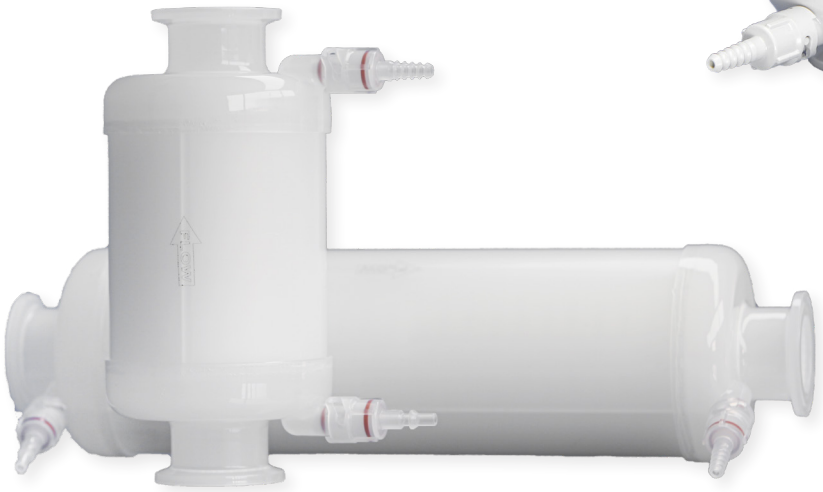
CAPSFLOW



The GVS Group

In over 45 years of history, GVS has evolved from a supplier of components for the healthcare sector to a global group that produces highly technological diversified filtration solutions.

Wide range of products and custom design expertise

GVS produces a wide range of filter materials, filters and off-the-shelf components in all its divisions, enabling its customers to reduce the design time for new product launches. All the GVS divisions work in highly regulated environments and the Group therefore operates with extremely high-quality standards. Thanks to its research and development centres located all over the world, GVS is also able to offer an extremely efficient and personalized service to meet its customers'needs: from product conception and design to testing and mass production.

Dynamic and flexible structure

GVS has developed a streamlined, dynamic and technologically advanced structure that has made it possible to achieve constant and balanced growth. The Group currently employs a total of 4869 people who work in automated assembly departments, in lines for the production and processing of filter membranes and in class 10,000 and 100,000 cleanrooms.

Global growth

The GVS Group has always paid great attention to research, development and innovation of its products and processes and has shown a strong trend towards development in global markets since its foundation.
In addition to the corporate headquarters in Bologna, GVS currently has 19 plants in Italy, United Kingdom, Brazil, United States, China, Mexico, Romania e Puerto Rico, and 29 commercial offices located all over the world. GVS has always adopted a "glocal" approach: it operates locally in contact with its customers, but relies on the strength of a global network.

For more information, visit www.gvs.com

INDEX

CSK series
Capsule Filters

CSK series - Asymmetrical PES membrane Capsule Filters

Description and use

- The PES membrane capsule utilizes single layer hydrophilic polyethersulfone membrane. lt offers broad chemical compatibility, high flow rate and low extractable.
- Polyethersulfone is particularly suited for the filtration of products that contain substances that adsorb to the media. The lower binding characteristics of polyethersulfone make it a good choice for filtration of valuable protein solutions such as vaccines and biologicals.

Typical Applications

- Cell Culture Media
- Large Volume Parenterals (LVP's)
- Pharmaceutical Bulk Chemical Solutions
- Diagnostics
- Blood and Serum Fractions
- Purified Water
- Beer, Wine and Spirits
- Juice & Soft Drinks
- Bottled Water

Fitting Option

- NPT-Male
- NPT-F
- Swagelok
- CPCPLC-Male
- CPCPLC-Female
- Hose Barb
- Stepped Hose Barb
- Triclover

Maximum Operating Conditions

- Maximum operating pressure:
  Liquid: 5 bar (80psi) at 77°F/25°C
  Gas: 3.5 bar (60psi) at 77°F/25°C
- Maximum Operating Temperature: 80 °C
- Autoclave at 125 °C, 30 minutes and 25 cycles
- Autoclave at 135 °C, 30 minutes and 15 cycles

Toxicity

All materials meet the specifications far biological safety per USP Class VI -121C° far plastics.

Filter Area

- 500 cm^2
- 1000 cm^2
- 1500 cm^2
- 2100 cm^2

Construction of Materials

- Filter Media: Polyethersulfone
- Media Support: Polypropylene
- End Caps: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Food Safety Compliance

- Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21CFR. Materials used to produce filter media and
- hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011

Capsule Integrity Test Specifications

Gen Purpose

Pore size	Min.Bubble point
0.04 µm	2.3 barg@22°C/IPA
0.1 µm	4.8 barg@22°C
0.2 µm	3.1 barg@22°C
0.45 µm	1.7 barg@22°C
0.65 µm	1.3 barg@22°C
0 .8 µm	1.2 barg@22°C
1.2 µm	0.8 barg@22°C

Low Bio

Pore size	Min.Bubble point
0.2 µm	3.5 barg@22°C
0.45 µm	2.3 barg@22°C
0.65 µm	1.5 barg@22°C

Ster Grade

0.2/0.04µm	2.3 Barg@22°C (IPA)
0.45/0.04µm	2.3 Barg@22°C (IPA)
0.45/0.2um	3.5 barg@22°C
0.65/0.2µm	3.5 barg@22°C
0.65/0.45µm	2.3 Barg@22°C
0.8/0.45um	2.3 Barg@22°C
0.2/0.1um	1.7 Barg@22°C (IPA)
0.45/0.1um	1.7 Barg@22°C (IPA)

ORDERING INFORMATION								
Product ype	Membrane Type	Membrane pore size	Application	Sterilization	Size	Fittings in / out	Vent/ Drain	Revision
CSK = Capsule Filter	PS = PES	**Application G**	G = Gen Purpose	N = Not Sterile	05= 500 cm^2	4NM=1/4"NPT-M	NN = None	0 = Bag label
		0010 = 0.1µm	B = Low Bio		10 = 1000cm^2	8NM = 3/8" NPT-M		1 = Housing Label
		0020 = 0.2µm	S = Ster Grade		15 = 1500cm^2	2NM = 1/2" NPT-M		
		0045 = 0.45µm			21 = 2100cm^2	8NF = 3/8" NPT-F		
		0065 = 0.65µm				4SL = 1/4" Swagelok		
		0080 = 0.8µm				5SL = 5/16" Swagelok		
		0100 = 1.2µm				8SL = 3/8" Swagelok		
		Application B				4CM = 1/4" CPC-PLC-M		
		0020 = 0.2µm				4HB = 3/4" HB		
		0045 = 0.45µm				8HB = 3/8" HB		
		0065 = 0.65µm				48B = 1/4"-3/8" HB		
		Application S				1TC = 1" TC		
		02X4 = 0.2/0.04µm						
		04X4 = 0.45/0.04µm						
		0402 = 0.45/0.2µm						
		0602 = 0.65/0.2µm						
		0604 = 0.65/0.45µm						
		0804 = 0.8/0.45µm						
		0201 = 0.2/0.1µm						
		0401 = 0.45/0.1µm						

CSK series - Hydrophobic ePTFE membrane Capsule Filters

Description and use

Capsflow CSK series PTFE membrane capsule utilizes single layer hydrophobic PTFE membrane. lt offers broad chemical compatibility, high flow rate and low extractables.

Benefits

- 100% integrity tested
- FDA food contact compliant
- Thermal bonding
- Non-fiber releasing

Typical Application

- Sterile air feed
- Chemicals
- Pharmaceuticals
- Solvent

Fitting Option

- NPT-Male
- NPT-F
- Swagelok
- CPCPLC-Male
- CPCPLC-Female
- Hose Barb
- Stepped Hose Barb
- Triclover

Toxicity

All components meet the specifications for biological safety per USP Class VI -121 °C for plastics.

