

Capsule Filters

In standard, medium, and mini configurations



MEISSNER
FILTRATION PRODUCTS

Max. Operating Pressure
& Temperature for Liquids:
75 psig @ 32°F to 100°F
(5.2 bar @ 0°C to 38°C)

Max. Operating Pressure
& Temperature for Gases:
50 psig @ 32°F to 100°F
(3.4 bar @ 0°C to 38°C)

FLOW

CS2MG7-77
7 µm, 3/4" San. Flange
Lot: FR37880
SN: T3897344



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FILTRATION PRODUCTS

Max. Operating Pressure
& Temperature for Liquids:
75 psig @ 32°F to 100°F
(5.2 bar @ 0°C to 38°C)

Max. Operating Pressure
& Temperature for Gases:
50 psig @ 32°F to 100°F
(3.4 bar @ 0°C to 38°C)

FLOW

CS2TW0.2-228
0.2 µm, 3/8" HB, Vent
Lot: FR4283
OT8788181



EverLUX®

MEISSNER
FILTRATION PRODUCTS

Max. Operating Pressure
& Temperature for Liquids:
75 psig @ 32°F to 100°F
(5.2 bar @ 0°C to 38°C)

Max. Operating Pressure
& Temperature for Gases:
50 psig @ 32°F to 100°F
(3.4 bar @ 0°C to 38°C)

FLOW

Lot: F

Meissner Filtration Products

Meissner designs, develops, manufactures and services advanced, high quality filtration and fluid processing systems worldwide. Our sophisticated material tracking and automated manufacturing operations provide unmatched quality control and traceability, guaranteeing the highest level of product performance and reliability. Meissner Technical Services (MTS) provides customer support for selecting, sizing, installing and operating filtration and fluid handling systems, as well as complete validation testing services and documentation. Meissner works closely with clients to specify products that maximize efficiency and optimize applications.

Capsule Filters

Meissner capsule filters are ready-to-use, disposable filter assemblies designed and manufactured for critical point-of-use filtration and small batch processing of liquids and gases. Capsule filter assemblies are compact, easy to use and specifically designed to satisfy the highest standards of filtration reliability, security and user convenience. Capsule assemblies combine a full range of filter media, pore size ratings and surface areas to satisfy numerous applications.

Each capsule consists of a compact filter element integrally sealed into a rugged, disposable polypropylene housing. Using a unique state-of-the-art process, the filter element and housing are thermally bonded into a self-contained unit. This permanently sealed, one-piece construction offers the greatest assurance of filtration performance, reliability and security in a wide range of fluids and applications.

All materials used in the manufacture of our capsule filters meet FDA requirements for food contact use and are biosafe in accordance with USP Class VI plastics biological reactivity tests. Meissner's capsule filters are manufactured in conformance to cGMP.



Capsule filters comply with European Commission Regulation No. 10/2011. The filters meet the requirements as specified in the current USP Class VI plastics, pyrogen and cytotoxicity tests. No binders or adhesives are used in the construction of these filters. Capsule filters are non-fiber-releasing as defined in 21 CFR 210.3(b)(6) and 211.72. All materials of construction meet FDA standards for food contact per 21 CFR 177.

Capsule filter assemblies are offered in several sizes with a variety of adapters for quick and easy connection to most filtration systems.

Applications and Use

Capsule filters meet the critical demand for contamination control in the pharmaceutical, biological, bioprocessing, electronics, chemical, food and beverage, cosmetics and other industries. Capsule assemblies are used to control particulate and microbial contamination in liquid and gas applications. These filters offer high reliability, security and convenience for point-of-use and small to medium batch processing applications. They are used in a wide variety of laboratory, pilot plant and production applications, and are ideal for flow rates less than 3 gpm (11 L/min) or 25 cfm (42.5 m³/hr).



Materials Construction

Capsule Housing: Polypropylene
Support Components: Polypropylene
Sealing Method: Thermal Bonding

All materials are listed for food contact use in the Code of Federal Regulations (CFR) Title 21.

Filter Media

Hydrophilic Membranes
SteriLUX® polyvinylidene fluoride (PVDF)
STyLUX® polyethersulfone (PES)
EverLUX® polyethersulfone (PES)

Hydrophobic Membranes
Steridyne® polyvinylidene fluoride (PVDF)
Ultradyne® polytetrafluoroethylene (PTFE)

Microfiber
Protec® RF borosilicate glass
Protec® RM borosilicate glass + PVDF membrane
ALpHA® polypropylene (PP)
ALpHA® G polyester (PBT)
Vanguard® polypropylene (PP)
DeltaMax® polypropylene (PP)
DeltaDepth® polypropylene (PP)

Operating Characteristics

CF(2), CS(2), CL(2), CJ2 Models

Operating Temperature Range:

32 °F to 100 °F (0 °C to 38 °C)

Maximum Operating Pressure:

75 psig @ 100 °F (5.2 bar @ 38 °C), liquid

50 psig @ 100 °F (3.4 bar @ 38 °C), gas

Maximum Temperature Rating:

140 °F @ 45 psig (60 °C @ 3.1 bar), liquid

140 °F @ 30 psig (60 °C @ 2.1 bar), gas

Reverse Operating Pressure:

15 psig @ 100 °F (1 bar @ 38 °C)

CM2, CK2 Models

Operating Temperature Range:

32 °F to 122 °F (0 °C to 50 °C)

Maximum Operating Pressure:

100 psig @ 122 °F (6.9 bar @ 50 °C), liquid

100 psig @ 122 °F (6.9 bar @ 50 °C), gas

Maximum Temperature Rating:

160 °F @ 35 psig (72 °C @ 2.4 bar), liquid

160 °F @ 35 psig (72 °C @ 2.4 bar), gas

Reverse Operating Pressure:

15 psig @ 100 °F (1 bar @ 38 °C)

Dimensions (Nominal)

Model	Diameter	Length
CJ2	2.75" (7.0 cm)	10.00" (25.4 cm)
CL(2)	2.75" (7.0 cm)	6.90" (17.5 cm)
CS(2)	2.75" (7.0 cm)	4.50" (11.4 cm)
CF(2)	2.25" (5.7 cm)	3.25" (8.3 cm)
CK2	1.25" (3.2 cm)	6.25" (15.9 cm)
CM2	1.25" (3.2 cm)	5.50" (14 cm)

Connections

Meissner capsule filters are available with a wide range of inlet/outlet connections. Please reference the ordering matrix for detailed information.

All models are available with luer or valved ports for venting, draining or sampling.

