pressure (25°C)	0.11 MPa (15 psi)
Max. temperature	60°C (140°F)

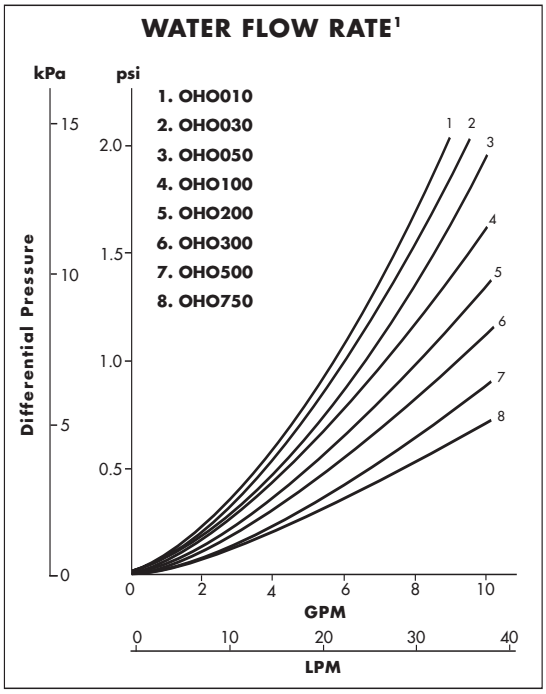
ORDERING INFORMATION

OH ○ - ⋮⋮⋮ - C ⋮⋮

Nominal Pore Size (µm)	**Nominal Pore Size Code**
1	**010**
3	**030**
5	**050**
10	**100**
20	**200**
30	**300**
50	**500**
75	**750**

Length (inches)	**Length Code**
10	**10**
20	**20**
30	**30**
40	**40**

PERFORMANCE DATA



1. Conditions: clean water at 25°C; data are for 10-inch cartridges

String Wound (W)

- Manufactured using "string" of selected materials wound around a core tube
- Core tubes available in polypropylene and three grades of steel
- Continuously wound – no joints that would restrict flow or allow by-pass
- Double-open end – compression seal eliminates the need for O-rings or gaskets
- Selection of materials allows a wide range of chemical and temperature tolerances

APPLICATIONS

- Coarse filtration upstream of a final pleated filter
- Filtration of industrial water
- Clarification of process fluids

SPECIFICATIONS

	All W cartridges
Nominal pore size	0.5 – 200 µm
Max. inlet pressure (25°C)	0.11 MPa (15 psi)

ORDERING INFORMATION

W - □ □ □□□ - C □ O

String Composition	String Composition Code
Bleached cotton, industrial	B
Bleached cotton, FDA	C
Glass fiber	G
Baked glass fiber	H
Nylon	N
Polypropylene, FDA	P
Fibrillated polypropylene	Q
Rayon	R
Polyester	S
Industrial polypropylene	V

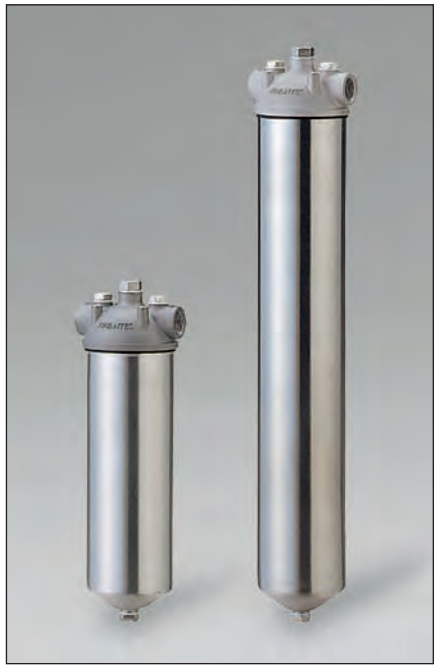
Core Composition	Core Composition Code
Tin plated steel	D
304 stainless	F
316 stainless	G
Polypropylene	P
Special core extender, cover	Z

Nominal Pore Size (µm)	Nominal Pore Size Code
0.5	005
1	010
3	030
5	050
10	100
15	150
20	200
25	250
30	300
40	400
50	500
75	750
100	P10
125	P12
150	P15
200	P20

Length (inches)	Length Code
5	B
9.75	F
10	1
20	2
30	3
40	4

Stainless Steel Cartridge Housing – 1TS Type

- Stainless steel housing for single cartridge filter, consisting of body and head with center post
- Easily perform cartridge filter replacement by loosening the cap nut and removing the housing head
- Choose from 3/4" PT or 1" PT inlet/outlet
- Designed for use with end fixture codes C and F
- Mounting accessories available



1TS, 1TS-2

Specifications

Model		1TS	1TS-2	1TS-B	1TS-2B
Cartridge Capacity		250 mm x 1	500 mm x 1	250 mm x 1	500 mm x 1
Cartridge Compatibility		End fixture codes: C and F			
Inlet/Outlet		3/4" PT		1" PT	
Dimensions (mm)	Height	366	619	369	622
	Diameter	121	121	123	123
Max. Operation Pressure		0.69 MPa (100 psi)			
Composition		Head: SCS14 Body: SUS316 Gasket: FPM, PTFE			
Weight (kg)		2.0	4.0	2.4	4.4

Note: Use thread-sealing tape on tapered inlet and outlet.

Ordering Information

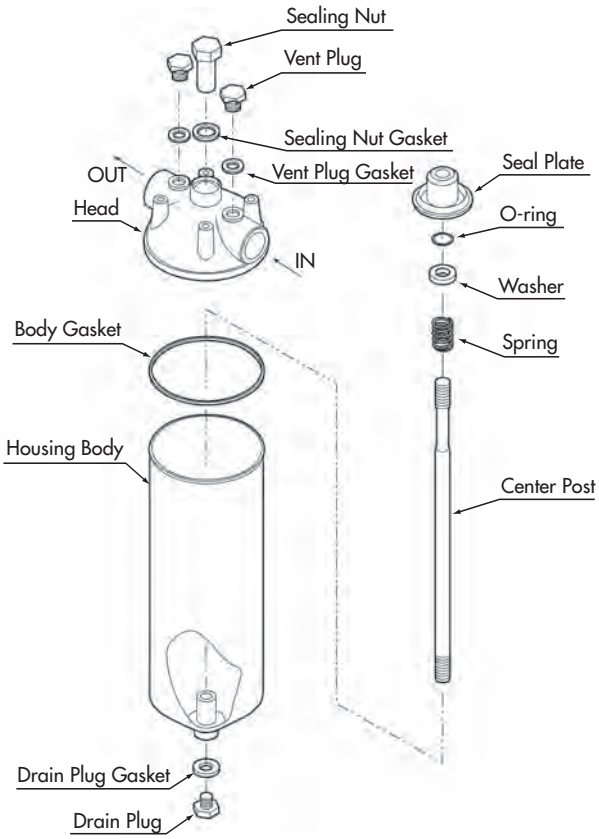
Model	1TS	1TS-2	1TS-B	1TS-2B
Catalog No.	26804010	26804020	26804040	26804030

Optional Accessories

Model	1TS, 1TS-B Stand	Mounting Kit
Composition	SUS304	Galvanized Steel
Catalog No.	28804030	28804055

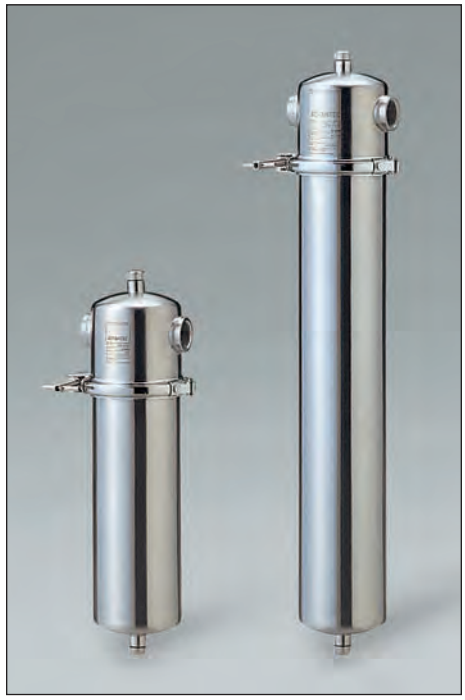
Stand

Unit with Mounting Kit



Stainless Steel Cartridge Housing – 1TM Type

- 2-part stainless steel housing for a single cartridge filter, consisting of body and head with clamp
- Easily perform cartridge filter replacement by loosening the sealing clamp and removing the housing head
- Few components allows for simple maintenance, and easy operation
- Lightweight housing can be cleaned by a washing machine
- Designed for use with end fixture codes M, H, and L



1TM-1S-MV, 1TM-2S-MV

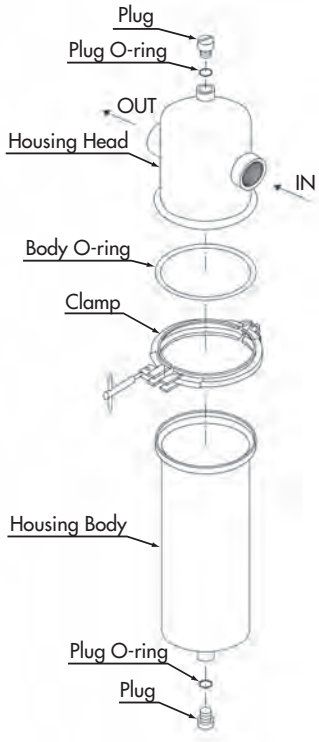
Specifications

Model		1TM-1S-MV	1TM-2S-MV
Cartridge Capacity		250 mm x 1	500 mm x 1
Cartridge Compatibility		End fixture codes: M, H, L	
Inlet/Outlet		1" PT	
Dimensions (mm)	Height	451	704
	Diameter	181	
Max. Operation Pressure		0.49 MPa (71 psi)	
Composition		O-ring: FPM	Head, Body: SU5304
Weight (kg)		1.8	2.2

Note: Use thread-sealing tape on tapered inlet and outlet.

Ordering Information

Model	1TM-1S-MV	1TM-2S-MV
Catalog No.	26805010	26805020



Sanitary Stainless Steel Cartridge Housing – 1TVA Type

- Sanitary stainless steel housing for a single cartridge filter, with sanitary ferrule type inlet, outlet, and seal for easy inspection and cleaning
- 3½ S-clamp wraps around body and base sections, which can be easily removed for disassembly
- Designed for use with end fixture codes* C and F
- 1TVA Type is compatible with applications that require vented housings

1TVA-1S-FS

Specifications

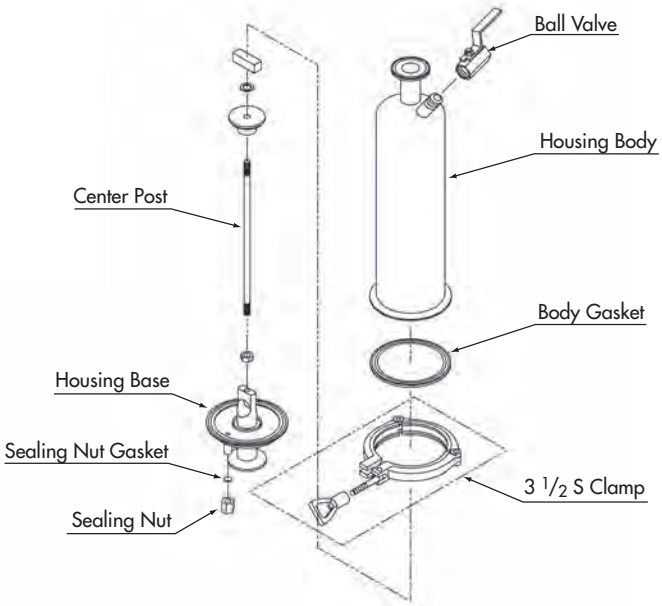
Model		1TVA-1S-FS	1TVA-2S-FS	1TVA-3S-FS
Cartridge Capacity		250 mm x 1	500 mm x 1	750 mm x 1
Cartridge Compatibility		End fixture codes: C and F*		
Inlet/Outlet		1S ferrule		
Dimensions (mm)	Height	408	658	908
	Diameter	200		
Max. Operation Pressure		0.49 MPa (71 psi)		
Composition		Gasket: Silicon, PTFE Ball Valve: SUS316 Body, Base, Clamp: SUS304		
Weight (kg)		3.5	5.0	6.5

Note: Ball valve cannot be sterilized by autoclave.
Use thread-sealing tape on tapered inlet and outlet.

* Please contact us for information on sanitary housings compatible with other filter cartridge end fixture codes.

Ordering Information

Model	1TVA-1S-FS	1TVA-2S-FS	1TVA-3S-FS
Catalog No.	26980101	26980102	26980103



Sanitary Stainless Steel Cartridge Housing – 1TWA Type

- Sanitary stainless steel housing for a single cartridge filter, with sanitary ferrule type inlet, outlet, and seal for easy inspection and cleaning
- 4S-clamp wraps around body and base sections; 3½S-nut seals the top plate and body
- Designed for use with end fixture codes* C and F
- Inlet/outlet base of 1TWA Type allows unit be placed on short, straight sections of piping

1TWA-1S-FS

SPECIFICATIONS

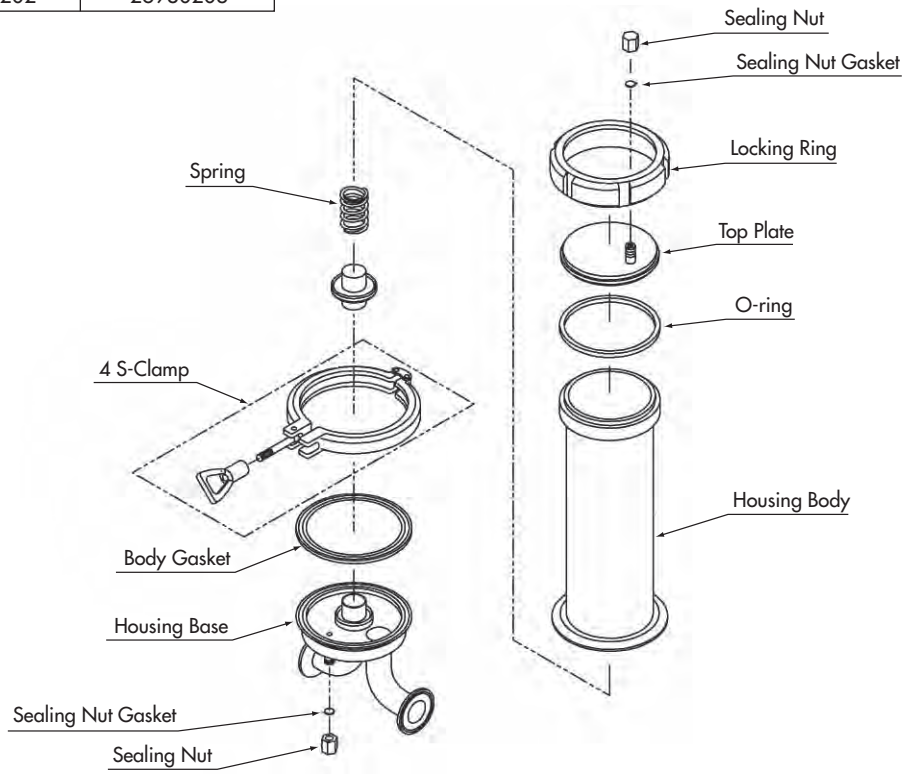
Model		1TWA-1S-FS	1TWA-2S-FS	1TWA-3S-FS
Cartridge Capacity		250 mm x 1	500 mm x 1	750 mm x 1
Cartridge Compatibility		End fixture codes: C and F*		
Inlet/Outlet		1S ferrule		
Dimensions (mm)	Height	412	667	917
	Diameter	183		
Max. Operation Pressure		0.49 MPa (71 psi)		
Composition		Gasket: Silicon Top Plate, Body, Base, Clamp: SUS304		
Weight (kg)		5.4	6.9	9.2

Note: Ball valve cannot be sterilized by autoclave.
Use thread-sealing tape on tapered inlet and outlet.

* Please contact us for information on sanitary housings compatible with other filter cartridge end fixture codes.

ORDERING INFORMATION

Model	1TWA-1S-FS	1TWA-2S-FS	1TWA-3S-FS
Catalog No.	26980201	26980202	26980203



Polypropylene Cartridge Housing – 1PP Type

- Polypropylene housing for a single cartridge filter, with 3/4" PTF (PT nipple) type inlet and outlet; high quality and economical
- Suitable for sanitary applications, such as pharmaceutical or high purity water filtration; smooth inner walls of housing deter adhesion and accumulation of microbes and minute particles
- Designed for use with end fixture codes* C and F
- Several accessories for mounting the unit are available
- Unit head available with push-button vent

1PP-1, 1PP-2

SPECIFICATIONS

Model		1PP-1-FS	1PP-2-FS
Cartridge Capacity		250 mm x 1	500 mm x 1
Cartridge Compatibility		End fixture codes: C and F*	
Inlet/Outlet		3/4" PTF (PT nipple)	
Dimensions (mm)	Height	340	594
	Diameter	126	
Max. Operation Temperature		60°C	
Max. Operation Pressure		0.49 MPa (71 psi) @ 25°C, 0.19 MPa (28 psi) @ 60°C	
Composition		Head, Body, Adapter, Drain Cap, Nipple: Polypropylene O-ring: Silicone, FPM, Ethylene-propylene Vent, Adapter Spring: SUS304	
Weight (kg)		0.84	1.3

Note: 1PA Type units are made for liquid filtration only and are not suitable for air filtration.
1PA Type units cannot be sterilized by autoclave.
Use thread-sealing tape on tapered inlet and outlet.

* Please contact us for information on polypropylene housings compatible with other filter cartridge end fixture codes.

ORDERING INFORMATION

Model	1PP-1-FS	1PP-2-FS
Catalog No.	43011000	43021000

OPTIONAL ACCESSORIES

		Catalog No.
Housing Stand (SUS304)	1PP-1K (for 1PP-1)	44801010
	1PP-2K (for 1PP-2)	44801020
Mounting Kit (SUS304)		44801030
Tightening Tools (PVC)	1PP-H (for head)	44801040
	1PP-B (for body)	44801050

Customize the unit with:

- Silicone, FPM, or Ethylene-propylene O-rings
- Inlet/outlet pressure gauges
- SUS304, PE-coated SUS304, or titanium adapter springs
- Housing available with SUS304 push-button vent or polypropylene vent (with O-ring seal).

Contact us for more information on these options.

Acrylic Cartridge Housing – 1PA Type

- Acrylic housing for a single cartridge filter, with 3/4" PF type inlet and outlet; high quality and economical
- Transparent housing permits observation of filtration process
- Lightweight yet strong construction; can be assembled by hand
- Designed for use with end fixture codes C and F

1PA

SPECIFICATIONS

Model		1PA
Cartridge Capacity		250 mm x 1
Cartridge Compatibility		End fixture codes: C and F
Inlet/Outlet		3/4" PF (3/4"PFM x 3/4" PTM changeable)
Dimensions (mm)	Height	345
	Diameter	170
Max. Operation Temperature		38°C
Max. Operation Pressure		0.5 MPa (73 psi) @ 38°C
Composition		Head: Polypropylene Body: Acrylonitrile Styrene Resin (acrylic) Body O-ring: Silicone Connector O-ring:NBR
Weight (kg)		1.0

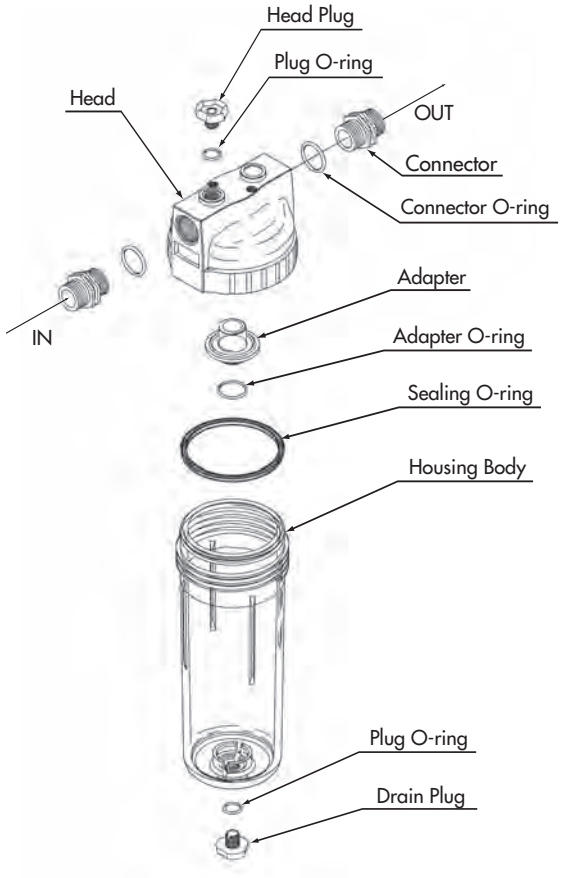
Note: - 1PA Type units are made for aqueous filtration only and are not suitable for air or organic solvent filtration.
- 1PA Type units cannot be sterilized by autoclave.
- Units include hand-tightening tool as standard accessory.
- Use thread-sealing tape on tapered inlet and outlet.