Cartridge lntegrity Test Specifications

Low Bio

Pore size	0.2 mm
Subbie Point	≥1. 4 barg (IPA/ Water)
Water intrusion	≤0.17 ml/min@2500 mbar/2100cm2, 2°C22°C

Gen Purpose

Pore size	Bubble Point / IPA
0010 = 0.1µm	1.7 barg
0020 = 0.2µm	1.1 barg
0045 = 0.45µm	0.6 barg
0065 = 0.65µm	0.5 barg
0100 = 1.0µm	0.4 barg
0300 = 3.0µm	0.1 barg
0500 = 5.0µm	0.07 barg

Capsule Integrity

- Minimum burst pressure: 123.5 psi (8.5 barg)

Construction Materials

- Filter Membrane: ePTFE
- Membrane Media Support: Polypropylene
- Capsule: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Sanitization/Sterilization

- Autoclavable

Filter Area

- 500 cm^2
- 1000 cm^2
- 1500 cm^2
- 2100 cm^2

Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21 CFR. Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011.

Maximum Operating Conditions

- Maximum operating pressure
  -Liquid: 5 bar (80psi) at 77°F/25°C
  -Gas: 3.5 bar (60psi) at 77°F/25°C
- Maximum Operating Temperature: 80 °C
- Autoclave at 125 °C, 30 minutes and 25 cycles
- Autoclave at 135 °C, 30 minutes and 15 cycles

ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings in / out**	**Vent/Drain**	**Revision**
CSK = Capsule Filter	PT = PTFE phobic	**Application G**	G = Gen Purpose	N = Not Sterile	05= 500 cm^2	4NM=1/4"NPT-M	NN = None	0 = Bag label
		0010 = 0.1µm	B = Low Bio		10 = 1000cm^2	8NM = 3/8" NPT-M		1 = Housing Label
		0020 = 0.2µm			15 = 1500cm^2	2NM = 1/2" NPT-M		
		0045 = 0.45µm			21 = 2100cm^2	8NF = 3/8" NPT-F		
		0065 = 0.65µm				4SL = 1/4" Swagelok		
		0100 = 1.0µm				5SL = 5/16" Swagelok		
		0300 = 3.0µm				8SL = 3/8" Swagelok		
		0500 = 5.0µm				4CM = 1/4" CPC-PLC-M		
		Application B				4HB = 3/4" HB		
		0020 = 0.2µm				8HB = 3/8" HB		
						48B = 1/4"-3/8" HB		
						1TC = 1" TC		

CSK series - Polypropylene membrane Capsule Filters

Description and use

CSK PP Capsule Filters with depth structure of polypropylene media. lt offers broad chemical compatibility, higher dirt holding capacity with high flow rates at low pressure drop, and low extractables. They are available in nominal and absolute rating.

Benefits

- Wide chemical compatibility
- High dirt hold capacity
- High retention
- Thermal bonding
- Non-fiber releasing

Typical Application

- Process Water
- Vinegar
- Aqueous solutions
- Beer, Wine and Spirits
- Juice, Soft Drinks, Edible Oils
- Bulk Chemicals
- Pharmaceutical intermediates

Construction Materials

- Filter Media: Polypropylene
- Media Support: Polypropylene
- End Caps: Polypropylene
- lnner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Sanitization/Sterilization

- Autoclavable
- Hot water

Toxicity

All components meet the specifications for biological safety per USP Class VI -121 °C for plastics.

Capsule Integrity

- Minimum burst pressure: 123.5 psi (8.5 barg)

Filter Area

- 500 cm^2
- 1000 cm^2
- 1500 cm^2
- 2100 cm^2

Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21CFR.
Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011.

Maximum Operating Conditions

- Maximum operating pressure
  -Liquid: 5 bar (80psi) at 77°F/25°C
  -Gas: 3.5 bar (60psi) at 77°F/25°C
- Maximum Operating Temperature: 80 °C
- Autoclave at 125 °C, 30 minutes and 25 cycles
- Autoclave at 135 °C, 30 minutes and 15 cycles

ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings in / out**	**Vent/Drain**	**Revision**
CSK = Capsule Filter	PP = Polypropylene	**Application G**	G = Gen Purpose	N = Not Sterile	05= 500 cm^2	4NM=1/4"NPT-M	NN = None	0 = Bag label
		0030 = 0.3µm	P= Premier		10 = 1000cm^2	8NM = 3/8" NPT-M		1 = Housing Label
		0060 = 0.6µm			15 = 1500cm^2	2NM = 1/2" NPT-M		
		0100 = 1.0µm			21 = 2100cm^2	8NF = 3/8" NPT-F		
		0300 = 3.0µm				4SL = 1/4" Swagelok		
		0500 = 5.0µm				5SL = 5/16" Swagelok		
		0700 = 7.0µm				8SL = 3/8" Swagelok		
		1000 = 10.0µm				4CM = 1/4" CPC-PLC-M		
		2000 = 20.0µm				4HB = 3/4" HB		
		3000 = 30.0µm				8HB = 3/8" HB		
		5000 = 50.0µm				48B = 1/4"-3/8" HB		
		Application P				1TC = 1" TC		
		0100 = 1.0µm						
		0300 = 3.0µm						
		0500 = 5.0µm						
		0700 = 7.0µm						
		1000 = 10.0µm						
		2000 = 20.0µm						
		3000 = 30.0µm						
		5000 = 50.0µm						

CIK series

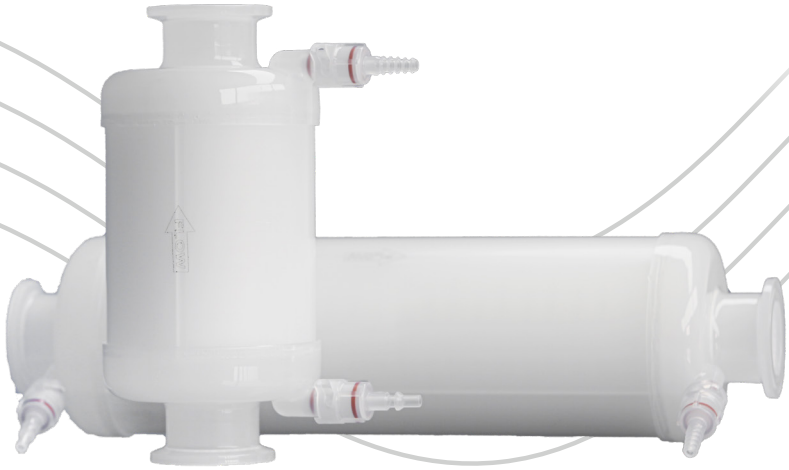
In Line Integrity Test Capsule Filter

CIK series - Asymmetrical PES membrane Bio-burden Reduction Capsule Filters

Capsflow CIK series is family of full size capsule filters with Staubli connection at the vent, which enables in-line integrity test.

The PES membrane capsule utilizes single layer hydrophilic polyethersulfone membrane. lt offers broad chemica compatibility, high flow rate and low extractable.

Polyethersulfone is particularly suited for the filtration of products that contain substances that adsorb to the media. The lower binding characteristics of polyethersulfone make it a good choice for filtration of valuable protein solutions such as vaccines and biologicals.



