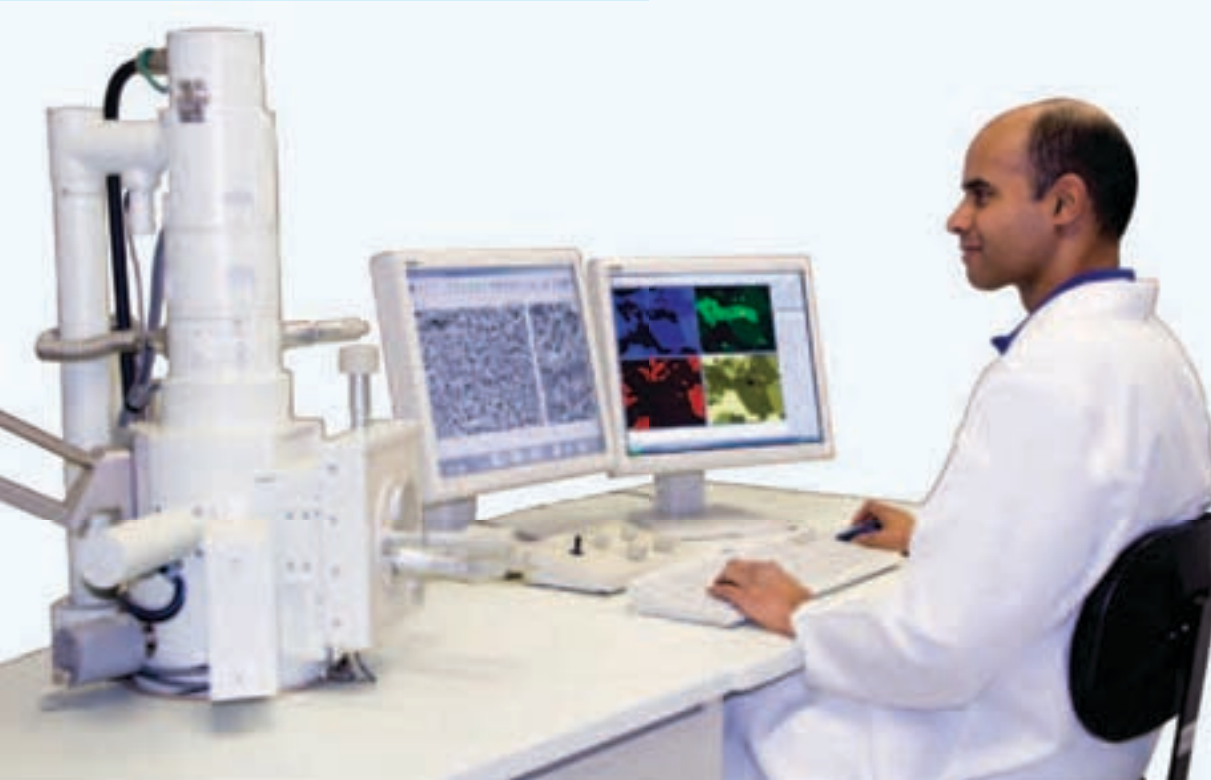


Capsule Filters



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.



Product Description

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, pleated 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.

ALPHA[®], Chemdyne[®], DeltaDepth[®], DeltaMax[®], EverLUX[™], STYLUX[®], SteriLUX[®], Steridyne[®], Ultradyne[®] and Vanguard[®] capsule filters are compliant with the overall migration limit of 10mg/dm² for repeat use applications in contact with alcoholic beverages and acidic food stuffs according to the European Commission Directive 2002/72/EC and subsequent amendments up to 2008/39/EC. Protec[®] capsule filters are compliant with the overall migration limit of 10mg/dm² for repeat use applications in contact with alcoholic beverages according to the European Commission Directive 2002/72/EC and subsequent amendments up to 2008/39/EC.

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⁻¹) or 10 cfm (16,9 m³h⁻¹).

Dual thread Luer-Lok® or valved ports offer reinforced security and reliability for venting, draining or sampling

High purity polypropylene housing and support materials provide maximum chemical resistance with minimal extractables

Available with a variety of membranes and media for optimum performance in a wide range of applications

Available with effective filtration areas from 0.22 to 3.3 ft² (0,02 - 0,31 m²) to meet precise batch size and throughput requirements

Filtration removal ratings from 0.04 to 99 micron

Permanently assembled, one-piece construction assures reliable fluid filtration with no bypass