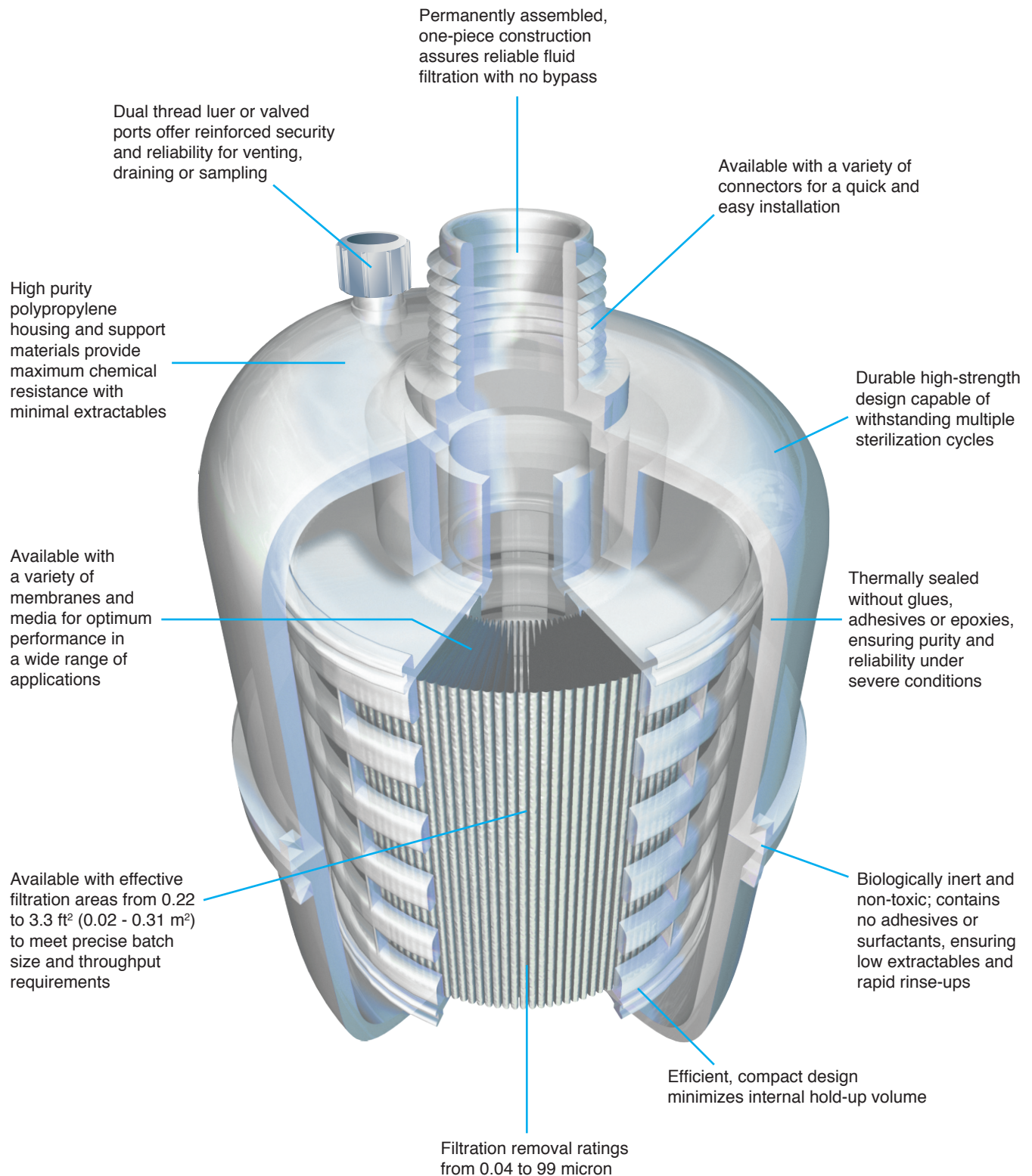
An optional filling bell assembly can be specified.

Sterilization

Autoclave at a minimum of 121 °C for 60 minutes or 135 °C for 45 minutes. Capsule assemblies can be repeatedly autoclaved without loss of integrity up to 130 °C. SteriLUX®, Steridyne®, STyLUX®, EverLUX®, ALpHA® G and Protec® capsules may be gamma irradiated up to 40 kGy. Autoclaving gamma irradiated capsules is not recommended. Capsule assemblies must not be *in situ* steam sterilized, as this will exceed the material design limits and can result in rupture of the plastic housing.



A Closer Look - Capsule Components



SteriLUX® PVDF

SteriLUX® disposable capsule filters are absolute-rated hydrophilic PVDF membrane filters optimized for sterile filtration, prefiltration and clarification of pharmaceutical and biological solutions. The surface-modified SteriLUX® membrane filter is manufactured by Meissner's proprietary process to provide immediate and permanent water-wettability, unmatched flow, high mechanical strength, thermal and chemical stability, and ultra-low binding characteristics.

Advantages

- Hydrophilic PVDF membrane
- Absolute ratings from 0.1 to 0.6 μm
- High flow rates at low pressure drops
- Ultraclean - no additives or surfactants
- Extremely low extractables
- High thermal and hydrolytic stability
- Extremely low protein and preservative binding
- Fully integrity testable in water
- Cleanroom manufactured
- 100% integrity tested during manufacture

Applications

SteriLUX® capsule filters can be used to filter acids, bases, organic solvents, pharmaceutical preparations and active ingredients, parenterals, biopharmaceuticals, vaccines, serum, blood products, ophthalmic solutions, orals, topicals, protein solutions, buffers, salts, diluents, microbiological growth media, cell and tissue culture media and additives, bulk pharmaceutical chemicals, diagnostics, cosmetics and toiletries, solvent/product mixtures, reagents, and water for injection (WFI).

Specifications

Filter Media: Polyvinylidene Fluoride (PVDF) Membrane

Absolute Filtration Ratings: 0.1, 0.2, 0.4, 0.6 μm

Effective Filtration Area

CM2	0.36 ft ² (335 cm ²)	CS(2)	1.6 ft ² (0.15 m ²)
CK2	0.45 ft ² (415 cm ²)	CL(2)	3.3 ft ² (0.31 m ²)
		CJ2	5.2 ft ² (0.48 m ²)

Bacterial Retention

ASTM F838 Challenge

0.1 μm , 0.2 μm > 10⁷ cfu/cm² *Brevundimonas diminuta*
(0.1 μm and 0.2 μm meet the FDA definition of a sterilizing grade filter.)

0.4 μm > 10⁷ cfu/cm² *Serratia marcescens*

Integrity Testing

Minimum Bubble Point, Water

0.1 μm	70 psi (4.8 bar)
0.2 μm	50 psi (3.4 bar)
0.4 μm	28 psi (1.9 bar)
0.6 μm	14 psi (1.0 bar)

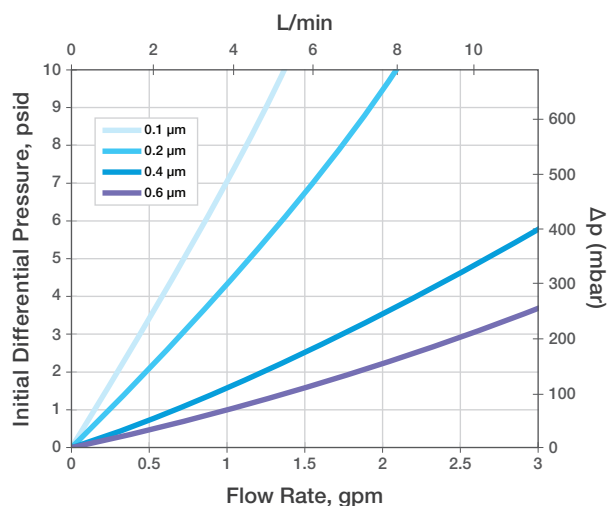
Minimum Bubble Point, 70/30% IPA/Water

0.1 μm	25 psi (1.7 bar)
0.2 μm	17 psi (1.2 bar)

Sterilization

Available presterilized (gamma)

SteriLUX® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.



Steridyne® PVDF

Steridyne® disposable capsule filters are absolute-rated hydrophobic PVDF membrane filters designed to provide absolute bacterial and particulate removal from critical gases and liquids. They are ideal for pharmaceutical gases, fermentor air, sterile venting, and for many low surface tension chemicals and solvents. Manufactured by Meissner's proprietary process, this hydrophobic PVDF membrane has high mechanical strength, broad chemical and solvent compatibility, and high thermal stability.

Advantages

- Inherently hydrophobic PVDF membrane
- Absolute rated 0.2 µm
- Virus-retentive in gases
- High air flow rates
- Ultraclean - no additives, surfactants, or post treatments
- Broad chemical compatibility
- High thermal and hydrolytic stability
- Cleanroom manufactured
- 100% integrity tested during manufacture

Applications

Steridyne® capsule filters are optimized for sterile vent and gas filtration, and can be used to filter acids, bases, organic solvents and solvent-product mixtures in pharmaceutical manufacturing. Steridyne® capsules are ideal for pharmaceutical, biopharmaceutical, chemical, food and beverage, general industrial and laboratory applications.