Typical Applications

- Cell Culture Media
- Large Volume Parenterals (LVP's)
- Pharmaceutical Bulk Chemical Solutions
- Diagnostics
- Blood and Serum Fractions
- Purified Water
- Beer, Wine and Spirits
- Juice & Soft Drinks
- Bottled Water

Vent/Drain Option

Staubli

Stepped hose barb

Fitting Option

- 1.5"TC
- 1/2" Hose Barb
- 3/4" Hose Barb

Maximum Operating Conditions

- Maximum opereting pressure
  -Liquid: 5 bar (80psi) at 77°F/25°C
  -Gas: 3.5 bar (60psi) at 77°F/25°C
- Maximum Operating Temperature: 80 °C
- Autoclave at 125 °C, 30 minutes and 25 cycles
- Autoclave at 135 °C, 30 minutes and 15 cycles

Toxicity

All materials meet the specifications

far biologica! safety per USP Class

VI -121"C far plastics

Filter Area

Size	Filtration Area
2.5''	= 1400 cm^2
5''	= 2500 cm^2
10''	= 6000 cm^2
20''	= 12000 cm^2
30''	= 18000 cm^2
40''	= 24000 cm^2

Construction of Materials

- Filter Media: Polyethersulfone
- Media Support: Polypropylene
- End Caps: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21CFR. Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011.

Cartridge Integrity Test Specifications

Water wetted membrane

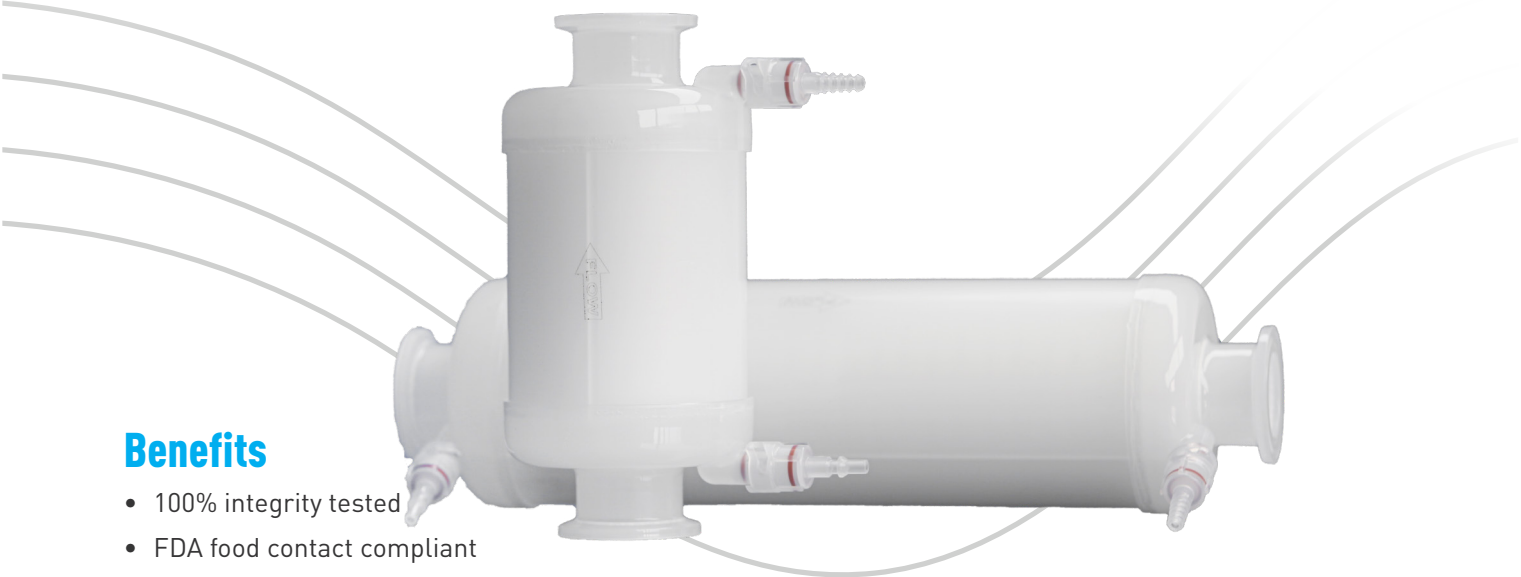
Pore size	Min.Bubble point	Diffusive Flow/10"
0.04 µm	2.3 barg@22°C/IPA	≤ 25 ml/ 1.7 barg
0.1 µm	1.7 barg@22°C/IPA	≤ 25 ml/ 1.3 barg
0.2 µm	3.5 barg@22°C	≤ 25 ml/ 2.8 barg
0.45 µm	2.3 barg@22°C	≤ 25 ml/ 1.7 barg
0.65 µm	1.6 barg@22°C	≤ 25 ml/ 1.0 barg
0 .8 µm	1.3 barg@22°C	≤ 25 ml / 0.8 barg
1.2 µm	0.9 barg@22°C	≤ 25 ml/ 0.6 barg

ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings In/Out**	**Vent/Drain**	**Revision**
CIK = Capsule InT Filter	PS = PES	0010 = 0.1 µm	B =Low Bio	N = Not Sterile	SS = 2.5"	5TC = 1.5" TC	SS = St/St	0 = Bag label
		0020 = 0.2 µm			LL = 5"	2HB = 1/2" HB	HH = HB/HB	1 = Housing label
		0045 = 0.45 µm			TE = 10"	4HB = 3/4" HB	SH = St/HB	
		0065 = 0.65 µm			TW = 20"	T2B = 1.5" TC/ 1/2" HB	HS = HB/St	
		0080 = 0.80 µm			TH = 30"	T4B = 1.5" TC/ 3/4" HB		
		0120 = 1.2 µm			FO = 40"	2BT = 1/2"HB/ 1.5 TC		
						2B4 = 1/2"HB/ 3/4"HB		
						4BT = 3/4"HB/ 1.5"TC		
						4B2 = 3/4"HB/ 1/2"HB		

CIK series - Hydrophobic ePTFE membrane Bio-burden Reduction Capsule Filters

Capsflow CIK series is family of full size capsule filters with Staubli connection at the vent, which enables in-line integrity test.

The PTFE membrane Bio-burden reduction capsule utilizes single layer hydrophobic PTFE membrane. lt offers broad chemical compatibility, high flow rate and low extractables.



Benefits

- 100% integrity tested
- FDA food contact compliant
- Thermal bonding
- Non-fiber releasing

Typical Application

- Sterile air feed
- Chemicals
- Pharmaceuticals
- Solvent

Capsule Integrity

- Minimum burst pressure: 123.5 psi (8.5 barg)

Construction Materials

- Filter Membrane: ePTFE
- Membrane Media Support: Polypropylene
- Capsule: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Sanitization/Sterilization

- Autoclavable

Cartridge lntegrity Test Specifications

Pore size	0.2 mm
Subbie Point	≥1. 2 barg (IPA/ Water)
Water intrusion	≤0.37 ml/min @ 2500 mbar/10", 22°C
Diffusive Flow	10 ml/min @ 800 mbar/ 10", 22°C

Filter Area

Size Filtration Area

- 2.5'' = 1500 cm^2
- 5'' = 2700 cm^2
- 10'' = 6300 cm^2
- 20'' = 12600 cm^2
- 30'' = 18900 cm^2
- 40'' = 25200 cm^2

Fitting Option

- 1.5" TC
- 1" Hose Barb
- 3/4" Hose Barb

Vent/Drain Option

- Staubli
- Stepped hose barb

Toxicity

- All components meet the specifications
- for biological safety per USP Class VI -121 °C for plastics

Food Safety Compliance

- Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21 CFR.
- Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011.