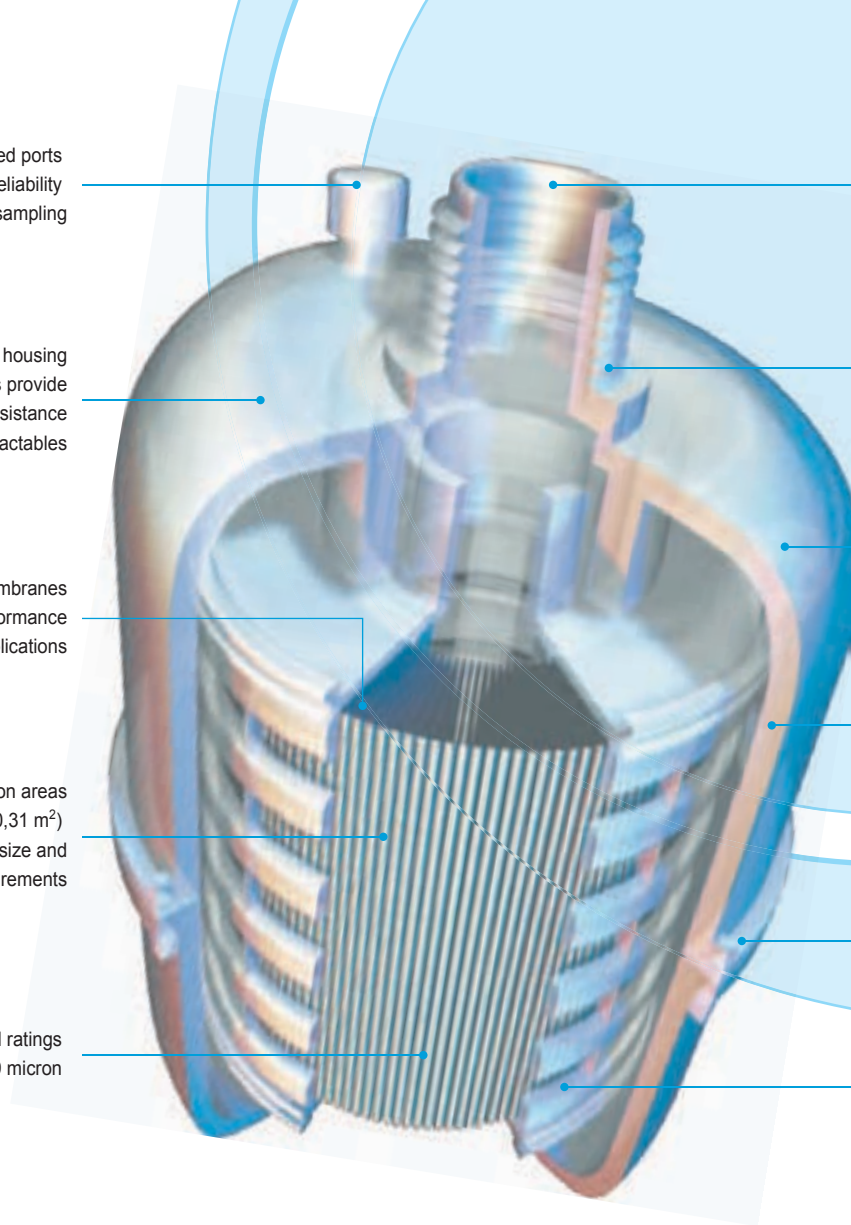
Available with a variety of connectors for a quick and easy installation

Durable high-strength design capable of multiple sterilization cycles

Thermally sealed without glues, adhesives or epoxies, ensuring purity and reliability under severe conditions

Biologically inert and non-toxic; Contains no adhesives or surfactants, insuring low extractables and rapid rinse-ups

Efficient, compact design minimizes internal hold-up volume



General Specifications

Materials of Construction

Capsule Housing: Polypropylene

Filtration Media

Hydrophilic Membranes

SteriLUX® PVDF
STyLUX® polyethersulfone
EverLUX™ polyethersulfone

Hydrophobic Membranes

Steridyne® PVDF
Chemdyne® polypropylene
Ultradyme® PTFE

Microfiber

Protec® RF borosilicate glass
Protec® RM borosilicate glass +
PVDF membrane
ALpHA® polypropylene
Vanguard® polypropylene
DeltaMax® polypropylene
DeltaDepth® 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.

Operating Characteristics

Maximum Operating Pressure:

Liquid Service: 75 psig @ 100 °F
(5,2 bar @ 38 °C)

Gas Service: 50 psig @ 100 °F
(3,4 bar @ 38 °C)

Operating Temperature Range:

32 °F to 100°F (0 °C to 38°C)

Maximum Temperature Rating:

160 °F @ 35 psig (71 °C @ 2,4 bar)

Dimensions (Nominal)

| MODEL | DIAMETER | LENGTH |
|-------|----------------|-----------------|
| CL | 2.75" (7,0 cm) | 6.90" (17,5 cm) |
| CS | 2.75" (7,0 cm) | 4.50" (11,4 cm) |
| CF | 2.25" (5,7 cm) | 3.25" (8,3 cm) |
| CM | 1.25" (3,2 cm) | 5.50" (14,0 cm) |
| CK | 1.25" (3,2 cm) | 6.25" (15,9 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-Lok® or valved ports for venting, draining or sampling.

CF, CS and CL models are available with an optional filling bell assembly.

Sterilization

Autoclave at a minimum of 121 °C for 60 minutes or 125 °C for 45 minutes. Capsule assemblies can be repeatedly autoclaved without loss of integrity at up to 130 °C. SteriLUX®, Steridyne® STyLUX® and EverLUX® 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.

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:

| | | | |
|-----|---|----|--|
| CM* | 0.22 ft ² (0,02 m ²) | CS | 1.6 ft ² (0,15 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CL | 3.3 ft ² (0,31 m ²) |

* nominal

Bacterial Retention: ASTM F838-05 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)

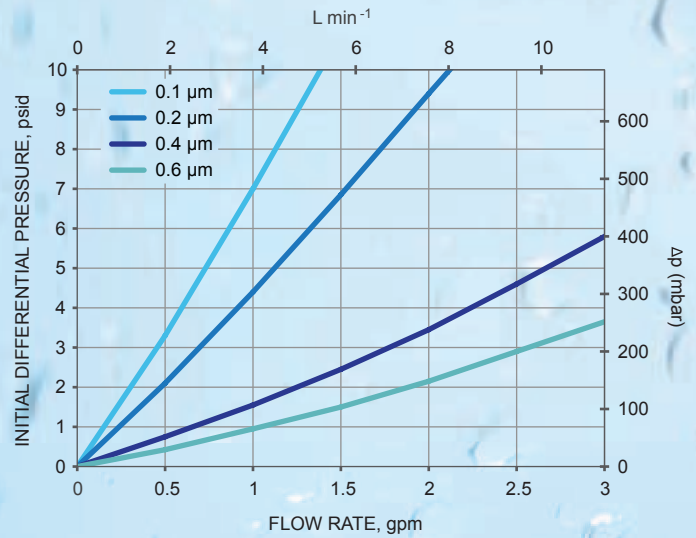
0.2 µm 50 psi (3,4 bar)

