

Ultradyne® Filters



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Ultradyne® Filters

Ultradyne® is a hydrophobic PTFE membrane filter offering maximum chemical compatibility with minimal extractables in a wide range of fluids and applications. This sterilizing grade filter provides reliable removal of particles and microorganisms from aggressive liquids, including strong acids and bases, and organic solvents. Ultradyne® is optimized for applications requiring complete removal of contaminant bacteria and viruses from air and gas streams, such as fermenter inlet air and exhaust, sterile process air, and sterile venting of tanks, lyophilizers, and autoclaves. The Ultradyne® filter provides sterility assurance, high flow rates and throughput under demanding conditions.

Materials of Construction

The Ultradyne® filter is manufactured using high quality components made from non-toxic and biologically inert raw materials. All components of the Ultradyne® filter are FDA listed for food contact use in the Code of Federal Regulations (CFR), Title 21 as below:

Components

Media:	PTFE	CFR Title 21, 177.1550
Upstream/Downstream support:	Polypropylene	CFR Title 21, 177.1520
Core/Outer guard:	Polypropylene	CFR Title 21, 177.1520
End caps/Adaptors:	Polypropylene	CFR Title 21, 177.1520
Capsule housing:	Polypropylene	CFR Title 21, 177.1520
O-rings:	Buna, EPR or Silicone	CFR Title 21, 177.2600
	Teflon® over Silicone or	CFR Title 21, 177.1550
	Teflon® over Viton®	
Sealing method:	Thermal bonding	

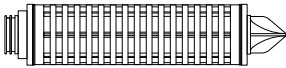
The Ultradyne® filter complies with European Commission Regulation No. 10/2011. The filter meets requirements as specified in the current USP Class VI plastics, pyrogen and cytotoxicity tests. No binders, adhesives or surfactants are used in the construction of Ultradyne® filters. The filters are non-fiber-releasing as defined in 21 CFR 210.3(b)(6) and 211.72.

Con igurations

Ultradyne® can be ordered in a variety of configurations from SFE filter cartridges through UltraCap® high capacity capsule filters.



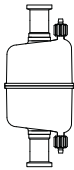
SFE Cartridge



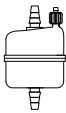
Cartridge



CL



CS



CF

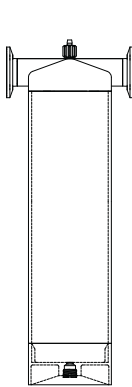


CK



CM

Capsule

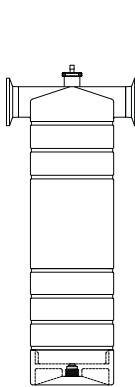


T-Style



Inline

UltraCap®



T-Style



Inline

UltraCap® H.D.

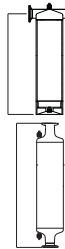
Dimensions

Cartridge	Diameter	Length (nominal)	EFA**
	2.75" (7 cm)	10" (25 cm) 20" (50 cm) 30" (75 cm) 40" (100 cm)	6.0 ft ² (0.56 m ²) 12.0 ft ² (1.11 m ²) 18.0 ft ² (1.67 m ²) 24.0 ft ² (2.23 m ²)

SFE Cartridge	Diameter	Length (nominal)	EFA
	2.25" (5,7 cm)	2.5" (6.4 cm) 5" (12.7 cm)	1.2 ft ² (0.11 m ²) 2.5 ft ² (0.23 m ²)

Capsule	Diameter	Length (nominal)	EFA
CL/CL2	2.75" (7.0 cm)	6.9" (17.5 cm)	2.5 ft ² (0.23 m ²)
CS/CS2	2.75" (7.0 cm)	4.5" (11.4 cm)	1.2 ft ² (0.11 m ²)
CF/CF2-A	2.25" (5.7 cm)	3.3" (8.3 cm)	0.33 ft ² (305 cm ²)
CF/CF2-B	2.25" (5.7 cm)	3.3" (8.3 cm)	0.50 ft ² (465 cm ²)
CK2	1.15" (2.9 cm)	6.25" (15.9 cm)	0.45 ft ² (415 cm ²)
CM2	1.15" (2.9 cm)	5.50" (14.0 cm)	0.36 ft ² (335 cm ²)