Maximum Operating Conditions

- Maximum operating pressure
  -Liquid: 5 bar (80psi) at 77°F/25°C
  -Gas: 3.5 bar (60psi) at 77°F/25°C
- Maximum Operating Temperature: 80 °C
- Autoclave at 125 °C, 30 minutes and 25 cycles
- Autoclave at 135 °C, 30 minutes and 15 cycles

ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings In/Out**	**Vent/Drain**	**Revision**
CIK = Capsule InT Filter	PT = PTFE phobic	0020 = 0.2 µm	B = Low Bio	N = Not Sterile	SS = 2.5" LL = 5" TE = 10" TW = 20" FO = 40"	5TC = 1.5" TC 2HB = 1/2" HB 4HB = 3/4" HB T2B = 1.5" TC/ 1/2" HB T4B = 1.5" TC/ 3/4" HB 2BT = 1/2"HB/ 1.5TC 2B4 = 1/2"HB/ 3/4"HB 4BT = 3/4"HB/ 1.5"TC 4B2 = 3/4"HB/ 1/2"HB	SS = St/St HH = HB/HB SH = St/HB HS = HB/St	0 = Bag label 1 = Housing label

CIK series - Polypropylene media
General Application Capsule Filters

CIKPP Capsule Filters with depth structure of polypropylene media. lt offers broad chemical compatibility, higher dirt holding capacity with high flow rates at low pressure drop, and low extractables. They are available in nominal and absolute rating.

Benefits

- Wide chemical compatibility
- High dirt hold capacity
- High retention
- Thermal bonding
- Non-fiber releasing

Typical Applications

- Process Water
- Vinegar
- Aqueous solutions
- Beer, Wine and Spirits
- Juice, Soft Drinks, Edible Oils
- Bulk Chemicals
- Pharmaceutical intermediates

Construction Materials

- Filter Media: Polypropylene
- Media Support: Polypropylene
- End Caps: Polypropylene
- lnner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Sanitization/Sterilization

- Autoclavable
- Hot water

Toxicity

- All plastic parts meet the specifications for biological safety per USP Class VI -121°C for plastics.

Filter Area

Size Filtration Area

- 2.5'' =1480 cm^2
- 5'' =2650 cm^2
- 10'' =5500 cm^2
- 20'' =11000 cm^2
- 30'' =16500 cm^2
- 40'' =22000 cm^2

Capsule Integrity

Minimum burst pressure: 123.5psi (8.5 barg)Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21CFR.

Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011

Maximum Operating Conditions

- Maximum opereting pressure
  -Liquid: 5 bar (80psi) at 77°F/25°C
  -Gas: 3.5 bar (60psi) at 77°F/25°C
- Maximum Operating Temperature: 80 °C
- Autoclave at 125 °C, 30 minutes and 25 cycles
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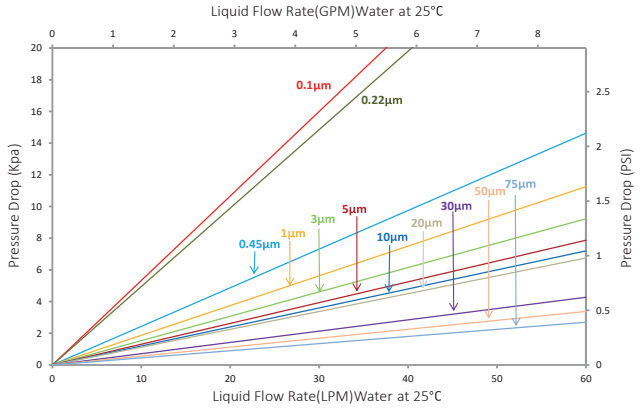
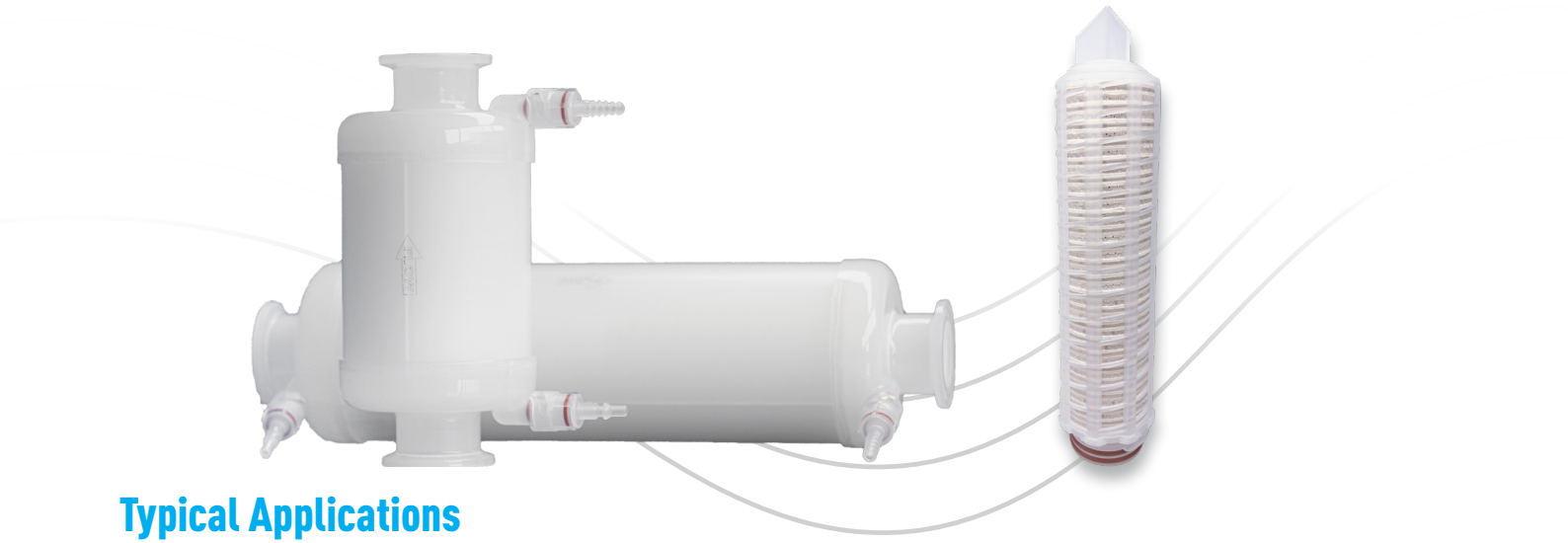


ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings**	**Vent/Drain**	**Revision**
CIK = Capsule InT Filter	PP = Polypropylene	**Application G**	G = Gen Purpose	N = Not Sterile	SS = 2.5"	5TC = 1.5" TC	SS = St/St	0 = Bag label
		0060 = 0.6 µm	P= Premier		LL = 5"	2HB = 1/2" HB	HH = HB/ HB	1 = Housing label
		Application P			TE = 10"	4HB = 3/4" HB	SH = St/HB	
		0100 = 1.0 µm			TW = 20"	T2B = 1.5" TC/ 1/2" HB	HS = HB/St	
		0300 = 3.0 µm			TH = 30"	T4B = 1.5" TC/ 3/4" HB		
		0500 = 5.0 µm			FO = 40"	2BT = 1/2"HB/ 1.5TC		
		0700 = 7.0 µm				2B4 = 1/2"HB/ 3/4"HB		
		1000 = 10.0 µm				4BT = 3/4"HB/ 1.5"TC		
		2000 = 20.0 µm				4B2 = 3/4"HB/ 1/2"HB		
		3000 = 30.0 µm						
		5000 = 50.0 µm						

KP cellulosic depth media capsule filter

KP cellulosic depth media capsule filter have been designed for simple, quick, and efficient filtration of fluids used in laboratories, pilot, and small scale applications. The family of products is particularly suitable for high loading liquid applications. The compact design of the filters with respect to the filtration area, reduces hold-up volume and optimizes performance. Multiple pore size options is assembled in all polypropylene construction for excellent chemical compatibility.

