ERTELALSOP
THE FIRST NAME IN LIQUID FILTRATION™

MicroCap™ Depth Filter Capsules

Uniquely Flexible to Meet Your Processing Needs

Efficient, Cost-Effective Batch Processing

A Capsule Suite Customized to Fit Your Processing Needs

Eliminate Batch Pooling

Tired of expensive and inefficient pooling of multiple batches to sustain processing?

MicroCap Capsules offer the most flexible solution and the most consistent results for all of your batch processing needs.

MicroCap single-use capsules are a uniquely flexible line of disposable depth filter products designed to optimize scale-up and scale-down studies.

The MicroCap Capsule Suite with six different capsule sizes can meet your process volume requirements without requiring the pooling of multiple batches.

Lab-scale through clinical scale process volumes can be easily managed within the framework of cost-effective, efficient processing. Scale-up and scale-down studies can be efficiently managed through capsules sized and aligned to standard process volumes.

Advantages

- **Uniquely flexible** — options in capsule size, effective filter area and connection styles to suit your needs
- **Linear Scalability** — assurance of application and throughput from lab to production scale
- **Low hold-up volume** — reduced post-use rinsing volumes for product recovery
- **Completely disposable** — no cleaning or cleaning validation

Processes

- Mammalian cell cultures
- Bacteria, yeast, and insect cell lysates
- Vaccines
- Blood plasma proteins and serum
- Media

MicroCap™
Single-Use Capsules

Applications

- Primary separations/prefiltration
- Secondary clarification
- Cell culture harvest
- Cell culture clarification
- DNA reduction
- Endotoxin reduction
- Host Cell Protein (HCP) reduction
- Protein aggregate removal
- Decolorization

Advanced Performance

An extensive range of enhanced depth filter medias has been developed by ErtelAlsop to meet the stringent requirements of the Biopharmaceutical industry and its unique filtration needs. Supported by comprehensive validation, ErtelAlsop's range of depth filter media enables reliable and efficient performance.

Reliability

All MicroCap depth filter capsules provide performance consistency and lot-to-lot traceability in easy-to-use formats. All MicroCap capsules are batch tested in order to meet all quality requirements and meet all applicable USP requirements including Class VI Biological Testing for Plastics.

Scalability

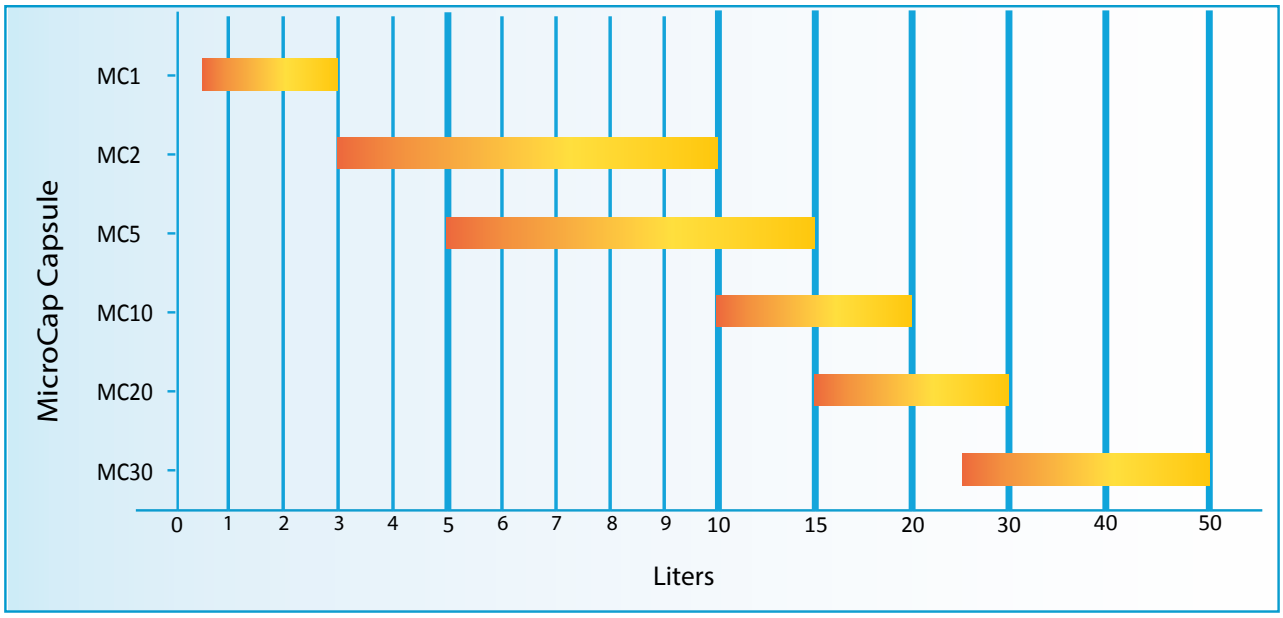
The versatility of MicroCap capsules enhances filtration efficiencies of laboratory, pilot and small-scale processes. The range of capsules and respective filter area enable both linear scalability in performance and as well as through the range of capsule sizes.

