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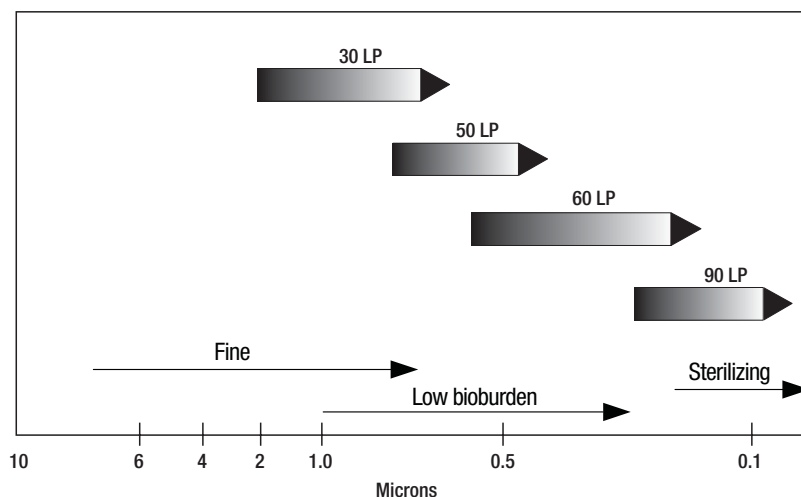
Zeta Plus™ LP Series

Lenticular Depth Filter Cartridges

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.



Graphic 1 : Zeta Plus LP Grade Selection

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.

Features and Benefits

Depth filtration media designed to retain contaminants by mechanical entrapment and electro-kinetic adsorption

- High contaminant holding capacity for economical filtration and reliable particle removal

Full range of scaleable capsule and cartridge filter configurations

- Allows pilot testing and scale-up with the same materials that will be used in full-scale systems

FDA Drug Master File and USP Class VI Biological Safety

- Eases validation and regulatory submissions by providing vital documentation and traceability

Self-contained, single-use disposable capsule and cartridge modules

- Reduced labour time for change-outs and elimination of cleaning validation

Low LAL reactivity

- LP Filter medium is non-pyrogenic and is less likely to cause false positive results



Picture 1: Zeta Plus Family

Applications

Blood products

Antibiotics

Intravenous solutions

Growth media purification

Pharmaceutical and Bioprocess fluids

Diagnostics

3M

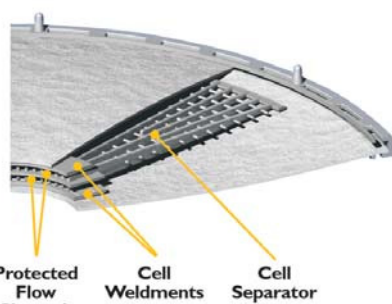
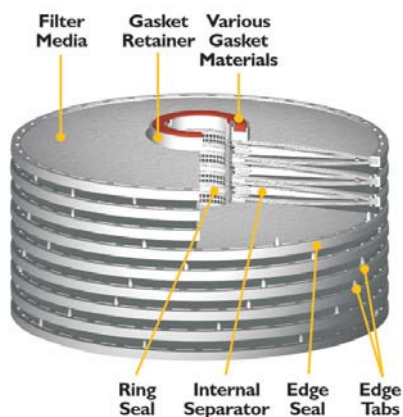
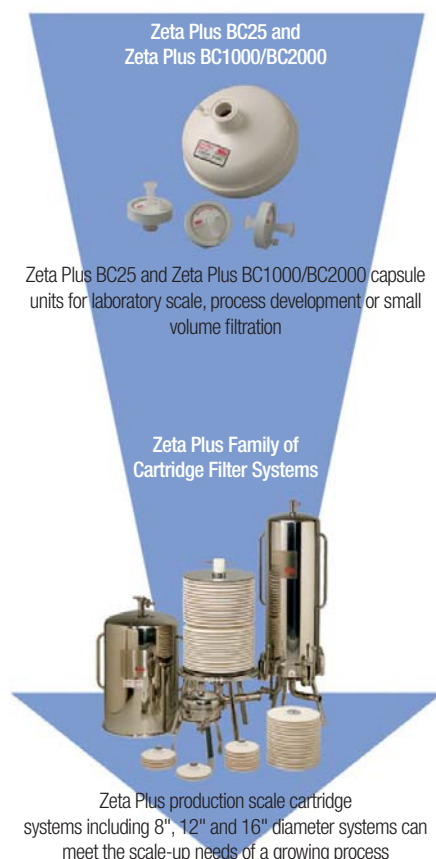