Specifications

Filter Media: Polyvinylidene Fluoride (PVDF) Membrane

Absolute Filtration Ratings: 0.2 µm

Effective Filtration Area

CM2	0.36 ft² (335 cm²)	CS(2)	1.6 ft² (0.15 m²)
CK2	0.45 ft² (415 cm²)	CL(2)	3.3 ft² (0.31 m²)
CF(2)	0.73 ft² (680 cm²)	CJ2	5.2 ft² (0.48 m²)



Bacterial Retention

ASTM F838 Challenge

Steridyne® retains > 10⁷ cfu/cm² *Brevundimonas diminuta*

(This filter meets the FDA definition of a sterilizing grade filter.)

Integrity Testing

Minimum Bubble Point, 60/40% IPA/water

0.2 µm 18 psi (1.24 bar)

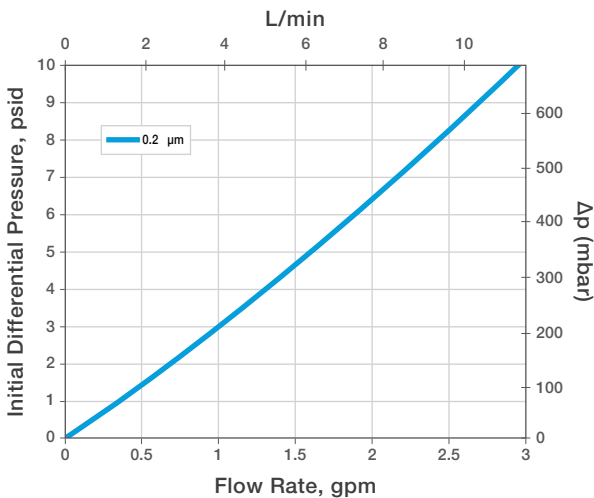
Minimum Bubble Point, 70/30% IPA/water

0.2 µm 17 psi (1.17 bar)

Sterilization

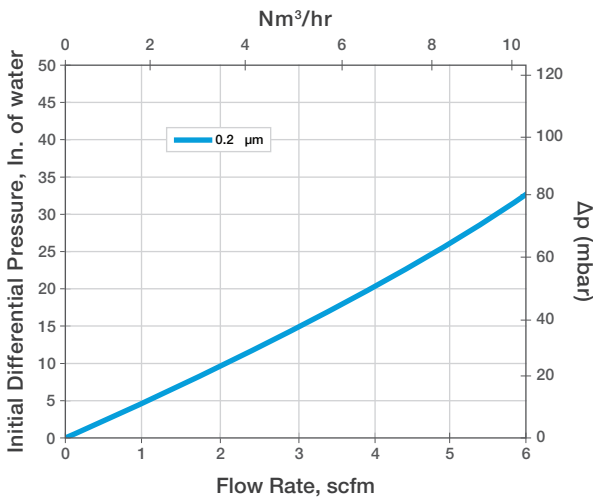
Available presterilized (gamma)

Steridyne® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.

Steridyne® Capsule Typical Air Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.

STyLUX® PES

STyLUX® disposable capsule filters are absolute-rated, polyethersulfone membrane filters designed to provide greater bacteria and particle removal at high flow rates and extremely low pressure drops. STyLUX® capsules contain an asymmetric PES membrane that offers the greatest assurance of filtration performance, stability and service life for controlling contaminants in demanding environments. The highly porous PES membrane is permanently hydrophilic, has exceptional flow rates, and provides excellent compatibility and extremely low extractables in a wide range of fluids and applications.

Advantages

- Permanently hydrophilic membrane
- Absolute ratings from 0.04 to 0.6 µm
- Extremely high flow rates at low pressure drops
- Ultraclean - no additives, surfactants, or post treatments
- High thermal and hydrolytic stability
- Wide chemical compatibility through pH range 1-14
- Highly passive to protein adsorption; low binding
- Reliable integrity under severe process conditions
- Fully integrity testable in water
- Cleanroom manufactured
- 100% integrity tested during manufacture

Applications

STyLUX® capsule filters offer the greatest security for high quality filtration in a wide variety of applications. Typical applications include ultrapure water, acids and bases, etchants, alcohols and aldehydes. STyLUX® capsules are designed for removal of particulates, colloids and microorganisms from a broad range of pharmaceutical and biological liquids. Typical liquids include pharmaceutical preparations, antibiotics, vaccines, protein solutions, immunologicals, virus suspensions, radiodiagnostics, enzymes, ophthalmic solutions, reagents, salt solutions, nutrients, serum and blood-based products, biologicals and many more.

Specifications

Filter Media: Polyethersulfone (PES) Membrane

Absolute Filtration Ratings: 0.04, 0.1, 0.2, 0.4, 0.6 µm

Effective Filtration Area

CM2	0.36 ft² (335 cm²)	CS(2)	1.6 ft² (0.15 m²)
CK2	0.45 ft² (415 cm²)	CL(2)	3.3 ft² (0.31 m²)
CF(2)	0.70 ft² (650 cm²)	CJ2	5.2 ft² (0.48 m²)

Bacterial Retention

ASTM F838 Challenge

0.04 µm, 0.1 µm, 0.2 µm > 10⁷ cfu/cm² *Brevundimonas diminuta*
(0.04 µm, 0.1 µm and 0.2 µm meet the FDA definition of a sterilizing grade filter.)

0.4 µm > 10⁷ cfu/cm² *Serratia marcescens*

0.04 µm SC0.1 > 10⁷ cfu/cm² *Acholeplasma laidlawii*

Integrity Testing

Minimum Bubble Point, Water

0.04 µm	115 psi (7.9 bar)
0.1 µm (SC grade)	110 psi (7.58 bar)
0.1 µm	80 psi (5.5 bar)
0.2 µm	44 psi (3.0 bar)
0.4 µm	32 psi (2.2 bar)
0.6 µm	18 psi (1.2 bar)

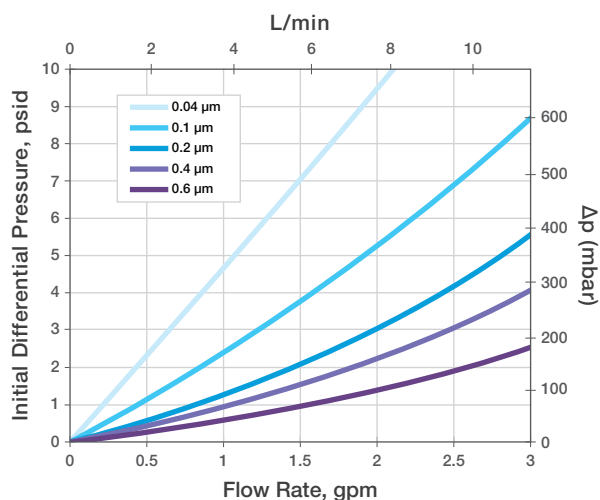
Minimum Bubble Point, 70/30% IPA/Water

0.04 µm	37 psi (2.55 bar)
0.1 µm (SC grade)	35 psi (2.41 bar)
0.1 µm	27 psi (1.9 bar)
0.2 µm	15 psi (1.0 bar)
0.4 µm	9 psi (0.6 bar)
0.6 µm	6 psi (0.4 bar)

Sterilization

Available presterilized (gamma)

STyLUX® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.



EverLUX® PES

The EverLUX® capsule filter is designed for very high contaminant capacity, extended service life and high flow, with low pressure drop in a wide range of biological fluids. Optimized for sterile filtration, prefiltration and clarification applications, EverLUX® filters offer exceptional service life and flow when filtering moderate to high contaminant liquids. They also provide absolute bacteria retention and low protein binding. EverLUX® is a highly cost-effective and time saving filter, often reducing the number of filters required and extending the time between change-outs.