The cellulosic depth media is structured in a stacked disk format to provide optimal flow. No adhesives, binders, surfactants are used in the process of manufacture.



Typical Applications

- Prefiltration
- Secondary clarification
- Cell culture harvest
- Cell culture clarification Protein aggregate removal

Filtration Area

- Single layer:1300cm^2/10''
- Double layer:650cm^2/10"

Material construction

- Filter Media:
  -Cleaned and bleached cellulose
  -Natural filter aid (kieselguhr, perlite)
- Media Support: Polypropylene
- End Caps: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene

Fitting Option

- 1.5"TC
- 1/2" Hose Barb
- 3/4" Hose Barb
- 314"TC

Vent/Drain Option

- Staubli
- Stepped hose barb

Toxicity

All materials meet the specifications for biological safety per USP Class Vl-121'C for plastics

Capsule Integrity

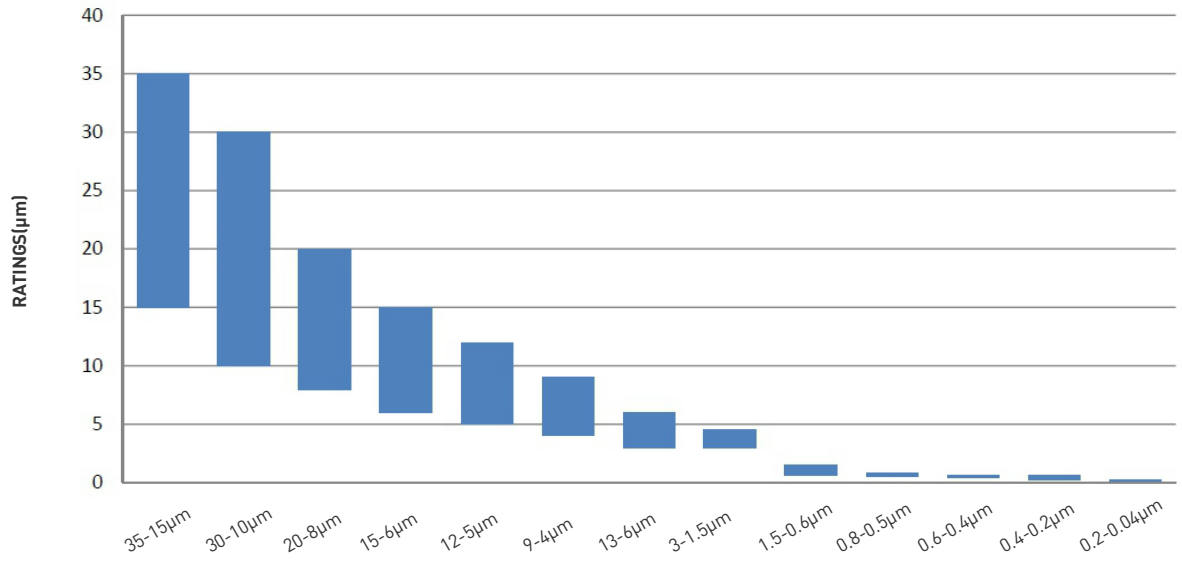
Minimum burst pressure:123.5psi(8.5barg)

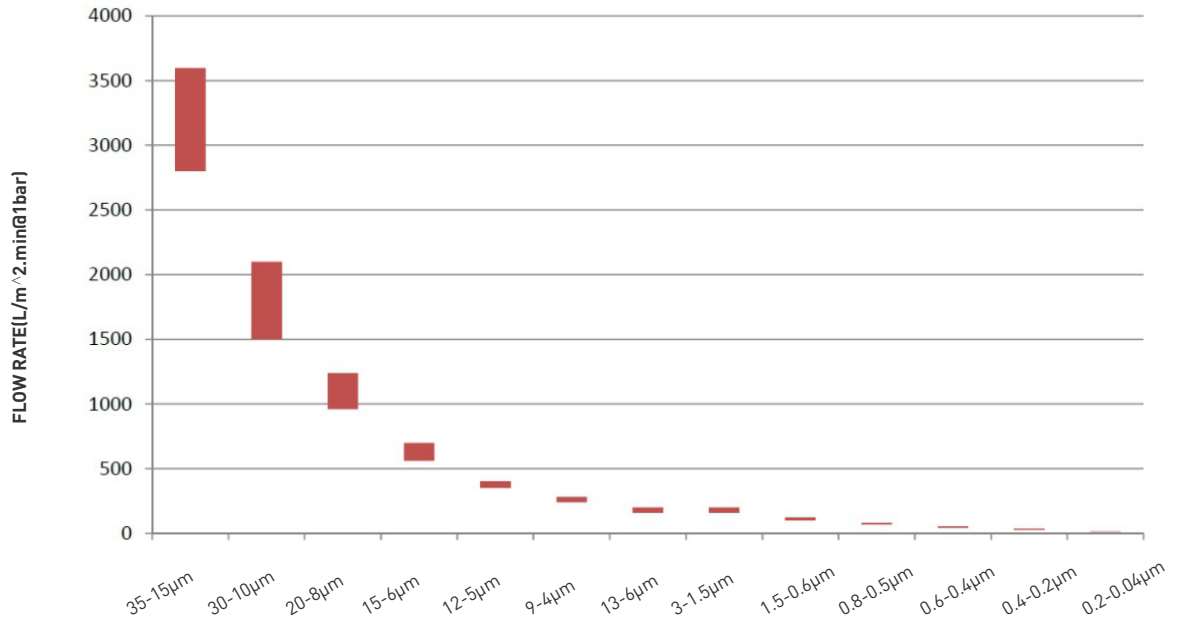
Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code ofFederalRegulations, 21CFRMaterials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011

Media Grade/Rating

	Retention Rating/μm
Coarse filtration	35-15
Coarse filtration	30-10
Coarse filtration	20-8
Clear filtration	15-6
Clear filtration	12-5
Clear filtration	9-4
Clear filtration	6-13
Fine filtration	3-1.5
Germ Reduction filtration	1.5-0.6
Sterile Filtration	0.8-0.5(Serratia marcescens, LRV>5)
Sterile Filtration	0.6-0.4(Serratia marcescens, LRV>7)
Sterile Filtration	0.4-0.2(Serratia marcescens, LRV>8)
Sterile Filtration	0.2-0.04(Serratia marcescens, LRV>8)





ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings in / out**	**Vent/Drain**	**Revision**
CKC = Capsule InT Depth Filter	CC = Cellulose	Z2Y4 = 0.2-0.04µm	G = Gen Purpose	N = Not Sterile	SS = 2.5"	5TC = 1.5" TC	SS = St/St	0 = Bag label
CCT = Capsule T-Line Depth Filter		Z4Z2=0.4-0.2µm			LL = 5"	2HB = 1/2" HB	HH = HB/HB	1 = Housing label
		Z6Z4 = 0.6-0.4µm			TE = 10"	4HB = 3/4" HB	SH = St/HB	
		Z8Z5=0.8-0.5µm			TW = 20"	T25 = 3/4" TC	HS = HB/St	
		15Z6=1.5-0.6µm			TH = 30"			
CCT is only available in 1.5"TC connection		3X15=3-1.5µm						
		9XX4=9-4µm						
		12X5=12-5µm						
		13X6=13-6µm						
		15X6=15-6µm						
		20X8=20-8µm						
		3010=30-10µm						
		33515=35-15µm						

CXK series

Steaming in Place

Capsule Filter

CXK series
Steaming in Place Capsule Filters

Description and use

The GVS CXK Capsflow Steaming in Place Capsule filters have a standard filter sealed in a robust plastic housing, which remains high-strength and integral at a harsh applications.
Typically Steaming in Place (SIP) sterilization. Capsflow filters are manufactured under criteria of certified Quality management system ISO 9001. All filters are integrity tested during manufacture to meet the set requirements.
Materials of construction comply with FDA regulations for food and beverage contact use.