UltraCap®	Diameter *	Length (nominal)	Capsule Dimension (overall)	EFA
T-style	3.25" (8 cm)	10" (25 cm) 20" (50 cm) 30" (75 cm)	12.3" (31.2 cm) 22.3" (56.6 cm) 32.3" (82 cm)	6.0 ft ² (0.56 m ²) 12.0 ft ² (1.11 m ²) 18.0 ft ² (1.67 m ²)
Inline	3.25" (8 cm)	10" (25 cm) 20" (50 cm) 30" (75 cm)	14.8" (37.6 cm) 24.9" (63.2 cm) 34.9" (88.6 cm)	6.0 ft ² (0.56 m ²) 12.0 ft ² (1.11 m ²) 18.0 ft ² (1.67 m ²)



UltraCap® H.D.	Diameter *	Length (nominal)	Capsule Dimension (overall)	EFA
T-style	3.5" (9 cm)	10" (25 cm) 20" (50 cm) 30" (75 cm) 40" (100 cm) 50" (125 cm)	11.7" (29.7 cm) 21.1" (53,6 cm) 30.6" (77.7 cm) 40.0" (101.6 cm) 49.5" (125.7 cm)	6.0 ft ² (0,56 m ²) 12.0 ft ² (1,11 m ²) 18.0 ft ² (1,67 m ²) 24.0 ft ² (2,23 m ²) 30.0 ft ² (2,79 m ²)
Inline	3.5" (9 cm)	10" (25 cm) 20" (50 cm) 30" (75 cm) 40" (100 cm) 50" (125 cm)	17.3" (43.9 cm) 26.8" (68.1 cm) 36.2" (91.9 cm) 45.7" (116.1 cm) 55.2" (140.2 cm)	6.0 ft ² (0,56 m ²) 12.0 ft ² (1,11 m ²) 18.0 ft ² (1,67 m ²) 24.0 ft ² (2,23 m ²) 30.0 ft ² (2,79 m ²)



***Inlet/outlet fittings extend beyond stated diameter **EFA = Effective Filtration Area**

Operating Characteristics

Cartridges and SFE (Small Flow Elements)

Maximum Operating Temperatures and Pressures 80
psid @ 32°F to 100°F
(Δp 5.5 bar @ 0°C to 38°C)

60 psid @ 150°F
(Δp 4.1 bar @ 66°C)

30 psid @ 180°F
(Δp 2.1 bar @ 82°C)

Capsules - CS/CL & CF Models

Maximum Operating Pressure, Liquids
75 psig @ 32°F to 100°F
(5.2 bar @ 0°C to 38°C)

Maximum Operating Temperature Rating
160°F @ 35 psig
(71°C @ 2.4 bar)

Maximum Operating Pressure, Gas
50 psig @ 32°F to 100°F
(3.4 bar @ 0°C to 38°C)

Capsules - CM/CK Models

Maximum Operation Pressure & Temperature, Liquids
100 psig @ 32°F to 122°F
(6.9 bar @ 0°C to 50°C)

Maximum Operating Pressure & Temperature, Gas
100 psig @ 32°F to 122°F
(6.9 bar @ 0°C to 50°C)

UltraCap® Model

Maximum Operating Pressure & Temperature, Liquids
75 psig @ 32°F to 100°F
(5.2 bar @ 0°C to 38°C)

45 psig @ 140°F
(3.1 bar @ 60°C)

Maximum Operating Pressure & Temperature, Gas
50 psig @ 32°F to 100°F
(3.4 bar @ 0°C to 38°C)

30 psig @ 140°F
(2.1 bar @ 60°C)

UltraCap® H.D. Model

Maximum Operating Pressure & Temperature, Liquids
90 psig @ 32°F to 100°F
(6.2 bar @ 0°C to 38°C)

55 psig @ 140°F
(3.8 bar @ 60°C)

Maximum Operating Pressure & Temperature, Gas
60 psig @ 32°F to 100°F
(4.1 bar @ 0°C to 38°C)

35 psig @ 140°F
(2.4 bar @ 60°C)

Cartridge Installation Instructions

Meissner filters are available in a number of different adapter and O-ring configurations designed to fit modern filter housings. The filter should fit snugly in the housing. Improper installation can impair filtration efficiency.

1. Verify that the correct filter part number for the application has been chosen.
2. Keep the filter in its plastic bag to avoid contaminating the cartridge as long a possible. Cut open the bag at the O-ring end. While holding the bagged cartridge, lubricate the O-rings by dipping the O-rings into clean water or other suitable liquid compatible with the process fluid.
3. Line up the open end of the cartridge with the housing seat and install using a slight twisting motion while holding the bagged cartridge near the O-ring adapter. Verify that the O-rings are fully seated and not twisted. If the cartridge has locking tabs, rotate the tabs into place with a clockwise motion until engaged. Caution: always rotate cartridges while firmly grasping the O-ring end of the cartridge to prevent excessive torque damage to the filter.
4. Repeat with additional cartridges. Remove protective bags from the cartridges. If present, install cartridge retainer system (plate or spring). Reassemble housing.