Advantages

- Permanently hydrophilic membrane
- Absolute ratings from 0.2 to 0.6 μm
- Extremely high flow rates at low pressure drops
- Ultraclean - no additives, surfactants, or post treatments
- High thermal and hydrolytic stability
- Wide chemical compatibility through pH range 1-14
- Low absorption, high transmission of proteins, active ingredients and preservatives
- Lower filtration costs through increased service life and contaminant-holding capacity
- Fully integrity testable in water
- Cleanroom manufactured
- 100% integrity tested during manufacture

Applications

EverLUX® capsule filters are designed for sterilization, prefiltration and clarification of low to high-contaminant liquids. Typical applications include blood products, buffers, complex biologicals, cell and tissue culture media, process intermediates, protein solutions, supernatants, vaccines and ophthalmic solutions.

Specifications

Filter Media: Polyethersulfone (PES) Membrane

Absolute Filtration Ratings: 0.1, 0.2, 0.4, 0.6 μm

Effective Filtration Area

STW Grade		SMH, SPH Grade	
CM2	0.28 ft ² (260 cm ²)	CM2	0.36 ft ² (335 cm ²)
CK2	0.35 ft ² (325 cm ²)	CK2	0.45 ft ² (415 cm ²)
CF(2)	0.58 ft ² (540 cm ²)	CF(2)	0.70 ft ² (650 cm ²)
CS(2)	1.2 ft ² (0.11 m ²)	CS(2)	1.6 ft ² (0.15 m ²)
CL(2)	2.6 ft ² (0.24 m ²)	CL(2)	3.3 ft ² (0.31 m ²)
CJ2	4.0 ft ² (0.37 m ²)	CJ2	5.2 ft ² (0.48 m ²)

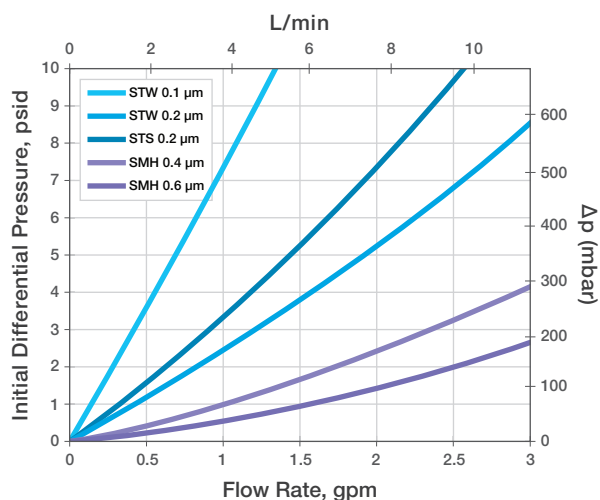
Bacterial Retention

ASTM F838 Challenge

STW 0.1 μm , STW 0.2 μm > 10⁷ cfu/cm² *Brevundimonas diminuta* (STW 0.1 μm , STW 0.2 μm meet the FDA definition of a sterilizing grade filter.)

SMH 0.4 μm > 10⁷ cfu/cm² *Serratia marcescens*

EverLUX® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.

Integrity Testing

Minimum Bubble Point, water (SM grade)

0.4 μm 40 psi (2.76 bar)

0.6 μm 22 psi (1.52 bar)

Minimum Bubble Point (STW grade)

0.1 μm 80 psi (5.52 bar), water

0.1 μm 30 psi (2.07 bar), 60/40% IPA/water

0.1 μm 27 psi (1.86 bar), 70/30% IPA/water

Maximum Diffusive Flow @ 40 psi, Water (STW grade - 0.1 μm)

CS(2)STW0.1-xxx 4.4 mL/min

CL(2)STW0.1-xxx 9.6 mL/min

Maximum Diffusive Flow @ 30 psi, Water (STW grade - 0.2 μm)

CM2STW0.2-xxx 1.2 mL/min

CK2STW0.2-xxx 1.9 mL/min

CF(2)STW0.2-B-xxx 2.7 mL/min

CS(2)STW0.2-xxx 6.0 mL/min

CL(2)STW0.2-xxx 13.0 mL/min

Sterilization

Available presterilized (gamma)



Ultradyne® PTFE

Ultradyne® disposable capsule filters are absolute-rated PTFE membrane filters that offer the greatest assurance of filtration performance and chemical compatibility in severe process conditions. Ultradyne® capsule filters contain a PTFE membrane that provides superior flow rates and long service life. The highly porous PTFE membrane is inherently hydrophobic and offers maximum chemical compatibility and minimal extractables in a wide range of fluids and applications.

Advantages

- Inherently hydrophobic membrane
- Absolute ratings from 0.1 to 1.0 μm
- Superior flow rates at low pressure drops
- Minimal extractable levels
- Wide chemical and solvent compatibility
- 100% integrity tested during manufacture
- Cleanroom manufactured

Applications

Ultradyne® capsule filters are inert, chemically pure filters designed for the utmost security in aggressive solvents, highly corrosive chemicals and gases. Typical applications include acids, bases, alcohols, solvents, esters, ketones, etchants, photolithographic chemicals, compressed air and gases, and sterile vents/exhausts for autoclaves, lyophilizers, sterilizers, fermentors and similar equipment.

Specifications

Filter Media: Polytetrafluoroethylene (PTFE) Membrane

Absolute Filtration Ratings: 0.1, 0.2, 0.4, 1.0 μm

Effective Filtration Area

CM2	0.36 ft ² (335 cm ²)	CS(2)	1.2 ft ² (0.11 m ²)
CK2	0.45 ft ² (415 cm ²)	CL(2)	2.5 ft ² (0.23 m ²)
CF(2)	0.50 ft ² (465 cm ²)	CJ2	5.3 ft ² (0.49 m ²)

Bacterial Retention

ASTM F838 Challenge

0.1 μm , TA 0.2 μm , TT 0.2 μm > 10⁷ cfu/cm² *Brevundimonas diminuta* (0.1 μm , TA 0.2 μm , TT 0.2 μm meet the FDA definition of a liquid rated sterilizing grade filter.)

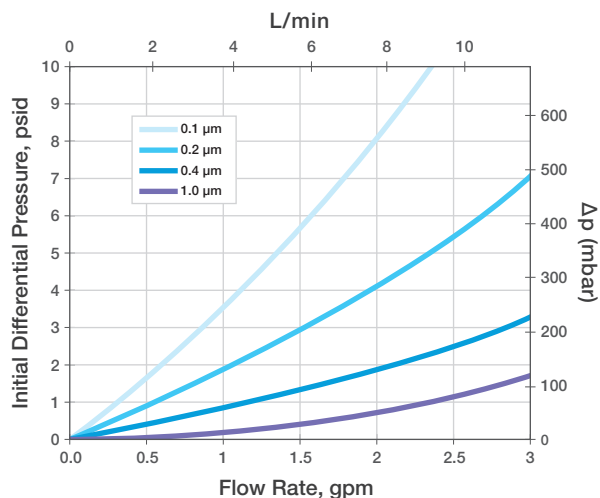
0.4 μm > 10⁷ cfu/cm² *Serratia marcescens*

Integrity Testing

Minimum Bubble Point, 60/40% IPA/Water

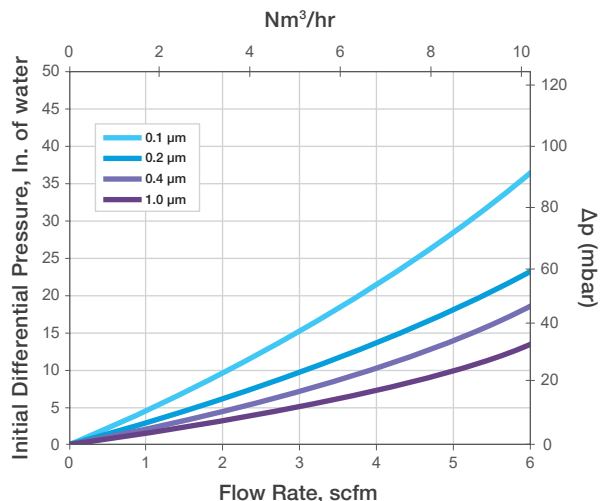
0.1 μm	20 psi (1.4 bar)
0.2 μm	14 psi (1.0 bar) TM grade - gas service
	16 psi (1.1 bar) TA, TT grade - liquid service
0.4 μm	7 psi (0.5 bar)
1.0 μm	4 psi (0.3 bar)

Ultradyne® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.

