



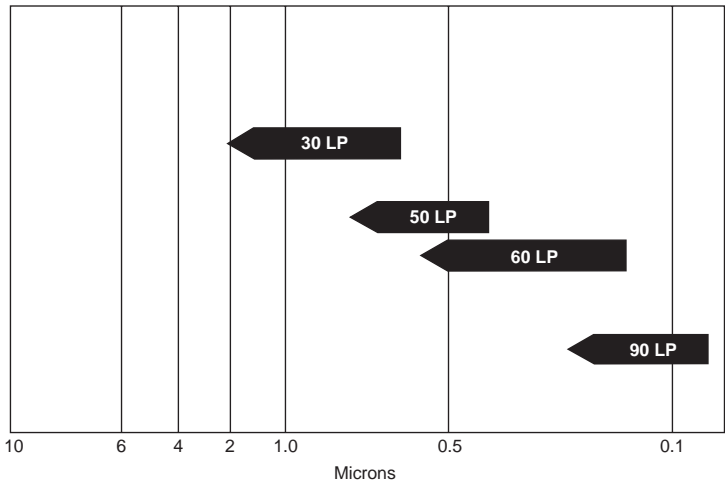
## ZETA PLUS® LP SERIES



Zeta Plus® LP filter media is a depth filter composed of inorganic filter aid cationic resin and cellulose, and is designed to be extremely low in extractables. The LP filter media is completely free of asbestos and glass microfibre.

### GRADE SELECTION

The Zeta Plus® LP media is available in four grades. In addition to the mechanical exclusion of particles by its depth loading feature, Zeta Plus® LP media adsorbs contaminants too small for removal by mechanical sieving.

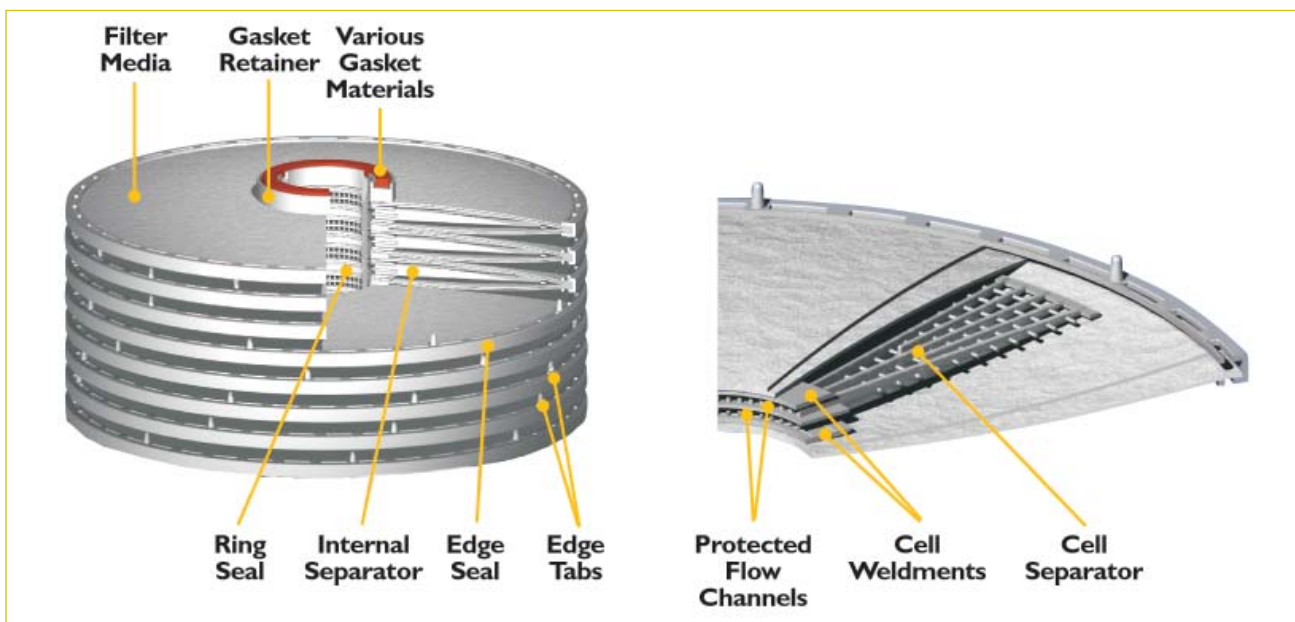


### Applications

- Blood products
- Antibiotics
- Intravenous solutions
- Growth media purification
- Pharmaceutical and Bioprocess fluids
- Diagnostics