ORDERING INFORMATION

Model	1PA
Catalog No.	26807000

OPTIONAL ACCESSORIES

Model	ø15mm Hose Adapter	L-shape Mounting Kit	Housing Stand
Composition	Polypropylene	SUS304	SUS304
Catalog No.	28801011	28801022	28801012



Vacuum Filtration

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Introduction

Vacuum filtration is used primarily in microbiological and analytical procedures that involve collecting a particulate (bacteria, precipitate, etc.) from a liquid suspension. Liquid poured into a funnel passes through a filter, which retains the particulate, and filtrate can be collected into a filter flask, directly or via a vacuum manifold. Applying vacuum reduces process time compared to gravity flow.

Advantec supplies a wide range of vacuum filter holders and accessories. Select from glass, polysulfone, or stainless steel assemblies with funnels holding from 15 to 1000 mL. See facing page for more details on supports.

Typical Applications	DNA/RNA hybridization, protein binding, receptor binding studies and gravimetric analysis		Coliform, yeast, mold, total bacteria, sterility testing	Colony hybridization, procedures requiring larger filtration area
Recommended Models				
Glass with glass frit	KG 13	KG 25	KG 47	KG 90
Glass with stainless steel support	-	KGS 25	KGS 47	KGS 90
Glass with PTFE support	-	-	KGT 47	-
Glass with all-PTFE seal	-	-	KGT 47 TF	-
All-glass assembly	-	GFA 25 GFS 25	GFA 47 GFS 47 GFT 47	-
Phase/Fraction collector	-	-	P/FC 1 P/FC 2	-
Polysulfone	-	-	KP 47	-
Stainless steel	-	-	KSF 47	-
Filter Specifications				
Membrane diameter	25 mm	25 mm	47 mm	90 mm
Filtration area	1.2 cm^2	2.1 cm^2	9.6 cm^2 *	43.2 cm^2

* See individual models for exceptions.

Glass Microfiltration: Support Systems

Sintered Glass Support (Glass Frit)

- Glass frit (nominal retention 30-50 microns)
- Recommended when filtering highly acidic (low pH) solutions or when slower flow rates are preferred to maximize contact with the filter or reagent
- Ground glass seal

Diameter	Funnel Size						
	13/100 mL	15 mL	100 mL	150 mL	300 mL	500 mL	1000 mL
13 mm	311100	-	311000	-	-	311050	311110
25 mm	-	311200	-	311280	311290	-	-
47 mm	-	-	311480	-	311400	311490	314110
90 mm	-	-	-	-	-	-	352100

Stainless Steel Support

- Stainless steel screen (Type 316, 100 mesh)
- PTFE gasket
- Maximize flow rate with proteinaceous or viscous solutions
- Will not shed particles into the filtrate
- Ground glass seal

Diameter	Funnel Size					
	15 mL	100 mL	150 mL	300 mL	500 mL	1000 mL
25 mm	311300	-	311380	311390	-	-
47 mm	-	311580	-	311500	311590	315110
90 mm	-	-	-	-	-	352200

PTFE Support

- PTFE support (0.05 inch / 1.3 mm diameter holes)
- Filter acidic solutions at a higher flow rate
- PTFE support is interchangeable with stainless steel support
- Ground glass seal

Diameter	Funnel Size			
	100 mL	300 mL	500 mL	1000 mL
47 mm	311680	311540	311690	316110

Glass frit, stainless steel support, PTFE support

All-PTFE Seal

- All-PTFE seal prevents sticking and tearing that can occur when membrane is autoclaved in place in a ground glass assembly
- PTFE flange seals to PTFE coated funnel

Diameter	Support	Funnel, 300 mL
47 mm	PTFE	351620
	Stainless Steel	351600

All PTFE seal

Glass Microfiltration: Support Systems

Sintered Glass Support (Glass Frit)

- Glass frit (nominal retention 30-50 microns)
- Recommended when filtering highly acidic (low pH) solutions or when slower flow rates are preferred to maximize contact with the filter or reagent
- Ground glass seal

Diameter	Funnel Size						
	13/100 mL	15 mL	100 mL	150 mL	300 mL	500 mL	1000 mL
13 mm	311100	-	311000	-	-	311050	311110
25 mm	-	311200	-	311280	311290	-	-
47 mm	-	-	311480	-	311400	311490	314110
90 mm	-	-	-	-	-	-	352100

Stainless Steel Support

- Stainless steel screen (Type 316, 100 mesh)
- PTFE gasket
- Maximize flow rate with proteinaceous or viscous solutions
- Will not shed particles into the filtrate
- Ground glass seal

Diameter	Funnel Size					
	15 mL	100 mL	150 mL	300 mL	500 mL	1000 mL
25 mm	311300	-	311380	311390	-	-
47 mm	-	311580	-	311500	311590	315110
90 mm	-	-	-	-	-	352200

PTFE Support

- PTFE support (0.05 inch / 1.3 mm diameter holes)
- Filter acidic solutions at a higher flow rate
- PTFE support is interchangeable with stainless steel support
- Ground glass seal

Diameter	Funnel Size			
	100 mL	300 mL	500 mL	1000 mL
47 mm	311680	311540	311690	316110

Glass frit, stainless steel support, PTFE support

All-PTFE Seal

- All-PTFE seal prevents sticking and tearing that can occur when membrane is autoclaved in place in a ground glass assembly
- PTFE flange seals to PTFE coated funnel

Diameter	Support	Funnel, 300 mL
47 mm	PTFE	351620
	Stainless Steel	351600

All PTFE seal

13 mm Glass Microanalysis Holders

- **Filter small volumes** of liquid
- **Concentrate samples** in a small area (1.2 cm^2)
- **KG 13 AA features a two-part funnel** (13 mL/100 mL) connected by a ground glass joint
- KG 13 available in three different funnel sizes

KG 13 A (311000)

KG 13 AA (311100)

SPECIFICATIONS

Materials:	
Support	Sintered glass
Funnel, base	Borosilicate glass
Stopper	Silicone rubber
Clamp	Anodized aluminum
Connection:	
Included	#5 stopper adapts to standard 125 mL vacuum filter flask
Optional	#8b stopper adapts to 1 L flask or standard manifold
Pressure:	Vacuum
Weight:	0.37 kg (0.88 lb)
Membrane Filter Compatibility:	
Filter size	25 mm
Prefilter size	Not Recommended
Filtration area	1.2 cm^2

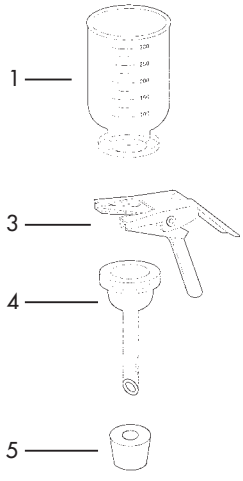
500 mL and 1 L funnels for 13 mm holders are available in complete assemblies or as accessory parts.

ORDERING INFORMATION

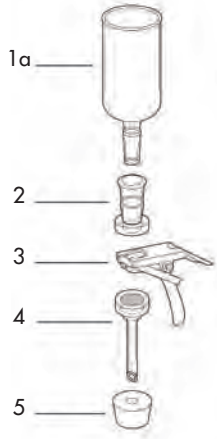
Funnel capacity	100 mL	500 mL	1000 mL	13/100 mL
Model	**KG 13 A**	**KG 13 B**	**KG 13 C**	**KG 13 AA**
Catalog No.	311000	311050	311110	311100

Replacement Parts

1	Funnel, 100 mL	311001
1	Funnel, 500 mL	311005
1	Funnel, 1000 mL	311010
1a	Funnel, 100 mL with 14/20 Male	311101
2	Microfunnel (13/100 mL)	311105
3	Clamp	311003
4	Base (glass frit)	311002
5	Stopper, #5	311004
5	Stopper, #8B	311008



KG 13 _



KG 13 AA
(311100)

25 mm Glass Microanalysis Holders

- **Use for filtering small volumes** for biological or particulate contamination
- Available with sintered glass or stainless steel support
- **Use stainless steel screen** when producing ultraclean filtrate or when filtering proteinaceous solutions

150 mL and 300 mL funnels for 25 mm holders are available in complete assemblies or as accessory parts.

SPECIFICATIONS

	KG 25	KGS 25
Materials:		
Support	Sintered glass	Stainless steel screen
Funnel, base	Borosilicate glass	
Stopper	Silicone rubber	
Clamp	Anodized aluminum	
Connection:		
Included	#5 stopper adapts to standard 125 mL vacuum filter flask	
Optional	#8b stopper adapts to 1 L flask or standard manifold	
Pressure:	Vacuum	
Weight:	0.19 kg (0.45 lb)	
Membrane Filter Compatibility:		
Filter size	25 mm	
Prefilter size	16 mm	
Filtration area	2.1 cm^2	

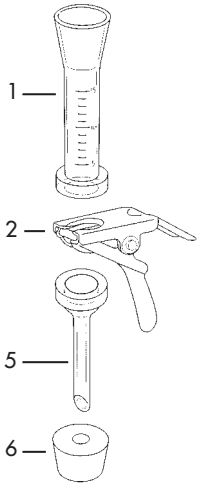
KG 25 (311200)

ORDERING INFORMATION

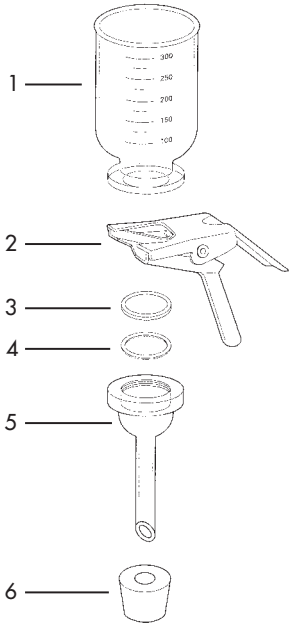
Funnel capacity		15 mL	150 mL	300 mL
Glass frit support	**Model**	**KG 25**	**KG 25 A**	**KG 25 B**
	Catalog No.	311200	311280	311290
Stainless steel support	**Model**	**KGS 25**	**KGS 25 A**	**KGS 25 B**
	Catalog No.	311300	311380	311390

Replacement Parts

		KG 25	KGS 25
1	Funnel, 15 mL	311201	
1	Funnel, 150 mL	311208	
1	Funnel, 300 mL	311209	
2	Clamp	311003	
3	Screen (stainless steel)	-	311304
4	Gasket (PTFE)	-	311305
5	Base	311202	311302
6	Stopper, #5	311004	
6	Stopper, #8b	311008	



KG 25
(311200)



KGS 25
(311390)

47 mm Glass Microanalysis Holders

- **Standard size** for microbiology and particulate analysis
- Filter up to 1000 mL
- Available with sintered glass, stainless steel, or PTFE support

47mm Glass Microanalysis Holder

SPECIFICATIONS

	KG 47	KGS 47	KGT 47
Materials:			
Support	Sintered glass	Stainless steel screen	PTFE
Funnel, base	Borosilicate glass		
Stopper	Silicone rubber		
Clamp	Anodized aluminum		
Connections (included):	#8 stopper adapts to standard 1 L vacuum filter flask or vacuum manifold cup		
Pressure:	Vacuum		
Weight:	0.6 kg (1.2 lb)		
Membrane Filter Compatibility:			
Filter size	47 mm		
Prefilter size	35 mm		
Filtration area	9.6 cm^2		

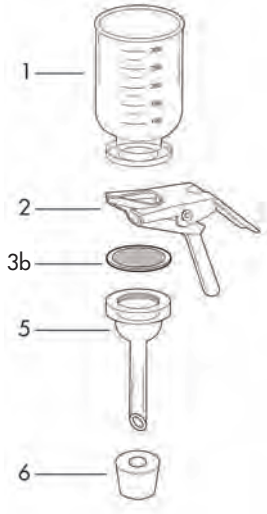
ORDERING INFORMATION

		Funnel Capacity			
		100 mL	300 mL	500 mL	1000 mL
Support Type	**Model**	**A**	**-**	**B**	**C**
Glass Frit Support	**KG 47**	311480	311400	311490	314110
Stainless Steel Support	**KGS 47**	311580	311500	311590	315110
PTFE Support	**KGT 47**	311680	311540	311690	316110

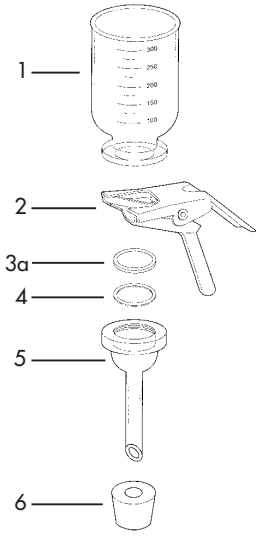
Replacement Parts

		KG 47	KGS 47	KGT 47
1	Funnel, 100 mL	311408		
1	Funnel, 300 mL	311401		
1	Funnel, 500 mL	311409		
1	Funnel, 1000 mL	311410		
2	Clamp	311403		
3a	Screen (stainless steel)	-	311504	-
3b	PTFE support	-	-	311604
4	Gasket (PTFE)	-	311505	-
5	Base	311402	311502	
6	Stopper, #8	311404		
-	Optional extension (2")	311450		

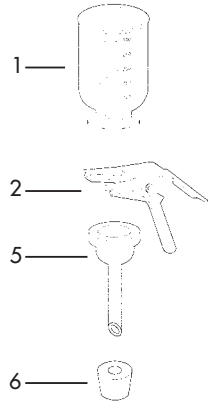
311450
The 2 inch extension provides physical separation of the two filters that set up in series.



KGT 47
(311540)



KGS 47
(311500)



KG 47
(311400)

47 mm Glass Microanalysis Holders – With All-PTFE Seal

- **Filter sealed between PTFE surfaces:**
  - Bottom of funnel is coated with PTFE
  - PTFE flange covers contact surface on glass base (except for glass frit base)

All PTFE seal

SPECIFICATIONS

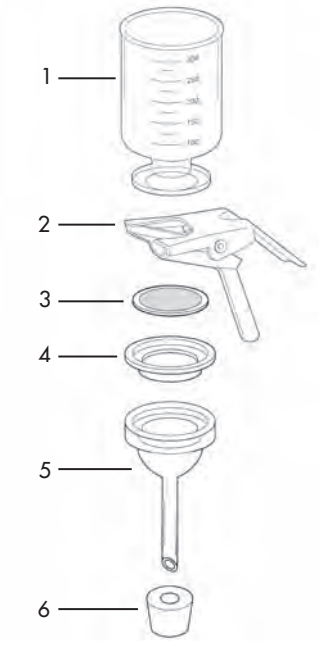
As for corresponding basic model (Page 82) with the addition of PTFE coating on bottom of funnel and PTFE flange for KGS 47 TF and KGT 47 TF.

ORDERING INFORMATION

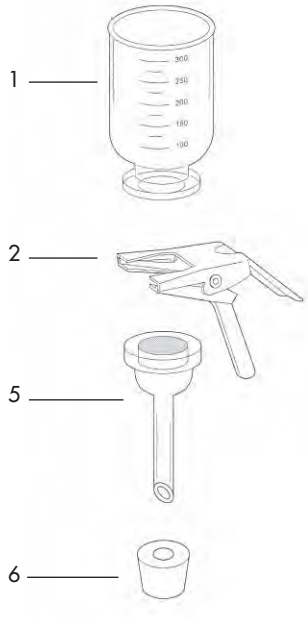
Funnel capacity		300 mL
Glass frit support	**Model**	**KG 47 TF**
	Catalog No.	311600
Stainless steel support	**Model**	**KGS 47 TF**
	Catalog No.	351600
PTFE support	**Model**	**KGT 47 TF**
	Catalog No.	351620

Replacement Parts

		KG 47 TF	KGS 47 TF	KGT 47T F
1	Funnel coated with PTFE, 300 mL	351601		
2	Clamp	311403		
3	Screen (stainless steel)	-	311504	-
3	PTFE support	-	-	311604
4	Flange (PTFE)	-	351603	351603
5	Base	311402	311602	
6	Stopper, #8	311404		



KGS 47 TF (351600)
KGT 47 TF (351620)



KG 47 TF
(311600)

47 mm Glass Microanalysis Holder – Sterility Test Unit

- **Complete filter assembly for sterility testing** of antibiotics and pharmaceuticals
- **Use with the sterility test manifold** (Page 94)

SPECIFICATIONS

As for corresponding basic model (Page 82) with additional components as listed below.

ORDERING INFORMATION

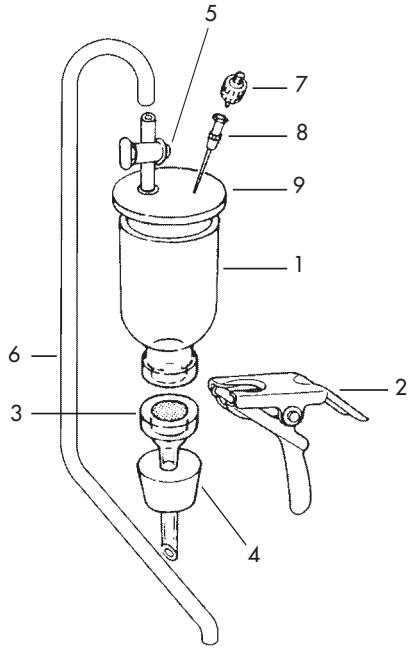
Funnel capacity	300 mL
Model	**STU 1A**
Catalog No.	314100

Replacement Parts

1	Funnel, 300 mL	311401
2	Clamp	311403
3	Base (glass frit)	311402
4	#8 Stopper	311404
5	Stopcock	313902
6	Silicone tubing 53 cm (21") 1/4"ID, 3/8"OD	313903
7	KS 13 filter holder*	301000
8	Injector needle	313901
9	Silicone cover	313904

*13 mm Hydrophobic PTFE membrane filter is recommended (Page 11).