Integrity Test: Manual Bubble Point of a Filter Housing System

(Consult factory for Pressure Hold Procedure)

Wetting

Hydrophobic filters must be wet with a low surface tension fluid such as 60% isopropyl alcohol (60% IPA) before they can be integrity tested with the bubble point or diffusion test. The filter may be wet by flowing 60% IPA through the vented filter housing or by soaking the filter in 60% IPA for 5 minutes.

To soak a filter cartridge, immerse the cartridge outlet end up in a cylinder of 60% IPA until the core completely fills with fluid. Note: remove Buna or silicone O-rings first to prevent O-ring swelling. Allow the cartridge to soak for approximately five minutes. Drain the cartridge but do not allow it to dry out. Reinstall the O-rings if necessary and install the filter into the housing.

Filter and Housing – Manual Bubble Point Test

The manual bubble point test relies on a wetted, microporous membrane filter, a housing or holder to contain the wetted filter, a calibrated pressure gauge, a regulated gas pressure source—usually compressed air or nitrogen, downstream tubing, and a beaker containing water, in which the tubing is immersed. Pressure is increased gradually, until a steady stream of bubbles is observed to come from the tubing. This pressure is referred to as the bubble point. The following highlights the basic steps required to perform a bubble point test on a filter.

Procedure (Figure 1)

1. Close all valves.
2. Open valves V_1 and V_3 fill the housing with 60% IPA or appropriate wetting fluid. Close V_3 once fluid escapes. Open V_6 to wet the cartridge.
3. Close V_1 after the cartridge is wetted.
4. Open V_2 and apply 1 – 2 psi (0,1 bar) regulated air pressure to the inlet side of the system.
5. If necessary, open V_4 to drain the downstream volume of 60% IPA.
6. Close V_4 .
7. Open V_5 and close V_6 .
8. While observing for continuous bubbling from the bubble point tube, slowly increase the air pressure. When a rapid, steady stream of bubbles is observed, the bubble point pressure has been reached. (Do not confuse the diffusive flow for the bulk gas flow of the bubble point.) Record the pressure where this occurs and compare it to the chart below.

Ultradyne® Integrity Test Values – Room Temperature

Pore size (μm) TM	1.0		0.4		0.2		TA0.2 / TT0.2		0.1	
Minimum Bubble Point	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
60% IPA	4	0.3	7	0.5	14	1,0	16	1.1	20	1.4

9. A bubble point value lower than the specification is an indication of one of the following:
 - Fluid with different surface tension than the recommended test fluid
 - Integral filter, but wrong pore size
 - High temperature
 - Incompletely wetted membrane
 - Non-integral membrane or seal

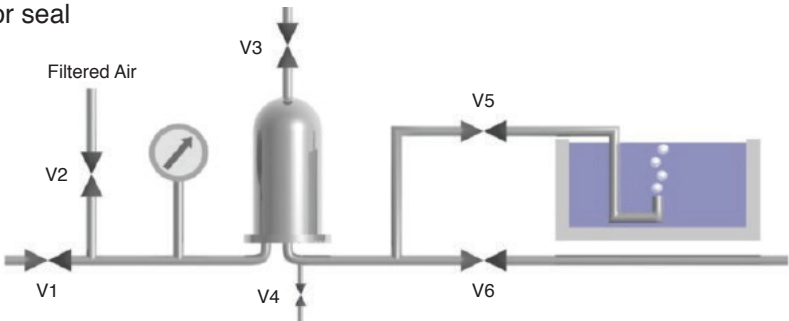


Figure 1

Integrity Test: Manual Bubble Point of a Capsule, UltraCap® & UltraCap® H.D.

1. Wet the filter capsule well. Drain the capsule housing.
2. Connect regulated compressed air and a calibrated gauge to the inlet and a narrow ID hose to the filter outlet and immerse the open hose end in a beaker of water. Alternatively, connect an automated integrity tester to the inlet and follow manufacturer's directions.
3. Apply air pressure to the filter to approximately 10 psi less than the minimum bubble point and observe the hose in the water beaker. (If the minimum bubble point is less than 10 psi, apply 1 - 2 psi.) The initial pleat pack compression will produce a large amount of bubbling that will decrease rapidly and be replaced by regularly spaced bubbles produced by air diffusing through the filter membrane.
4. Slowly increase the air pressure and observe the steady stream of bubbles in the water. The bubble point is the pressure at which a marked change in the rate of bubbling occurs, accompanied by an increase in sound volume. Record the pressure where this occurs and compare it to the chart below.