Ultradyne® Capsule Typical Air Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.



ALpHA® PP Microfiber

ALpHA® disposable capsule filters are absolute-rated depth-type filters made of self-bonded polypropylene microfiber filter medium that maintains consistent porosity and particle retention. ALpHA® capsules provide superior flow rates and high throughputs, submicron retention, high efficiency and dirt-holding capacity. All-polypropylene construction offers excellent chemical compatibility and low extractables in a wide range of fluids and applications.

Advantages

- Absolute removal ratings from 0.45 to 70 µm
- Precise particle retention at rated level
- 100% polypropylene construction
- High flow rates
- Ultraclean - contains no binders, adhesives or surfactants
- Self-bonded filter media, non-fiber releasing
- Cleanroom manufactured

Applications

ALpHA® capsule filters offer a low cost alternative to membrane capsule filters. Typical applications include prefiltration and clarification of water, gases, chemicals, solvents, etchants, buffers, reagents, photochemicals, coatings and inks.

Pore Size (µm)	Removal Rating in Microns (µm) at % Efficiency		
	100%	99%	90%
0.45	0.45	0.40	<0.30
0.6	0.6	0.56	0.38
0.8	0.8	0.72	0.50
1.2	1.2	1.1	0.7
2.4	2.4	2.3	2.0
5.0	5.0	4.5	3.0
7.0	7.0	6.5	5.0
10.0	10.0	9.5	7.5
20.0	20.0	19.0	12.0
30.0	30.0	26.0	16.0
40.0	40.0	35.0	28.0

Specifications

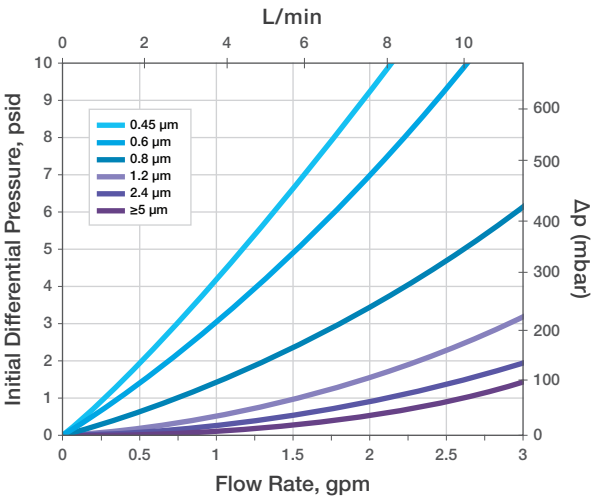
Filter Media: Polypropylene (PP) Microfiber

Absolute Filtration Ratings: 0.45, 0.6, 0.8, 1.2, 2.4, 5, 7, 10, 20, 30, 40, 70 µm

Effective Filtration Area

CM2	0.29 ft² (270 cm²)	CS(2)	1.0 ft² (0.09 m²)
CK2	0.36 ft² (335 cm²)	CL(2)	2.0 ft² (0.19 m²)
CF(2)	0.50 ft² (465 cm²)	CJ2	3.2 ft² (0.30 m²)

ALpHA® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.



ALpHA® G PBT Microfiber

ALpHA® G capsule filters utilize a unique absolute-rated depth type polyester filter media that has been optimized for gamma irradiation cycles commonly used to sterilize single-use systems. The filter's tapered pore structure provides high flow rates and high throughput, while also delivering extraordinary dirt holding capacity.

Advantages

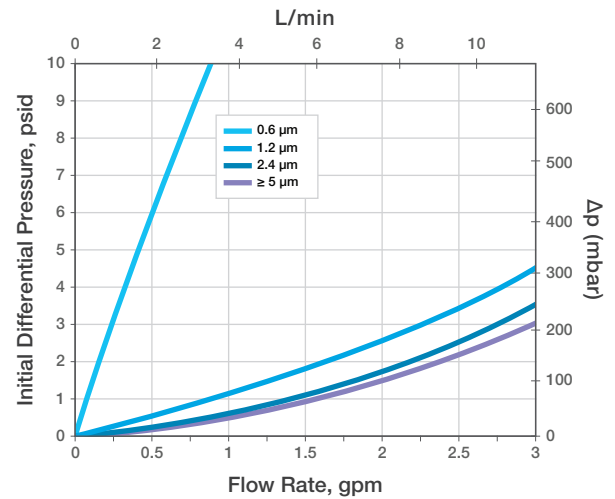
- Absolute removal ratings from 0.6 to 20 μm
- Precise particle retention at rated level
- Gamma irradiatable – ALpHA® G filters can be provided sterile for immediate use through gamma irradiation
- Ready to use – ALpHA® G filters do not typically require pre-rinse steps before use or post-use rinse steps and blow down steps for product recovery
- Self-bonded filter media, non-fiber releasing
- Low extractables and endotoxin levels
- Cleanroom manufactured

Applications

ALpHA® G capsule filters are ideal for use in the clarification of biopharmaceuticals, and have been optimized for single-use systems requiring gamma irradiation.

Pore Size (μm)	Removal Rating in Microns (μm) at % Efficiency		
	100%	99%	90%
0.6	0.6	0.56	0.38
1.2	1.2	1.1	0.7
2.4	2.4	2.3	2.0
5.0	5.0	4.5	3.0
7.0	7.0	6.5	5.0
10.0	10.0	9.5	7.5
20.0	20.0	19.0	12.0

ALpHA® G Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with $\frac{3}{8}$ " hose barb connections. Consult factory for complete flow rate information.

Specifications

Filter Media: Polyester (PBT) Microfiber

Absolute Retention Ratings: 0.6, 1.2, 2.4, 5, 7, 10, 20 μm

Effective Filtration Area

CM2	0.29 ft ² (270 cm ²)	CS(2)	1.0 ft ² (0.09 m ²)
CK2	0.36 ft ² (335 cm ²)	CL(2)	2.0 ft ² (0.19 m ²)
		CJ2	3.2 ft ² (0.30 m ²)

Sterilization

Available presterilized (gamma)



Protec® Glass Microfiber

The Protec® capsule filter is a glass microfiber prefilter optimized to protect downstream sterile filters. The Protec® RF capsule can be specified with either a single layer of 0.5 μm or 1 μm rated borosilicate glass fiber media. The Protec® RM combines an outer layer of borosilicate glass fiber media with an inner layer of Meissner's proprietary hydrophilic PVDF membrane. Protec® capsule filters provide consistent submicron contaminant removal with high dirt-holding capacity and high flow rates. Protec® filters effectively protect downstream membrane filters and equipment.

Advantages

- RF version is available in absolute-rated 0.5 μm and 1 μm
- RM version is available in absolute-rated 0.2 μm to 0.5 μm
- All-polypropylene support materials
- High flow rates and excellent filtration economics
- Cleanroom manufactured

Applications

Protec® capsule filters are optimized for clarification, prefiltration and bioburden reduction in biological liquids, including serum, plasma fractions and other blood products, vaccines, tissue and cell culture media and feeds, cell removal from fermentation broths, pre-column chromatography and biopharmaceuticals.