Sterility test unit



STU 1A
(314100)

90 mm Glass Microanalysis Holders

- **Larger filtration** area for filtering larger volumes (>500 ml)
- **Use for viscous samples** or those with a heavy particle or bioburden that would clog a 47 mm filter
- **Available with sintered glass or stainless steel support**

KG 90 (352100)

SPECIFICATIONS

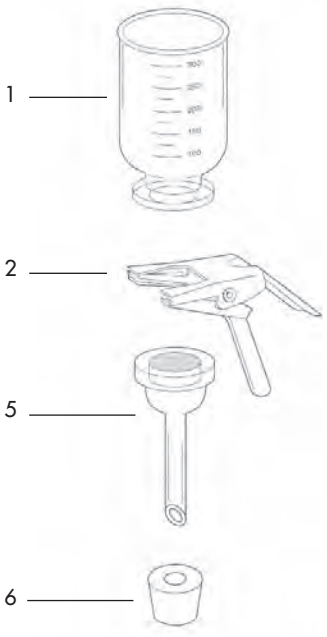
	KG 90	KGS 90
Materials:		
Support	Sintered glass	Stainless steel screen
Funnel, base	Borosilicate glass	
Stopper	Silicone rubber	
Clamp	Anodized aluminum	
Connection (Included):	#8 stopper adapts to standard 1 L vacuum filter flask or vacuum manifold cup	
Pressure:	Vacuum	
Weight:	1.2 kg (2.82 lb)	
Membrane Filter Compatibility:		
Filter size	90 mm	
Prefilter size	70 mm	
Filtration area	43 cm^2	

ORDERING INFORMATION

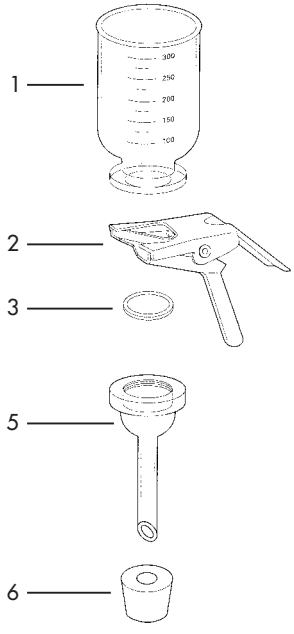
Funnel capacity		1000 mL graduated (1100 mL max.)
Glass frit support	**KG 90**	352100
Stainless steel support	**KGS 90**	352200

Replacement Parts

		KG 90	KGS 90
1	Funnel, 1000 mL	352101	
2	Clamp	352103	
3	Screen (stainless steel)	-	352204
5	Base	352102	352202
6	#8 Stopper	311404	



KG 90
(352100)



KGS 90
(352200)

Filter Flasks and Stoppers

- Borosilicate filter flasks and silicone rubber stoppers are compatible with Advantec filter holders
- Use flasks to collect filtrate or to act as a trap to prevent liquid from damaging pump or vacuum line
- #5 and #8b stoppers adapt 13 mm, 25 mm and KP 47 filter holders to 125 mL (#5) and 1 L (#8b) flasks
- #8 stopper adapts 47 mm (except KP 47) and 90 mm filter holders to the 1 L flask
- Side arm connection 3/8"
- Flasks with ground glass joint fit holders with female joint (GFA, P/FC 2)

Flasks and stoppers compatible with Advantec filter holders

Borosilicate Glass Filter Flasks

Volume	Opening	Catalog No.
125 mL	Fits #5 stopper	311230
1 L	Fits #8 stopper	311430
250 mL	19/22 male joint (ground glass)	311225
1 L	40/35 male joint (ground glass)	311425
2 L	40/35 male joint (ground glass)	311426

Silicone Rubber Stoppers

Size	Catalog No.
#5	311004
#8b	311008
#8	311404

All-Glass Filtration Assemblies

- **All-glass design** restricts contact with reactive surfaces such as steel or rubber to minimize contamination of sample or filtrate
- **Standard 25 and 47 mm filtration funnels** mount on filtration flask using a ground glass joint
- Outlet of support base drip tube is positioned below the side arm connection to prevent sample aspiration into vacuum line
- **All wetted surfaces are borosilicate glass** with the exception of stainless steel and PTFE support options

GFA 25 (311220)

SPECIFICATIONS

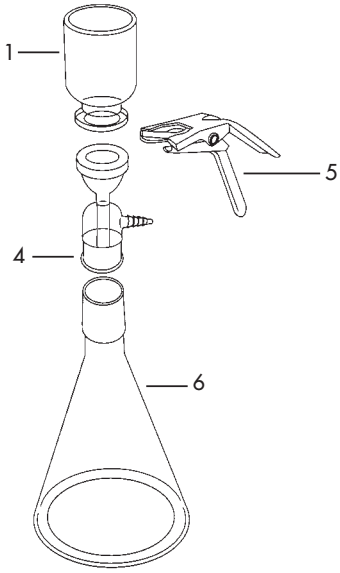
	25 mm Holder	47 mm Holder
Materials:		
Funnel, base unit and flask	Borosilicate glass	
Support	Sintered glass, stainless steel screen, or PTFE	
Connections:		
Ground glass joint	14/20 female	40/35 female
Side arm	6 mm ($^{19}/_{22}$ inch)	6 mm ($^{3}/_{8}$ inch)
Capacity:		
Funnel	15 mL	300 mL
Receiver flask	250 mL	1 L
Membrane filter size	25 mm	47 mm
Prefilter size (if used with membrane)	16 mm	35 mm
Filtration area	2.1 cm^2	9.6 cm^2

ORDERING INFORMATION

	25 mm Holder		47 mm Holder	
Support type:	**Model**	Catalog No.	**Model**	Catalog No.
Glass frit	**GFA 25**	311220	**GFA 47**	311420
Stainless steel	**GFS 25**	311320	**GFS 47**	311520
PTFE	-	-	**GFT 47**	311620

Replacement Parts

		25 mm Holder		47 mm Holder		
Model		**GFA 25**	**GFS 25**	**GFA 47**	**GFS 47**	**GFT 47**
Catalog No.		311220	311320	311420	311520	311620
1	Funnel	311201		311401		
-	Support	-	311304	-	311504	311604
-	PTFE Gasket	-	311305	-	311505	-
4	Support base	311222	311322	311422	311522	
5	Clamp	311003		311403		
6	Receiver flask	311225		311425		



GFA

Optional Accessories

	25 mm Holder	47 mm Holder
Funnel, 100 mL	-	311408
Funnel, 150 mL	311208	-
Funnel, 300 mL	311209	-
Funnel, 500 mL beveled	-	311409
Funnel, 1 L graduated	-	311410
Receiver flask, 2 L	-	311426

Phase/Fraction Collectors

- **Collect aliquots of filtrate** during the filtration process using the 2-way Y bore PTFE valve
- **Prevents venting** of hazardous sample or solvents to atmosphere
- **Collect multiple samples** with additional receiver sample tubes
- **Two mounting options:** P/FC 1 mounts on standard manifold or 1 L flask using a #8 stopper, P/FC 2 has female 40/35 joint to mount on an extraction manifold (Page 93) or 1 L flask
- Available with sintered glass, stainless steel, or PTFE support

P/FC 2 (311800)

SPECIFICATIONS

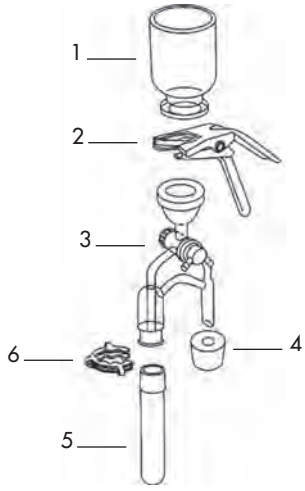
	P/FC 1	P/FC 2
Materials:		
Funnel, base unit, and receiver tube	Borosilicate glass	
Support	Sintered glass, stainless steel screen, or PTFE	
Connections:		
Base to outlet	#8 Stopper	40/35 ground glass joint
Alternate outlet to receiver tube	Ground glass joint	
Capacity:		
Funnel	300 mL	
Membrane Filter Compatibility:		
Membrane filter size	47 mm	
Prefilter size	35 mm	
Filtration area	9.6 cm^2	

ORDERING INFORMATION

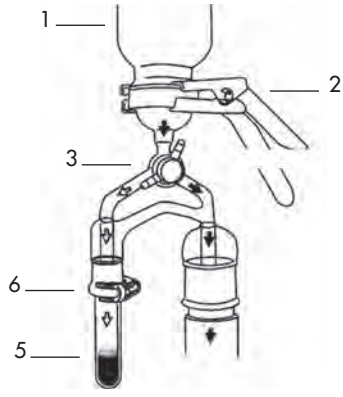
Model	P/FC 1	P/FC 2
Outlet type	#8 Stopper	40/35 glass joint
Glass frit support	311700	311800
Stainless steel support	311750	311850
PTFE support	311760	311860

Replacement Parts

Model		P/FC 1	P/FC 2
Outlet type		#8 Stopper	40/35 glass joint
1	Funnel	311401	
2	Clamp	311403	
3	Base assembly – glass frit	311702	311802
3	Base assembly – SS or PTFE support	311752	311852
-	Support – stainless steel screen	311504	
-	Support – PTFE	311604	
-	PTFE gasket (for stainless support)	311505	
4	#8 Stopper	311404	-
5	Receiver tube	311705	
6	Clip	311706	



P/FC 1



P/FC 2

Stainless Steel Filter Holders – KSF 47

- **Nonbreakable stainless steel unit** may be flame sterilized to sanitize the holder between samplings
- **Set pins and a locking nut** on the funnel to help prevent twisting and tearing of the membrane
- **Autoclavable** with membrane in place

KSF 47 (352600)

SPECIFICATIONS

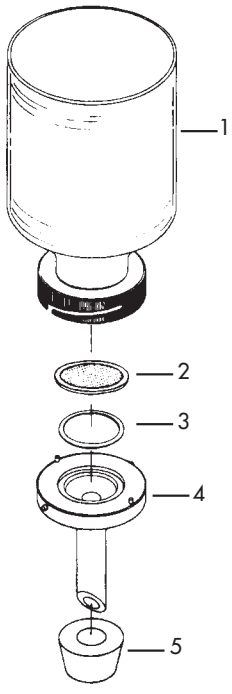
	KSF 47
Materials:	
Support	Type 304 stainless steel screen
Funnel, base	Type 304 stainless steel
Stopper	Silicone rubber
Gasket	PTFE
Connections (included)**:**	#8 stopper adapts to standard 1 L vacuum filter flask or vacuum manifold cup
Capacity:	
Funnel	500 mL
Pressure:	Vacuum (21 in Hg recommended)
Weight:	0.5 kg (1.17 lb)
Membrane Filter Compatibility:	
Filter size	47 mm
Prefilter size	35 mm
Filtration area	9.3 cm^2

ORDERING INFORMATION

Model	KSF 47
Catalog No.	352600

Replacement Parts

		KSF 47
1	Funnel	352601
2	SS support screen	311504
3	PTFE gasket	311505
4	Base	312602
5	#8 Stopper	311404



KSF 47
(352600)

Polysulfone Filter Holders

- **Can be used aseptically**
- **Recessed filter support** provides sufficient clearance so that the membrane will not twist or tear when the funnel is secured
- **Graduated funnel** in 300 mL (standard) or 500 mL (wide mouth) capacities
- **Receiver flask** (KP 47 S) is interchangeable with all other models
- **Funnel cover** can be vented aseptically using disposable syringe filter (13JP050AN, see page 15)

KP 47 H
(501020)

KP 47 U
(501030)

KP 47 W
(501050)

KP 47 S
(501000)

SPECIFICATIONS

	KP 47 H	KP 47 U	KP 47 W	KP 47 S
Materials:				
Support	Polypropylene			
Funnel and base	Polysulfone			
Receiver flask	-	-	-	Polysulfone
Stopper, O-rings	Silicone rubber			
Caps	-	Silicone rubber	-	Silicone rubber
Vacuum adapter	-	-	-	Polypropylene
Connection:				
Outlet	#8b stopper adapts to standard 1 L vacuum filter flask or vacuum manifold cup; KP 47 S screws onto receiver flask			
Receiving flask port	-	-	-	Luer slip
Funnel cover port	-	Luer slip	-	Luer slip
Capacity:				
Funnel	300 mL	300 mL	500 mL	300 mL
Receiver	-	-	-	300 mL
Pressure:	Vacuum (25 in Hg maximum)			
Weight:	0.15 Kg (0.33 lb.)	0.16 Kg (0.36 lb.)	0.15 Kg (0.33 lb.)	0.26 Kg (0.58 lb.)
Membrane Filter Compatibility:				
Filter size	47 mm			
Prefilter size	41 mm			
Filtration area	13.5 cm^2			

ORDERING INFORMATION

Model	Description	Main Components	Catalog No.
KP 47 H	Polysulfone Filter Holder	Funnel, base	501020
KP 47 U	Polysulfone Aseptic Filter Unit	Funnel, base, cover	501030
KP 47 W	Wide Mouth Polysulfone Filter Holder	Funnel, base	501050
KP 47 S	Polysulfone Aseptic Filter System	Funnel, base, cover, receiver	501000

Replacement Parts – Funnel assembly

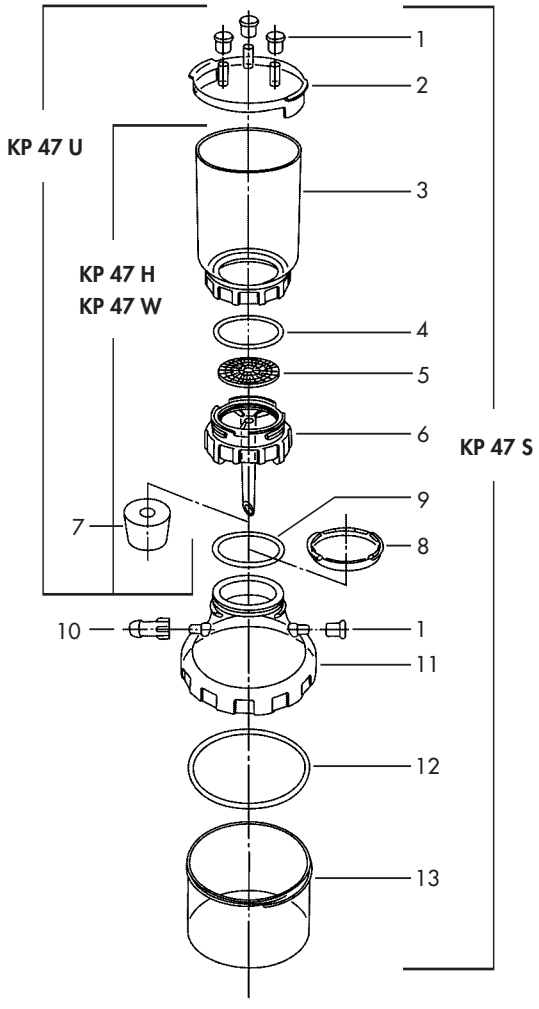
Model		KP 47 H	KP 47 U	KP 47 W	KP 47 S
	Catalog No.	501020	501030	501050	501000
1	Gum rubber cap (1)	-	501010	-	501010
2	Funnel cover	-	501001	-	501001
3	Funnel	501002		501102	501002
4	Funnel O-ring	501008			
5	Filter support	501004			
6	Base	501003			
7	#8b Stopper	311008			
-	Cap and filter kit: 5 caps (501010) and 1 filter (13JP050AN)	KP47KIT	-	KP47KIT	-

Replacement Parts – Receiver flask

Model		KP 47 S
8	Receiver cover	501005
9	Receiver adapter O-ring	501009
10	Vacuum adapter	501013
11	Receiver adapter	501007
12	Receiver O-ring	501015
13	Receiver flask	501006

Optional Accessories

4	Funnel O-ring, FPM	501011
9	Receiver adapter O-ring, FPM	501012
12	Receiver O-ring, FPM	501016



PVC Vacuum Manifold – Standard Cup

- **Lightweight**
- **Resistant to acids**
- **Standard cup** accepts a #8 and #8b stopper to adapt microanalysis units and other devices
- **2-way** valve with PTFE stopcock in PVC body
- Not autoclavable

KMP 6 (313600)
KMP 3 (313400)

SPECIFICATIONS

Materials:	
Body and branches	Polyvinylchloride (PVC)
Valves	PTFE stopcock, PVC body
Connections:	
Outlet	1/4" male NPT to hose barb fitting connects main manifold to 3/8" i.d. vacuum tubing
Standard cup	Accepts #8 and #8b stopper
Temperature:	
Maximum	60°C (140°F)

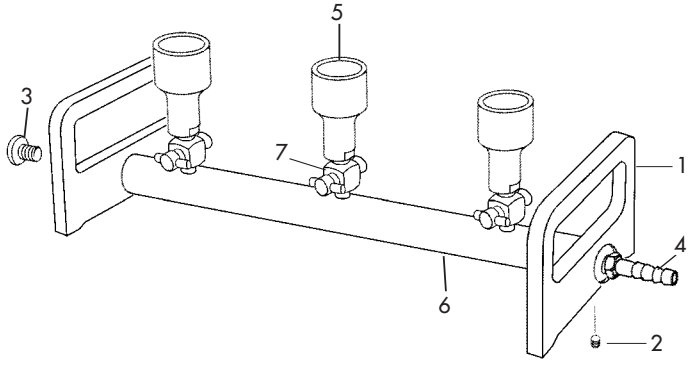
Dimensions:	L x W x H		Distance between stations (center to center)		Weight	
	in	cm	in	cm	lb	kg
3 station	17 3/4 x 4 3/4 x 7	45.1 x 12 x 17.8	5 1/2	14	3.3	1.5
6 station	34 1/2 x 4 3/4 x 7	87.6 x 12 x 17.8	4 3/4	12	5.5	2.5

ORDERING INFORMATION

		Standard cup
3 station	**KMP 3**	313400
6 station	**KMP 6**	313600

Replacement Parts

1	Handle	313401
2	Handle set screw	313015
3	Pipe plug	313412
4	PVC Hose barb	373411
5	Branch (Standard cup)	313410
6	Main manifold:	
	3 station	313403
	6 station	313603
7	Stopcock assembly, 2-way	313430



KMP 3
(313400)

PVC Extraction Manifold – Exterior Taper

- **Exterior taper** accepts a 40/35 female joint
- **3-way valve** with luer slip vent port accepts disposable syringe filters (see page 15)
- **Lightweight and resistant to acids**
- **Broad base** for extra stability
- **Ideal for EPA Method 1664** oil and grease analysis
- Not autoclavable, can be sanitized with ethanol or formaldehyde

KMX 3 (373330)

SPECIFICATIONS

Materials:	
Body and branches	Polyvinylchloride (PVC)
Valves	PTFE stopcock, PVC body
Connections:	
Outlet	1/4" male NPT to hose barb fitting connects main manifold to 3/8" ID vacuum tubing
Exterior taper	40/35 male joint
Temperature:	
Maximum	60°C (140°F)

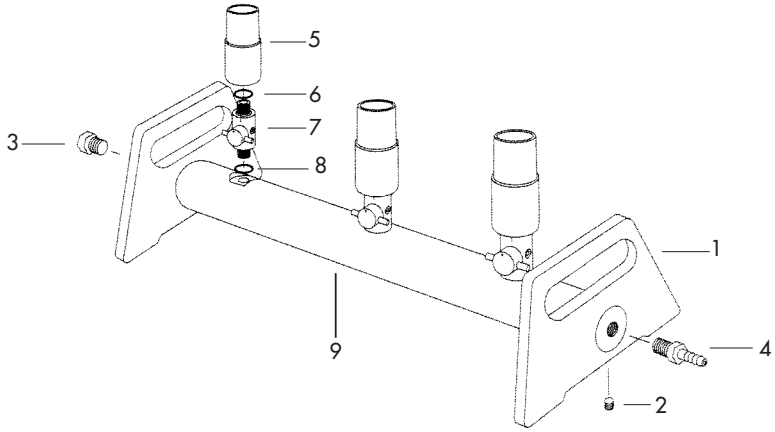
Dimensions:	L x W x H		Distance between stations (center to center)		Weight	
	in	cm	in	cm	lb	kg
Single	10 x 6 5/8 x 8	25.4 x 16.8 x 20.3	-	-	4	1.8
3 station	21 1/2 x 6 5/8 x 8	54.6 x 16.8 x 20.3	6 1/2	16.5	6	2.7

ORDERING INFORMATION

		Exterior Taper
Single	**KMX 1**	373130
3 station	**KMX 3**	373330

Replacement Parts

1	Handle	373401
2	Socket cap screw	373015
3	Pipe plug	373412
4	PVC Hose barb	373411
5	Branch (Male taper)	713010
6	Branch O-ring (EPR)	373017
7	Stopcock assembly, 3-way	373430
8	Branch Gasket (Buna)	373018
9	Main manifold:	
	1 station	373103
	3 station	373303



KMX 3
(373330)

Stainless Steel Vacuum Manifolds

- **Autoclavable**
- **2-way or 3-way valve available**, use a 3-way valve when the manifold is used under closed conditions and must be vented to atmosphere without breaking the vacuum connection. 3-way valve vent is female luer slip, accepts standard disposable syringe filter (Page 15) or stainless steel syringe filter holder (KS 13, page 99)
- **Standard cup** accepts a #8 stopper to adapt microanalysis units and other devices
- **Exterior taper** accepts a 40/35 female joint
- **Sterility Test Manifold** features rear mounted flushing manifold for use in USP bacteria retentive method

Vacuum Filter Manifold Family

SPECIFICATIONS

Materials:	
Body and branches	Type 304 stainless steel
Valves	PTFE stopcock, chrome plated brass body
Connections:	
Outlet	1/4" male NPT to hose barb fitting connects main manifold to 3/8" ID vacuum tubing
Standard cup	Accepts #8 and #8b stopper
Exterior taper	40/35 male joint

Exterior taper for a 40/35 glass joint. 3-way valve.