Ultradyn® Integrity Test Values – Room Temperature

Pore size (µm) TM	1.0		0.4		0.2		TA0.2 / TT0.2		0.1	
Minimum Bubble Point	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
60% IPA	4	0.3	7	0.5	14	1.0	16	1.1	20	1.4

Quality Awareness - All Integrity Test Methods

1. While increasing the air pressure, do not confuse the additional bubbles produced by a rapid increase in air pressure with the bubble point. Observe the bubbles when the air pressure has stabilized.
2. If the integrity test fails, rewet the filter with additional IPA and repeat the test. If the filter has been used to filter product, it may take several minutes of high volume flush to remove the product and return to the reference integrity test value. It is not appropriate to recirculate the IPA in this case.
3. Integrity tests in IPA must be performed promptly to avoid drying the membrane out under pressure.

Integrity Test: Manual Diffusive Flow Test (Filter Housing System)

The diffusion test may be performed on Ultradyne® filter cartridges and capsules. The filter is wetted, drained and a constant air pressure is applied. Diffusional air flow through the membrane is measured.

The manual diffusive flow test relies on a wetted membrane filter of sterilizing grade, a housing or holder to contain the wetted filter, a calibrated pressure gauge, a regulated gas-pressure source, usually compressed air or nitrogen, downstream tubing, and an inverted, water-filled graduated cylinder suspended in a container of water. Test pressure is increased to the manufacturer's recommended test pressure. The following highlights the basic steps required to perform a diffusive flow test on a single cartridge filter.

Procedure (Figure 2)

1. Close all valves.
2. Open V₁ and V₆. Thoroughly wet the filter with 60% IPA, opening vent V₃ to allow trapped air to escape. The complete wetting of the filter is crucial to the accuracy of the test. An incompletely wet filter will fail. Close V₁ and V₃.
3. Open V₂ and apply the specified air pressure to the inlet side of the system. This will push the upstream volume of IPA through the filter.
4. If necessary, open V₄ to drain the downstream volume of IPA. IPA remaining downstream of the filter may cause an inaccurate diffusion reading by interfering with the air flow in the outlet tube. Close V₄.
5. Open V₅ and close V₆.
6. Verify the test pressure and adjust as necessary.
7. Fill a graduated cylinder with water and place the outlet tube under the inverted opening. Record the volume of air diffused per minute. The recorded flow rate must not exceed the flow rate specified for the filter per the chart below.

Ultradyne® Diffusion Values

Pore size	Test pressure		mL/min		
	psi	bar	Per 10" (25 cm)	CL / 5" (12.7 cm)	CS / 2.5" (6.4 cm)
TA0.2 / TT0.2	10	0.7	10	4.1	2.0
TM0.2	9	0.6	10	-	-
TM0.4	4	0.3	30	-	-

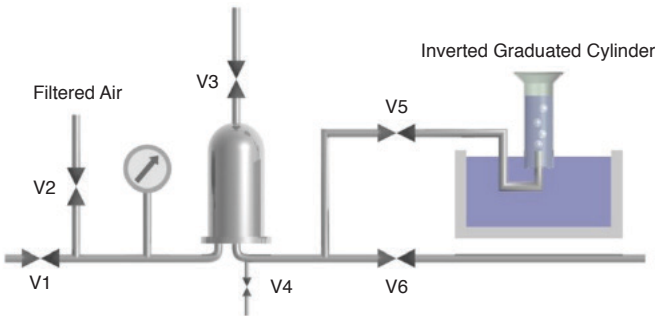


Figure 2

Autoclave Instructions

Meissner filters may be autoclaved repeatedly without loss of integrity.

Capsule, UltraCap® and UltraCap® H.D. Filters

The following outlines the steps recommended in the autoclave sterilization of Meissner filter capsules.