Filter Area

MicroCap Capsule	Single Layer (cm^2)*	Double Layer (cm^2)**
MC1	23	23
MC2	170	80
MC5	330	170
MC10	960	500
MC20	1920	1000
MC30	2880	1500

* Single-layer media such as MicroMedia®, XL Series™, and MicroClear™
** Double-layer media such as DXL Series

Approximate Batch Size



Efficient, Cost-Effective Processing

Available in a variety of sizes and configurations, MicroCap Capsules enable single-batch processing without costly pooling of multiple batches. This variety in capsule sizes and configurations also provides adequate filter area to complete entire processing runs in an efficient and cost effective manner.

Consistent Processing

MicroCap Capsules offer processing consistency through manufacturing controls of the depth filter media, creating the lot-to-lot consistency of the filter media required for performance reliability. These manufacturing controls, coupled with capsule design that utilizes the same internal structure and flow path, enables consistent processing from run to run and from capsule to capsule.

Predictable Processing

Consistent product design, internal structure and flow path coupled with reliable filter media performance enable predictive scalability throughout the range in capsule sizes.

Capsules

Capsules for Process Development and Lab Scale Processing

MicroCap capsules are available in 6 different sizes (1 in., 2.5 in., 5 in., 10 in., 20 in. and 30 in. in height) ranging in effective filter area from 23 cm^2 to 2880 cm^2 with single-layer media (23 cm^2 to 1500 cm^2 with double-layer media). This enables processing without the necessity of pooling multiple batches of material to efficiently utilize the appropriate single-use capsule.

The MC1capsule* is designed to suit your testing needs as a screening tool for depth filter media selection. The MC1 provides optimal throughput and predictive, scalable results from small batch sizes ranging from approximately 0.5 liters to 3 liters.

Positioned for use during laboratory development and optimization of scale-up and scale-down studies, MC1 capsules, with 23 cm^2 of effective filter area (EFA), are effective tools for quickly determining the correct depth filter media to suit your processing needs. With the same filter media, flow paths and design as the larger capsules in this series, the MC1 capsule allows for simplified process development studies.

The MC2 and MC5 capsules are intended for use in processes batch sizes typical of early stage laboratory to process development ranging from approximately 3 to 15 liters. Available with a large variety of depth filter media options and optional inlet/outlet configurations, MicroCap capsules provide simple, reliable capsule performance suited to your process needs.

*The MC1 is also available in the MicroCap Laboratory Cabinet. Please reference: **Technical Bulletin Cab-13**.

MC1

MC2

MC5

MicroCap™ Single-Use Capsules

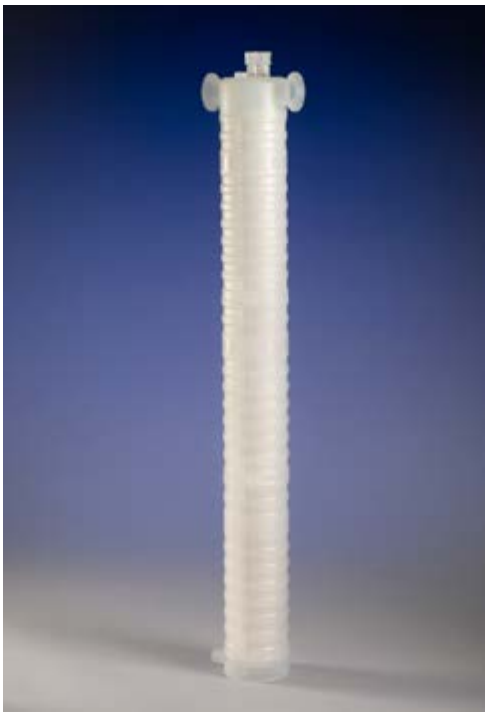
Capsules for Lab and Production Scale Processing