Standard Cup

Dimensions:	L x W x H		Distance between stations (center to center)		Weight	
	in	cm	in	cm	lb	kg
Single	8 x 4 3/4 x 7	20.3 x 12 x 17.8	-	-	5.5	2.5
3 station	18 x 4 3/4 x 7	45.7 x 12 x 17.8	5 1/2	14	9.9	4.5
6 station	28 1/2 x 4 3/4 x 7	72.4 x 12 x 17.8	4 3/4	12	14.3	6.5

Exterior Taper

Dimensions:	L x W x H		Distance between stations (center to center)		Weight	
	in	cm	in	cm	lb	kg
Single	8 x 4 3/4 x 8	20.3 x 12 x 20.3	-	-	5.5	2.5
3 station	18 x 4 3/4 x 8	45.7 x 12 x 20.3	5 1/2	14	10.4	4.7
6 station	28 1/2 x 4 3/4 x 8	72.4 x 12 x 20.3	4 3/4	12	16.9	7.7

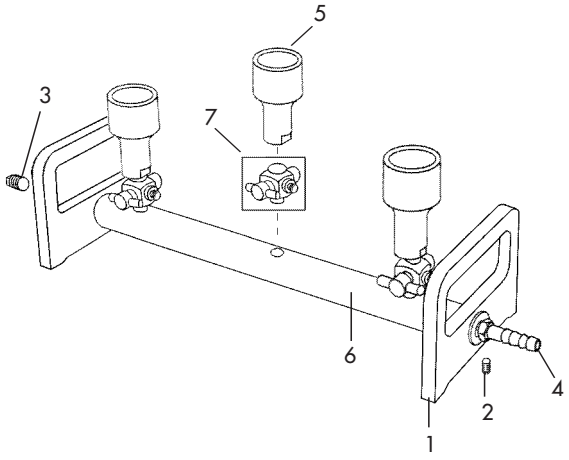
Standard branch accepts a #8 or #8b stopper, 2-way valve.

ORDERING INFORMATION

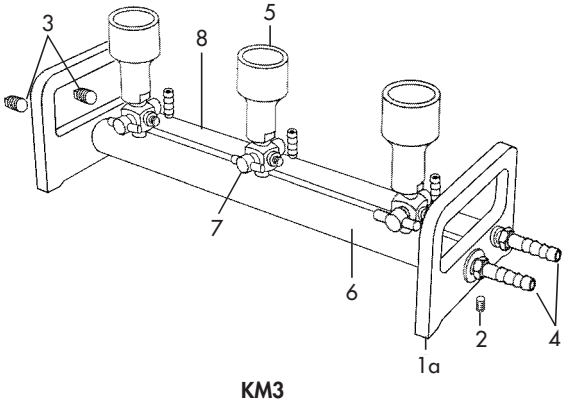
	Standard cup		**Exterior taper**		**Sterility Test** (standard cup)
Valve type:	2-way	3-way	2-way	3-way	3-way
Single	**SS 2X**	**SS 3X**	**SS SPE/2**	**SS SPE/3**	**-**
	351120	351130	361120	361130	-
3 station	**KM3N**	**KM3NV**	**KM3N XT/2**	**KM3N XT/3**	**KM3**
	353100	353130	363120	363130	313000
6 station	**KM6N**	**KM6NV**	**KM6N XT/2**	**KM6N XT/3**	**KM6**
	353300	353330	363320	363330	313200

Replacement Parts

1	Handle standard	313101
1a	Handle (sterility test)	313001
2	Handle set screw	313015
3	Pipe plug	313012
4	Hose barb	304507
5	Branch:	
	Standard cup	313010
	Exterior taper	613010
6	Main manifold:	
	Single	361103
	3 station	313003
	6 station	313203
7	Stopcock assembly:	
	2-way	613005
	3-way	313005
8	Flushing manifold (sterility test):	
	3 station	313004
	6 station	313204



KM3NV
(353130)



KM3
(313000)

Vacuum Pressure Pump

- Maintains continuous vacuum for filtration
- Also can be used for positive pressure filtration (<60 psi)
- Oil free operation minimizes aerosol contamination
- Quiet operation
- Easy to maintain
- Portable compact design

VP-24 Vacuum Pressure Pump

SPECIFICATIONS

Materials:	
Wetted parts	Aluminum, stainless steel, and Nordell Normax
Valves	Reed type
Power cord	6′ long, 3-wire
Connections:	
Inlet and outlet ports	1/4" NPTF to hose barb fitting connects vacuum pump to 3/8" ID vacuum tubing
Power requirements	115 V, 60 Hz, 4.2 A or 220 V, 50 Hz, 1.9 A
Pressure:	
Maximum pressure	0.41 MPa (60 psi)
Maximum vacuum	81kPa (24Hg") from atm
Temperature:	
Maximum inlet	37.8°C (100°F)
Free air capacity:	34 L/min (1.2 cfm)
Weight:	9.1 Kg (20 lb)

ORDERING INFORMATION

Model	Description	Catalog No.
VP-24	Vacuum pressure pump, 115 V	800800
	Vacuum pressure pump, 220 V	800801

Replacement Parts

Service kit:	Catalog No.
Replacement head gasket, filter, muffler elements, leaf valves, screws and valve retainers	800810
Vacuum gauge and regulator assembly	800820
Pressure gauge and regulator assembly	800830
Hose barb 3/8"	800840

Pressure Filtration

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Introduction

Pressure type filter holders can be used for ultracleaning or sterilizing liquids and gases. Advantec holders have been designed to maximize flow rates and to minimize holder resistance and can be used in either batch or continuous filtration procedures.

Advantages of Pressure Filtration

- Higher differential pressures are possible, resulting in higher flow rates. The pressure differential across the membrane is not limited to atmospheric pressure (≥14.7 psi)
- Unintentional contamination downstream of the membrane is minimized
- Denaturation of proteins and other biological polymers due to foaming downstream of the membrane is avoided
- Vapor accumulation and possible explosion can be avoided using an inert gas to pressurize solvents and combustible or flammable liquids

RECOMMENDED PRESSURE FILTER HOLDERS FOR TYPICAL APPLICATIONS AND VOLUMES

	Volume to be Filtered					
	<10 mL	**<50 mL**	**<1 liter**	**<5 liters**	**<20 liters**	**>20 liters**
Typical Applications	Enzymes, Radiolabelled samples	Proteins, enzymes, Radiolabelled samples, gases	Biological media, electrolyte solution for counters, gases	Biological media, ultrapure water, serum, gases	Biological media, ultrapure water, serum, gases	Pharmaceuticals, cosmetics, large scale biologicals
Recommended Models						
Luer Connection	KS 13	KS 25 PP 25 PFA 25	PP 47	-	-	-
Threaded Connection	-	LS 25	KS 47 LS 47 LS 47 HP PP 47 PFA 47	KS 90 KS 90 UH	KS 142 KS 142 UH	KS 293 KS 293 UH
Sanitary Connection	-	KS 25 F	KS 47 F	KS 90 ST	KS 142 ST	KS 293 ST
Holders with Reservoir	-	-	KST 47	KST 90	KST 142	-
Filter Specifications						
Membrane Diameter (mm)	13	25	47	90	142	293
Prefilter Diameter[1] (mm)	8	21 or 25	35, 38, 42.5, or 47	76	124	257
Filtration Area (cm^2)	0.9	3.8	11.2, 12.5, or 13.5	45.3	113	530
Liquid Flow Rate[2] (L/min)						
0.20 µm	0.016	0.07	0.22	0.8	2.0	9.3
0.45 µm	0.04	0.17	0.6	2.0	5.1	23.9
1.00 µm	0.20	0.84	2.8	10.0	24.9	116.6
5.00 µm	0.40	1.5	5.0	18.1	45.2	212.0

1. Prefilter size varies with model – refer to individual model specifications before choosing a prefilter.
2. Liquid flow rates represent typical initial water flow rates at 0.7 kg/cm^2 (10 psi) differential pressure at 20°C using clean water filtered to 0.1 µm using MCE membrane.

Stainless Steel Syringe Holders

- **Can be sterilized** by standard procedures including autoclaving
- **Luer fittings** fit typical syringes
- **Can be tightened securely,** wrench set included

Stainless steel syringe holders

APPLICATIONS

- Filter or clean small volumes of liquid such as eyewash or photoresist
- Clear turbid solutions such as serum
- Purify virus solutions

SPECIFICATIONS

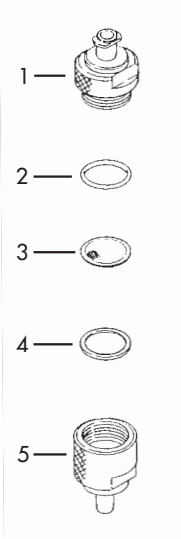
	KS 13	KS 25
Materials:		
Body and support screen	Type 304 Stainless Steel	
Gasket	PTFE	
O-ring	PTFE	
Connections:		
Inlet	Female Luer-lock	
Outlet	Male Luer slip	
Dead volume	0.2 mL	0.4 mL
Pressure:		
Inlet	0.68 MPa (99 psi)	
Differential	0.29 MPa (42 psi)	
Membrane Compatibility:		
Filter size	13 mm	25 mm
Prefilter size	8 mm	21 mm
Filtration area	0.9 cm^2	3.8 cm^2
Dimensions:		
Diameter	16 mm (0.6")	32 mm (1.25")
Length	39 mm (1.54")	36 mm (1.42")
Weight:	0.1 kg (0.25 lb)	0.2 kg (0.38 lb)

ORDERING INFORMATION

Model	KS 13	KS 25
Catalog No.	301000	301200

Replacement Parts

		KS 13	KS 25
1	Inlet, male	301001	301201
2	O-ring (PTFE)	301004	301204
3	Screen (304 SS)	301003	301203
4	Gasket (PTFE)	301002	301202
5	Outlet, female	301005	301205
-	Universal wrenches (2/pk)	301006	301006



KS 13

Stainless Steel Gas Line Holders

- **Female threaded locking ring** enables filter changes without removing the holder from connecting gas lines
- **Dual support screens** protect the membrane filter from reverse pressure surges and allow forward and reverse flow from either inlet or outlet
- Tighten by hand only, Hand torque maximum is 1.69 N.m (15 lbs/in)

Stainless Steel Gas Line Holders

APPLICATIONS

- Ultraclean and sterilize air and other gases including compressed gases
- In-line between pressurizing source (pump or gas cylinder) and dispensing vessel

SPECIFICATIONS

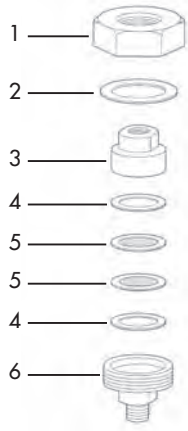
	LS 25	LS 47
Materials:		
Body and support screen	Type 304 Stainless Steel	
Locking ring	Nickel-plated brass	
Gaskets	PTFE	
O-ring (standard)	PTFE	Silicone
Connections:		
Inlet	1/4" NPTF, comes with hose barb fitting (3/8")	
Outlet	1/4" NPTM, comes with hose barb fitting (3/8")	
Pressure:		
Inlet	0.49 MPa (71 psi)	
Differential	0.20 MPa (29 psi)	
Filter Specifications:		
Filter size	25 mm	47 mm
Prefilter size	25 mm	47 mm
Filtration area	3.8 cm^2	12.5 cm^2
Dimensions:		
Diameter	38 mm (1.5")	69 mm (2.7")
Length	50 mm (2.0")	57 mm (2.2")
Weight:	0.3 kg (0.63 lb)	0.8 kg (1.75 lb)

ORDERING INFORMATION

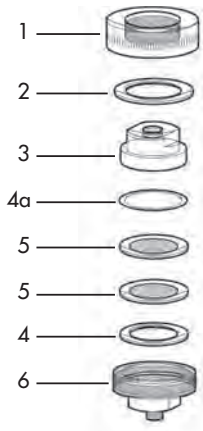
Model	LS 25	LS 47
Catalog No.	304500	304700

Replacement Parts, Accessories, and Optional O-rings

		LS 25	LS 47
-	Hose barb (1/4" NPTM)	304507	
1	Locking ring	304501	304701
2	Locking ring gasket (PTFE)	304504	304704
3	Inlet body (1/4" NPTF)	304505	304710
4	Gasket (PTFE)	301202	304702
4a	O-ring (Silicone)	-	357210
4a	O-ring (FPM)	-	304714
4a	O-ring (FEP encapsulated)	-	304716
5	Stainless steel screen (304 SS)	301203	304703
6	Outlet body (1/4" NPTM)	304506	304711
-	Hose barb (1/4" NPTF)	304508	



LS 25



LS 47

High Pressure Stainless Steel Holder

- **Operate at high pressure,** up to 9.8 MPa (1420 psi)
- **Standard FPM O-rings** compatible with many aggressive liquids and gases
- **Back pressure support screen available** to prevent membrane rupture and deflect flow at very high pressures

LS 47 HP

Applications

- Filter liquids or gases under high pressure

Specifications

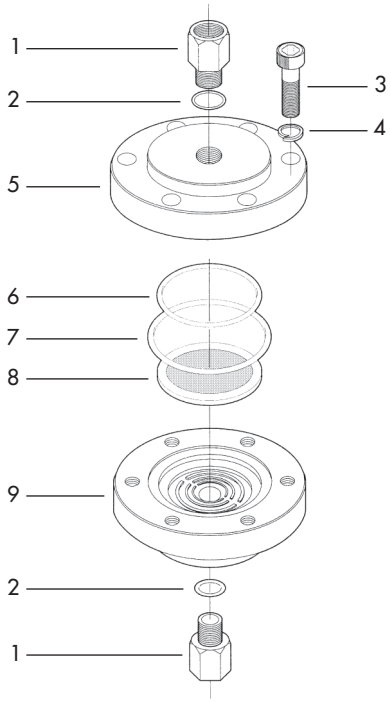
	LS 47 HP
Materials:	
Body and support screen	Type 304 Stainless Steel
O-rings	FPM
Connections:	
Inlet and Outlet	1/4" NPTF
Pressure:	
Inlet	9.8 MPa (1422 psi)
Differential	1.9 MPa (276 psi)
Dead volume:	
Upstream	3 mL
Downstream	6.5 mL
Membrane Compatibility:	
Membrane filter size	47 mm
Prefilter size	38 mm
Filtration area	11.2 cm^2
Dimensions:	
Diameter	88 mm (3.5")
Height (including adapters)	94 mm (3.7")
Weight:	2.7 kg (4.1 lb)

Ordering Information

Model	LS 47 HP
Catalog No.	304900

Replacement Parts and Accessories

		LS 47 HP
1	Inlet/outlet adapter	304904
2	Adapter O-ring	304905
3	Hex cap screw, M-8	304915
4	Cap screw washer	304916
5	Inlet plate	304901
6	Inner O-ring	304906
7	Outer O-ring	304910
8	Sintered steel support	304903
9	Outlet plate	304902
-	Back pressure support screen (optional)	304920



LS 47 HP

Polypropylene In-Line and Aerosol Holders

- **Compatible** with a wide range of chemicals and temperatures
- **Exterior locking ring** design allows the unit to be assembled quickly and efficiently without tearing the membrane

Polypropylene In-Line and Aerosol Holders

Applications

- Ultraclean and sterilize liquids
- Aseptic sampling of liquids or gases at point-of-use
- Environmental air sampling (PPO 47)

Specifications

	PP 25	PP 47	PPO 47
Materials:			
Body and support screen	Polypropylene		
O-rings (standard)	Silicone		Silicone/PTFE
Connections:			
Inlet	Female Luer-Lock	Combination 1/4" NPTM, Female Luer slip	Open Face
Outlet	Male Luer slip	Combination 1/4" NPTM, Female Luer slip	Combination 1/4" NPTM, Female Luer slip
Pressure:			
Inlet	0.49 MPa (71 psi)		-
Differential	0.29 MPa (42 psi)	0.49 MPa (71 psi)	-
Temperature:			
Maximum operating (liquids)	80°C (176°F)		
Autoclave	121°C (250°F), 15 psi, 20 min slow exhaust only		
Filter Specifications:			
Filter size	25 mm	47 mm	
Prefilter size	21 mm	42.5 mm	-
Filtration area	3.5 cm^2	13.5 cm^2	
Recommended volume	<50 mL	Up to 1 liter	-
Dimensions:			
Diameter	30 mm (1.2")	65 mm (2.6")	
Height	30 mm (1.2")	50 mm (2.0")	
Weight:	0.41 oz (12g) per 6 pk/box	1.7 oz (47g)	

Ordering Information

Model	PP 25	PP 47	PPO 47
Catalog No.	540100	501200	501300

Typical initial liquid flow rates (in mL/min)

Membrane Pore size (µm)	PP 25	PP 47
0.20	35	250
0.45	80	600
1.20	320	1700
3.00	740	2800

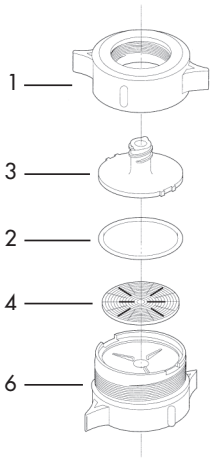
Conditions: initial flow rates of water being filtered through a mixed cellulose esters (MCE) at a differential pressure of 1 kg/cm² (14 psi) at 20°C.