1. Loosely cover the capsule inlet and outlet with autoclave wrap. All capsule vents are on the upstream side of the filter and should be loosened or removed to facilitate steam penetration. Hose barb vent valves must be opened at least two full turns to prevent valve leakage post autoclaving.
2. The weight of clamps or fittings attached to the capsule must be supported to avoid damaging the adapters. Sanitary flanges may have clamps and gaskets loosely attached to the filter. If fittings must be attached to flanges, tri-clamps are preferable to bi-clamps and should be tightened after the assembly has cooled.
3. Autoclave the capsule at a minimum of 121°C for 60 minutes or 125°C for at least 45 minutes with the capsule in a horizontal position using a slow exhaust or liquid cycle. T-style UltraCap® capsules may be autoclaved horizontally or with the outlet oriented downward to facilitate the removal of condensate from the downstream side of the filter. As autoclave systems vary, sterilization cycles should be validated under actual system or autoclave loading conditions. Downstream attachments can significantly increase the time required to sterilize the filter core.
4. Allow the capsule to cool. Gently close vents finger tight. Excessive tightening of vent valves will damage the sealing surfaces. Integrity test if desired. Install filter into system aseptically.

Cartridge and SFE (Small Flow Elements)

The following outlines the steps required to autoclave a Meissner filter cartridge and housing assembly. A stainless steel reinforcement ring is required for filter configurations with 222 or 226 O-rings.

1. Install the filter into the housing. Loosely cover the inlet and outlet with autoclave wrap. Vent and drain valves should be fully open.
2. Autoclave the cartridge and housing assembly at a minimum of 121°C for 30 minutes with the filter outlets in an outlet down or horizontal position using a slow exhaust or liquid cycle. As autoclave systems vary, sterilization cycles should be validated under actual system or autoclave loading conditions. Assemblies attached to the outlet can increase the required sterilization times.
3. Allow the housing assembly to cool. Integrity test if desired.
4. Install the sterile filter assembly into the system using aseptic techniques.

Different autoclave temperature and time combinations may be used to sterilize the filters but the combination should be validated to ensure that sterilization occurs under those conditions. Temperatures above 135°C are not recommended.

Inline Steam Sterilization Procedure

Steaming in place (SIP) is frequently used in critical applications where a sterile effluent is desired. To prevent damage to the filter cartridge's O-ring adapter, cartridges with 222 or 226 O-ring adapters must be reinforced with a stainless steel ring. Ultradyne® filter cartridges with reinforced O-ring adapters are capable of repeated sterilization cycles without loss of integrity. The steps required to steam sterilize the Ultradyne® filter cartridge and system using saturated steam are outlined in the procedure below.

The steam should be free of rust and other particulates. The housing should be clean before the cartridge is installed. If you are steam sterilizing a wetted cartridge, upstream and downstream gauges must be provided to verify that the differential pressure across the membrane does not exceed 5 psi (0,3 bar). To assure sterilization, steam pressure in the assembly must not be allowed to fall below 15 psi (1 bar or 121°C). Condensate should be drained from the system during sterilization. A typical piping schematic is outlined in Figure 3.

Caution: Capsules, UltraCap® and UltraCap® H.D. are not designed for inline steam sterilization!

Procedure (Figure 3)

1. Close all valves.
2. Open valve V_4 .
3. If cartridge is wet, or if there is a large volume tank downstream of the filter, open V_5 .
 - a. Slowly open V_2 . This will connect both sides of the filter to steam pressure.
 - b. Crack open V_7 to vent trapped air.
 - c. Crack open V_6 allowing steam to flow through the system.
 - d. Slowly close V_5 but do not allow the differential pressure across the cartridge to exceed 5 psi (0,3 bar).
 - e. Leave drain V_8 cracked during sterilization to drain condensate.
4. If sterilizing a dry cartridge, slowly open V_2 .
 - a. Crack open V_7 to vent trapped air.
 - b. Crack open V_6 to allow steam to flow through the system. Do not allow the differential pressure across the cartridge to exceed 5 psi (0,3 bar).
 - c. Leave drain V_8 cracked during sterilization to drain condensate.
5. Steam sterilize for 30 to 60 minutes at 15 to 20 psig (1,0 to 1,4 bar), or as long as experience dictates.
6. When sterilization is complete, close V_2 .
7. Open V_3 and introduce sterile air or nitrogen regulated to the same pressure as the steam.
8. Close V_8 once steam and condensate flow stops.
9. Allow the system to cool to room temperature. Do not allow the differential pressure across the cartridge to exceed 5 psi (0,3 bar). Then close V_3 , V_7 and V_6 . Keep the system under pressure until ready for use.
10. Crack vent V_7 and allow the system pressure to equalize. The filtration process may now be started or the filter can be wetted and integrity tested.