Benefits

- Purpose-designed for SIP
- Cost-saving
- Easy connection with sanitary flange
- On-line connection to automatic integrity tester Available in multiple choice of media and ratings

Typical Application

- Sterile filtration of air and liquid in pharmaceutical and biological products
- Sterile air feed

Construction Materials

- Hydrophobic Filter membrane: PTFE,
- Hydrophilic Filter membrane: PES, NYLON
- Media Support: Polypropylene
- End Caps: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Filter sealing without glue in housing

Traceability

Each capsule is marked with a unique part number, batch number and serial number to enable full traceability

Size

- 2.5" (84 mm)
- 5" (159 mm)

Toxicity

All components meet the specifications for biological safety per USP class VI 121°C for plastic

Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21 CFR. Materials used to produce filter media
and hardware are safe for use in contact with food-stuffs in accordance with EU Directives 10/2011. Rohs 2011/65/EU compliance.

Filtration Area

CXKPT (PTFE), CXKPS (PES)

- 2.5" : 600 cm^2

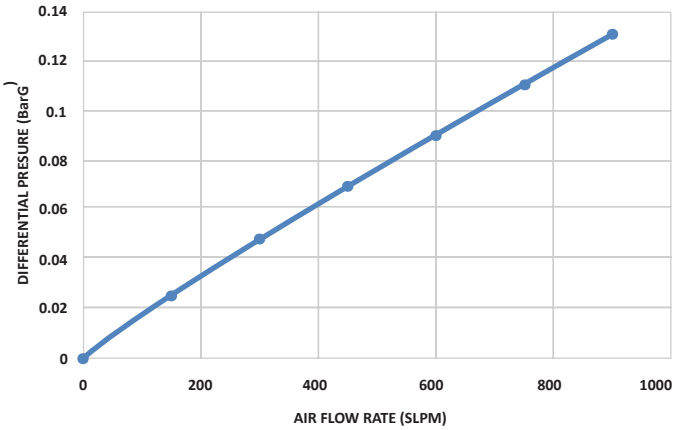
CXKNY (NYLON)

- 2.5" : 700 cm^2
- 5" : 2100 cm^2
- 5" : 1700 cm^2

Maximum Operating Conditions

- CXKPT (PTFE) 0.2 µm:
- Maximum Pressure: 5.8 barg @ 40°C
- Maximum Differential Pressure: 5barg @ 40°C

Typical Air Flow Rate



CXKPT 5" PTFE 0.2 µm

Performance data

	CXKPT			CXKPS				CXKNY		
Filter membrane	PTFE (Hydrophobic)			PES (Hydrophilic)				NYLON (Hydrophilic)		
Membrane pore size	0.05 µm	0.1 µm	0.2 µm	0.45 µm	0.1 µm	0.21 µm	0.45 µm	0.1 µm	0.21 µm	0.45 µm
Flow rate 2,5" Liquid 1 cP *		2lpm@6psid	3.1lpm@6psid	5.9lpm@6psid	7.5lpm@5psid	5lpm@5psid	5lpm@2.6psid	4lpm@8.5psid	5lpm@5.5psid	5lpm@3.5psid
Flow rate 5" Liquid 1 cP *		5lpm@6.5psid	5lpm@4psid	5lpm@1.9psid	5lpm@4psid	5lpm@2.2psid	5lpm@1.3psid	5lpm@4.6psid	5lpm@3.4psid	5lpm@2.8psid
Maximum Operating Parameter Pressures Forward/Reverse (bar)	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5	6.5/3.5
Integrity Test specification Bubble point (bar)	2.7 (IPA)	1.6 (IPA)	1.6 (IPA)	0.5 (IPA)	1.8 (IPA)	3.6 (WATER)	2.6 (WATER)	4.5 (WATER)	3.3 (WATER)	1.9 (WATER)
N. SiP sterilization cycles	100 cycles @126 °C			50 cycles @126 °C				50 cycles @126 °C		

* CXKPT (PTFE - Hydrophobic) IPA Wetted membrane

ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings in / out**	**Vent/Drain**	**Revision**
CXK = Capsule SIP Filter	PT = PTFE phobic	0005 = 0.05 µm (PT only)	X = Steaming in place	N = Not Sterile	SS = 2.5"	5TC = 1.5" TC	SS = St/St	0 = Bag label
	PT = PES	0010 = 0.1 µm			LL = 5"		HH = HB/HB	
	NY = NYLON	0020 = 0.2 µm					SH = St/HB	
							HS = HB/St	

CIL series

TIn-line filter PES membrane Capsule Filter

TIn line filter PES membrane
Capsule Filters bio-burden reduction

Description and use

The TIn-line capsule filters is family of full size capsule filters available in multiple option of length. The PES membrane capsule utilizes single layer hydrophilic polyethersulfone membrane. It offers broad chemical compatibility, high flow rate and low extractables.

Polyethersulfone is particularly suited for the filtration of products that contain substances that adsorb to the media. The lower binding characteristics of polyethersulfone make it a good choice for filtration of valuable protein solutions such as vaccines and biologicals.

Typical Applications

- Cell Culture Media
- Large Volume Parenterals (LVP's)
- Pharmaceutical Bulk Chemical Solutions
- Diagnostics
- Blood and Serum Fractions
- Purified Water
- Beer, Wine and Spirits
- Juice & Soft Drinks
- Bottled Water

Toxicity

- All materials meet the specifications
- far biological safety per USP Class
- VI -121C° far plastics.

Filter Area

- 0. 6 cm^2/10"c

Fitting Option

- 1.5" TC

Vent/Drain Option

- Stepped hose barb

Capsule Integrity

- Minimum burst pressure: 123.5psi (8.5barg)

Construction Materials

- Filter Media: Polyethersulfone
- Media Support: Polypropylene
- End Caps: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding
- Filter sealing without glue in housing

Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21CFR. Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011.

Capsule Integrity Test Specifications

Pore size	Min.Bubble point	Diffusive Flow
0.2 µm	3.5 barg@22°C	≤28ml/2.8 barg
0.45 µm	2.3 barg@22°C	≤25ml/1.7 barg
0.65 µm	1.6 barg@22°C	≤25ml/1.0 barg

ORDERING INFORMATION								
Product Type	Membrane Type	Membrane pore size	Application	Sterilization	Size	Fittings In/Out	Vent/Drain	Revision
CIL= TIn-Line Capsule Filter	PS = PES	0020 = 0.2 µm	B =Low Bio	N = Not Sterile	SS = 2.5"	5TC = 1.5" TC	HH = HB/HB	0 = Bag label
		0045 = 0.45 µm			LL = 5"			1 = Housing label
		0065 = 0.65 µm			TE = 10"			
					TW = 20"			
					TH = 30"			
					FO = 40"			