Intended for larger volume processing (10 to 50 or more liters), the MC10, MC20, and MC30 MicroCap capsules share the same internal structure, flow path, and robust design as the smaller capsules in the MicroCap line. These T-style capsules are easily manifolded to seamlessly integrate additional filter area or establish a fully encapsulated filter train. With effective filter areas of 960 cm^2, 1920 cm^2 and 2880 cm^2 in single-layer format (500 cm^2, 1000 cm^2 and 1500 cm^2 in double-layer format) the MC10, MC20 and MC30 MicroCap capsules are ideally sized for larger process development though production scale needs.

MC10

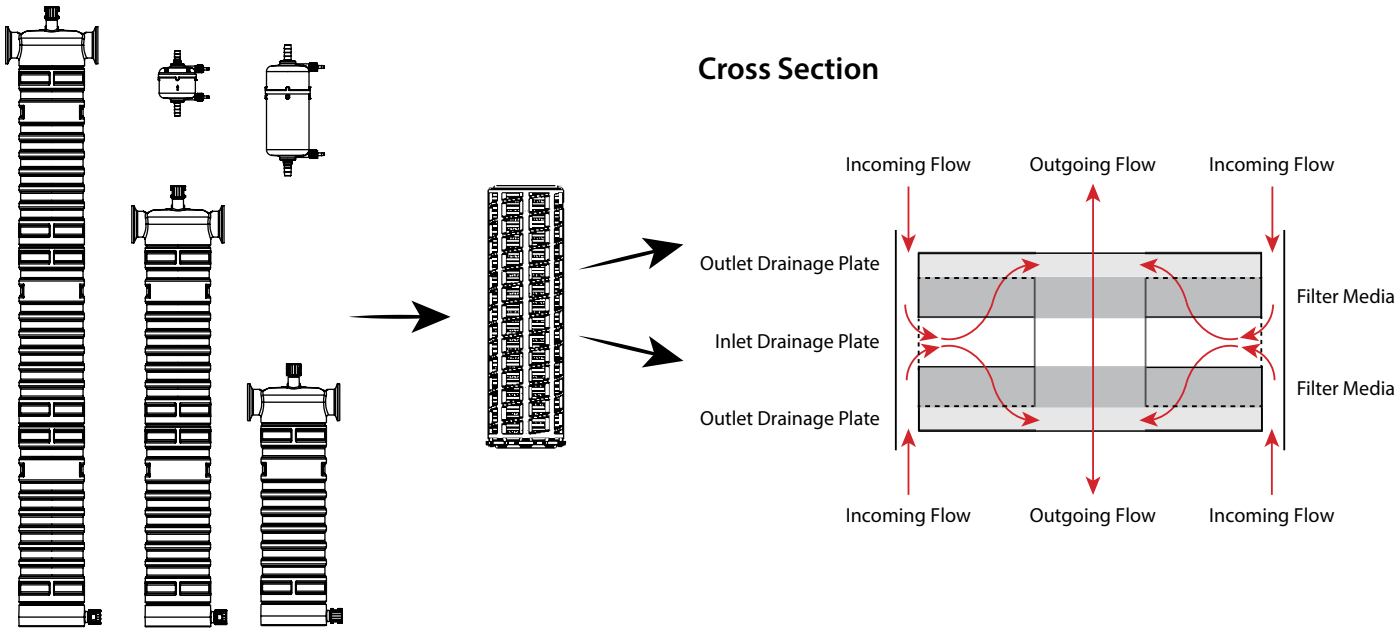
MC20

MC30



Common Flow Path for Predictable Scaleup

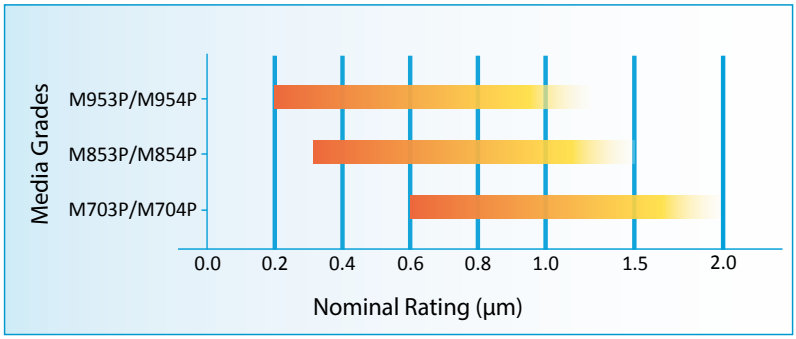
MicroCap Capsules use the same internal cartridge design for processing consistency. Their consistent structure and flow path provide enhanced and predictable linear scale-up for all capsule sizes.