Features	Benefits
<ul style="list-style-type: none"> <li>• Depth filtration media designed to retain contaminants by mechanical entrapment and electrokinetic adsorption.</li> </ul>	<ul style="list-style-type: none"> <li>• High contaminant holding capacity for economical filtration and reliable particle removal.</li> </ul>
<ul style="list-style-type: none"> <li>• Full range of scaleable capsule and cartridge filter configurations.</li> </ul>	<ul style="list-style-type: none"> <li>• Allows pilot testing and scale-up with the same materials that will be used in full-scale systems.</li> </ul>
<ul style="list-style-type: none"> <li>• FDA Drug Master File and USP Class VI Biological Safety.</li> </ul>	<ul style="list-style-type: none"> <li>• Eases validation and regulatory submissions by providing vital documentation and traceability.</li> </ul>
<ul style="list-style-type: none"> <li>• Self-contained, single-use disposable capsule and cartridge modules.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced labour time for change-outs and elimination of cleaning validation.</li> </ul>
<ul style="list-style-type: none"> <li>• Low LAL reactivity</li> </ul>	<ul style="list-style-type: none"> <li>• LP Filter medium is non-pyrogenic, and is less likely to cause false positive results</li> </ul>

## CARTRIDGE CONSTRUCTION :



## CARTRIDGE CONSTRUCTION

Zeta Plus® LP Series filter media is available in both flat stock (sheets) and cartridges. Cartridges are constructed from individual cells. Each cell is constructed using polypropylene molded edge seals and internal separators for high performance. The cells are assembled into a cartridge under a predetermined compression and made into a single unit by three 316 stainless steel bands with polypropylene cell separators. Various gasket materials are available depending upon application. Filter cartridges are available in 8, 12 and 16-inch diameters.

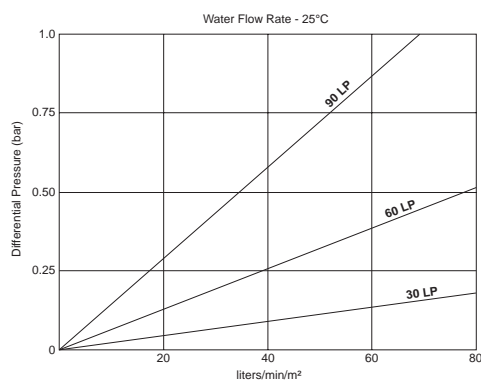
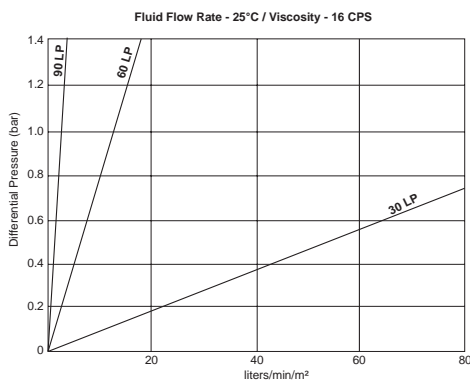
## CAPSULE CONSTRUCTION

Zeta Plus® LP Series filters are available in ready to use, fully disposable BioCap® capsules. The BioCap® Series capsules are completely encapsulated disposable filters for small volume filtration. BioCap® capsules are autoclavable and available in three sizes (25, 650 and 1300 m<sup>2</sup> filtration area) to provide a high degree of application flexibility.



## EFFICIENT FLOW RATES

The following graphs depict the flow rates for clean water and a 16 CPS fluid. Although the flow capacity is decreased by high viscosity solutions, an efficient flow rate can be achieved with proper media type selection. A maximum flow rate of 40 litres/m<sup>2</sup> is recommended to ensure optimal filter life and efficiency.