0.4 µm 28 psi (1,9 bar)

0.6 µm 14 psi (1,0 bar)

Sterilization: Available presterilized (gamma)

SteriLUX® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/8" hosebarb 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:

| | | | |
|------|---|------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CF-B | 0.75 ft ² (0,07 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CS | 1.6 ft ² (0,15 m ²) |
| CF-A | 0.51 ft ² (0,05 m ²) | CL | 3.3 ft ² (0,31 m ²) |

* nominal

Bacterial Retention: ASTM F838-05 Challenge

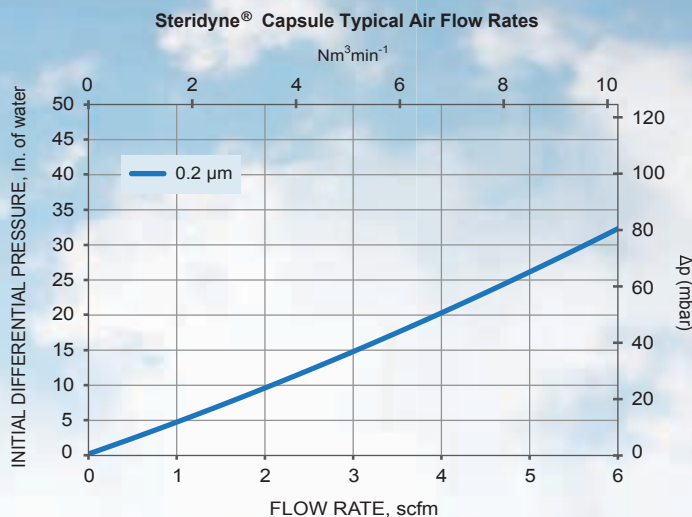
Steridyne® retains > 10⁷ cfu/cm² *Brevundimonas diminuta*, which meets the FDA definition of a sterilizing grade filter.

Integrity Testing

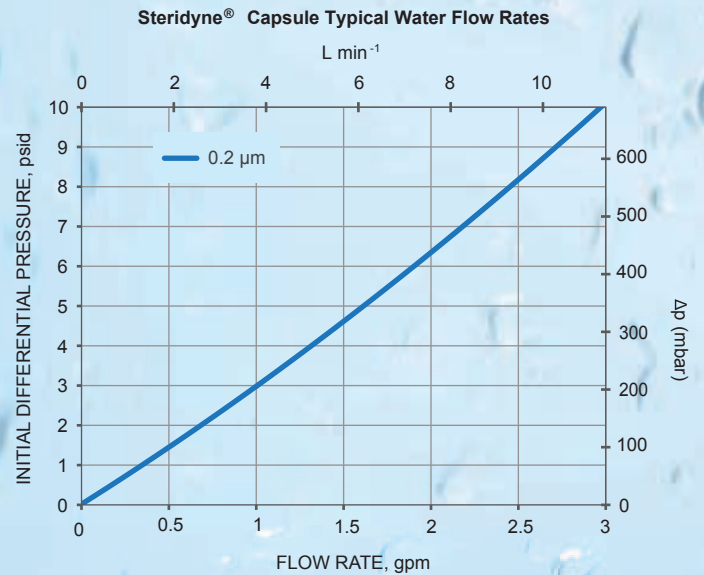
Minimum Bubble Point, 60/40% IPA/water

0.2 µm 18 psi (1,2 bar)

Sterilization: Available presterilized (gamma)



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



Data shown is for "CS" style capsule with 3/8" hosebarb 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 polyethersulfone membrane which offers the greatest assurance of filtration performance, stability and service life for controlling contaminants in demanding environments. The highly porous polyethersulfone 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:

| | | | |
|------|---|------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CF-B | 0.70 ft ² (0,07 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CS | 1.6 ft ² (0,15 m ²) |
| CF-A | 0.48 ft ² (0,04 m ²) | CL | 3.3 ft ² (0,31 m ²) |

* nominal

Bacterial Retention:

ASTM F838-05 Challenge

0.04, 0.1 µm, 0.2 µm > 10⁷ cfu/cm² *Brevundimonas diminuta*, which meets the FDA definition of a sterilizing grade filter.

0.4 µm > 10⁷ cfu/cm² *Serratia marcescens*

Integrity Testing

Minimum Bubble Point, Water

0.04 µm 115 psi (7,9 bar)

0.1 µm 80 psi (5,5 bar)

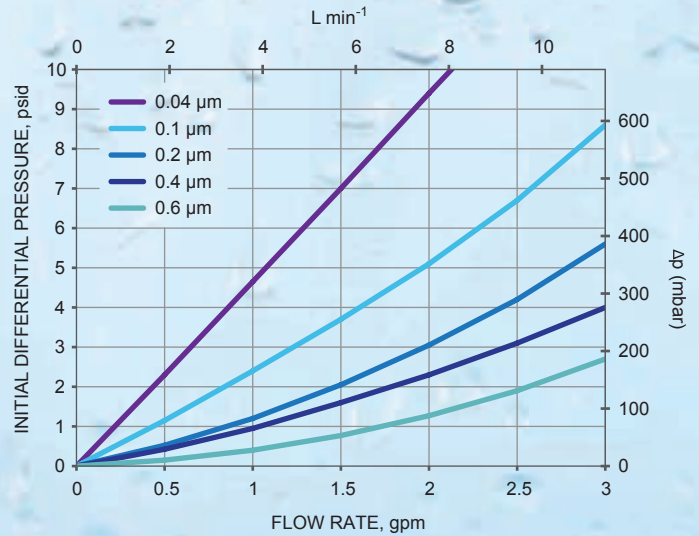
0.2 µm 44 psi (3,0 bar)