Replacement Parts and Optional O-rings

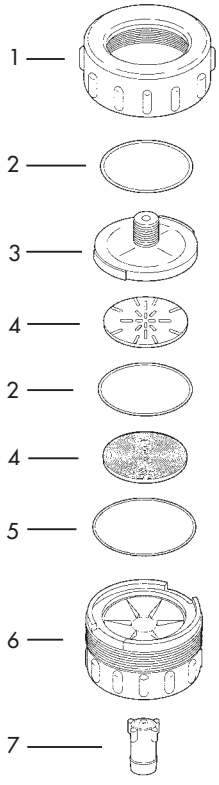
		PP 25
1	Locking ring, outer	540101
2	Inlet cap O-ring (silicone)	540106
2	Inlet cap O-ring (FPM)	540107
2	Inlet cap O-ring (EPR)	540108
3	Inlet cap	540102
4	Support screen	540104
6	Outlet base	540103

		PP 47
1	Locking ring, outer	501201
2	Inlet cap O-ring (silicone)	501204
2	Inlet cap O-ring (FPM)	530108
2	Inlet cap O-ring (EPR)	530109
3	Inlet cap	501202
4	Support screen	501004
5	Outlet base O-ring (silicone)	501208
5	Outlet base O-ring (FPM)	501210
5	Outlet base O-ring (EPR)	501211
6	Outlet base	501203
7	Outlet adapter (male luer slip to hose barb)	501013

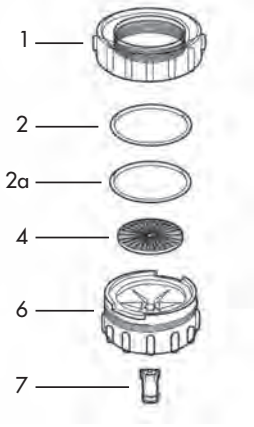
		PPO 47
1	Locking ring, outer	501004
2	Inlet cap O-ring (silicone)	501204
2a	Sealing O-ring (PTFE)	501301
4	Support screen	501004
6	Outlet base	501203
7	Outlet adapter (male luer slip to hose barb)	501013



PP 25



PP 47



PPO 47

PFA In-Line Filter Holders

- **Superior chemical compatibility** – can be used with chemically aggressive liquids
- **Dual support screens** allow for flow in either direction
- **Exterior locking ring** for quick assembly without tearing the membrane

PFA 25, PFA 47

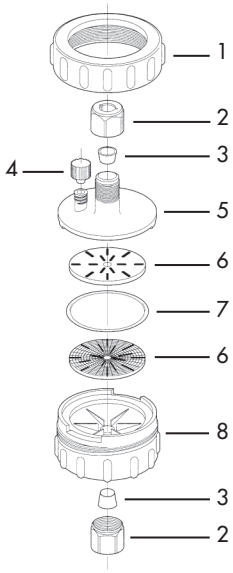
Applications

- Sterilize and ultraclean liquids under positive pressure
- Ideal for filtering small volumes of high purity acids, alkalis or organic solvents

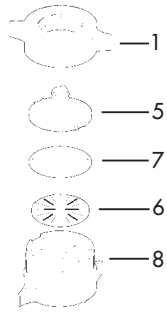
Note: PFA 47 unit has an air/bleed vent

Specifications

	PFA 25	PFA 47
Materials:		
Body and support screen	PFA Locking ring on PFA 47: ETFE glass fiber filled PFA	
O-ring (standard)	Perfluoroelastomer	
Connectors:		
Inlet	Female Luer-Lock	Combination 1/4" NPTM, 1/4" tubing adapter
Outlet	Male Luer slip	
Pressure:		
Inlet	0.29 MPa (42 psi)	
Differential, positive or negative, at 25°C	0.29 MPa (42 psi)	
Temperature:		
Maximum operating	121°C (250°F)	
Autoclave	121°C (250°F), 15 min	
Weight:	0.8 oz (22g)	5.2 oz (120g)
Dimensions:		
Diameter	32 mm (1.3")	65 mm (2.6")
Height	32 mm (1.3")	70 mm (2.8")
Membrane Compatibility:		
Filter size	25 mm	47 mm
Prefilter size	21 mm	42.5 mm
Filtration area	3.5 cm^2	13.5 cm^2
Flow Rate:		
Pore size (PTFE membrane)	Typical methanol flow rate at 1 kg/cm^2, 20°C	
0.2 µm (J020)	60 mL/min	400 mL/min
0.5 µm (J050)	150 mL/min	700 mL/min
1.0 µm (J100)	350 mL/min	1200 mL/min



PFA 47



PFA 25

Replacement Parts

		PFA 25	PFA 47
1	Locking ring	530201	530101
2	Inlet/Outlet adapter	-	530111
3	Tubing adapter	-	530110
4	Vent cap	-	530105
5	Inlet cap	530202	530102
6	Support screen	530204	530104
7	Inlet O-ring	530206	530106
8	Outlet	530203	530103

Ordering Information

Model	PFA 25	PFA 47
Catalog No.	530200	530100

Optional O-rings

		PFA 25	PFA 47
7	Inlet O-ring (FPM)	540107	530108
7	Inlet O-ring (EPR)	540108	530109
7	Inlet O-ring (Silicone)	540106	501204

Sanitary In-Line Stainless Steel Holders

- **Sanitary inlet and outlet connections** are non-threaded and can be completely disassembled for thorough cleaning
- **47 mm holder features vent** to allow air venting on upstream side of the membrane at any time during filtration

KS 25 F, KS 47 F

APPLICATIONS

- Point of use filtration on sterile filling machines
- Flow decay studies for scale up to larger filtration systems
- Liquid or gas

SPECIFICATIONS

	KS 25 F	KS 47 F
Materials:		
Body and support screen	Type 304 Stainless Steel	
O-rings	FPM and Silicone	
Gasket	PTFE	
Connectors:		
Inlet/Outlet	6 mm (0.24") OD barb	8 mm (0.32") OD barb
	4 mm (0.16") ID	6 mm (0.24") ID
Pressure:		
Inlet	0.49 MPa (71 psi)	
Differential	0.29 MPa (42 psi)	
Weight:	0.45 kg (1 lb)	0.9 kg (2 lb)
Dimensions:		
Diameter (without clamp)	50 mm (2.0")	60 mm (2.4")
Length (with vent valve)	72 mm (2.8")	98.5 mm (3.9")
Membrane Compatibility:		
Filter size	25 mm	47 mm
Prefilter size	21 mm	35 mm (47 mm)*
Filtration area	3.8 cm^3	12.5 cm^2

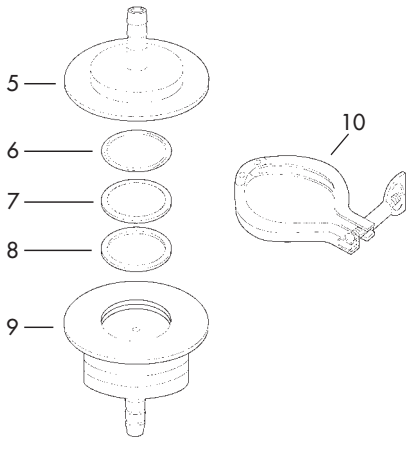
* If a membrane filter is used as a prefilter, use a 47 mm filter and place a polyester separator (DS type) between the 2 membranes (See page 30).

ORDERING INFORMATION

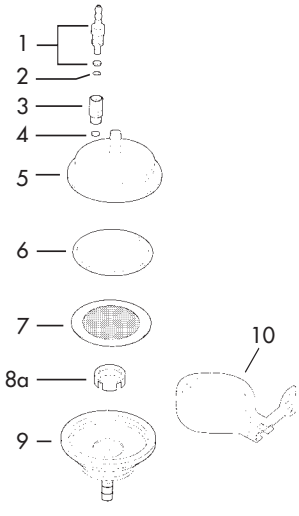
Model	KS 25 F	KS 47 F
Catalog No.	357000	357200

Replacement Parts

		KS 25 F	KS 47 F
1	Vent valve with PTFE packing	-	357205
2	Vent valve O-ring (FPM)	-	357206
3	Valve body, female	-	357207
4	Vent valve gasket (PTFE)	-	357208
5	Inlet body	357001	357201
6	O-ring (silicone)	357003	357210
7	Support screen	301203	304703
8	Gasket (PTFE)	357004	-
8a	Underdrain support	-	357204
9	Outlet body	357002	357202
10	Clamp	306000	306300



KS 25 F



KS 47 F

Vented In-Line Stainless Steel Holder

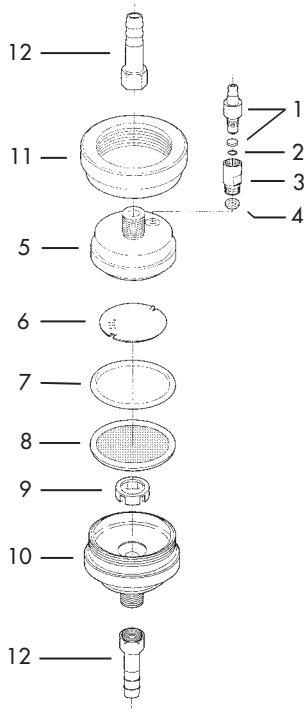
- **Support screen is PTFE coated** to prevent membrane sticking during autoclaving
- **Back pressure support screen** prevents membrane rupture during reverse pressure surges
- **Vent valve** in inlet body enables venting at any time during filtration
- Available in type 304 or type 316 stainless steel

KS 47

APPLICATIONS

- Sterilize and ultraclean liquids or gases under positive pressure
- Sterilize with a membrane in place for microbiological studies
- Install for point of use filtration on filling machines

Note: When using the KS 47 inline to filter gases, a second support screen should be used upstream of the membrane



KS 47

SPECIFICATIONS

	KS 47
Materials:	
Body and support screen	Type 304 or 316 stainless steel
O-rings (standard)	FPM and silicone
Support screen	PTFE coated stainless steel
Gasket	PTFE
Connections:	1/4" NPTM to hose barb (9.5 mm)
Pressure:	
Inlet	0.68 MPa (99 psi)
Differential	0.29 MPa (42 psi)
Dead Volume:	
Upstream	5 mL
Downstream	2 mL
Weight:	0.8 kg (1.8 lb)
Membrane Compatibility:	
Filter size	47 mm
Prefilter size	35 mm (47 mm)*
Filtration size	12.5 cm^2

* If a membrane filter is used as a prefilter, use a 47 mm filter and place a polyester separator (DS type) between the 2 membranes (See page 30).

Replacement Parts

		KS 47	
		Type 304 SS	Type 316 SS
1	Vent valve with PTFE packing	357205	
2	Vent valve O-ring (FPM)	357206	
3	Valve body, female	357207	
4	Gasket (PTFE)	357208	
5	Inlet body	357401	357501
6	Back pressure support	357404	357504
7	O-ring (silicone)	357210	
8	Support screen	304715	304815
9	Underdrain support	357204	357304
10	Outlet body	357402	357502
11	Locking ring	357405	357505
12	Inlet/outlet adapter	304508	304608

ORDERING INFORMATION

	KS 47
304 SS	357400
316 SS	357500

Accessories and Optional O-rings

7	O-ring (PTFE encapsulated)	304706	
7	O-ring (FPM)	304714	
8	Support screen (order second for upstream support, see note above)	304715	304815

Large Standard Stainless Steel Holders – 90, 142, 293mm

- **Seal membrane by hand tightening** locking wing nuts
- **Optimal holder design** minimizes resistance and maximizes flow rate
- **Available in either type 304 or type 316 stainless steel**
- **Each unit labeled** with identifying serial numbers on the outside of both the inlet and outlet plates

KS 90, KS 142, KS 293

Applications

- Use in-line for filtering gases or liquids
- Use with pressure vessel (see page 115) for batch type operations

Specifications

	KS 90	KS 142	KS 293
Materials:			
Body	Type 304 or 316 stainless steel		
Support screen	PTFE coated photoetched stainless steel		
O-rings (standard)	Silicone		
Gasket	PTFE		
Connections:			
Inlet, 3/4" NPTF to:	11 mm (3/8") hose barb		16 mm (5/8") hose barb
Outlet, 3/4" NPTM to:			
Pressure:			
Inlet	0.68 MPa (99 psi)		
Differential	0.29 MPa (42 psi)		
Weight:	4 kg (8.8 lb)	6 kg (13 lb)	19 kg (42 lb)
Membrane Compatibility:			
Membrane filter size	90 mm	142 mm	293 mm
Prefilter size	76 mm	124 mm	257 mm
Filtration area	45 cm^2	113 cm^2	530 cm^2

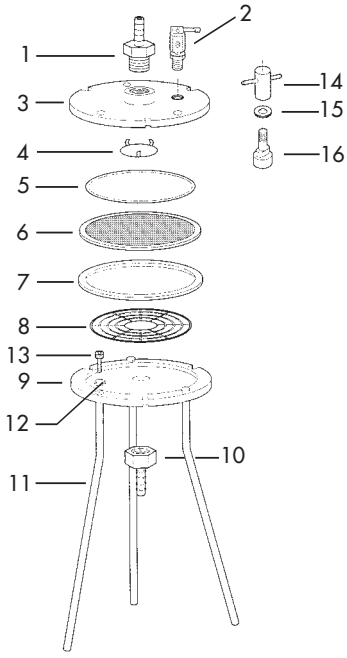
Supplied with aluminum wrench (spanner) and 6 mm allen wrench (hex key).

Ordering Information

	KS 90	KS 142	KS 293
304 SS	300800	301900	302500
316 SS	300900	302000	302600

Replacement Parts

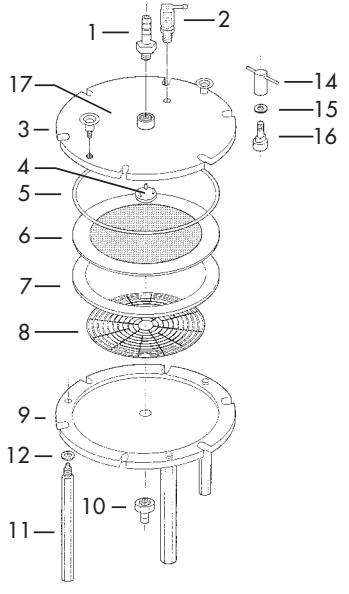
Inlet and Outlet Assemblies				
		KS 90	KS 142	KS 293
1	Inlet adapter (304 SS)	300813		302513
1	Inlet adapter (316 SS)	300913		302613
2	Vent relief valve	301825		
3	Inlet plate (304 SS)	300809	301909	302509
3	Inlet plate (316 SS)	300909	302009	302609
9	Outlet plate (304 SS)	300801	301901	302501
9	Outlet plate (316 SS)	300901	302001	302601
10	Outlet adapter (304 SS)	300817		302517
10	Outlet adapter (316 SS)	300917		302617
Filter Support System				
		KS 90	KS 142	KS 293
4	Flow deflector (316 SS)	301808		
5	O-ring (silicone)	301705	301905	302505
6	Support screen (PTFE coated SS)	301804	302004	302604
7	Gasket (PTFE)	301703	301903	302503
8	Underdrain support (316 SS)	301802	302002	302602
Sealing and Support Assemblies				
		KS 90	KS 142	KS 293
11	Leg	301719	301919	302519
12	Leg washer		301720	302518
13	Leg bolt	301718		-
14	Sealing wing nut	301914		302514
15	Sealing washer	301916		302516
16	Sealing bolt	301915		302515



KS 90, KS 142

Accessories and Optional O-rings

		KS 90	KS 142	KS 293
5	O-ring (FEP-encapsulated silicone)	301706	301906	302506
5	O-ring (FPM)	301707	301907	302507
6	Support Screen (316 SS)	301835	302035	302635
-	Back pressure support screen (304 SS)	301726	301926	302530
-	Back pressure support screen (316 SS)	301728	301928	302532
-	Back pressure support screen (PTFE coated 304 SS)	301727	301927	302531
-	Back pressure support screen (PTFE coated 316 SS)	301729	301929	302533
-	Allen wrench (hex key) 6 mm	301721		-
-	Spanner (wrench) 142 mm	301922		



KS 293

Large Sanitary Stainless Steel Holders – 90, 142, 293 mm

- **Sanitary connections** are threadless and can be completely disassembled for thorough cleaning
- **Designed for minimal resistance and maximal flow**
- **Available in either type 304 or 316 stainless steel**
- **Removable wing nuts** tighten easily by hand to seal membrane
- **Both inlet and outlet plates clearly marked** with identifying serial number

KS 142 ST

Applications

- Ultraclean or sterilize gases or liquids
- Use with a pressure vessel for large volumes and batch type operations

Specifications

Materials:	
Body	Type 304 or 316 stainless steel
Support screen	PTFE coated photoetched stainless steel
O-ring (standard)	Silicone
Gaskets (standard)	PTFE and Silicone
Connections:	
Inlet and Outlet	1½" sanitary fitting to 14.3 mm hose barb
Pressure:	
Inlet	0.68 MPa (99 psi)
Differential	0.29 MPa (42 psi)

Supplied with aluminum wrench (spanner) and 6 mm allen wrench (hex key).

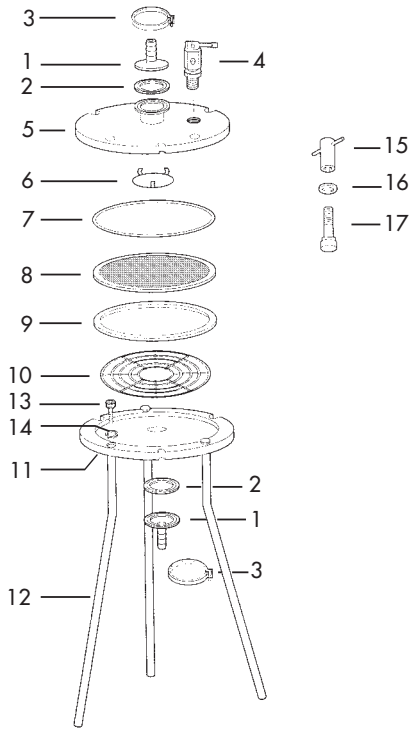
Ordering Information

	KS 90 ST	KS 142 ST	KS 293 ST
304 SS	-	302100	302700
316 SS	351800	302200	302800

Assemblies are available with PTFE coating by special order.

Replacement Parts

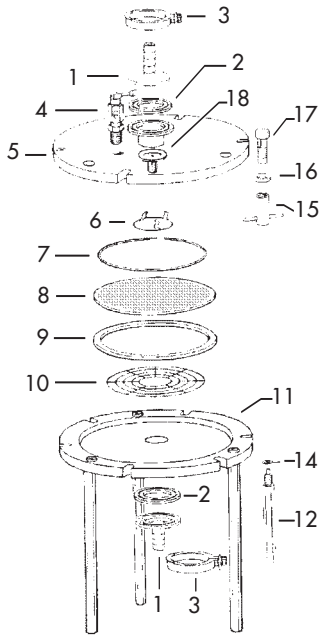
Inlet and Outlet Assemblies				
		KS 90 ST	KS 142 ST	KS 293 ST
1	Inlet/Outlet adapter (304 SS)	306203		
1	Inlet/Outlet adapter (316 SS)	306204		
2	Inlet/Outlet gasket (silicone)	306108		
3	Clamp, 1.5 Tri-Clamp	306000		
4	Vent relief valve	301825		
5	Inlet plate (304 SS)	-	302109	302801
5	Inlet plate (316 SS)	351809	302209	302709
11	Outlet plate (304 SS)	-	302101	302809
11	Outlet plate (316 SS)	351801	302201	302701
Filter Support System				
		KS 90 ST	KS 142 ST	KS 293 ST
6	Flow deflector (316 SS)	302208		302808
7	O-ring (silicone)	301705	301905	302505
8	Support screen (PTFE coated SS)	301804	302004	302604
9	Gasket (PTFE)	301703	301903	302503
10	Underdrain support (316 SS)	301802	302002	302602
Sealing and Support Assemblies				
		KS 90 ST	KS 142 ST	KS 293 ST
12	Leg	301919		302519
13	Leg bolt	301718		-
14	Leg washer	301720		302518
15	Sealing wing nut	301914		302514
16	Sealing washer	301916		302516
17	Sealing bolt	301915		302515
18	Handle	-	-	302520



KS 90 ST
KS 142 ST

Accessories and Optional O-rings

		KS 90 ST	KS 142 ST	KS 293 ST
7	O-ring (FEP-encapsulated silicone)	301706	301906	302506
7	O-ring (FPM)	301707	301907	302507
8	Support Screen (316 SS)	301835	302035	302635
-	Back pressure support screen (304 SS)	301726	301926	302530
-	Back pressure support screen (316 SS)	301728	301928	302532
-	Back pressure support screen (PTFE coated 304 SS)	301727	301927	302531
-	Back pressure support screen (PTFE coated 316 SS)	301729	301929	302533
2	Inlet/Outlet gasket (PTFE)	306109		
2	Inlet/Outlet gasket (FPM)	306110		
-	Allen wrench (hex key), 6 mm	301721		-
-	Spanner (wrench), 142 mm	301922		



KS 293 ST

Large Stainless Steel Holders with Reservoirs

- **Designed for filtering small batches** of liquid without having to use a separate pressure vessel
- **Separate ports** for pressurizing the reservoir and for adding additional sample
- **Membrane sealed internally** by hand-tightening locking wing nuts
- **Available in either type 304 or 316 stainless steel**

APPLICATIONS

- Sterilizing, ultracleaning, and flow decay tests for pilot studies
- Suitable for hazardous toxicity testing and TCLP
- Optional back pressure screen recommended for intermittent fill operations

KST 47

KST 90

SPECIFICATIONS

	KST 47	KST 90	KST 142
Materials:			
Body	Type 304 SS	Type 304 or 316 SS	
Support screen	Photoetched 304 SS	PTFE coated photoetched 304 SS	
O-rings (standard)	Silicone		
Gasket (standard)	Silicone/PTFE	PTFE	
Connections:			
Inlet	1/4" NPTM		
Inlet adapter	11 mm hose barb	Ball valve with stepped hose barb (7 mm, 10.5 mm, 13 mm)	
Outlet	1/4" NPTM	3/4" NPTM	
Outlet adapter	10 mm hose barb	11 mm hose barb	
Pressure:			
Inlet	0.49 MPa (71 psi)		
Differential	0.29 MPa (42 psi)		
Vent relief valve	0.44 ± 0.04 MPa (64 ± 6 psi)		
Weight:	1 kg (2.2 lb)	5 kg (11 lb)	6 kg (13 lb)
Capacity:	200 mL	750 mL	1.5 L
Membrane Compatibility:			
Membrane filter size	47 mm	90 mm	142 mm
Prefilter size	35 mm	76 mm	124 mm
Filtration area	12.5 cm^2	45.3 cm^2	113 cm^2

Supplied with aluminum wrench (spanner) and 6 mm allen wrench (hex key).