## QUALITY CONTROL

Zeta Plus® LP cartridges are manufactured in accordance with a strict quality assurance programme, following ISO regulation. Each media lot is sample audited for flow, density, charge capacity, organic and inorganic extractables, and pyrogenicity. In addition, Zeta Plus LP cartridge packaging is labelled with a lot identification number to provide complete traceability.

CHEMICALS	LP	GASKETS			
		Nitrile	Fluoro carbone	Ethylene Propylene	Silicone
Acetic Acid 5% -20%	G	G	G	G	G
Acetone 100%	G	P	G	G	G
Benzene	G	P	F	P	F
Carbon Tetrachloride Pure	G	F	G	P	F
Chlorothene	G	P	G	P	F
Chloroform - Dry	G	P	G	P	F
1,4 - Dioxane	G	P	P	P	P
DMF	G	F	P	P	No Data
Ethanol 10%	G	G	F	G	G
Ethanol 50%	G	G	F	G	G
Ethyl Acetate	G	P	P	P	F
n-Heptane	G	G	G	P	F
Hexane	G	G	G	P	F
1,1,1 - Trichloroethane	G	P	G	P	F
Lacquer thinner	G	G	G	P	F
Methanol	G	G	P	G	G
Methylene chloride (wet)	G	P	F	P	P
Methyl Ethyl Ketone (MEK)	G	P	P	G	G
Methyl Isobutyl Ketone (MIBK)	G	P	P	G	G
Paint thinner	G	P	G	P	G
Petroleum Ether	G	F	G	P	F
Sodium Hydroxide 20%	F-P	F	G	G	G
Toluene	G	P	G	P	F
Water (ambient)	G	G	G	G	G
Water (82°C)	G	G	G	G	G
Xylene	G	P	G	P	F

*Explanation of ratings:*  
**G** = Satisfactory - to maximum temperature given for material, unless restriction is noted.  
**F** = Fair - to maximum temperature given for material, unless restriction is noted.  
**P** = Not recommended.

Zeta Plus® LP series extractables (PPM) - Dynamic Flow Rinse				
Extractable Rinse Volume (l/m <sup>2</sup> )	30 LP Series	60 LP Series	90 LP Series	
Copper	1	0.002	0.009	0.033
	25	<0.001	0.002	0.001
	50	<0.001	<0.001	<0.001
	100	<0.001	<0.001	<0.001
Nickel	1	0.004	0.020	0.019
	25	0.001	0.003	0.002
	50	0.001	<0.001	0.002
Chromium	1	<0.001	<0.001	0.002
	25	<0.001	<0.001	<0.001
	50	<0.001	<0.001	<0.001
100	<0.001	<0.001	<0.001	

Not detected : Co, Mo and Ag.

## RECOMMENDED OPERATING PARAMETERS

<b>Maximum Operating Pressure</b>	Standard and Special precoat Zeta Plus® Cartridges : 2.4 bar maximum cartridge pressure drop. BioCap® 25 Capsules : 2.75 bar maximum inlet pressure, 2.4 bar maximum media pressure drop. BioCap® 1000 / 2000 Series Capsules : 5.5 bar at 25°C, 2.75 bar at 60°C, maximum inlet pressure ; 2.4 bar maximum cartridge pressure drop.
<b>Maximum Operating Temperature</b>	Standard and Special precoat Zeta Plus® Cartridges : 82°C. BioCap® 25 Capsules : 40°C. BioCap® 1000 / 2000 Capsules : 60°C.
<b>Recommended Pre-use Rinse</b>	54 l/m <sup>2</sup> @ 20 lpm/m <sup>2</sup>
<b>Sterilization Parameters</b>	Standard and Special precoat Zeta Plus® Cartridges : autoclave or in-situ steam sterilisation for 1 hour at 121° C. BioCap® 25 : Autoclave for 30 minutes at 121° C (1 cycle). BioCap® 1000 / 2000 : Autoclave for 30 minutes at 121° C (up to 3 cycles).
<b>Operating FLUX range</b>	1.2 - 12 lpm/m <sup>2</sup>

## COMPATIBILITY

The following table provides information about the diverse chemical compatibility of Zeta Plus® LP media. *These recommendations are intended as a guide only.*

## EXTRACTABLES

Zeta Plus® LP media is designed to be extremely low in extractables. The following table provides the maximum amount of organic and inorganic compounds extracted from the LP filter. A dynamic flow rinse was utilized to obtain the extractable values.