0.4 µm 32 psi (2,2 bar)

0.6 µm 18 psi (1,2 bar)

Sterilization: Available presterilized (gamma)

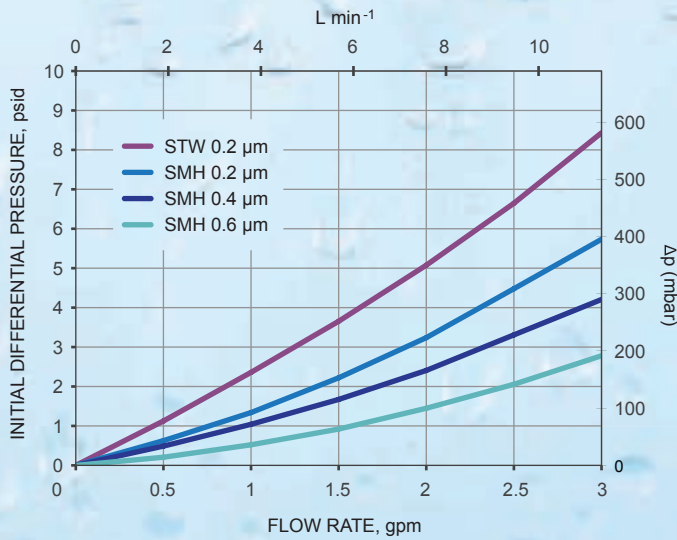
STyLUX® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 1/4" hosebarb connections. Consult factory for complete flow rate information.



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.



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 adsorption, 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: 0.2, 0.4, 0.6 μm

Effective Filtration Area:

| | STW Grade | SMH, SPH Grade |
|------|---|--|
| CM* | 0.22 ft ² (0,02 m ²) | CM* 0.22 ft ² (0,02 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CK* 0.43 ft ² (0,04 m ²) |
| CF-A | 0.40 ft ² (0,04 m ²) | CF-A 0.48 ft ² (0,04 m ²) |
| CF-B | 0.58 ft ² (0,05 m ²) | CF-B 0.70 ft ² (0,07 m ²) |
| CS | 1.2 ft ² (0,11 m ²) | CS 1.6 ft ² (0,15 m ²) |
| CL | 2.6 ft ² (0,24 m ²) | CL 3.3 ft ² (0,31 m ²) |

* nominal

Bacterial Retention: ASTM F838-05 Challenge

STW 0.2 μm > 10⁷ cfu/cm² *Brevundimonas diminuta*

STW 0.2 μm meets the FDA definition of a sterilizing grade filter.

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

Integrity Testing

Minimum Bubble Point, Water (SM grade)

0.2 μm 62 psi (4,3 bar)

0.4 μm 40 psi (2,8 bar)

0.6 μm 22 psi (1,5 bar)

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

CLSTW0.2 13.0 mL/min

CSSTW0.2 6.0 mL/min

CFSTW0.2-A 1.9 mL/min

CFSTW0.2-B 2.7 mL/min

Sterilization: Available presterilized (gamma)

Chemdyne® PP

Chemdyne® disposable capsule filters are 100% polypropylene absolute-rated membrane filters. Chemdyne® capsule filters contain a polypropylene membrane for maximum chemical compatibility, performance, reliability and economy in critical processes. The highly porous polypropylene membrane is inherently hydrophobic, maintains consistent porosity and retention, and provides excellent chemical compatibility and exceptionally low extractables levels in a wide range of fluids and applications.

Advantages

- Inherently hydrophobic membrane
- Absolute ratings from 0.04 to 0.2 µm
- All polypropylene construction
- High flow rates at low pressure drops
- Ultraclean - no additives, surfactants, or post treatments
- Extremely low extractables
- Wide chemical compatibility and purity
- Cost-effective alternative to PTFE membrane capsules
- 100% integrity tested during manufacture
- Cleanroom manufactured

Applications

Chemdyne® capsule filters offer excellent security for high quality filtration, chemical compatibility, reliability and performance in a wide variety of applications. Typical applications include acids, bases, alcohols, solvents, etchants, photolithographic solutions, compressed air and gases, and sterile vents/exhausts for autoclaves, lyophilizers, sterilizers, fermentors and similar equipment.

Specifications

Filter Media: Polypropylene Membrane

Absolute Filtration Ratings: 0.04, 0.1, 0.2 µm

Effective Filtration Area:

| | | | |
|------|---|------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CF-B | 0.50 ft ² (0,05 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CS | 1.2 ft ² (0,11 m ²) |
| CF-A | 0.33 ft ² (0,03 m ²) | CL | 2.5 ft ² (0,23 m ²) |

* nominal

Bacterial Retention: ASTM F838-05 Challenge

0.1, 0.2 µm > 10⁷ cfu/cm² *Brevundimonas diminuta*

(0.1 µm, 0.2 µm meet the FDA definition of a sterilizing grade filter)