MicroMedia Filter Sheets

Pharmaceutical grade MicroMedia Filter Sheets contain a high performance filter media consisting of a balance of cellulose fibers, diatomaceous earth (DE) filter aid, and a wet strength resin. MicroMedia Filter Sheets provide consistent performance across a variety of applications.

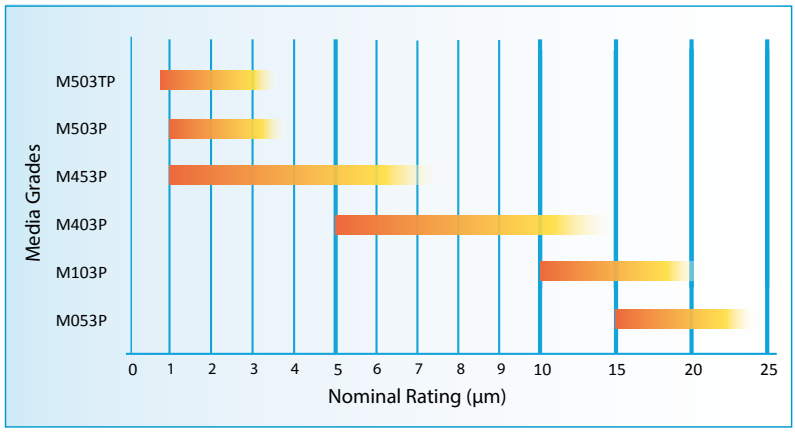
Fine to Medium Filter Media Grades



XL Series

ErtelAlsop's MicroMedia XL Series depth filter media incorporates a high performance grade of diatomaceous earth (DE) for greatly enhanced filter performance. In addition, its high purity, low extractables and rigorous quality control make it the leading product for depth filtration in critical applications such as pharmaceuticals and biologics. The reduced levels of metals/contaminants result in increased permeability compared to conventional DE contribute to its purity and usability as a filter for products that must meet the highest standards.