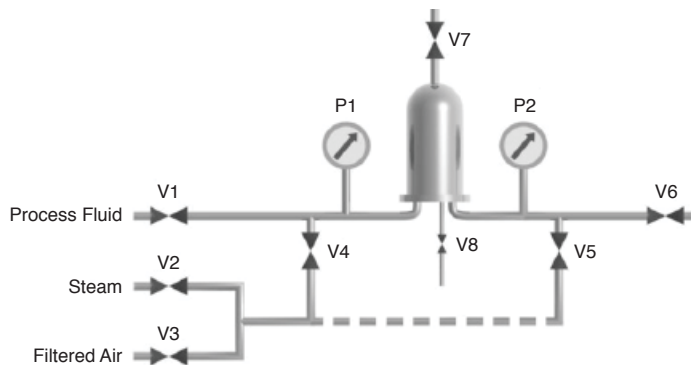


Figure 3

Storage and Shelf Life

Meissner manufactures a complete line of filter products and One-Touch® single use assemblies. Products are suitably bagged and boxed for shipping and may be stored in the original packaging in a clean dry area between 0°C and 40°C (32°F to 100°F). The following gives the minimum shelf life expectancies for Ultradyne® products.

Filters

The Ultradyne® filter has an expected shelf life greater than 5 years in the cartridge, small flow, large and small capsule lines, and disc configurations. Filters may be used beyond their minimum expected shelf life if they were stored in their original packaging and are integrity tested prior to use and found to be within specification. Filter product age can be determined from the date on the original Certificate of Quality or Conformance.

One-Touch® Products

The One-Touch® product line of single-use systems, including but not limited to biocontainers, tubing, and/or filter assemblies, has labeling which identifies the product specific expiration date. The standard shelf life of nonsterile One-Touch® products is 2 years from the date of manufacture. These standard time periods may be amended to reflect the various components included in a specific configuration, a change that will be indicated on the product label.

Ultradyne® Membrane Grade Descriptions

- TM =** This absolute, particulate rated filter is 100% integrity tested during manufacture. It is suited for high purity filtration of liquids, or for economical sterilization of air/gas when regulatory requirements are minimal. A Certificate of Conformance is available on a lot basis.
- TT =** This absolute, microbially rated, sterilizing grade filter meets full traceability requirements for the pharmaceutical industry. (It qualifies as a sterilizing grade filter per ASTM F838 liquid bacterial challenge.) It is 100% integrity tested during manufacture. Each TT 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.
- TA =** This sterilizing grade filter is absolute, microbially rated and 100% integrity tested during manufacture. (It qualifies as a sterilizing grade filter per ASTM F838 liquid bacterial challenge.) It is suited for critical applications when regulatory documentation requirements are minimal. A Certificate of Conformance is available on a lot basis.
- TD =** This absolute, particulate rated, double layer filter is 100% integrity tested during manufacture. It is suited for applications when regulatory documentation requirements are minimal. A Certificate of Conformance is available on a lot basis.

Cartridge Ordering Matrix Description

TM	0.2	—	2	C6	R	S
		—				
Filter Grade	Absolute Rating (µm)	—	Cartridge Length	End Cap Configuration	Reinforcement Ring Option	Seal Material (O-ring or Gasket)
TM	0.05, 0.1, 0.2, 0.4, 1.0, 5.0		1 = 10"	GS = DOE; flat gaskets (9.75", 19.5", 29.25", 39" length filters)	(Blank) = Standard - no reinforcement ring	<u>O-ring Seal</u> B = Buna
TT	0.2		2 = 20"	GL = DOE; flat gaskets (20", 30", 40" length filters)	R = Reinforcement ring required for autoclave/SIP applications	E = EPR
TA	0.2		3 = 30"	C1 = SOE; 222 nO-Ring®, button cap end C2 = SOE; 222 O-rings, button cap end		S = Silicone T = Teflon® over Silicone
TD	0.1, 0.2		4 = 40"	F1 = SOE; 222 nO-Ring®, fin end F2 = SOE, 222 O-rings, fin end C5 = SOE; 226 nO-Ring®, button cap end C6 = SOE; 226 O-rings, button cap end F5 = SOE; 226 nO-Ring®, fin end F6 = SOE; 226 O-rings, fin end DN = DOE; internal 120 O-rings RN = SOE; internal 120 O-ring, recessed cap end DA = DOE; internal 213 O-rings RA = SOE; internal 213 O-ring, recessed cap end		V = Viton® X = Teflon® over Viton® <u>Gasket Seal</u> B = Buna E = EPR P = Polyethylene S = Silicone T = Teflon® V = Viton®