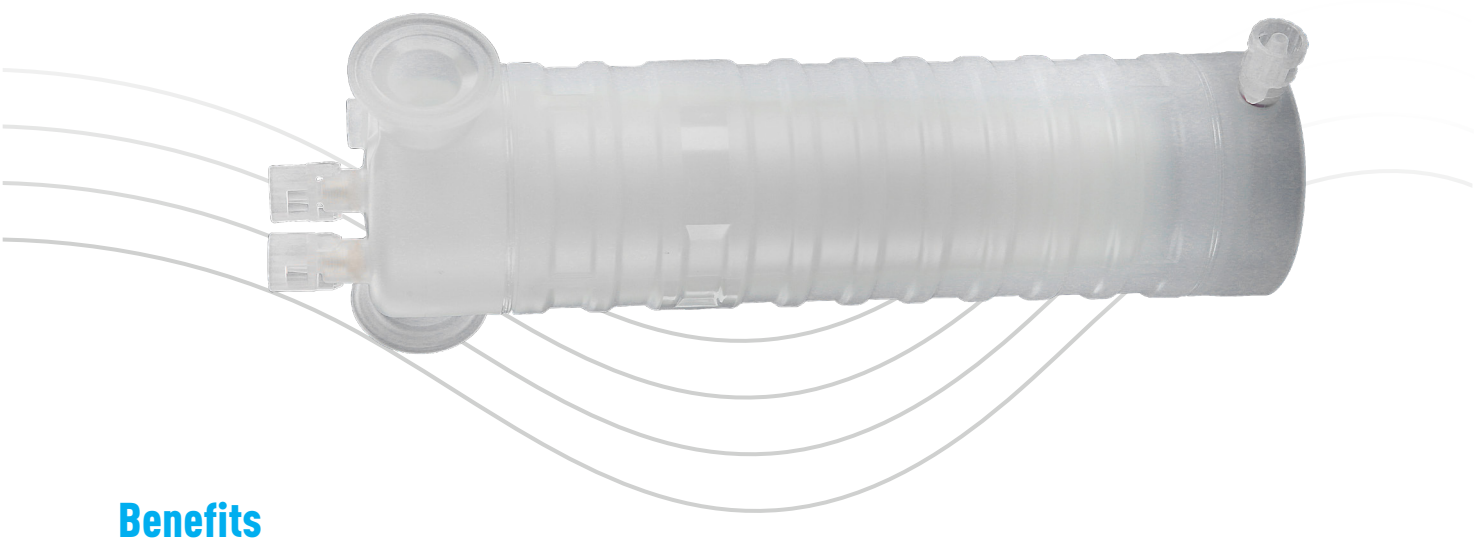
CIL series

Hydrophobic PTFE membrane Capsule Filter

TIn line filter Hydrophobic PTFE membrane Capsule Filters bio-burden reduction

Description and use

The TIn-line capsule filters is family of full size capsule filters available in multiple option of length. The PTFE membrane bio-burden reduction capsule utilizes single layer hydrophobic PTFE membrane. It offers broad chemical compatibility, high flow rate and low extractables.



Benefits

- 100% integrity tested
- FDA food contact compliant
- Thermal bonding
- Non-fiber releasing

Typical Applications

- Sterile air feed
- Chemicals
- Pharmaceuticals
- Solvent

Toxicity

- All materials meet the specifications
- far biological safety per USP Class
- VI -121C° far plastics.

Filter Area

- 10": 64000cm^2

Fitting Option

- 1.5" TC

Vent/Drain Option

- Hose barb

Capsule Integrity

- Minimum burst pressure: 123.5psi (8.5barg)

Construction Materials

- Filter Media: ePTFE membrane
- Media Support: Polypropylene
- Capsule: Polypropylene
- Inner Core: Polypropylene
- Outer Cage: Polypropylene
- Sealing Method: Thermal Bonding

Sanitization /Sterilizaion

Autoclavable

Food Safety Compliance

Materials of construction comply with FDA regulations for food and beverage contact use as detailed in the US Code of Federal Regulations, 21CFR. Materials used to produce filter media and hardware are safe for use in contact with foodstuffs in accordance with EU Directives 10/2011

Capsule Integrity Test Specifications

Pore size	Bubble point	Water Intrusion	Diffusive Flow
0.2 µm	≥ 1.2 barg(IPA/Water)	≤ 0.37ml/min @2500mbar/10",22°C	≤10ml/min @800mbar/10",22°C

ORDERING INFORMATION								
Product Type	**Membrane Type**	**Membrane pore size**	**Application**	**Sterilization**	**Size**	**Fittings In/Out**	**Vent/Drain**	**Revision**
CIL= TIn-Line Capsule Filter	PT = PTFE phobic	0020 = 0.2 µm	B =Low Bio	N = Not Sterile	SS = 2.5" LL = 5" TE = 10" TW = 20" TH = 30" FO = 40"	5TC = 1.5" TC	HH = HB/HB	0 = Bag label 1 = Housing label

Bio Depth Capsule Filter

Bio Depth Capsule Filter

Description and use

The Bio Depth Capsule Filter are designed for Bio-products industry which mainly used in cell harvest clarification and downstream liquid filtration. The MSBDID is for lab scale filtration, MSBDED is for pilot testing research and lab scale protein production. The MSBDRD includes three models with different processing capabilities: small, large and integrated models. All models are comprised of a holder, a set of top and bottom separators, and a number of filter modules that can be adjusted. The Bio Depth Capsule Filters have completely independent filter medium, its pore size of upper and lower layer is asymmetrical, this design not only helps to enhance the contaminant holding capacity but also helps to extend the service life of the filter cartridge.

Application

- Culture medium filtration
- Cell lysates filtration
- Host cell protein or hybrid protein aggregates filtration
- Protect downstream process

Features

- Disposable design makes it easier to install and dismantle
- High contaminant holding capacity
- High filtration efficiency for impurities
- Manufactured in a clean room environment

Bio-Safety

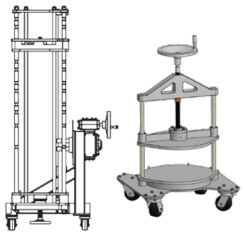
Endotoxin	Comply with USP<85>, endotoxin content <0.25EU/ mL
Biocompatibility	Comply with USP<87>USP<88>

Construction of Materials

MediaCellulose	filter-aids and resins
Core/Cage/End Cap	PP/PC
Seal Material Option	Silicone

MSBDD-L

Filtration Area: 4000cm²



Filter Holders

Performance

Max. Operating Temperature	40 ˚C(104˚F)
Max. Operating DP	3 bar (44 psi) 125˚C, 30min,
Autoclaving	1cycle

MSBDID

Filtration Area: 34cm²

MSBDED-S

Filtration Area: 1600cm²

Single cell capsule

Filtration Area: 0.23m²(2.4ft²)

Multicell capsule

Dual layer:1 .6m²(17.2ft²)
Single layer:2 .5m²(27.0ft²)

ORDERING INFORMATION		
Product Type	**Core**	**Removal Rating**
MSBDID	P = PP	C0102 = 0.1~0.4μm C0105 = 0.1~0.8μm C0140 = 0.1~9μm C0240 = 0.2~9μm C0290 = 0.2~20μm C0690 = 0.6~20μm C0890 = 0.8~20μm

ORDERING INFORMATION			
Product Type	**Core**	**Removal Rating**	**Length**
MSBDID	P = PP	C0102 = 0.1~0.4μm C0105 = 0.1~0.8μm C0140 = 0.1~9μm C0240 = 0.2~9μm C0290 = 0.2~20μm C0690 = 0.6~20μm C0890 = 0.8~20μm	S = Short L = Long

ORDERING INFORMATION							
Product Type	**Membrane**	**Removal Rating**	**Filter Cell**	**Layer**		**Seal Material**	**Separator**
MSBDID	C = PC	C0102 = 0.1~0.4μm C0105 = 0.1~0.8μm C0140 = 0.1~9μm C0240 = 0.2~9μm C0290 = 0.2~20μm C0690 = 0.6~20μm C0890 = 0.8~20μm	S= Single-Cell Capsule L = Multi-Cell Capsule	001=1 003=3 005=5 007=7 009=9 011=11	002=2 004=4 006=6 008=8 010=10	S = Silicone	B=None T=Top R=Bottom TR= Top + Bottom

Sterilizing Filter

50 mm Sterilizing Filter

Description and use

Positive pressure sterilizing filters are widely applicable to sterilizing filtration of aqueous solutions in biological laboratories, adapt for the peristaltic pump, syringe or other positive pressure device.