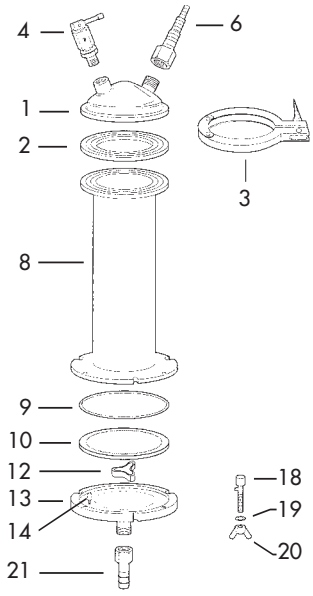
Ordering Information

	KST 47	KST 90	KST 142
304 SS	301500	361600	302300
316 SS	-	361700	302400

Assemblies are available with PTFE coating by special order.

Replacement Parts

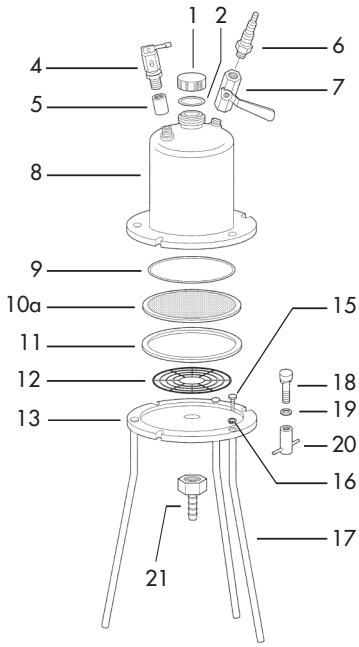
		KST 47	KST 90	KST 142
Inlet Assembly				
1	Inlet cap	301508	301610	302310
2	Inlet cap gasket/O-ring (silicone)	306108	301609	302309
3	Clamp, 1.5 TC	306000	-	
4	Vent relief valve	301825		
5	Vent socket	-	302313	
6	Inlet adapter (304 SS)	301515	351624	
6	Inlet adapter (316 SS)	-	361624	
7	Valve (304 SS)	-	351625	
7	Valve (316 SS)	-	361625	
Holder Body and Filter Support System				
		KST 47	KST 90	KST 142
8	Reservoir (304 SS)	301507	351608	302308
8	Reservoir (316 SS)	-	361708	302408
9	O-ring (silicone)	357210	301705	301905
10	Support screen (304 SS)	304703	-	-
10a	Support screen (PTFE coated SS)	-	301804	302004
11	Gasket (PTFE)	-	301703	301903
12	Underdrain support (316 SS)	301517	301802	302002
13	Outlet plate (304 SS)	301501	300801	301901
13	Outlet plate (316 SS)	-	300901	302001
Sealing and Support Assemblies				
		KST 47	KST 90	KST 142
14	Guide pins	301511	-	-
15	Sealing bolt (leg)	-	301718	
16	Locking washer (leg)	-	301720	
17	Leg	-	301719	301919
18	Wing-type bolt	301512	301915	
19	Sealing washer	301514	301916	
20	Wing-type nut	301513	301914	
21	Outlet adapter (NPTF to hose barb)	301515	300817	300917



KST 47

Accessories and Optional O-rings/Gaskets

		KST 47	KST 90	KST 142
2	Inlet cap O-ring (FEP-encapsulated silicone)	-	302328	-
2	Inlet cap gasket (FPM)	306110	-	
2	Inlet cap gasket (PTFE)	306109	-	
9	O-ring (FEP-encapsulated silicone)	-	301706	301906
9	O-ring (PTFE)	301505	-	
9	O-ring (FPM)	301506	301707	301907
-	Back pressure support screen (304 SS)	-	301726	301926
-	Back pressure support screen (316 SS)	-	301728	301928
-	Back pressure support screen (PTFE coated 304 SS)	-	301727	301927
-	Back pressure support screen (PTFE coated 316 SS)	-	301729	301929
-	Allen wrench (hex key) 6 mm	-	301721	
-	Spanner (wrench) 142 mm	-	301922	



KST 90
KST 142

Pressure Filtration

Multi-Media Pressure Sealing Holders

- **Dual sealing system** compresses the filter between the inside wall of the outlet plate and the O-ring on the outer edge
- **Broad range of media thickness,** including pads, can be used without compromising sealing up to 3mm
- **Multiple layers of media** can be used in a single holder without lateral wicking

KS 142 UH

Specifications

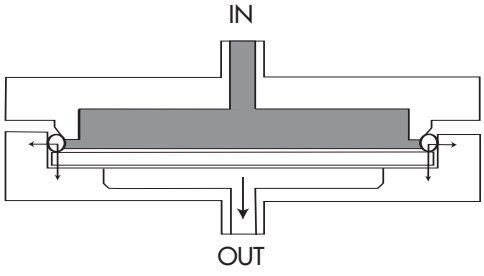
	KS 90 UH	KS 142 UH	KS 293 UH
Materials:			
Body	Type 304 stainless steel		
Support screen	PTFE coated photoetched stainless steel		
O-ring	Silicone		
Connections:			
Inlet/Outlet	3/4" NPTF/ 3/4" NPTM		
Adapter	11 mm hose barb		16 mm hose barb
Pressure:			
Inlet	0.68 MPa (99 psi)		
Differential	0.29 MPa (42 psi)		
Weight:	4.5 kg (9.9 lb)	7 kg (15.4 lb)	21 kg (46 lb)
Membrane Compatibility:			
Membrane filter size	90 mm	142 mm	293 mm
Prefilter size	76 mm	124 mm	257 mm
Filtration area	45.3 cm^2	113 cm^2	530 cm^2

Ordering Information

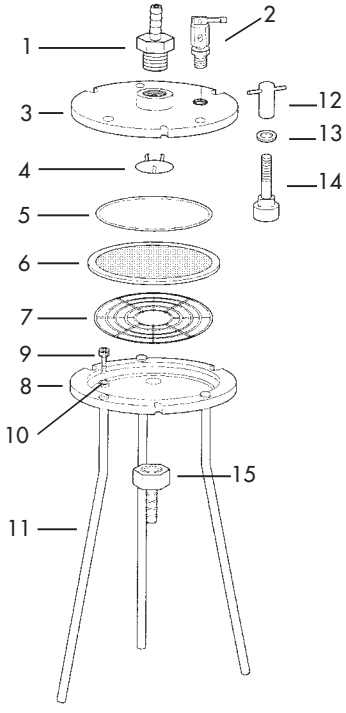
Model	KS 90 UH	KS 142 UH	KS 293 UH
Catalog No.	301790	301990	302590

Replacement Parts

Inlet Assembly				
		KS 90 UH	KS 142 UH	KS 293 UH
1	Inlet adapter	300813		302513
2	Vent relief valve	301825		
3	Inlet plate	301799	301999	302599
Holder Body and Filter Support System				
		KS 90 UH	KS 142 UH	KS 293 UH
4	Flow deflector	301708		
5	O-ring (silicone)	301795	301995	303704
6	Support screen (PTFE coated SS)	301794	301994	302594
7	Underdrain support (316 SS)	301702	301902	302502
8	Outlet plate	301791	301991	302591
Sealing and Support Assemblies				
		KS 90 UH	KS 142 UH	KS 293 UH
9	Leg bolt	301798		-
10	Locking washer (leg)	301720		-
11	Leg	301709	301919	302597
12	Sealing wing nut	301723	301914	302515
13	Sealing washer	301716	301916	302516
14	Sealing wing bolt	-	301695	302595
15	Outlet adapter	300817		302517



Sealing mechanism



KS 90 UH

Pressure Vessels

- **Stainless Steel Type 304 or 316L**
- **1 gallon to 10 gallon sizes** (3.8 to 38 liters)
- **Standard or Wide Mouth openings** available for ease of cleaning
- **ASME certified:** a certificate of analysis is available upon request
- **Electropolished finish** provides a smooth, releasable, cleanable surface
- **Disassemble completely** for thorough cleaning
- **Molded rubber base** protects the vessel against rough handling (available with steel base for continuous operation at high temperatures)
- **Use under positive or negative pressure**
- **Optional vacuum closure available** when working with negative pressure or when operating at low pressures (<30 psi/2.1 bar) or with stiffer O-rings (FPM)
- **Special orders available** (coatings, additional sizes)

SPECIFICATIONS

Materials:	
Vessel	Type 304 or type 316L stainless steel
Skirt: 1 – 5 gallon	Molded neoprene rubber
Skirt: 8 – 10 gallon	Stainless steel
Connections:	
Inlet/outlet	1/4" NPTF
Standard closure	3 7/8" x 3 1/4"
Wide mouth closure	5 7/8" x 4 7/8"
Pressure:	
Max. operating	See table below
Optional relief valve	0.69 MPa (100 psi)
Max. negative	95 kPa (29" Hg)
Temperature:	
Max. operating	See table below

APPLICATIONS

- Contain process fluids for filtration through pressure type membrane filter holders
- Type 316/316L stainless complies with current good manufacturing practices and are recommended for low pH and high salt applications

Volume:					
U.S. gallons	1 gal	3 gal	5 gal	8 gal	10 gal
Liters	3.78 L	11.3 L	18.9 L	30.2 L	37.8 L
Dimensions:					
Overall height	21.6 cm	38.7 cm	57.2 cm	52.9 cm	63.4 cm
	8.5"	15.25"	22.5"	20.8"	24.9"
Inside diameter	22.9 cm (9")			30.5 cm (12")	
Weight:	3.6 kg	5 kg	6.8 kg	11.1 kg	12.5 kg
	8 lb	11 lb	15 lb	24.5 lb	27.5 lb
Recommended for use with:					
Pressure Filter Holders	KS 90	KS 142		KS 293	
	KS 90 ST	KS 142 ST		KS 293 ST	
	KS 90 UH	KS 142 UH		KS 293 UH	

MAXIMUM OPERATING TEMPERATURE AND PRESSURE

Type of Stainless Steel	Maximum Operating Temperature		1, 3, 5 gallon models				8 and 10 gallon models			
			Standard Opening		Wide Mouth		Standard Opening		Wide Mouth	
	°F	°C	psi	MPa	psi	MPa	psi	MPa	psi	MPa
Type 304	100	38	175	1.21	140	0.97	130	0.90	129	0.89
	150	66	170	1.17	135	0.93	130	0.90	125	0.86
	200	93	165	1.14	130	0.90	120	0.83	120	0.83
	250	121	160	1.10	130	0.90	120	0.83	115	0.79
	300	149	155	1.07	125	0.86	115	0.79	110	0.76
Type 316L	100	38	155	1.07	130	0.90	115	0.79	115	0.79
	150	66	155	1.07	130	0.90	115	0.79	115	0.79
	200	93	155	1.07	130	0.90	115	0.79	115	0.79
	250	121	155	1.07	130	0.90	115	0.79	110	0.76
	300	149	150	1.03	125	0.86	110	0.76	110	0.76

Note: O-rings containing silicone rubber should not be operated extensively at temperatures over 250°F (121°C).

Pressure Vessels

With an opening 2 1/4 times larger, the Wide Mouth vessel is easy to clean and inspect.

Ordering Information

Complete Assemblies

	Standard opening		Wide Mouth opening	
Type Stainless Steel (SS)	304 SS	316L SS	304 SS	316L SS
Capacity:				
1 gallon	720140	720160	740140	740160
3 gallon	720340	720360	740340	740360
5 gallon	720540	720560	740540	740560
8 gallon	730840	730860	740840	740860
10 gallon	731040	731060	741040	741060

1. Pressure vessels are available in other sizes by special order.

Replacement Parts

		316L SS
Dip tube assembly:	1 gallon	720161
	3 gallon	720361
	5 gallon	720561
	8 gallon	730861
	10 gallon	731061
Closure:	Standard	720162
	Wide mouth	740162
Plastic feet for closure assembly:		720022

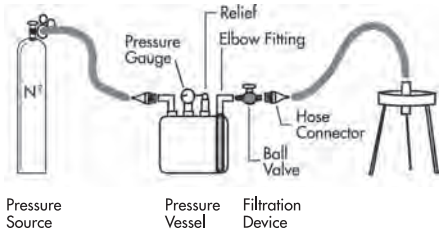
Optional Parts and O-rings

	Standard opening	Wide Mouth opening
Standard closure (316 SS)	720162	740162
Vacuum closure (316 SS)	720152	740152
O-ring (EPR)[2]	720001	720019
O-ring (FPM)	720015	720021
O-ring (PTFE encapsulated silicone rubber)	720020	720018

2. EPR (ethylene propylene rubber) O-rings are manufactured from E300-70 EPDM and meet FDA CFR177, 2600 and ASTM D2000 specifications.

Accessories

	1/4" NPT	Type of stainless[3]	Catalog No.
Vent/relief valve: 7 kg/cm², 100 psi	Male	304 SS	301825
Pressure gauge[4]: 0 – 160 psi	Male	-[5]	720002
Hose barb (11 mm)	Male	304 SS	304507
Hose barb (11 mm)	Female	304 SS	304508
Pipe plug	Male	304 SS	313012
Elbow fitting	Male/Female	316 SS	720003
Ball valve	Male/Female	316 SS	720004
Close nipple	Male/Male	316 SS	720005
Quick-connect body	Male	316 SS	720006
Quick-connect stem (hose barb)	-	316 SS	720007



3. All parts are available in (hose barb) type 316 stainless steel by special order.
4. Caution: pressure gauges should not be autoclaved.
5. All wetted parts consist of a copper alloy, and the threaded connector is made of brass.

Stirred Cells

- **Tangential flow design** increases membrane life and sample throughput
- **PTFE stir bar** is mounted to stay clear of the membrane
- **All contact surfaces are non-metal**
- **Clear plastic reservoir** allows for fluid level and sample condition to be visually monitored
- **Removable top cap** (UHP 25, 43, and 62) and sample port (UHP 76, 90, 150) allow sample to be added during filtration
- **Pressure relief valve** supplied

Stirred Cells

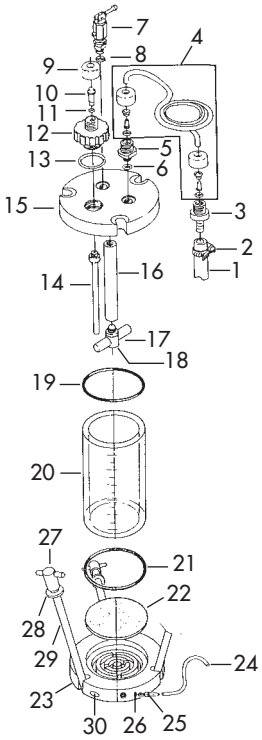
APPLICATIONS

- Desalting and concentrating proteins, enzymes, virus, and other biological samples
- Filtering fluids that contain a heavy particle burden, e.g. bacteria, silts

Note: Cells are not autoclavable

SPECIFICATIONS

	UHP 25	UHP 43	UHP 62	UHP 76	UHP 90	UHP 150
Materials:						
End caps and stir rod	Polyacetal					
Cell barrel	Polycarbonate				Acrylic	
O-rings	Silicone					
Support screen	Polypropylene					
Stir bar	PTFE					
Connections:						
Pressurizing	M10					
Vent valve	10 mm screw, female					
Pressure:						
Maximum	0.5 MPa (73 psi)					
Vent relief valve	0.44 ± 0.04 MPa (63 ± 6 psi)					
Max. Operating Temperature	40°C					
Dimensions:						
Diameter	60 mm	68 mm	82 mm	117 mm	135 mm	198 mm
Height	138 mm	161 mm	190 mm	211 mm	230 mm	268.5 mm
Weight:	0.05 kg	0.18 kg	0.35 kg	0.46 kg	1.4 kg	3.1 kg
	0.11 lb	0.40 lb	0.77 lb	1.01 lb	3.08 lb	6.82 lb
Volumes:						
Capacity	10 mL	70 mL	200 mL	450 mL	600 mL	2000 mL
Min. recoverable upstream	0.5 mL	2.5 mL	4.5 mL	10 mL	15 mL	60 mL
Downstream holdup	1.3 mL	4.6 mL	9.1 mL	13 mL	20 mL	41 mL
Membrane Compatibility:						
Membrane filter size	25 mm	43 mm	62 mm	76 mm	90 mm	150 mm
Filtration area	3.5 cm^2	11.5 cm^2	27.0 cm^2	38.5 cm^2	54.5 cm^2	162 cm^2



UHP 76, 90, 150

ORDERING INFORMATION

Model	UHP 25	UHP 43	UHP 62	UHP 76	UHP 90	UHP 150
Catalog No.	341000	341100	341200	341300	341400	341500

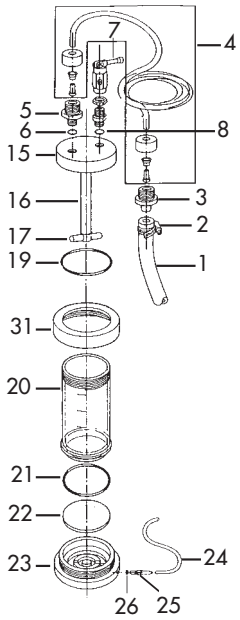
Replacement Parts

Inlet Assembly

		All Models
1	Pressurizing hose	341001
2	Hose clamp	341002
3	Male hose adapter	341003
4	Hose adapter assembly	341033
5	Inlet nipple adapter	341115
6	Inlet adapter O-ring (silicone)	341013
7	Vent/relief valve (with washer)	341012
8	Vent valve O-ring (silicone)	341008

Inlet Port Assembly (UHP 76, 90, 150)

		UHP 76	UHP 90	UHP 150
9	End cap adapter		341006	
10	Inlet port adapter		341438	
11	Inlet cap O-ring		341436	
12	Sample port inlet cap	341335	341435	341539
13	Sample port adapter O-ring	341336	341432	341532
14	Sample port tube	341334	341434	341534



UHP 25, 43, 62

Body

		UHP 25	UHP 43	UHP 62	UHP 76	UHP 90	UHP 150
15	Inlet end cap	341026	341126	341226	341326	341425	341525
16	Stir rod	341027	341127	341227	341327	341426	341526
17	Stir bar and adapter	341028	341128	341228	341328	341427	341527
18	Set bolt for stir bar	-	-	-	341331	341431	341531
19	Inlet cap O-ring (silicone)	341030	341130	341230	341322	341422	341522
21	Outlet cap O-ring (silicone)	341022	341122	341222			
20	Cell barrel	341024	341124	341224	341324	341424	341524
22	Support screen (polypropylene)	341021	341121	341221	341321	341421	341521
23	Outlet end cap	341020	341120	341220	341320	341420	341520
31	Locking ring	341025	341125	341225	-	-	-

Outlet Assembly

		UHP 25, 43, 62	UHP 76	UHP 90	UHP 150
24	Outlet tubing	341019	341319	341419	341519
25	Outlet adapter	341018	341318	341418	341518
26	Outlet adapter O-ring	341016	341316	341416	341516