Medium to Coarse Filter Media Grades



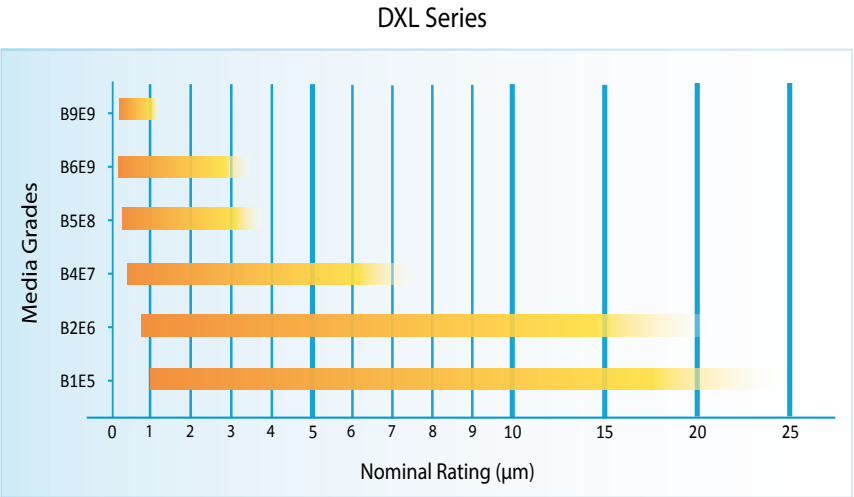
MicroMedia Grades

Media Series	Media Grades	Nominal Rating (µm)	Format	Filter Properties/Material
MicroMedia	M954P	0.25 – 1.0	Single Layer	Cellulose with filter aid
	M854P	0.3 – 1.25		
	M704P	0.45 – 1.5		
XL Series	M953P	0.25 – 1.0		Cellulose with high purity filter aid
	M853P	0.3 – 1.25		
	M703P	0.45 – 1.5		
	M503TP	0.8 – 2.75		
	M503P	1.0 – 3.0		
	M453P	2.5 – 6.0		
	M403P	5.0 – 12.0		
	M103P	10.0 – 17.0		
	M053P	15.0 – 20.0		

MicroCap™ Single-Use Capsules

DXL Series

Consisting of two distinct layers, the double-layer configuration of DXL Series depth filter media maximizes contaminant loading within the body of the filter structure for prolonged filter life. DXL Series depth filter media efficiently manage process streams containing high solids that are often associated with low viability cell cultures. Combining any two layers of ErtelAlsop's XL Series media allows the design of a filter solution to address the unique characteristics of a process stream and to improve process optimization.



MicroClear

Consisting of immobilized activated carbon and cellulose fibers, ErtelAlsop's MicroClear depth filter media provides superior adsorption characteristics over traditional stirred tank or packed bed carbon applications. Designed for use in a single-pass process, the large surface area of carbon to the process stream enables highly efficient color or odor removal. Unlike other depth filter media, designed for mechanical particle removal, MicroClear depth filter media are designed for adsorption of colors, odors or other soluble contaminants.

Carbon per Unit Area

Effective Filter Area	Amount of Carbon (grams)
23 cm^2	2
170 cm^2	15
330 cm^2	29
960 cm^2	83
1920 cm^2	166
2880 cm^2	249

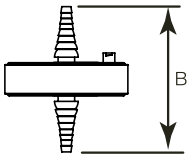
MicroClear Media Grades

Media Grades	Activation Method	Typical Application
MC55P	Steam Activated	General Applications
MC55CP	Chemically Activated	Decolorization in Pharmaceutical Applications
MC55GP	Steam Activated	Fine Chemical and Pharmaceutical intermediates

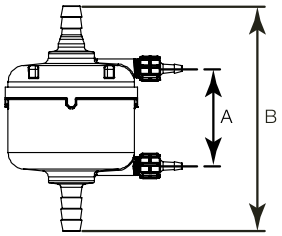
MicroMedia Grades

Media Series	Media Grades	Nominal Rating (µm)	Format	Filter Properties/Material
DXL Series*	B9E9	0.25 – 1.0	Double Layer	Cellulose with high purity filter aid
	B6E9	0.25 – 2.75		
	B5E8	0.3 – 3.0		
	B4E7	0.45 – 6.0		
	B2E6	0.8 – 17.0		
	B1E5	1.0 – 20.0		
MicroClear	MC55	Steam Activated	Single Layer	Cellulose with activated carbon
	MC55CP	Chemical Activated		
	MC55GP	Steam Activated		
*** Other media combinations available upon request**				