Small Flow Elements (SFE Filters) Ordering Matrix Description

L	TM	0.2	—	5	6	R	S
L			—				
Model	Filter Grade	Absolute Rating (µm)	—	Filter Length/(Area) nominal	Adapter Selection	Reinforcement Ring Option	O-ring Material
L	TM	0.05, 0.1, 0.2, 0.4, 1.0, 5.0		2 = 2.5"/1.2 ft² (0.11 m²)	P = Standard internal 116 O-ring	(Blank) = Standard - no reinforcement ring	B = Buna
	TT	0.2		5 = 5.0"/2.5 ft² (0.23 m²)	2 = 222 O-rings (for autoclave/SIP applications, select "R" under "Reinforcement Ring Option")	R = Reinforcement ring - required only for the 222 and 226 adapter when autoclaving or steam sterilizing	E = EPR
	TA	0.2			6 = 226 O-ring style locking adapter (for autoclave/SIP applications, select "R" under "Reinforcement Ring Option")		S = Silicone
	TD	0.1, 0.2			SK = Skirt-flange adapter (no reinforcement or O-ring options available)		T = Teflon® over Silicone
					L = 116 O-ring with Mini Lock		V = Viton®
							X = Teflon® over Viton®

Capsule (CS/CL) Ordering Matrix Description

C	S	2	TM	0.2	—	02	2
C					—		
Model	Filtration Area (nominal)	Material Code	Filter Grade	Absolute Rating (µm)	—	Inlet/Outlet Connections	Vent/Drain Ports
C	S = 1.2 ft² (0.11 m²) L = 2.5 ft² (0.23 m²)	(Blank) or 1 = Polypropylene capsule shell material 2 = Animal component free polypropylene capsule shell material	TM TT TA TD	0.05, 0.1, 0.2, 0.4, 1.0, 5.0 0.2 0.2 0.1, 0.2		00 = 1" sanitary flange 02 = 1" sanitary flange inlet; 3/8" hose barb outlet 0C = 1" sanitary flange inlet; 1/2" hose barb outlet 22 = 3/8" hose barb 2B = 3/8" hose barb with filling bell CC = 1/2" hose barb 44 = 1/4" MNPT 55 = 3/8" FNPT 66 = 3/8" MNPT 77 = 3/4" sanitary flange 88 = 3/4" hose barb 99 = 1/2" hose barb flexible tubing	0 = No vent/drain port 1 = 1 luer port with cap, outlet side 2 = Standard - 2 luer ports with caps 4 = 2 sanitary valves with hose barb 5 = 1 sanitary valve with hose barb connection, outlet side 6 = 1 sanitary valve with hose barb connection, inlet side

Capsule (CF) Ordering Matrix Description

CF	2	TM	0.2	—	33	A	1
CF				—			
Model	Material Code	Filter Grade	Absolute Rating (µm)	—	Inlet/Outlet Connections	Filtration Area (nominal)	Vent/Drain Ports
CF	(Blank) or 1 = Polypropylene capsule shell material 2 = Animal component free polypropylene capsule shell material	TM TT TA TD	0.05, 0.1, 0.2, 0.4, 1.0, 5.0 0.2 0.2 0.1, 0.2		33 = Hose barb (1/4" - 3/8") 3B = Hose barb (1/4" - 3/8") with filling bell 41 = 1/4" MNPT inlet; 1/4" hose barb outlet 44 = 1/4" MNPT 77 = 3/4" sanitary flange	A = 0.33 ft² (305 cm²) B = 0.50 ft² (465 cm²)	0 = No vent/drain port 1 = Standard - 1 luer port with cap, outlet side 2 = 2 luer ports with caps 4 = 2 sanitary valves with hose barbs 5 = 1 sanitary valve with hose barb connection, inlet side

Capsule (CM/CK) Ordering Matrix Description

C	K	2	TM	0.2	—	77	4
C		2			—		
Model	Filtration Area (nominal)	Material Code	Filter Grade	Absolute Rating (µm)	—	Inlet/Outlet Connections	Vent/Drain Ports
C	M = 0.36 ft² (335 cm²) K = 0.45 ft² (415 cm²)	2 = Animal component free polypropylene capsule shell material	TM TT TA TD	0.05, 0.1, 0.2, 0.4, 1.0, 5.0 0.2 0.2 0.1, 0.2		11 = 1/4" hose barb 1B = 1/4" hose barb w/ filling bell 22 = 3/8" hose barb 2B = 3/8" hose barb w/ filling bell 41 = 1/4" MNPT; 1/4" hose barb out 44 = 1/4" MNPT 71 = 3/4" TC in; 1/4" hose barb out 72 = 3/4" TC in; 3/8" hose barb out 77 = 3/4" sanitary (TC) flange	0 = No vent/drain port 1 = 1 luer port with cap, inlet side 2 = Standard - 2 luer ports with caps 4 = 2 sanitary valves with hose barb 5 = 1 sanitary valve with hose barb connection, inlet side 6 = 1 sanitary valve with hose barb, outlet side