GVS 50 mm sterilizing filter is suitable for removing microor-ganisms, particles, precipitates, and undissolved powders larger than 0.22 μm from aqueous solutions. It has the stepped hose barb design that ensures stable connection between the filter and the hose.The membrane material is 0.22 μm hydrophilic polyethersulfone (PES) , can filter samples up to 8 L in volume.

- Membrane diameter: 50 mm
- Membrane pore size: 0.22 μm
- Pattern: Two stepped barbs, filling bell
- Materials:
  -Filter housing: Methyl methacrylate-butadiene-styrene (MBS)
  -Filter Membrane: Hydrophilic polyether sulfone (PES)
  -Filling Bell: Polycarbonate (PC)
  -Filling Bell Cap: Low-density polyethylene (LDPE) Conforming to USP Class VI standards

Features

- The filter membrane is made of 0.22 μm hydrophilic polyether- sulfone for high throughput and excellent filtration performance
- The products have an effective filtration area of up to 19.9 cm^2, and can filter samples up to 3.8-8 L in volume
- Maximum operating temperature: 45°C
- Maximum inlet pressure: 3.3 bars (50 psi) at 25°C
- Typical water flow rate: 390 mL/min at 25°C under 15 psi
- It is designed with a filling bell avoiding liquid splashing and pollution
- Stepped hose barb design that ensures stable connection between the filter and the hose
- Filter surface with coding marks, clearly distinguish inlet and outlet
- Sterilized by irradiation, SAL 10-6, DNase/RNase-free, Non-pyrogenic, Non-cytotoxic

Special Tips:

The test results show that the 50 mm sterilizing filters are suitable for most aqueous solutions, such as acetic acid (5%), aqueous buffer, cell media, bleaching agent (5% solution), sodium hydroxide (10%), sulfuric acid (20%). The unlisted reagents should be tested for applicability before use.

Ordering information								
Product Code	Description	Adaptive Tube Diameter	Membrane Pore Size (μm)	Membrane Diameter (mm)	Outer Diameter (mm)	Sterile	Qty. Per Bag	Qty. Per Case
PLAJSF0505SA	PES membrane, two stepped barbs, filling bell	1/2 " -1/4 "ID	0.22	50	62	Y	1	10
PLAJSF1505SA	PES membrane, two stepped barbs, without filling bell	1/2 " -1/4 "ID	0.22	50	62	Y	1	10

Disc Capsule Filter

Description and use

Disc capsule filters are made of polytetrafluoroethylene which have excellent resistance to organic and inorganic chemical corrosion properties along with natural hydrophobici-ty. It can be widely used in sterile ventilation processes such as biotechnology, pharmaceuticals, laboratories etc. It's easy to use and operate, the lightweight design (only 20g) makes the structure very stable and reliable and will not appear hose bending to adversely affect ventilation.

Typical Applications

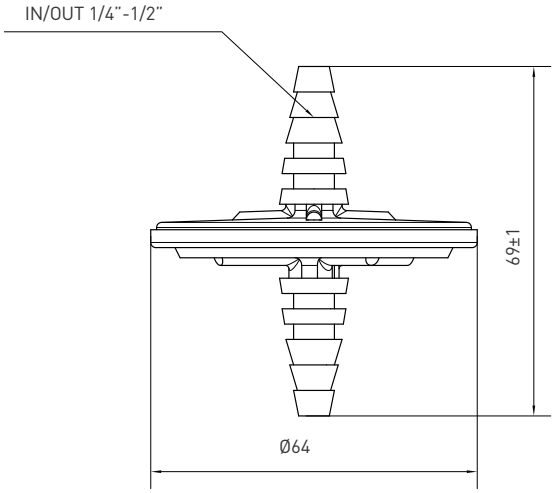
- Sterile ventilation of culture containers and CO^2 incubators
- Sterile ventilation of fermenters and storage tanks
- Autoclave steam sterilization air exchange
- Removal of gas particles

Features

- PTFE components provide broad chemical compatibility
- Natural hydrophobicity, strong resistance property to chemical corrosions
- High flow rate and low extractables
- Lightweight structure, easy to install and dismantle
- 100% Integrity Test

Dimensions

OD	64mm
Length	69mm
Inlet/Outlet	1/4"-1/2"HB



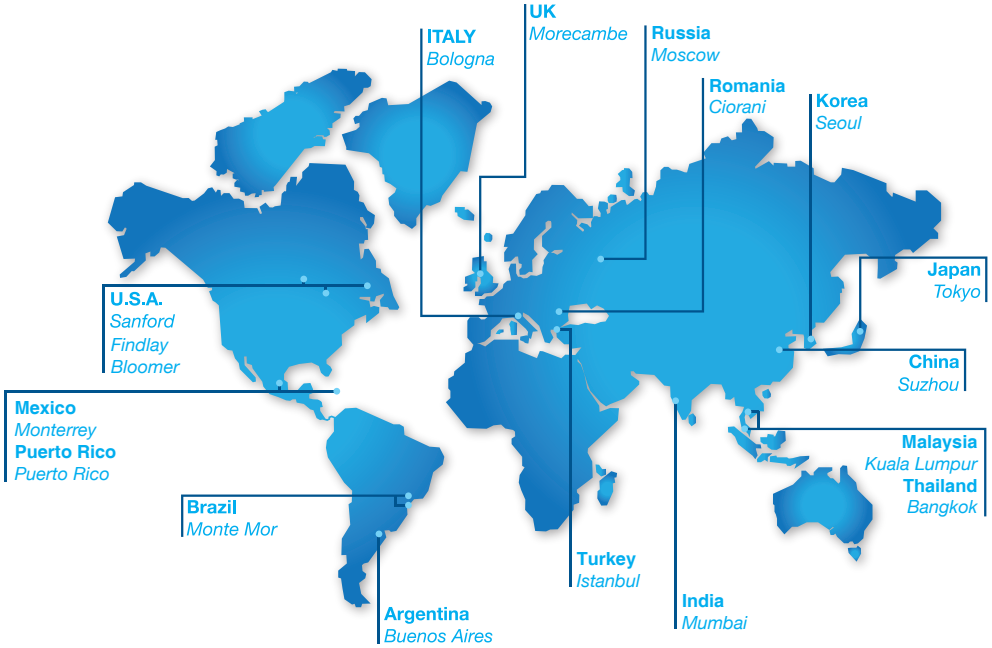
Construction of Materials

Housing	PP
Media	Hydrophobic PTFE

Performance

Max. Operating Pressure	3 Bar@20˚C
Autoclaving	125˚C-30min-60cycles
Filtration Area	20cm²

Ordering information			
Product Code	Pore size	Package	Sterilization
VF50ASPPT002AX01	0.22μm	10/pk	YES
VF50ASPPT004AX01	0.45μm	10/pk	YES
VF50ANPPT002AC01	0.22μm	100/pk	NO
VF50ANPPT004AC01	0.45μm	100/pk	NO



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PRODUCT COLLECTION - Capsflow Catalog

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