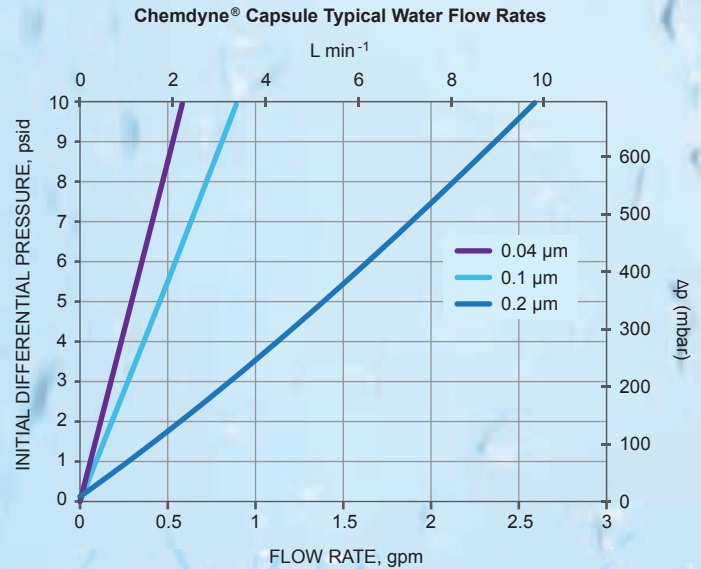
Integrity Testing

Minimum Bubble Point, 60% IPA

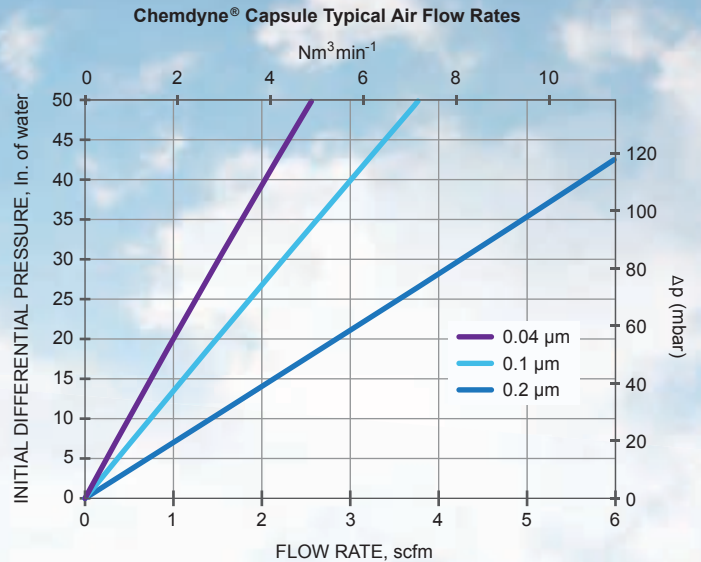
0.04 µm 29 psi (2,0 bar)

0.1 µm 24 psi (1,7 bar)

0.2 µm 10 psi (0,7 bar)



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



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



Ultradyne® PTFE

Ultradyne® disposable capsule filters are absolute-rated PTFE membrane filters which offer the greatest assurance of filtration performance and chemical compatibility in severe process conditions. Ultradyne® capsule filters contain a PTFE membrane which 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 0.05 to 5.0 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: PTFE Membrane

Absolute Filtration Ratings: 0.05, 0.1, 0.2, 0.4, 1.0, 5.0 µm

Effective Filtration Area:

| | | | |
|------|---|------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CF-B | 0.50 ft ² (0,05 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CS | 1.2 ft ² (0,11 m ²) |
| CF-A | 0.33 ft ² (0,03 m ²) | CL | 2.5 ft ² (0,23 m ²) |

* nominal

Bacterial Retention: ASTM F838-05 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

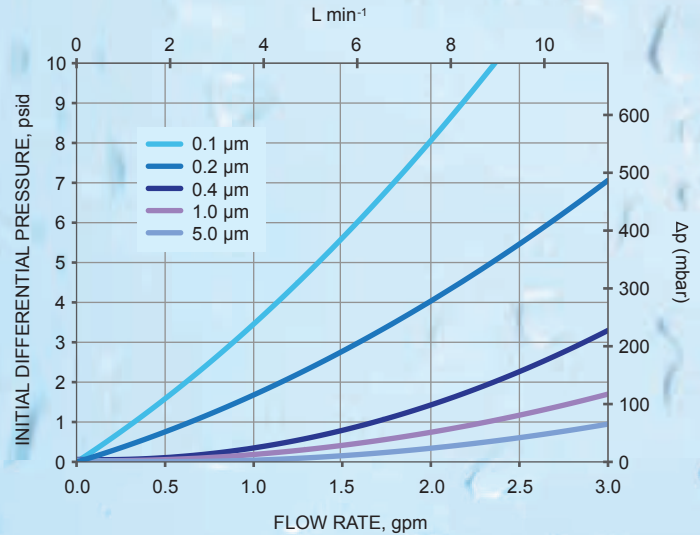
0.1 µm 20 psi (1,4 bar)

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)

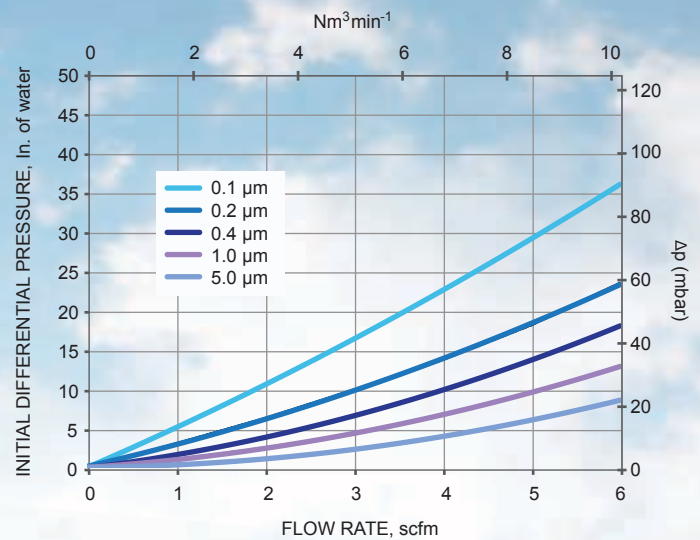
1.0 µm 4 psi (0,3 bar)

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 which 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 Microfiber