Clamp Assembly (UHP 76, 90, 150)

		UHP 76	UHP 90	UHP 150
27	Nut for tie rod	341332	341441	341441
28	Washer for tie rod	341331	341440	341440
29	Tie rod	341330	341439	341543
30	Set pins	341342	341442	341546

Cell on Stirrer

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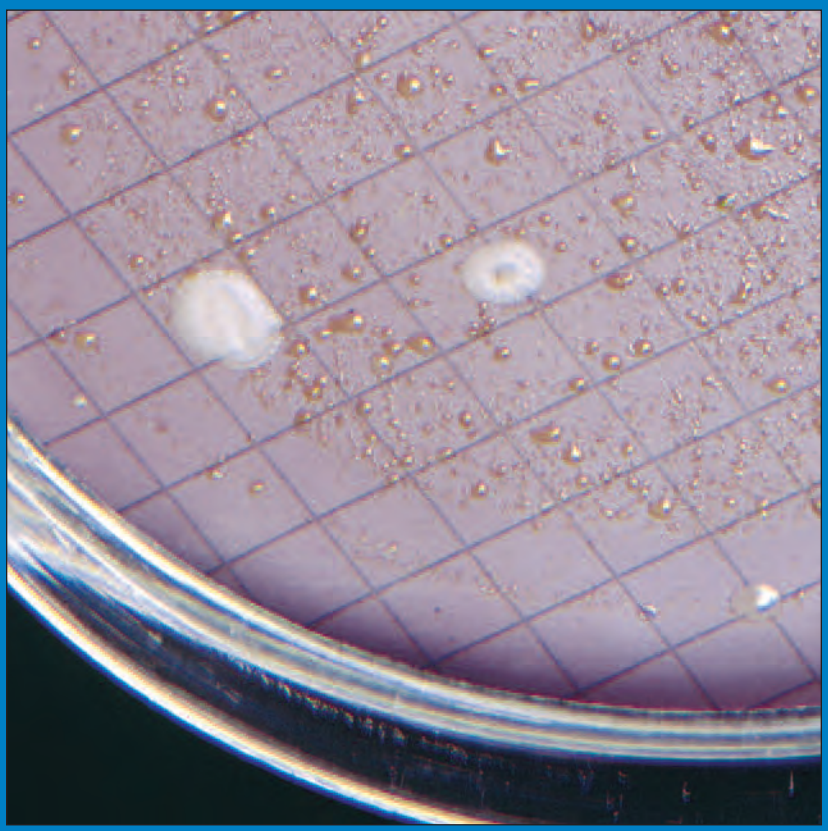


Selecting and Designing a Filtration System

In designing or selecting a system for microporous filtration, it is worthwhile to spend some time defining a few specific parameters of the filtration problem:

- **What is to be filtered, liquid or gas?** For filtering of gases or sterile venting of vessels or gas lines, use a hydrophobic membrane such as PTFE. Chemical resistance tables can be used to help select a membrane material suitable to the liquid being filtered. Also check the compatibility of the filter holder and any O-rings with the filtrate.
- **What size are the smallest particles to be removed?** In general, a pore size just smaller than the smallest size particle to be removed is chosen. For example, 0.20 µm pore size membrane is generally used for sterilizing culture medium, but a 0.10 µm membrane is needed to ensure Mycoplasma removal.
- **At what pressures will the system be operated?** Check the specifications or assume a differential pressure of 2-5 psi (~0.3 kg/cm^2) for a single holder. Be sure to account for the effects of pressure drop in a multi-holder system.
- **How will the filter holder be connected to the system?** Standard Luer, threaded, sanitary, and hose connectors are available depending on the model. Check the specifications for the product you choose.
- **What is the operating temperature?** Check the specifications for your filtration medium (membrane or other filter) and holder.
- **What size filter and holder do I need?** Estimate what volume you will be filtering and the amount of time you plan to allow for the filtration. By dividing the volume by the time in which you expect to complete this filtration you will get a desired minimum flow rate. Use the graphs at right to determine the flow rate per unit area for the differential pressure and membrane in your system (assume a pressure differential of 5 psi (~0.3 kg/cm^2) if it is not known). Divide the desired flow rate by the flow rate per unit area to get a minimum filtration area in cm^2. Multiply this area by a factor of ~5 to allow for clogging.

ADJUSTMENTS

For gaseous filtrations that take place outside of standard temperature and pressure (20°C, one atmosphere), correct flow rates using the following formula:

$$F = Fo \frac{293}{273+T} \frac{P + \triangle P/2}{1.03 + \triangle P/2}$$

F = Corrected flow rate
Fo = Flow rate from chart
T = Temperature in °C
P = Exit pressure in kg/cm^2
$\triangle$P = Pressure drop through the system in kg/cm^2

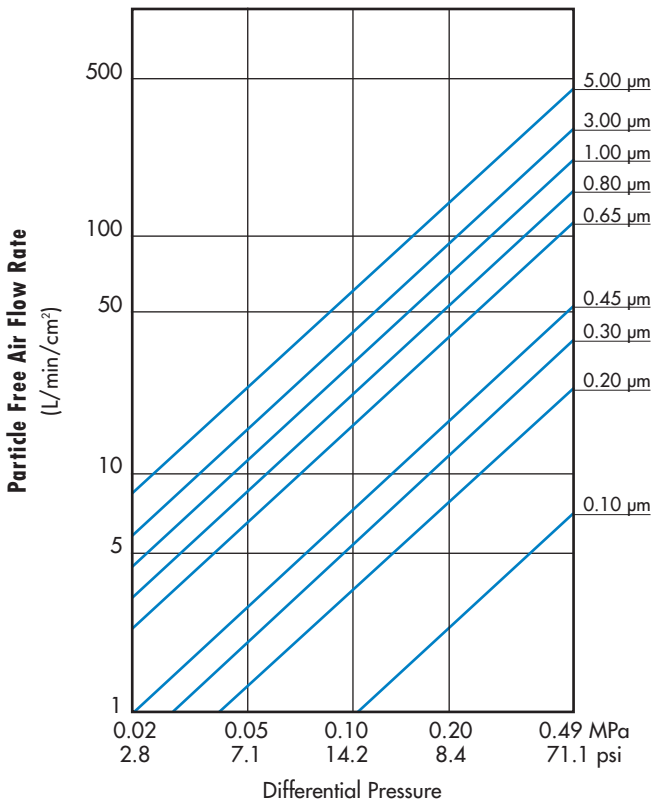
Liquid viscosity can have a significant effect on flow rate. Use this formula to correct for this effect:

$$\text{Flow rate} = \frac{A \bullet P}{V}$$

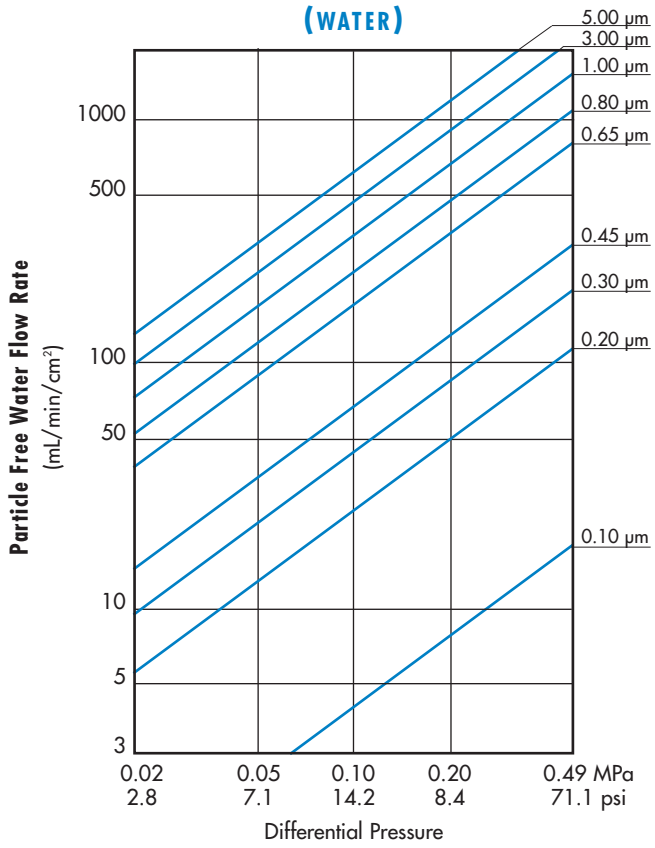
A = Effective filtration area
P = Differential pressure
V = Viscosity

GRAPHS – FLOW RATE VS. DIFFERENTIAL PRESSURE

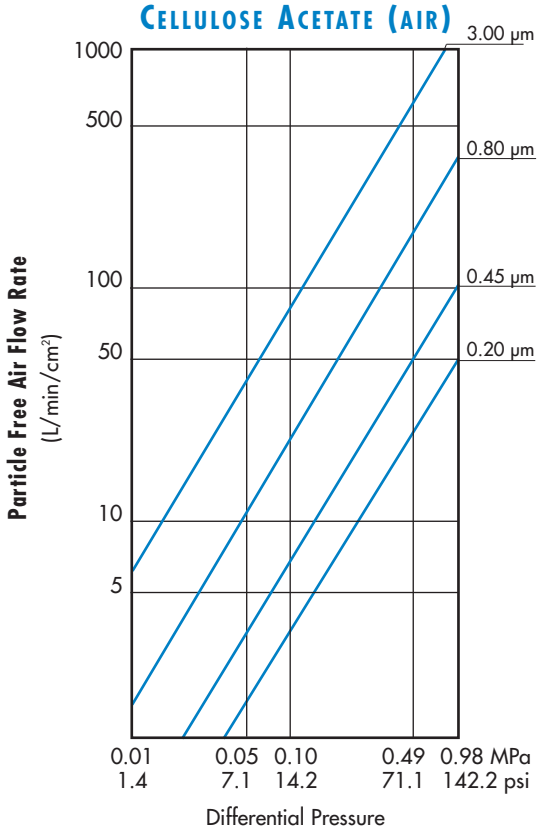
MIXED ESTER OF CELLULOSE (AIR)



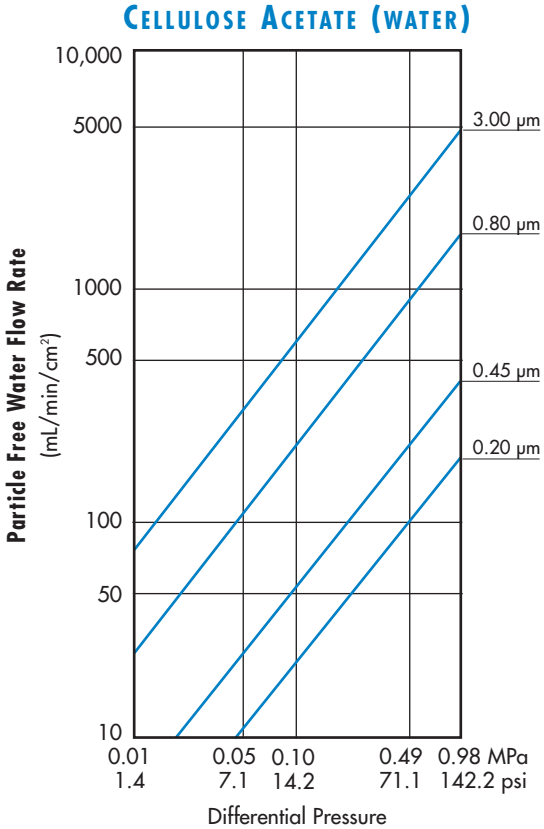
MIXED ESTER OF CELLULOSE (WATER)



CELLULOSE ACETATE (AIR)



CELLULOSE ACETATE (WATER)



Chemical Compatibility

This guide should be used as a reference to select the proper membrane, O-ring and filter holder with regard to chemical compatibility.

Recommendations are based on a 24-hour static exposure to the test fluid at room temperature.

- o – **Recommended**. No change in either water flow rate or bubble point will be observed.
- ✱ – **Limited resistance**. Additional in-house testing is advised as swelling, discoloration or other minor changes may occur.
- x – **Not recommended**. Significant changes in water flow rate and/or bubble point can be expected.
- ▬ – **Data not available**.

Chemical Compatibility – Membrane Filters

Chemical		Polymer/Product											
		MCE		CA	NYLON	PCTE		PTFE	Supported PTFE	Hydrophilic PTFE	CMF Coated Cellulose acetate	37 mm monitor	37 mm monitor set
		White	Black			White	Black						
ACID	Glacial Acetic acid	x	x	x	x	o	x	o	o	o	x	x	x
	10% Acetic acid	o	o	o	o	o	o	o	o	o	o	✱	✱
	12 kmol/m³ Hydrochloric acid (37%, 12N)	x	x	x	x	o	x	o	o	o	x	x	x
	6 kmol/m³ Hydrochloric acid (19%, 6N)	o	x	x	x	o	o	o	o	o	x	✱	✱
	12 kmol/m³ Nitric acid (53%, 12N)	x	x	x	x	o	x	o	o	o	x	x	x
	6 kmol/m³ Nitric acid (26%, 6N)	o	x	x	x	o	x	o	o	o	x	x	x
	18 kmol/m³ Sulfuric acid (96%, 36N)	x	x	x	x	x	x	o	o	x	x	x	x
	3 kmol/m³ Sulfuric acid (16%, 6N)	o	o	x	x	o	o	o	o	o	x	✱	✱
	85% Phosphoric acid	o	o	x	▬	o	x	o	o	o	x	✱	✱
	5% Boric acid	o	o	o	✱	o	o	o	o	o	o	o	o
	50% Formic acid	✱	x	x	▬	o	x	o	o	o	✱	▬	▬
	35% Hydrofluoric acid	o	x	x	x	o	x	o	o	o	x	x	x
	60% Perchloric acid	x	x	x	▬	o	x	o	o	o	x	▬	▬
ALKALI	6 kmol/m³ Sodium hydroxide (26%, 6N)	x	x	x	x	x	x	o	o	o	x	x	x
	6 kmol/m³ Potassium hydroxide (20%, 6N)	x	x	x	o	x	x	o	o	o	x	x	x
	6 kmol/m³ Aqueous ammonia (11%, 6N)	x	x	x	x	x	x	o	o	o	x	x	x
ALCOHOL	Methyl alcohol	x	x	✱	o	o	x	o	o	o	o	x	x
	Ethyl alcohol	x	x	✱	o	o	x	o	o	o	o	x	x
	Isopropyl alcohol	✱	x	✱	o	o	x	o	o	o	o	x	x
	Isobutyl alcohol	o	x	o	o	o	x	o	o	o	o	x	x
	Butyl alcohol	✱	x	o	o	o	x	o	o	o	o	x	x
	Glycerol	o	o	o	o	o	o	o	o	o	o	o	o
	Amyl alcohol	✱	x	o	o	o	x	o	o	o	o	✱	✱
	Benzyl alcohol	x	x	o	o	o	x	o	o	o	x	✱	✱
	Ethylene glycol	✱	x	o	o	o	o	o	o	o	o	✱	x

Continued on next page

CHEMICAL COMPATIBILITY – MEMBRANE FILTERS (CONTINUED)

Chemical		Polymer/Product											
		MCE		CA	NYLON	PCTE		PTFE	Supported PTFE	Hydrophilic PTFE	CMF Coated Cellulose acetate	37 mm monitor	37 mm monitor set
		White	Black			White	Black						
ETHERS	Ethyl ether	O	O	O	O	*	X	O	O	O	O	*	X
	Isopropyl ether	O	O	O	-	O	X	O	*	O	O	X	X
	Tetrahydrofuran	X	X	X	*	X	X	O	*	O	X	X	X
	Dioxane	X	X	X	O	X	X	O	*	O	X	X	X
	Petroleum ether	O	O	O	-	O	O	O	O	O	O	-	-
ESTERS	Methyl acetate	X	X	X	O	X	X	O	*	O	X	X	X
	Butyl acetate	X	X	*	-	*	X	O	*	O	O	X	X
	Amyl acetate	X	X	*	O	O	*	O	*	O	O	X	X
KETONES	Acetone	X	X	X	O	X	X	O	O	O	X	X	X
	Methylethyl ketone	X	X	X	O	X	X	O	*	O	X	X	X
	Methyl isobutyl ketone	X	X	X	-	X	X	O	*	O	X	X	X
	Cyclohexanone	X	X	X	O	X	X	O	O	O	X	X	X
HYDROCARBONS	Benzene	O	X	O	*	X	X	O	O	O	O	X	X
	Toluene	O	O	O	*	X	*	O	*	O	O	X	X
	Xylene	O	X	O	O	O	X	O	*	O	X	X	X
	Hexane	O	O	O	O	O	O	O	O	O	O	X	X
	Gasoline	O	O	O	O	O	O	O	*	O	O	*	X
	Kerosene	O	O	O	O	O	O	O	*	O	X	O	*
HALOGENATED HYDROCARBONS	Chloroform	O	O	X	O	X	X	O	*	O	X	X	X
	Methylene chloride	*	X	X	*	X	X	O	*	O	X	X	X
	Trichloroethylene	O	O	O	O	X	X	O	*	O	O	X	X
	Tetrachloroethylene	O	X	O	-	X	X	O	*	O	O	X	X
	Carbon tetrachloride	O	O	O	O	O	O	O	O	O	O	X	X
AMINES	Aniline	X	X	X	X	X	X	O	O	O	X	X	X
	Dimethyl formamide	X	X	X	O	X	X	O	O	O	X	X	X
	Diethyl acetamide	X	X	X	O	X	X	O	O	O	X	X	X
	Triethanolamine	X	X	O	O	O	X	O	O	O	X	X	X
CELLOSOLVES	Methyl cellosolve	X	X	X	O	O	X	O	O	O	X	X	X
	Butyl cellosolve	X	X	O	O	O	X	O	O	O	O	X	X
MISCELLANEOUS	Nitrogen	O	O	O	O	O	O	O	O	O	O	O	O
	Hydrogen	O	O	O	O	O	O	O	O	O	O	O	O
	30% Hydrogen peroxide	O	O	O	O	O	O	O	O	O	O	X	X
	Saline solution	O	O	O	O	O	O	O	O	O	O	O	O
	Dimethylsulfoxide	X	X	*	*	X	X	O	O	O	X	X	X
	Nitrobenzene	X	X	X	O	X	X	O	O	O	X	X	X
	Methanol (1): Chloroform (1)	X	X	X	-	X	X	O	*	O	X	X	X
	Pyridine	X	X	X	O	X	X	O	*	O	X	X	X
	Acetonitrile	X	X	X	O	X	X	O	O	O	X	X	X
	Phenol	X	X	X	O	X	X	O	O	O	X	X	X
	Freon	O	O	O	O	O	O	O	*	O	O	O	O
	37% Formaldehyde	O	X	*	O	O	X	O	O	O	O	X	X
	Silicone oil	O	O	O	O	O	X	O	*	O	X	-	-
	n-Hexane (95): Ethyl acetate (5)	*	O	X	-	O	O	O	*	O	O	X	X
	Nitric acid (70): Distilled water (30)	X	X	X	X	X	X	O	O	O	X	X	X
	Petroleum oil	O	O	O	O	O	X	O	O	O	O	*	X

O – Recommended *** – Limited resistance** **X – Not recommended** **- – Data not available**