Specifications

Filter Media: Borosilicate Glass Microfiber (RF - single layer);

Borosilicate Glass Microfiber + PVDF (RM - double layer)

Absolute Filtration Ratings: 0.5, 1 μm (RF); 0.2, 0.3, 0.5 μm (RM)

Effective Filtration Area

	RF Grade		RM Grade
CM2	0.29 ft ² (270 cm ²)	CM2	0.26 ft ² (240 cm ²)
CK2	0.36 ft ² (335 cm ²)	CK2	0.33 ft ² (305 cm ²)
CF(2)	0.50 ft ² (465 cm ²)	CF(2)	0.42 ft ² (390 cm ²)
CS(2)	1.0 ft ² (0.09 m ²)	CS(2)	0.86 ft ² (0.08 m ²)
CL(2)	2.0 ft ² (0.19 m ²)	CL(2)	1.7 ft ² (0.16 m ²)
CJ2	3.2 ft ² (0.30 m ²)	CJ2	2.8 ft ² (0.26 m ²)

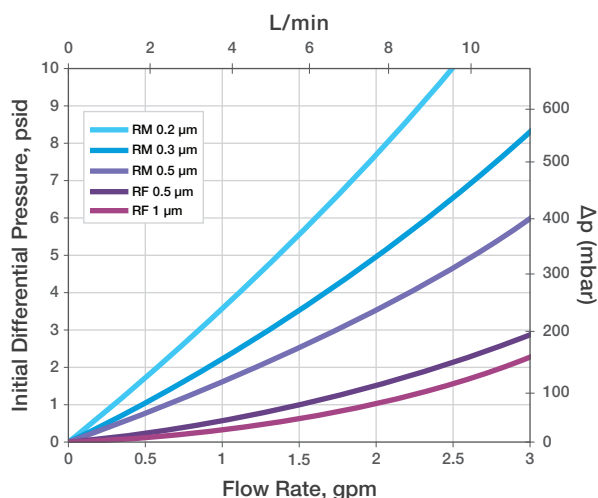
Typical Microbial Retention per cm²

Grade	Rating	Organism	LRV
RF	0.5 μm	<i>Saccharomyces cerevisiae</i>	6
RM	0.5 μm	<i>Serratia marcescens</i> ,	5
		<i>Saccharomyces cerevisiae</i>	≥7
RM	0.3 μm	<i>Serratia marcescens</i>	6
RM	0.2 μm	<i>Serratia marcescens</i>	≥7

Sterilization

Available presterilized (gamma)

Protec® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.



DeltaMax® PP Depth

DeltaMax® disposable capsules are absolute-rated polypropylene depth filters. The filter's unique spiral construction creates a gradient pore structure that maximizes service life and flow rates. DeltaMax® is compatible with a wide array of chemicals and cleaning agents. It is free of surfactants and other additives. It resists contaminant unloading even at high differential pressure.

Advantages

- Absolute-rated polypropylene (PP) depth media
- Absolute retention ratings from 0.5 to 70 μm
- All-polypropylene construction
- Wide chemical compatibility
- High dirt-holding capacity provides long service life
- Rigid support core for added strength
- Cleanroom manufactured

Applications

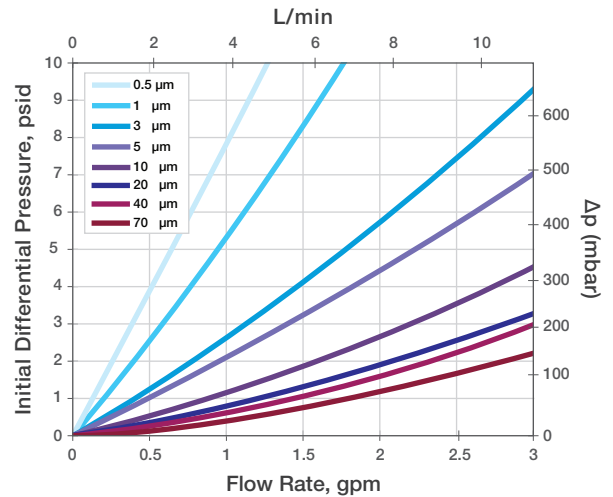
DeltaMax® capsule filters are ideal for clarification, polishing, bioburden reduction and prefiltration in pharmaceutical and biological process liquids, cosmetics and personal care product liquids, chemicals, solvents, UPW and CMP slurries. They are also optimized for wine, beer, mineral water, soft drinks, other beverages, and water purification systems.

Specifications

Filter Media: Polypropylene (PP) Microfiber Depth

Absolute Filtration Ratings: 0.5, 1, 3, 5, 10, 20, 40, 70 μm

DeltaMax® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with $\frac{3}{8}$ " hose barb connections. Consult factory for complete flow rate information.



DeltaDepth® PP Depth

DeltaDepth® disposable capsules are nominally-rated polypropylene depth filters. DeltaDepth® capsules feature a gradient pore structure that maximizes service life and flow rates. DeltaDepth® capsules are extremely robust and compatible with a wide array of chemicals and cleaning agents. The filter is free of surfactants, lubricants, resin binders, adhesives, antistatic or release agents, and other additives.

Advantages

- Polypropylene (PP) depth media
- Nominal retention ratings from 0.5 to 50 μm
- All-polypropylene construction
- Wide chemical compatibility
- High dirt-holding capacity provides long service life
- Rigid support core for added strength
- Cleanroom manufactured

Applications

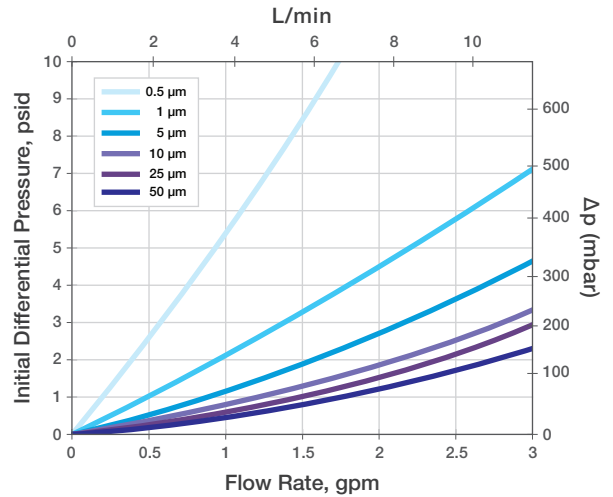
DeltaDepth® capsule filters are ideal for clarification, polishing, bioburden reduction and prefiltration applications. DeltaDepth® capsules are compatible with a wide range of chemicals and cleaning agents. Typical prefiltration applications include pharmaceutical and biological product and process liquids, cosmetics, personal care product liquids, microelectronic chemicals, solvents, UPW and CMP slurries, wine, beer, mineral water, soft drinks, purification systems, chemical processing, potable water, photographic chemicals and metal finishing.

Specifications

Filter Media: Polypropylene (PP) Microfiber Depth

Nominal Retention Ratings: 0.5, 1, 5, 10, 25, 50 μm

DeltaDepth® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with $\frac{3}{8}$ " hose barb connections. Consult factory for complete flow rate information.



Vanguard® PP Microfiber

Vanguard® disposable capsules are economical, premium quality filters that provide consistently high filtration efficiency, superior flow rates, considerable dirt-holding capacity and exceptional service life. Vanguard® capsules are effective in an extremely wide range of fluids and applications.

Advantages

- Nominal retention ratings from 0.1 to 99 µm
- All-polypropylene construction
- High contaminant capacity
- High flow rates
- Ultraclean - contains no binders, adhesives or surfactants
- Self-bonded filter media, non-fiber-releasing
- Cleanroom manufactured

Applications

Vanguard® capsule filters are most appropriate for use when high efficiency filtration and economy are crucial. Typical applications include prefiltration and clarification of water, gases, chemicals, solvents, etchants, reagents, photochemicals, coatings and inks.