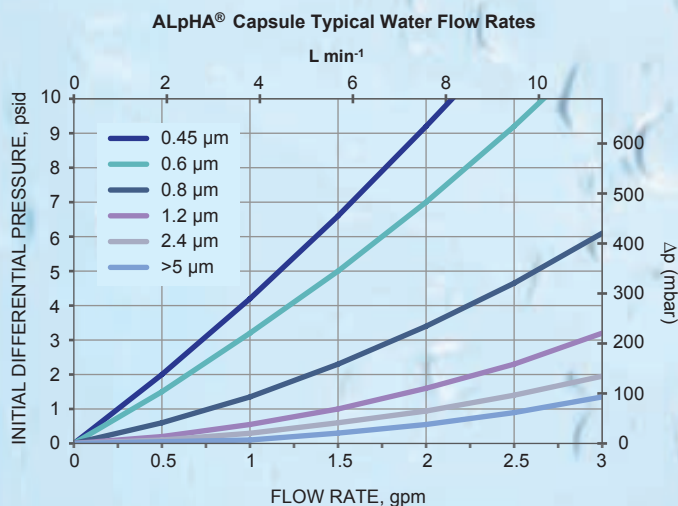
Absolute Retention Ratings:

0.45, 0.6, 0.8, 1.2, 2.4, 5, 7, 10, 20, 30, 40, 70 µm

Effective Filtration Area:

| | | | |
|------|---|------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CF-B | 0.50 ft ² (0,05 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CS | 1.0 ft ² (0,09 m ²) |
| CF-A | 0.33 ft ² (0,03 m ²) | CL | 2.0 ft ² (0,19 m ²) |

* nominal



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



Protec® Glass Microfiber

The Protec® capsule filter is a glass microfiber prefilter optimized to protect downstream sterile filters. The Protec® RF capsule contains a single layer of 0.5 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 0.5 µm absolute-rated
- 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 µm (RF); 0.2 µm, 0.3 µm, 0.5 µm (RM)

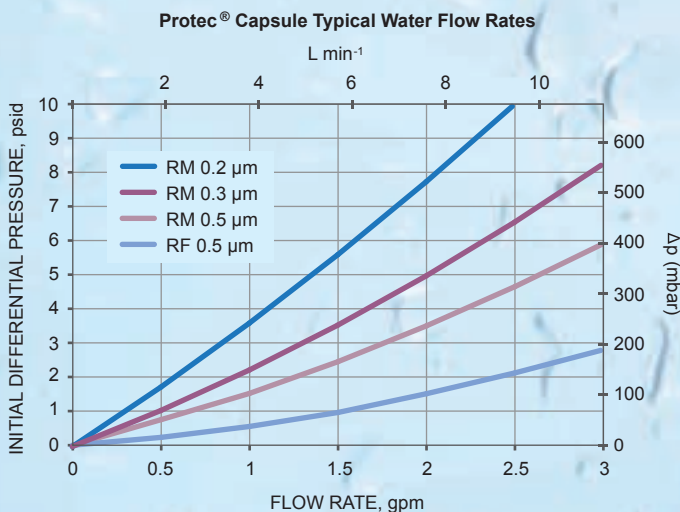
Effective Filtration Area:

| RF Grade | | RM Grade | |
|----------|---|----------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CM* | 0.22 ft ² (0,02 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CK* | 0.43 ft ² (0,04 m ²) |
| CF-A | 0.33 ft ² (0,03 m ²) | CF-A | 0.28 ft ² (0,03 m ²) |
| CF-B | 0.50 ft ² (0,05 m ²) | CF-B | 0.42 ft ² (0,04 m ²) |
| CS | 1.0 ft ² (0,09 m ²) | CS | 0.86 ft ² (0,08 m ²) |
| CL | 2.0 ft ² (0,19 m ²) | CL | 1.7 ft ² (0,16 m ²) |

* nominal

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> , <i>Saccharomyces cerevisiae</i> | >7 |
| RM | 0.3 µm | <i>Serratia marcescens</i> | 6 |
| RM | 0.2 µm | <i>Serratia marcescens</i> | >7 |



Data shown is for "CS" style capsule with 3/8" hosebarb 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.

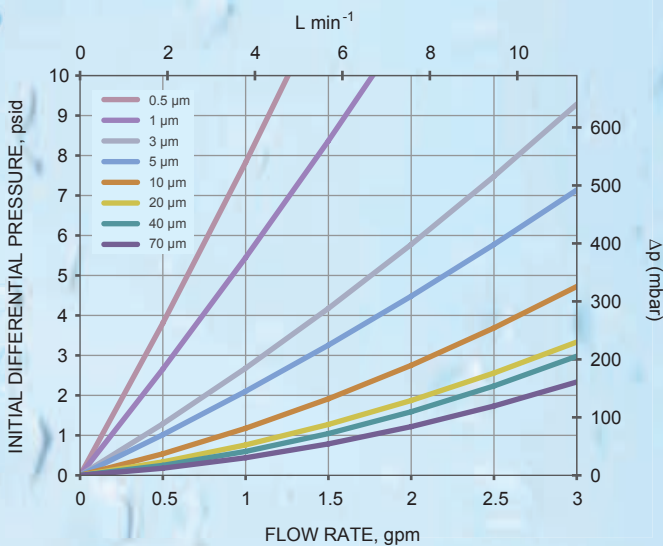
Specifications

Filter Media: Polypropylene Microfiber Depth

Absolute Retention 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 3/8" hosebarb 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