Zeta Plus® LP series extractables (PPM) - Dynamic Flow Rinse				
Extractable Rinse Volume (l/m <sup>2</sup> )	30 LP Series	60 LP Series	90 LP Series	
Calcium	1	0.037	0.800	0.790
	25	0.014	0.096	0.060
	50	0.094	0.012	0.009
	100	<0.001	<0.020	<0.001
Magnesium	1	0.880	1.800	2.600
	25	0.140	0.220	0.770
	50	<0.001	0.016	<0.001
	100	0.013	<0.020	0.029
Sodium	1	1.700	4.600	8.500
	25	<0.001	1.900	4.200
	50	<0.001	<0.001	<0.001
	100	<0.001	0.600	<0.001
Potassium	1	0.002	0.026	0.002
	25	0.001	0.002	0.002
	50	<0.001	0.001	0.001
	100	<0.001	0.001	<0.001
Iron	1	0.068	0.250	0.230
	25	0.012	0.031	0.016
	50	0.002	0.015	0.007
	100	<0.001	0.005	0.003
Zinc	1	0.008	0.026	0.031
	25	0.007	0.008	0.007
	50	<0.001	0.013	0.005
	100	<0.001	<0.001	<0.001
Aluminium	1	0.112	0.330	1.400
	25	0.037	0.049	0.099
	50	0.006	0.009	0.018
100	0.002	0.002	0.088	
Manganese	1	0.009	0.026	0.079
	25	<0.001	0.017	0.013
	50	<0.001	<0.001	<0.001
100	<0.001	<0.001	<0.001	
Silica	1	0.070	0.200	0.260
	25	0.010	0.022	0.070
	50	<0.001	<0.001	0.005
100	0.002	<0.001	<0.001	

## ZETA PLUS® LP SERIES - ORDERING GUIDE

### CARTRIDGES

ZETA PLUS®	DIAMETER (inch)	CARTRIDGE DESIGN	GASKET TYPE	GRADE	FORMULATION
Z	08	P - Plug-in 7 cells 0.23 m <sup>2</sup>	Standard: A - Silicone (MVQ)*	30 50 60 90	LP resin S
		D - Standard 8 cells 0.26 m <sup>2</sup>			
Z	12	C - 9 cells / small 0.85 m <sup>2</sup>	Standard: D - Nitrile (NBR)*		
		B - Special precoat 12 cells 1.1 m <sup>2</sup>	Options: A - Silicone (MVQ)*		
		D - Standard 16 cells 1.5 m <sup>2</sup> S - Special 7 cells 0.7 m <sup>2</sup>	B - Fluorocarbon (FPM)* C - EPR (EPDM)*		
Z	16	M - Standard diffusion netting 14 cells - 3.2 m <sup>2</sup>			
		D - Standard 15 cells - 3.4 m <sup>2</sup>			
		S - Special precoat 9 cells 2.1 m <sup>2</sup>			

### BIOCAP® CAPSULES

CATALOGUE NUMBER	GRADE & FORMULATION
BC 0025L (Luer) - 25 cm <sup>2</sup> area	30 LP 50 LP 60 LP 90 LP
BC 0025S (Sanitary) - 25 cm <sup>2</sup> area	
BC 1000A (single pack) - 650 cm <sup>2</sup> area	
BC 1000B (3 pack) - 650 cm <sup>2</sup> area	
BC 2000A (single pack) - 1300 cm <sup>2</sup> area	
BC 2000B (3 pack) - 1300 cm <sup>2</sup> area	

### SCIENTIFIC APPLICATIONS SUPPORT SERVICES (SASS)

CUNO's 90+ years of experience are synonymous with quality, performance and high level technical support. The cornerstone of CUNO's philosophy is service to customers, not only in product quality and prompt delivery, but also in validation, in applications support and in the sharing of scientific information. CUNO's Scientific Applications Support Services group works closely with customers to solve difficult separation problems and to recommend the most economical and efficient filter systems. SASS specialists routinely work with third-party contract laboratories to validate Zeta Plus® filters for viral clearance applications. Contact CUNO's SASS group for more details on viral validation support.

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