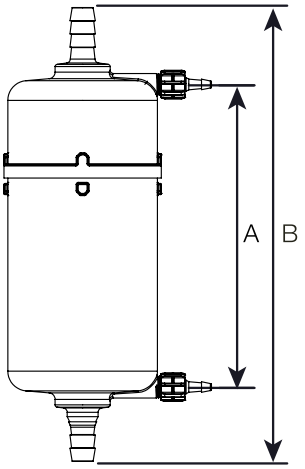
MC1



MC2

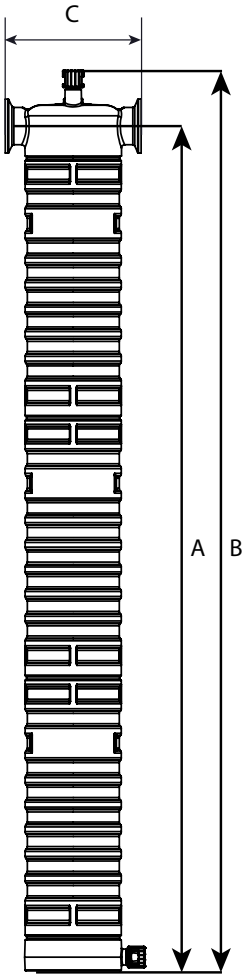


MC5

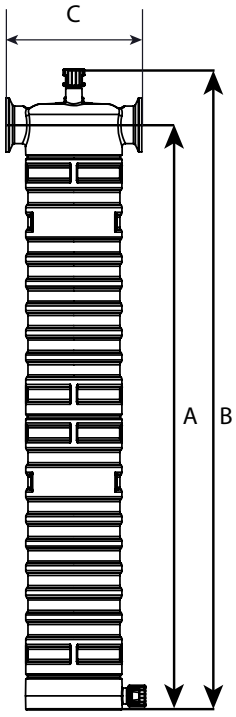


MicroCap Capsule Dimensions (mm)						
Inlet/Outlet Fittings	MC1		MC2		MC5	
	A	B	A	B	A	B
Hose Barb	-	79	80	148	137	205
Sanitary Clamp	-	-	80	126	137	183

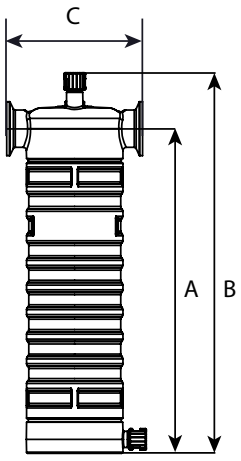
MC30



MC20



MC10



MicroCap Capsule Dimensions (mm)									
Inlet/Outlet Fittings	MC10			MC20			MC30		
	A	B	C	A	B	C	A	B	C
Sanitary Clamp	304	356	127	547	599	127	790	842	127

Technical Specifications

Materials of Construction	
Capsule Shell and internals	Polypropylene
Capsule Filter Media	Cellulose fibers Diatomaceous earth Powdered activated carbon* Resin
O-rings	Silicone
Maximum Operating Pressure	
MicroCap MC1	2.5 barg (36 psig) @ 22 ºC
All Other MicroCap Capsules	5.5 barg (80 psig) @ 22 ºC
Maximum Differential Pressure	
MicroCap MC1	2 bard (30 psid)
All Other MicroCap Capsules	2.4 bard (35 psid)
Sterilization - Autoclave	
MicroCap MC1	1 cycle @ 121 ºC for 30 minutes
All Other MicroCap Capsules	2 cycles @ 125 ºC for 60 minutes

* Carbon with MicroClear Capsules Only

Hold-up Volume		
MicroCap Capsules	**Total Void Volume (mL)***	**Holdup Volume (mL)****
MC1	-	-
MC2	176	68
MC5	299	142
MC10	1080	392
MC20	2160	784
MC30	3240	1176

* **Total Void Volume** = Total upstream and downstream void volume with internal cartridge installed

** **Holdup Volume** = Liquid remaining in depth filter media post blow down.

MicroCap Laboratory Cabinet

The MicroCap Laboratory Cabinet has been created to simplify filtration and separation studies for research and development and process development laboratories.

Choose from three cabinet options, each containing MicroCap MC1 capsules with 23 cm^2 (3.48 $in.^2$) of effective filtration area. The MicroCap Laboratory Cabinet can serve your clarification, cell harvest, or color removal needs.

For more, please reference: **Technical Bulletin Cab-13**.

Ordering Information

Example: M053PCAP05MTB is a MC5 capsule with M053P media, 1/2 in. sanitary clamp inlet/outlet, and vent valves.

M053P	CAP	05	MT		B	
Media Grade	**Type**	**Size**	**Inlet/ Outlet**	**Description**	**Vent**	**Description**
See Media Grades Table	CAP	01	H	Stepped Hose Barb	O	Luer Lock
		02	3H	3/8 in. Hose Barb	B	Vent Valve
		05	MT	1/2 in. Sanitary Clamp		
		10	TC	1 1/2 in. Sanitary Clamp	C	Inlet/Outlet 1/4 in. Bleed Valve
		20				
		30				

Media Grades

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	B1E5	1.0 – 20.0		
MicroClear	MC55	Steam Activated	Single Layer	Cellulose with activated carbon
	MC55CP	Chemical Activated		
	MC55GP	Steam Activated		
*** Other media combinations available upon request**				

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