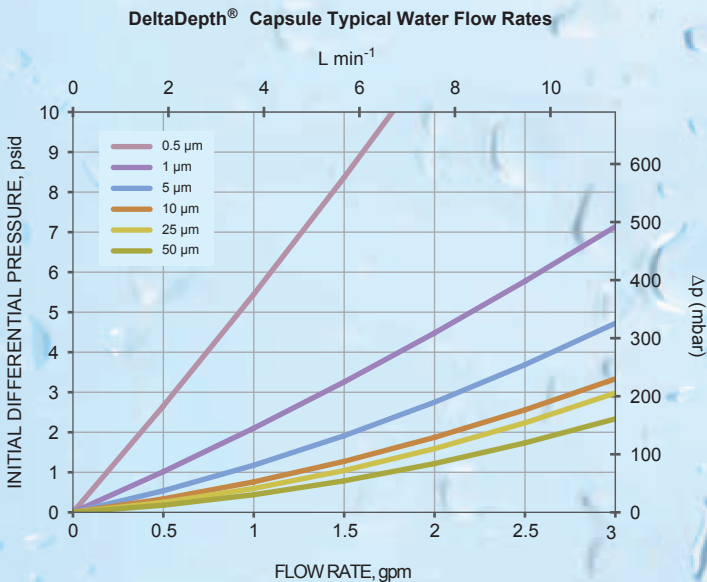
Applications

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 Microfiber Depth

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



Data shown is for "CS" style capsule with 3/8" hosebarb 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 Microfiber

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

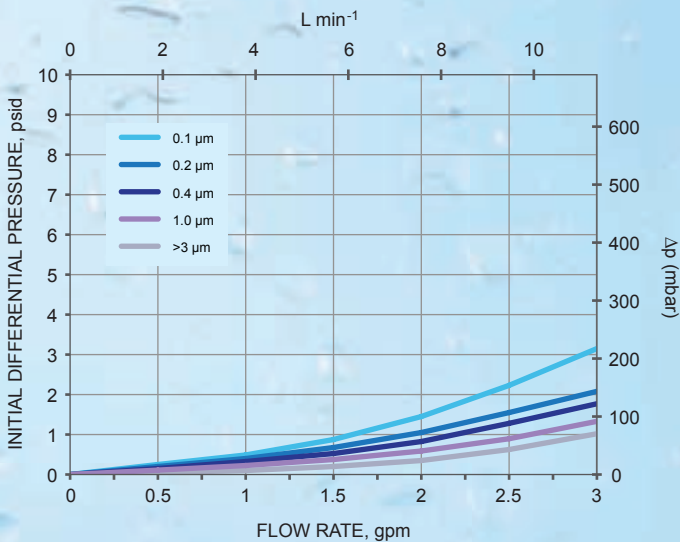
Effective Filtration Area:

| | | | |
|------|---|------|---|
| CM* | 0.22 ft ² (0,02 m ²) | CF-B | 0.50 ft ² (0,05 m ²) |
| CK* | 0.43 ft ² (0,04 m ²) | CS | 1.0 ft ² (0,09 m ²) |
| CF-A | 0.33 ft ² (0,03 m ²) | CL | 2.0 ft ² (0,19 m ²) |

* nominal



Vanguard® Capsule Typical Water Flow Rates



Data shown is for "CS" style capsule with 3/4" hosebarb connections. Consult factory for complete flow rate information.

Ordering Guide: CM & CK Capsules

| Capsule Options | | |
|-----------------|----------------------------|--|
| C | Standard Capsule | |
| G | Gamma Irradiated Capsule** | |

| | | | |
|----------|-------------|-----------------|----------|
| C | K SM | 0.2 - 77 | 4 |
|----------|-------------|-----------------|----------|

| Filter Surface Area* | |
|--|---|
| 0.4 ft ² (0,04 m ²) | K |
| 0.2 ft ² (0,02 m ²) | M |

| Vent / Drain Ports | |
|--------------------|---|
| 0 | No vent/drain ports |
| 1 | One, luer port with cap, inlet side |
| 2 | Standard; two, luer ports with caps |
| 4 | Two, sanitary valves with hose barbs |
| 5 | One, sanitary valve with hose barb, inlet side |
| 6 | One, sanitary valve with hose barb, outlet side |

| Inlet / Outlet Connections | |
|----------------------------|---|
| 11 | 1/4" (6 mm) hosebarb |
| 22 | 3/8" (10 mm) hosebarb |
| 44 | 1/4" (6 mm) MNPT |
| 71 | 3/4" (19 mm) TC in; 1/4" (6 mm) hosebarb out |
| 72 | 3/4" (19 mm) TC in; 3/8" (10 mm) hosebarb out |
| 77 | 3/4" (19 mm) sanitary (TC) flange |

| Membrane Media | Grade | Retention Rating (µm) |
|------------------|---|--|
| SteriLUX® | 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® | VMV ² , VTV ¹ | 0.2 |
| STyLUX® | SL ³ , SM ² , SP ⁴ , ST 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 (ST) |
| EverLUX™ | SLH ³ , SMH ² , SPH ⁴ , STW ¹ | 0.2, 0.4, 0.6 (SLH, SMH) / 0.1, 0.2, 0.4 (SPH) / 0.2 (STW) |
| Chemdyne® | PM ² , PT ¹ | 0.04, 0.1, 0.2 (PM) / 0.2 (PT) |
| Ultradyme® | TA ² , TM, TT ¹ | 0.2 (TA, TT) / 0.05, 0.1, 0.2, 0.4, 1.0, 5.0 (TM) |
| Microfiber Media | Grade | Retention Rating (µm) |
| ALpHA® | MF | 0.45, 0.6, 0.8, 1.2, 2.4, 5, 7, 10, 20, 30, 40, 70 |
| Protec® | RF, RM | 0.5 (RF) / 0.2, 0.3, 0.5 (RM) |
| Vanguard® | 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.

**G option is not available for Chemdyne® and Ultradyme® filters.

¹ T-Grade (VTH, ST, 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.