UltraCap® (T-Style & Inline) Ordering Matrix Description

CU	TM	0.2	—	2	T	00	2
CU			—				
Model	Filter Grade	Absolute Rating (µm)	—	Cartridge Length	Body Style	Inlet/Outlet Connections	Vent/Drain Ports T-Style
CU	TM	0.05, 0.1, 0.2, 0.4, 1.0, 5.0		1 = 10"	T = T-style	00 = 1" sanitary flange	0 = No vent or drain
	TT	0.2		2 = 20"	N = Inline	77 = 3/4" sanitary flange	1 = No vent; 1/4" sanitary drain plug
	TA	0.2		3 = 30"		02 = 1" sanitary flange inlet; 3/8" hose barb outlet	2 = Sanitary vent; 1/4" sanitary drain plug
	TD	0.1, 0.2				0C = 1" sanitary flange inlet; 1/2" hose barb outlet	3 = Sanitary vent; 3/4" sanitary flange gauge port; 1/4" sanitary drain plug
						09 = 1" sanitary flange inlet; 9/16" hose barb outlet	4 = Sanitary vent; no drain
						08 = 1" sanitary flange inlet; 3/4" hose barb outlet	5 = Sanitary vent; 3/4" sanitary flange gauge port; no drain
						22 = 3/8" hose barb	6 = No vent or drain; 3/4" sanitary flange gauge port
						CC = 1/2" hose barb	
						99 = 9/16" hose barb	
						88 = 3/4" hose barb	
						AA = 1/2" Flaretek®	
						BB = 3/4" Flaretek®	
							Vent/Drain Ports Inline
							0 = No vent or drain
							2 = Two sanitary vent/drain valves
							4 = One sanitary vent or drain valve, outlet side

UltraCap® H.D. (T-Style & Inline) Ordering Matrix Description

CR	2	TM	0.2	—	2	T	00	2
CR	2			—				
Model	Material Code	Filter Grade	Absolute Rating (µm)	—	Cartridge Length	Body Style	Inlet/Outlet Connections	Vent/Drain Ports T-Style
CR	2 = Animal component free polypropylene capsule shell material	TM	0.05, 0.1, 0.2, 0.4, 1.0, 5.0		1 = 10"	T = T-style	00 = 1" sanitary flange	0 = No vent or drain
		TT	0.2	2 = 20"	N = Inline	77 = 3/4" sanitary flange	1 = No vent; 1/4" sanitary drain plug	
						02 = 1" sanitary flange inlet; 3/8" hose barb outlet	2 = Sanitary vent; 1/4" sanitary drain plug	
		TA	0.2	3 = 30"		0C = 1" sanitary flange inlet; 1/2" hose barb outlet	3 = Sanitary vent; 3/4" sanitary flange gauge port; 1/4" sanitary drain plug	
		TD	0.1, 0.2	4 = 40"		09 = 1" sanitary flange inlet; 9/16" hose barb outlet	4 = Sanitary vent; no drain	
				5 = 50"		08 = 1" sanitary flange inlet; 3/4" hose barb outlet	5 = Sanitary vent; 3/4" sanitary flange gauge port; no drain	
						0D = 1" sanitary flange inlet; 1" hose barb outlet	6 = No vent or drain; 3/4" sanitary flange gauge port	
						22 = 3/8" hose barb	A = No vent; sanitary drain valve	
						CC = 1/2" hose barb	B = Sanitary vent; sanitary drain valve	
						99 = 9/16" hose barb	C = Sanitary vent; sanitary drain; 3/4" sanitary flange gauge port	
						88 = 3/4" hose barb		
						DD = 1" hose barb		
						AA = 1/2" Flaretek®		
						BB = 3/4" Flaretek®		
								Vent/Drain Ports Inline
								0 = No vent or drain
								2 = Two sanitary vent/drain valves
								4 = One sanitary vent or drain valve, outlet side

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