Specifications

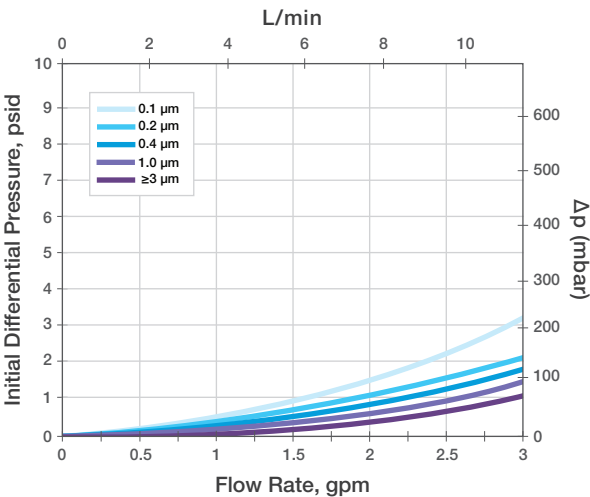
Filter Media: Polypropylene (PP) Microfiber

Nominal Filtration Ratings: 0.1, 0.2, 0.4, 1, 3, 5, 10, 30, 60, 99 µm

Effective Filtration Area

CM2	0.29 ft² (270 cm²)	CS(2)	1.0 ft² (0.09 m²)
CK2	0.36 ft² (335 cm²)	CL(2)	2.0 ft² (0.19 m²)
CF(2)	0.50 ft² (465 cm²)	CJ2	3.2 ft² (0.30m²)

Vanguard® Capsule Typical Water Flow Rates

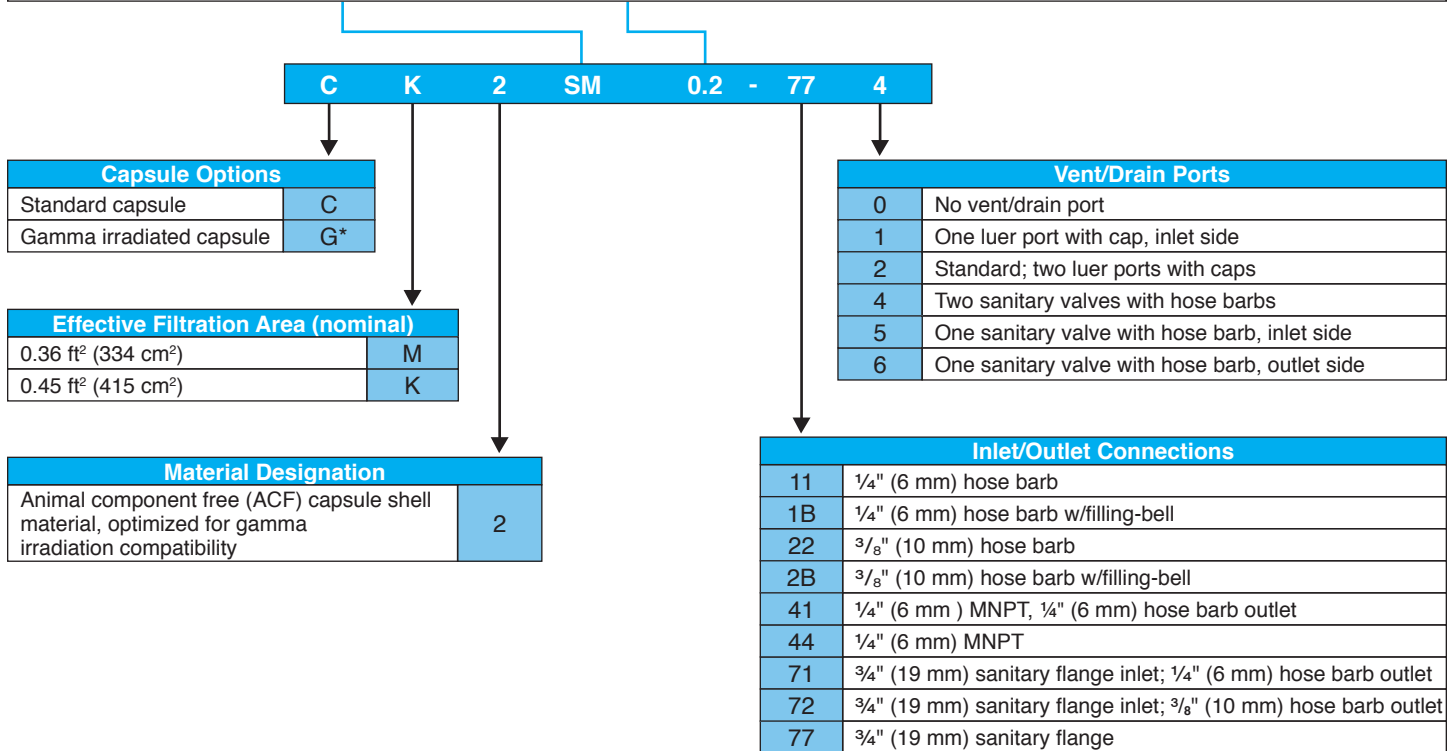


Data shown is for "CS" style capsule with 3/8" hose barb connections. Consult factory for complete flow rate information.



Capsule Filter Ordering Guide - CM2 & CK2 Models

Product	Grade	Retention Rating (µm)
SteriLUX® PVDF	VLH ³ , VMH ² , VPH ⁴ , VTH ¹	0.1, 0.2, 0.4, 0.6 (VLH, VMH, VTH) / 0.1, 0.2, 0.4 (VPH)
Steridyne® PVDF	VMV ² , VTV ¹	0.2
STyLUX® PES	SL ³ , SM ² , SP ⁴ , ST ¹ , SC ¹	0.04, 0.1, 0.2, 0.6 (SL, SM) / 0.04, 0.1, 0.2, 0.4 (SP) / 0.04, 0.1, 0.2, 0.4 (ST) / 0.1 (SC)
EverLUX® PES	SLH ³ , SMH ² , SPH ⁴ , STW ¹	0.4, 0.6 (SLH, SMH) / 0.2, 0.4 (SPH) / 0.1, 0.2 (STW)
Ultradyn® PTFE	TA ² , TM, TT ¹	0.2 (TA, TT) / 0.1, 0.2, 0.4, 1.0 (TM)
Microfiber Media	Grade	Retention Rating (µm)
ALpHA® PP	MF	0.45, 0.6, 0.8, 1.2, 2.4, 5, 7, 10, 20, 30, 40, 70
ALpHA® G Polyester	MG	0.6, 1.2, 2.4, 5, 7, 10, 20
Protec® Glass fiber	RF	0.5, 1 (RF)
Protec® Glass fiber w/PVDF	RM	0.2, 0.3, 0.5 (RM)
Vanguard® PP	MN	0.1, 0.2, 0.4, 1, 3, 5, 10, 30, 60, 99



CM and CK capsules are not available with DeltaDepth® or DeltaMax® media.

*Gamma irradiated capsule option is not available for Chemdyn®, Ultradyn®, ALpHA®, and Vanguard® media.

¹T-Grade (VTH, ST, SC, STW, VTV, PT, TT): This absolute, microbially rated filter meets full traceability requirements for the pharmaceutical industry. It is 100% integrity tested during manufacture. Each T-grade filter is shipped with a Certificate of Quality stating exact quality control criteria and test performance results. This is a validatable product to meet the stringent requirements of the pharmaceutical industry.

²M-Grade (VMH, SM, SMH, VMV, PM, TA): This absolute, microbially rated filter is 100% integrity tested during manufacture. It is suited for critical applications when regulatory documentation requirements are minimal. A certificate of conformance is available on a lot basis.

³L-Grade (SLH, VLH, SL): This filter is not 100% integrity tested or flushed during manufacture. It is offered as an economical prefilter or final filter when sterility assurance is not required.

⁴P-Grade (SPH, VPH, SP): This is an absolute, particulate rated filter. It is 100% integrity tested during manufacture.