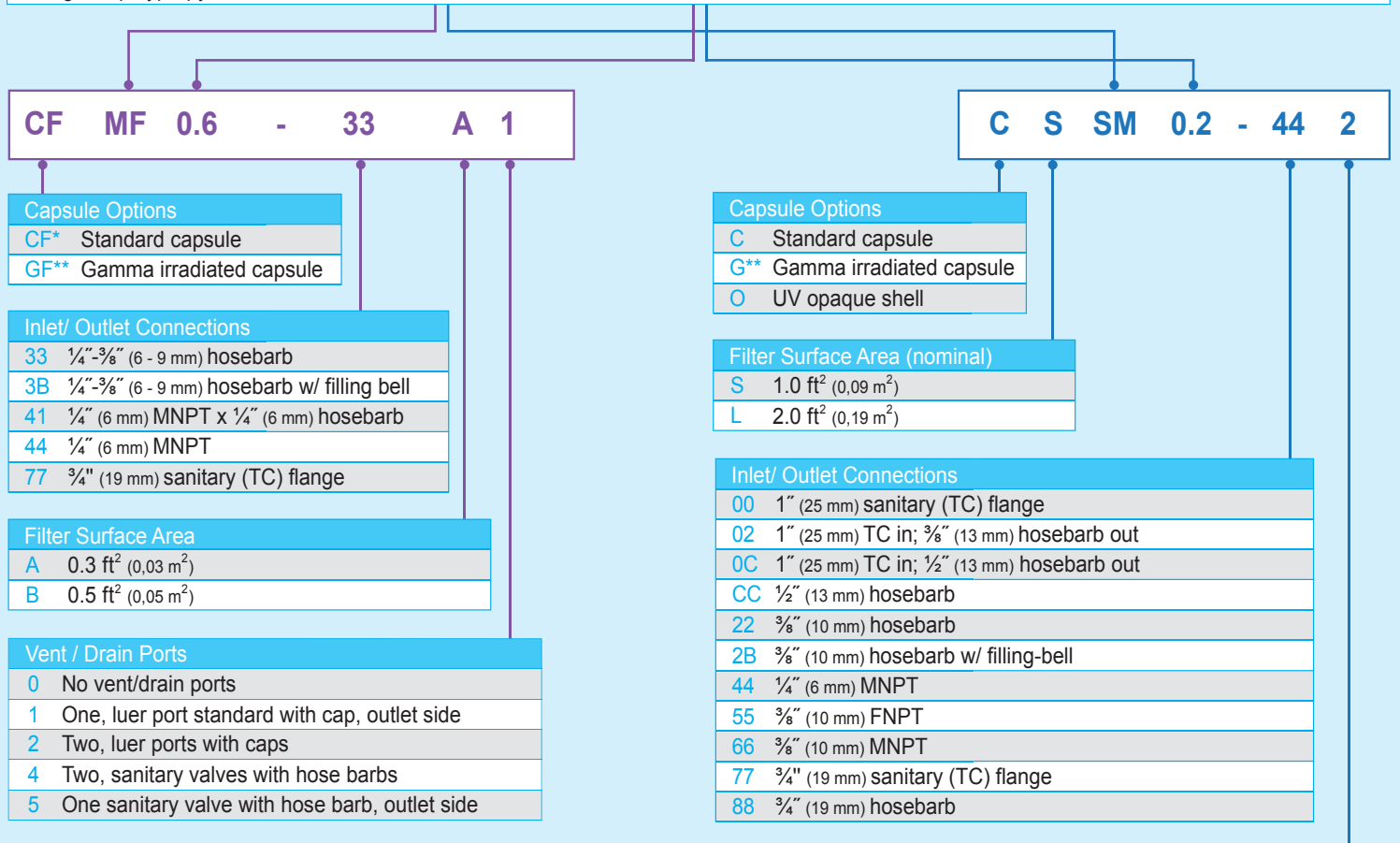
² M-Grade (VMH, SM, VMV, PM, TA): This absolute, microbially rated filter is 100% integrity tested during manufacture. It is suited for critical applications when regulatory documentation requirements are minimal. A certificate of conformance is available on a lot basis.

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.

Capsule Filter Ordering Guide

| 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 | 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 (ST) |
| EverLUX™ PES | SLH ³ , SMH ² , SPH ⁴ , STW ¹ | 0.2, 0.4, 0.6 (SLH, SMH) / 0.1, 0.2, 0.4 (SPH) / 0.2 (STW) |
| Chemdyne® polypropylene | PM ² , PT ¹ | 0.04, 0.1, 0.2 (PM) / 0.2 (PT) |
| Ultradyme® PTFE | TA ² , TM, TT ¹ | 0.2 (TA, TT) / 0.05, 0.1, 0.2, 0.4, 1.0, 0.5 (TM) |
| Microfiber Media | Grade | Retention Rating (µm) |
| ALpHA® polypropylene | MF | 0.45, 0.6, 0.8, 1.2, 2.4, 5, 7, 10, 20, 30, 40, 70 |
| Protec® glass fiber | RF | 0.5 |
| Protec® glass fiber + PVDF membrane | RM | 0.2, 0.3, 0.5 |
| DeltaMax® polypropylene | DM | 0.5, 1, 3, 5, 10, 20, 40, 70 |
| DeltaDepth® polypropylene | DD | 0.5, 1, 5, 10, 25, 50 |
| Vanguard® polypropylene | MN | 0.1, 0.2, 0.4, 1, 3, 5, 10, 30, 60, 99 |



*CF capsules not available with SteriLUX®, DeltaDepth® or DeltaMax® media

**G option is not available for Chemdyne® and Ultradyme® filters.

¹ T-Grade (VTH, ST, 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.



4181 Calle Tesoro • Camarillo, CA 93012 • 800.391.9458
Int'l: +1.805.388.9911 • Fax 805.388.5948 • meissner.com