CHEMICAL COMPATIBILITY: DISPOSABLE SYRINGE FILTER UNITS

Chemical		AS Mixed cellulose esters with acrylic housing	CS Cellulose acetate with acrylic housing	CP Cellulose acetate with PP housing	HP Hydrophilic PTFE with PP housing	JP Hydrophobic PTFE with PP housing	NS Nylon with acrylic housing	NP Nylon with PP housing
ACIDS	3 kmol/m³ Hydrochloric acid (10%, 3N)	O	*	*	O	O	*	*
	9 kmol/m³ Hydrochloric acid (30%, 9N)	X	X	X	O	O	X	X
	1 kmol/m³ Sulfuric acid (5%, 2N)	O	O	O	O	O	*	*
	4 kmol/m³ Sulfuric acid (20%, 8N)	X	X	X	O	O	X	X
	1 kmol/m³ Nitric acid (5%, 1N)	O	O	*	O	O	*	*
	5 kmol/m³ Nitric acid (20%, 5N)	X	X	X	*	*	X	X
	20% Acetic acid	O	O	O	O	O	O	O
	Glacial acetic acid	X	X	X	O	O	X	X
	10% Hydrofluoric acid	X	X	X	O	O	X	X
	35% Hydrofluoric acid	X	X	X	O	O	X	X
	10% Chromic acid	*	*	*	*	*	*	*
	10% Phosphoric acid	O	O	O	O	O	*	*
ALKALIS	2.5 kmol/m³ Sodium hydroxide (10%, 2.5N)	X	X	X	O	O	X	X
	2 kmol/m³ Potassium hydroxide (10%, 2N)	X	X	X	O	O	X	O
	8 kmol/m³ Aqueous ammonia (28%, 8N)	X	O	*	O	O	O	O
ALCOHOLS	Methyl alcohol	X	X	O	O	O	O	O
	Ethyl alcohol	X	*	O	O	O	O	O
	n-Propyl alcohol	*	O	O	O	O	O	O
	Isopropyl alcohol	*	O	O	O	O	O	O
	n-Butyl alcohol	*	O	O	O	O	O	O
	Amyl alcohol	*	O	O	O	O	O	O
	Benzyl alcohol	*	X	X	O	O	*	O
	Ethylene glycol	X	X	O	O	O	*	O
	Glycerol	O	O	O	O	O	O	O
ETHERS	Ethyl ether	X	X	*	*	*	X	O
	Isopropyl ether	X	X	O	O	O	-	-
	Tetrahydrofuran (THF)	X	X	X	*	*	X	*
	Dioxane	X	X	X	*	*	X	O
ESTERS	Methyl acetate	X	X	X	*	*	X	O
	Ethyl acetate	X	X	X	*	*	X	-
	Butyl acetate	X	X	X	*	*	X	X
	Amyl acetate	X	X	*	*	*	X	-
KETONES	Acetone	X	X	X	O	O	X	O
	Methyl ethyl ketone (MEK)	X	X	X	*	*	X	O
	Methyl isobutyl ketone (MIBK)	X	X	X	*	*	X	O
	Cyclohexanone	X	X	X	*	*	X	O
HYDROCARBONS	Benzene	X	X	*	*	*	X	*
	Toluene	X	X	*	*	*	X	*
	Xylene	X	X	*	*	*	X	*
	n-Hexane	X	X	*	*	*	X	O
	Gasoline	*	*	O	O	O	*	O
	Kerosene	O	O	*	*	*	X	O

Continued on next page

Chemical Compatibility: Disposable Syringe Filter Units (continued)

Chemical		AS Mixed cellulose esters with acrylic housing	CS Cellulose acetate with acrylic housing	CP Cellulose acetate with PP housing	HP Hydrophilic PTFE with PP housing	JP Hydrophobic PTFE with PP housing	NS Nylon with acrylic housing	NP Nylon with PP housing
HALOGENATED HYDROCARBONS	Chloroform	x	x	x	*	*	x	*
	Methylene chloride	x	x	x	*	*	x	*
	Trichloroethylene	x	x	*	*	*	x	o
	Carbon tetrachloride	x	x	*	o	o	x	o
	Trichloroethane	x	x	x	*	*	x	o
	Perchloroethylene	x	x	x	*	*	x	o
	Freon (TMC)	x	x	*	*	*	x	o
AMINES	Aniline	x	x	x	*	*	x	*
	Dimethyl formamide	x	x	x	*	*	x	o
	Diethylacetamide	x	x	x	*	*	x	-
	Triethanolamine	x	o	o	o	o	x	-
CELLOSOLVES	Ethyl acetate cellosolve	x	x	x	*	*	x	*
MISCELLANEOUS	Acetonitrile	x	x	x	*	*	x	*
	Pyridine	x	x	x	*	*	x	o
	6% Sodium Hypochloride	x	x	x	o	o	x	-
	35% Formaldehyde	x	*	*	o	o	x	-
	Iron (II) chloride	o	o	o	o	o	o	o
	Copper sulfate	o	o	o	o	o	o	o
	Mineral oil	*	o	*	*	*	*	*
	Salt water	o	o	o	o	o	o	o
	10% Hydrogen peroxide	x	*	o	o	o	x	o
	Nitrobenzene	x	x	x	*	*	x	-
	Phenol	x	x	x	o	o	x	-
	Silicone oil	x	x	x	o	o	x	-
	Petroleum oil	*	*	o	o	o	x	-
	Acetonitrile (70): water (30)	x	x	x	o	o	x	o

o – Recommended *** – Limited resistance** **x – Not recommended** **- – Data not available**

CHEMICAL COMPATIBILITY – CAPSULES

Chemical		CCS	CCF	CCFH	CCP	CCG
ACIDS	5% Acetic acid	O	O	O	O	O
	20% Acetic acid	O	O	*	O	*
	10% Chromic acid	-	*	*	*	X
	3 kmol/m³ Hydrochloric acid (10%, 3N)	O	O	O	O	O
	11 kmol/m³ Hydrochloric acid (35%,11N)	O	O	X	O	*
	10% Hydrofluoric acid	-	O	O	O	X
	1 kmol/m³ Nitric acid (5%, 1N)	-	O	O	O	*
	4 kmol/m³ Nitric acid (20%, 4N)	-	*	*	*	X
	10% Phosphoric acid	-	O	O	O	O
	1 kmol/m³ Sulfuric acid (5%, 2N)	O	O	O	O	O
	4 kmol/m³ Sulfuric acid (20%, 8N)	O	O	O	O	*
ALKALIS	2.5 kmol/m³ Sodium hydroxide (10%, 3N)	O	O	X	O	*
	2 kmol/m³ Potassium hydroxide (10%, 2N)	O	O	X	O	*
	5 kmol/m³ Aqueous ammonia (10%, 5N)	O	O	X	O	*
	15 kmol/m³ Aqueous ammonia (28%, 15N)	O	O	X	O	*
ALCOHOLS	Methyl alcohol	O	O	O	O	*
	Ethyl alcohol	O	O	O	O	*
	n-propyl alcohol	O	O	O	O	*
	n-butyl alcohol	O	O	*	O	*
	Ethylene glycol	O	O	O	O	O
ETHERS	Ethyl ether	*	*	*	*	X
	Dioxane	*	*	*	*	X
	Tetrahydrofuran (THF)	X	*	X	*	X
ESTERS	Amyl acetate	-	*	*	*	-
	Methyl acetate	-	*	*	*	*
	Ethyl acetate	X	*	*	*	*
	Butyl acetate	-	*	*	*	*
KETONES	Acetone	X	*	*	*	X
	Methyl ethyl ketone (MEK)	X	*	*	*	X
	Methyl isobutyl ketone (MIBK)	X	*	-	*	X
HYDROCARBONS	n-hexane	*	*	-	*	*
	Cyclohexane	*	*	*	*	*
	Benzene	*	*	*	*	*
	Toluene	X	*	*	*	X
	Xylene	-	*	*	*	*
HALOGENATED HYDROCARBONS	Chloroform	X	*	X	*	X
	Carbon tetrachloride	-	*	*	*	*
	Freon (TMC)	X	*	-	*	X
	Methylene chloride	X	*	X	*	X
	Trichloroethylene	-	*	*	*	X
	Trichloroethane	-	*	-	*	*
AMINES	Dimethyl formamide	X	*	*	*	X
ALDEHYDES	Acetaldehyde	-	-	-	-	-
	35% Formaldehyde	O	O	*	O	O

Continued on next page

Chemical Compatibility – Capsules (continued)

Chemical		CCS	CCF	CCFH	CCP	CCG
CELLOSOLVES	Acetic cellosolve	-	*	-	*	*
MISCELLANEOUS	Acetonitrile	-	*	-	*	-
	Pyridine	-	*	-	*	x
	Nitrobenzene	-	-	x	-	-
	6% Sodium hypochlorite	-	o	o	o	o
	Ferrous chloride	o	o	o	o	o
	Copper sulfate	o	o	o	o	o
	Mineral oil	*	*	*	*	*
	Salt water	o	o	o	o	o
	10% Hydrogen peroxide	o	o	o	o	*

o – Recommended *** – Limited resistance** **x – Not recommended** **- – Data not available**

CHEMICAL COMPATIBILITY – CARTRIDGES

Chemicals		TCR	TCS TCS-G TCS-E	TCF TCFH	TCY TCYE	TCP TCPE TCPD	TC	TC (SUS type with NBR Gasket)	TCG	TCG-R (NBR Gasket)
ACIDS	20% Acetic acid	o	o	o	o	o	x	*	*	*
	10% Chromic acid	x	-	*	x	*	x	x	x	x
	3 kmol/m³ Hydrochloric acid (10%, 3N)	x	o	o	x	o	x	x	o	x
	9 kmol/m³ Hydrochloric acid (30%, 9N)	x	o	o	x	o	x	x	*	x
	10% Hydrofluoric acid	x	-	o	x	o	*	x	x	x
	1 kmol/m³ Nitric acid (5%, 1N)	x	-	o	*	o	*	x	*	x
	4 kmol/m³ Nitric acid (20%, 4N)	x	-	*	x	*	x	x	x	x
	10% Phosphoric acid	o	-	o	o	o	*	x	o	o
	1 kmol/m³ Sulfuric acid (5%, 2N)	x	o	o	o	o	*	*	o	*
	4 kmol/m³ Sulfuric acid (20%, 8N)	x	o	o	x	o	x	x	*	x
ALKALIS	2.5 kmol/m³ Sodium hydroxide (10%, 2.5N)	x	o	o	x	*	x	x	x	x
	2 kmol/m³ Potassium hydroxide (20%, 2N)	x	o	o	x	*	x	x	x	x
	15 kmol/m³ Aqueous ammonia (28%, 15N)	*	o	o	x	*	x	x	*	*
ALCOHOLS	Methyl alcohol	*	o	o	o	o	*	*	*	*
	Ethyl alcohol	o	o	o	o	o	*	*	*	*
	n-propyl alcohol	o	o	o	o	o	o	*	*	*
	n-butyl alcohol	o	o	o	o	o	o	*	*	*
ETHERS	Dioxane	x	x	*	x	*	x	x	x	x
	Tetrahydrofuran (THF)	x	x	*	x	*	x	x	x	x
	Ethyl ether	x	x	x	x	x	x	x	x	x
ESTERS	Amyl acetate	-	-	x	x	x	-	-	-	-
	Methyl acetate	x	-	*	x	*	*	x	*	x
	Ethyl acetate	x	x	*	x	*	*	x	*	x
	Butyl acetate	x	-	*	x	*	*	x	*	x
KETONES	Acetone	x	x	*	x	*	-	x	x	x
	Methyl ethyl ketone (MEK)	x	x	*	x	*	x	x	x	x
	Methyl isobutyl ketone (MIBK)	x	x	*	x	*	x	x	x	x
HYDROCARBONS	n-hexane	x	x	x	x	x	x	x	x	x
	Benzene	x	x	*	*	*	x	x	*	x
	Toluene	x	x	*	*	*	*	x	x	x
	Xylene	x	-	*	*	*	*	x	*	x
HALOGENATED HYDROCARBONS	Chloroform	x	x	x	x	x	x	x	x	x
	Carbon tetrachloride	*	-	*	*	*	*	x	*	x
	Freon (TMC)	x	x	*	x	*	-	-	x	x
	Methylene chloride	x	x	x	x	x	x	x	x	x
	Trichloroethylene	x	-	x	x	x	x	x	x	x
	Trichloroethane	x	-	*	*	*	*	x	*	-
AMINES	Dimethyl formamide	x	x	*	x	*	x	x	x	x

Continued on next page

CHEMICAL COMPATIBILITY – CARTRIDGES (CONTINUED)

Chemicals		TCR	TCS TCS-G TCS-E	TCF TCFH	TCY TCYE	TCP TCPE TCPD	TC	TC (SUS type with NBR Gasket	TCG	TCG-R (NBR Gasket)
ALDEHYDES	35% Formaldehyde	*	O	O	*	O	*	*	O	*
CELLOSOLVES	Acetic cellosolve	X	-	*	X	*	-	-	*	-
MISCELLANEOUS	Acetonitrile	X	-	*	X	*	-	-	-	-
	Pyridine	X	-	*	X	*	X	X	X	X
	6% Sodium hypochlorite	X	-	*	X	*	X	X	*	*
	Ferrous chloride	O	O	O	O	O	X	X	O	X
	Copper sulfate	O	O	O	O	O	*	O	O	O
	Mineral oil	*	*	*	*	X	X	X	*	*
	Salt water	O	O	O	O	O	O	*	O	*
	10% Hydrogen peroxide	*	O	O	*	O	*	*	*	*

O – Recommended *** – Limited resistance** **X – Not recommended** **- – Data not available**

CHEMICAL COMPATIBLITY – CARTRIDGES AND O-RINGS

Chemicals		WPP	WPS	WCP	WSP	Gasket/O-ring EPR EPDM	SILICONE	NBR	CHLOROPRENE	FPM	PTFE	FEP Encap-sulated
ACIDS	20% Acetic acid	O	*	*	*	O	O	*	*	O	O	O
	10% Chromic acid	*	*	X	O	*	*	X	X	*	O	O
	3 kmol/m³ Hydrochloric acid (10%, 3N)	O	X	X	X	O	O	O	O	O	O	O
	9 kmol/m³ Hydrochloric acid (30%, 9N)	O	X	X	X	O	X	*	X	O	O	O
	10% Hydrofluoric acid	O	X	X	X	*	X	X	*	*	O	O
	1 kmol/m³ Nitric acid (5%, 1N)	O	*	*	*	O	O	X	X	O	O	O
	4 kmol/m³ Nitric acid (20%, 4N)	*	*	X	*	X	X	X	X	O	O	O
	10% Phosphoric acid	O	O	*	O	O	O	O	O	O	O	O
	1 kmol/m³ Sulfuric acid (5%, 2N)	O	*	*	*	O	O	O	O	O	O	O
	4 kmol/m³ Sulfuric acid (20%, 8N)	O	X	X	X	O	O	O	O	O	O	O
ALKALIS	2.5 kmol/m³ Sodium hydroxide (10%, 2.5N)	O	O	*	O	O	X	O	O	O	O	O
	2 kmol/m³ Potassium hydroxide (20%, 2N)	O	O	*	-	O	*	O	O	O	O	O
	15 kmol/m³ Aqueous ammonia (28%, 15N)	O	O	*	*	O	O	X	O	O	O	O
ALCOHOLS	Methyl alcohol	O	O	O	O	O	O	X	O	*	O	O
	Ethyl alcohol	O	O	O	O	O	O	*	O	O	O	O
	n-propyl alcohol	O	O	O	-	O	O	*	O	O	O	O
	n-butyl alcohol	O	O	O	*	O	O	X	O	O	O	O
ETHERS	Dioxane	*	*	-	-	*	*	X	X	X	O	O
	Tetrahydrofuran (THF)	*	*	X	-	X	X	X	X	X	O	O
	Ethyl ether	*	*	O	-	X	X	X	*	X	O	O
ESTERS	Amyl acetate	*	*	-	-	*	X	X	X	X	O	O
	Methyl acetate	*	*	O	-	O	*	X	*	X	O	O
	Ethyl acetate	*	*	O	*	*	*	X	X	X	O	O
	Butyl acetate	*	*	O	-	*	X	X	X	X	O	O
KETONES	Acetone	*	*	*	O	O	*	X	*	X	O	O
	Methyl ethyl ketone (MEK)	*	*	O	*	*	*	X	X	X	O	O
	Methyl isobutyl ketone (MIBK)	*	*	*	-	X	O	X	X	X	O	O
HYDROCARBONS	n-hexane	*	*	O	-	X	X	O	*	O	O	O
	Benzene	*	*	*	*	X	*	X	X	O	O	O
	Toluene	*	*	O	*	X	X	X	X	O	*	*
	Xylene	*	*	O	O	X	X	X	X	O	O	O
HALOGENATED HYDROCARBONS	Chloroform	*	*	O	*	X	X	X	X	O	*	*
	Carbon tetrachloride	*	*	O	-	X	X	X	X	O	O	O
	Freon (TMC)	*	*	O	-	-	-	X	-	-	O	O
	Methylene chloride	*	*	O	-	X	X	X	X	O	O	O
	Trichloroethylene	*	*	O	*	X	X	X	X	O	O	O
	Trichloroethane	*	*	O	-	X	X	X	-	O	O	O
AMINES	Dimethyl formamide	X	*	*	*	O	O	X	X	X	O	O
ALDEHYDES	35% Formaldehyde	O	*	*	*	O	-	O	O	O	O	O
CELLOSOLVES	Acetic cellosolve	*	*	-	-	*	O	X	*	X	O	O
MISCELLANEOUS	Acetonitrile	*	*	O	-	O	X	X	O	X	O	O
	Pyridine	*	-	O	-	X	X	X	X	X	O	O
	6% Sodium hypochlorite	*	X	X	X	O	X	*	O	O	O	O
	Ferrous chloride	O	X	X	X	O	O	O	O	*	O	O
	Copper sulfate	O	O	O	O	O	O	O	O	O	O	O
	Mineral oil	*	*	O	O	X	*	O	*	O	O	O
	Salt water	O	*	*	*	O	O	O	O	O	O	O
	10% Hydrogen peroxide	*	O	*	O	*	O	X	O	O	O	O

Sterile Membrane Cross Reference Conversion Guide

Advantec MFS	Description	Millipore	Whatman	Pall	Catalog Page
A020H047A	White grid	GSWG 047 S1	7187 114	-	19
A045C047A	White plain	HAWP 047 S0	-	-	19
A045D047A	White grid	HAWG 047 S0	-	63077	19
A045F047A	White grid	HAWG 047 S2, SJ	7141 104	-	19
A045F047W	White grid	HAWG 047 S2	-	-	19
A045H047A	White grid	HAWG 047 S1, S	7141 114	66068, 66278	19
A045H047W	White grid	HAWG 047 S1, S	7141 114	66068, 66278	19
A045H047Y	White grid	HAWG 047 S3	7141 124	66278	19
A045T047A	White grid	HAWG 047 A0	7141 204	64194	19
A065F047A	White grid	HCWG 047 S4	-	-	19
A065H047A	White grid	HCWG 047 S1	-	66426	19
A045R047A	Black grid	HABG 047 S1, S	7153 104	66378	20
A080R047A	Black grid	AABG 047 SO	-	-	20
A045W047A	Green grid	-	7155 104	66379	20

See individual listings for packaging configurations.

Glass, Quartz, and Paper Cross Reference Conversion Guide

Advantec MFS	Millipore	Whatman	Pall	Fisher	Schleicher & Schuell	Ahlstrom	Catalog page
GA-55	APFA	GF/A	-	09-804-55A	31	111	28
GF-75	APFF	GF/F	-	-	20	151	28
GB-100R	-	EPM2000	(Air)	-	1HV	-	28
GB-140	APFB	GF/B	-	09-804-55B	32	121	28
GC-50	AP-40/APFC	GF/C 934 AH	A/E (Water)	09-804-55C	30/25	131	28
GC-90	AP15	-	-	-	-	-	28
GD-120	APFD	GF/D	-	09-804-55D	40	141	28
GS-25	AP20	-	-	-	-	164	28
QR-100	-	QM-A	Micro Quartz	-	-	-	28
No. 1	FP105	1	-	09-795F	410 or 1450cv	631	32
No. 101	FH560-260	4	-	09-790-12F	-	-	32
No. 131	FP102	3 or 6	-	09-803-6G	597	238	32
No. 2	FP104	2	-	09-801-E	604	601	32
No. 231	-	1	-	-	-	-	32
No. 232	-	-	-	-	-	642	32
No. 235	-	5	-	09-803-5F	-	610	32

Comparisons of glass fiber filters are for those with closest similarity. Exact counterparts do not exist due to the nature of the depth type filter matrix.

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