Capsule Filter Ordering Guide - CS(2), CL(2), CJ2 & CF(2)

Membrane Media	Grade	Retention Rating (µm)
SteriLUX® PVDF	VLH ³ , VMH ² , VPH ⁴ , VTH ¹	0.1, 0.2, 0.4, 0.6 (VLH, VMH, VTH) / 0.1, 0.2, 0.4 (VPH)
Steridyne® PVDF	VMV ² , VTV ¹	0.2
STyLUX® PES	SL ³ , SM ² , SP ⁴ , ST ¹ , SC ¹	0.04, 0.1, 0.2, 0.4, 0.6 (SL, SM) / 0.04, 0.1, 0.2, 0.4 (SP) / 0.04, 0.1, 0.2, 0.4 (ST) / 0.1 (SC)
EverLUX® PES	SLH ³ , SMH ² , SPH ⁴ , STW ¹	0.4, 0.6 (SLH, SMH) / 0.2, 0.4 (SPH) / 0.1, 0.2 (STW)
Ultradyne® PTFE	TA ² , TM, TT ¹	0.2 (TA, TT) / 0.1, 0.2, 0.4, 1.0 (TM)
Microfiber Media	Grade	Retention Rating (µm)
ALpHA® PP	MF	0.45, 0.6, 0.8, 1.2, 2.4, 5, 7, 10, 20, 30, 40, 70
ALpHA® G polyester	MG	0.6, 1.2, 2.4, 5, 7, 10, 20
Protec® Glass fiber	RF	0.5, 1
Protec® Glass fiber w/PVDF	RM	0.2, 0.3, 0.5
DeltaMax® PP	DM	0.5, 1, 3, 5, 10, 20, 40, 70
DeltaDepth® PP	DD	0.5, 1, 5, 10, 25, 50
Vanguard® PP	MN	0.1, 0.2, 0.4, 1, 3, 5, 10, 30, 60, 99

CF	2	MF	0.6 - 33	B	4
Capsule Options					
Standard capsule	CF*				
Gamma irradiated capsule	GF**				
Material Designation					
Legacy capsule shell material	Null				
Animal component free (ACF) capsule shell material, optimized for gamma irradiation compatibility	2				
Inlet/Outlet Connections					
1/4" - 3/8" (6-9 mm) hose barb			33		
1/4" - 3/8" (6-9 mm) hose barb w/filling bell			3B		
1/4" (6 mm) MNPT x 1/4" (6 mm) hose barb			41		
1/4" (6 mm) MNPT			44		
3/4" (19 mm) sanitary flange			77		
Effective Filtration Area (nominal)					
0.5 ft. ² (0.05 m ²)				B	
Vent/Drain Ports					
No vent/drain ports					0
One, luer port standard with cap, outlet side					1
Two, luer ports with caps					2
Two, sanitary valves with hose barbs					4
One sanitary valve with hose barb, outlet side					5

*CF capsules not available with SteriLUX®, Chemdyne®, ALpHA® G, Protec®, DeltaDepth® or DeltaMax® media. EverLUX® is not available in 0.1, 0.2 µm STW-grade media.

**Gamma irradiated option is not available for Chemdyne®, Ultradyne®, ALpHA®, Vanguard®, DeltaMax®, and DeltaDepth® media.

¹ ALpHA® G is only available in an ACF shell, optimized for gamma irradiation.

¹ T-Grade (VTH, ST, SC, STW, VTV, PT, TT): This absolute, microbially rated filter meets full traceability requirements for the pharmaceutical industry. It is 100% integrity tested during manufacture. Each T-grade filter is shipped with a Certificate of Quality stating exact quality control criteria and test performance results. This is a validatable product to meet the stringent requirements of the pharmaceutical industry.


² M-Grade (VMH, SM, SMH, VMV, PM, TA): This absolute, microbially rated filter is 100% integrity tested during manufacture. It is suited for critical applications when regulatory documentation requirements are minimal. A certificate of conformance is available on a lot basis.

³ L-Grade (SLH, VLH, SL): This filter is not 100% integrity tested or flushed during manufacture. It is offered as an economical prefilter or final filter when sterility assurance is not required.

⁴ P-Grade (SPH, VPH, SP): This is an absolute, particulate rated filter. It is 100% integrity tested during manufacture.

C	S	2	SM	0.2 - 77	4																																																
<div><div>Capsule Options</div><table><tr><td>Standard capsule</td><td>C</td></tr><tr><td>Gamma irradiated capsule</td><td>G**</td></tr><tr><td>UV opaque shell</td><td>O</td></tr></table><div>Effective Filtration Area (nominal)</div><table><tr><td>1.0 ft² (0.09 m²)</td><td>S</td></tr><tr><td>2.0 ft² (0.19 m²)</td><td>L</td></tr><tr><td>4.0 ft² (0.37 m²)</td><td>J</td></tr></table><div>Material Designation</div><table><tr><td>Legacy capsule shell material</td><td>Null†</td></tr><tr><td>Animal component free (ACF) capsule shell material, optimized for gamma irradiation compatibility</td><td>2</td></tr></table><div>Inlet/Outlet Connections</div><table><tr><td>¾" (19 mm) sanitary flange</td><td>77</td></tr><tr><td>¾" (19 mm) sanitary flange in; ⅜" (10 mm) hose barb out</td><td>72</td></tr><tr><td>1" (25 mm) sanitary flange</td><td>00</td></tr><tr><td>1" (25 mm) sanitary flange long neck</td><td>LL</td></tr><tr><td>1" (25 mm) sanitary flange in; ⅜" (10 mm) hose barb out</td><td>02</td></tr><tr><td>1" (25 mm) sanitary flange long neck in; ⅜" (10 mm) hose barb out</td><td>L2</td></tr><tr><td>1" (25 mm) sanitary flange in; ½" (13 mm) hose barb out for flexible tubing</td><td>09</td></tr><tr><td>1" (25 mm) sanitary flange long neck in; ½" (13 mm) hose barb for flexible tubing out</td><td>L9</td></tr><tr><td>⅜" (10 mm) hose barb</td><td>22</td></tr><tr><td>⅜" (10 mm) hose barb w/filling bell</td><td>2B</td></tr><tr><td>½" (13 mm) hose barb for rigid tubing</td><td>CC</td></tr><tr><td>½" (13 mm) hose barb for flexible tubing</td><td>99</td></tr><tr><td>¾" (19 mm) hose barb</td><td>88</td></tr><tr><td>¼" (6 mm) MNPT</td><td>44</td></tr><tr><td>⅜" (10 mm) FNPT</td><td>55</td></tr><tr><td>⅜" (10 mm) MNPT</td><td>66</td></tr></table></div>						Standard capsule	C	Gamma irradiated capsule	G**	UV opaque shell	O	1.0 ft² (0.09 m²)	S	2.0 ft² (0.19 m²)	L	4.0 ft² (0.37 m²)	J	Legacy capsule shell material	Null†	Animal component free (ACF) capsule shell material, optimized for gamma irradiation compatibility	2	¾" (19 mm) sanitary flange	77	¾" (19 mm) sanitary flange in; ⅜" (10 mm) hose barb out	72	1" (25 mm) sanitary flange	00	1" (25 mm) sanitary flange long neck	LL	1" (25 mm) sanitary flange in; ⅜" (10 mm) hose barb out	02	1" (25 mm) sanitary flange long neck in; ⅜" (10 mm) hose barb out	L2	1" (25 mm) sanitary flange in; ½" (13 mm) hose barb out for flexible tubing	09	1" (25 mm) sanitary flange long neck in; ½" (13 mm) hose barb for flexible tubing out	L9	⅜" (10 mm) hose barb	22	⅜" (10 mm) hose barb w/filling bell	2B	½" (13 mm) hose barb for rigid tubing	CC	½" (13 mm) hose barb for flexible tubing	99	¾" (19 mm) hose barb	88	¼" (6 mm) MNPT	44	⅜" (10 mm) FNPT	55	⅜" (10 mm) MNPT	66
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Two, sanitary valves with hose barbs	4
One sanitary valve with hose barb, outlet side	5
One sanitary valve with hose barb, inlet side	6



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