Figure 1: Zeta Plus Cartridge Construction



Cartridge Construction

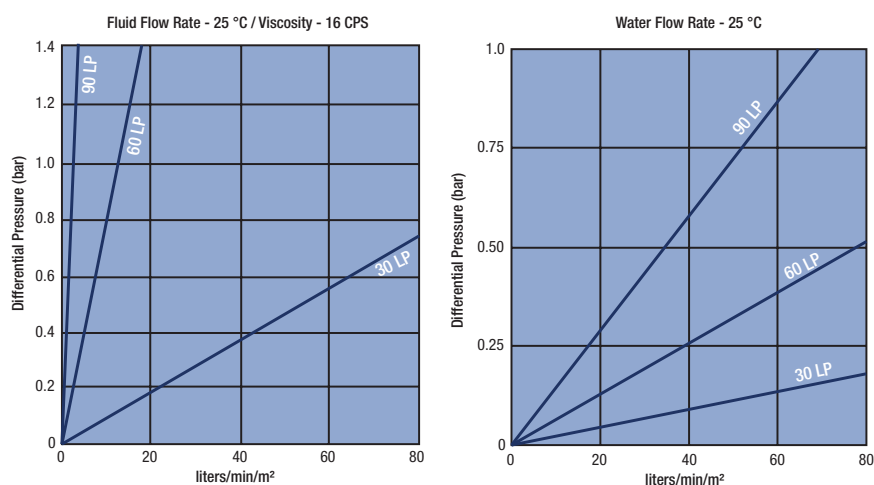
Zeta Plus LP Series filter media is available in both flat stock (sheets) and cartridges. Cartridges are constructed from individual cells. Each cell is constructed using polypropylene moulded edge seals and internal separators for high performance. The cells are assembled into a cartridge under a predetermined 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 Zeta Plus BC capsules. The Zeta Plus BC capsule filters are completely encapsulated disposable filters for small volume filtration. Zeta Plus BC capsules are autoclavable and available in three sizes (25, 650 and 1300 cm² 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/m² is recommended to ensure optimal filter life and efficiency.



Graphic 2: Zeta Plus Flow Rate Graphs

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.

Compatibility

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

CHEMICALS	LP	GASKETS			
		Nitrile	Fluorocarbon	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
Chloroethene	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	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.

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 Zeta Plus LP filter. A dynamic flow rinse was utilized to obtain the extractable values.

Operating Parameters

	Maximum Operating Pressure	Maximum Operating Temperature	Recommended Flush	Sterilisation Parameters	Maximum Flow Rate (FLUX) (in l/min per m²)
Standard and Special pre-coat Zeta Plus Cartridges	2.4 bar	82 °C	54 l/m² at 20 lpm/m²	autoclave or in-situ steam sterilisation for 1 hour at 121 °C	1.2 to 12
Zeta Plus BC25 Capsules	Inlet pressure: 2.75 bar Media pressure: 2.4 bar	40 °C	54 l/m² at 20 lpm/m²	Autoclave for 30 minutes at 121 °C (1 cycle)	1.2 to 12
Zeta Plus BC1000 and BC2000 Series Capsules	Inlet pressure: 5.5 bar at 25 °C 2.75 bar at 60 °C Media pressure: 2.4 bar	60 °C	54 l/m² at 20 lpm/m²	Autoclave for 30 minutes at 121 °C (up to 3 cycles)	1.2 to 12

Table 2: Zeta Plus LP series extractables (PPM) - Dynamic Flow Rinse

Extractable Rinse Volume (l/m²)	30 LP Series	60 LP Series	90 LP Series
Calcium	1	0.037	0.800
	25	0.014	0.096
	50	0.094	0.012
	100	<0.001	<0.001
Magnesium	1	0.880	1.800
	25	0.140	0.220
	50	<0.001	0.016
	100	0.013	<0.020
Sodium	1	1.700	4.600
	25	<0.001	1.900
	50	<0.001	<0.001
	100	<0.001	0.600
Potassium	1	0.002	0.026
	25	0.001	0.002
	50	<0.001	0.001
	100	<0.001	<0.001
Iron	1	0.068	0.250
	25	0.012	0.031
	50	0.002	0.015
	100	<0.001	0.005
Zinc	1	0.008	0.026
	25	0.007	0.008
	50	<0.001	0.013
	100	<0.001	<0.001
Aluminium	1	0.112	0.330
	25	0.037	0.049
	50	0.006	0.009
	100	0.002	0.002
Manganese	1	0.009	0.026
	25	<0.001	0.017
	50	<0.001	<0.001
	100	<0.001	<0.001
Silica	1	0.070	0.200
	25	0.010	0.022
	50	<0.001	<0.001
	100	0.002	<0.001
Copper	1	0.002	0.009
	25	<0.001	0.002
	50	<0.001	<0.001
	100	<0.001	<0.001
Nickel	1	0.004	0.020
	25	0.001	0.003
	50	0.001	<0.001
	100	0.002	0.001
Chromium	1	<0.001	<0.001
	25	<0.001	<0.001
	50	<0.001	<0.001
	100	<0.001	<0.001

Not detected: Co, Mo and Ag.

Zeta Plus LP Series Ordering Guide

1. Cartridges

Zeta Plus	Diameter (inch)	Cartridge Design	Gasket Type	Grade	Formulation	
Z	08	P = Plug-in 7 cells (0.23 m²)	Standard A = Silicone (MVQ)*	30 50 60 90	LP Resin S	
		D = Standard 8 cells (0.26 m²)	Standard D = Nitrile (NBR)*			
	12	C = 9 cells / small (0.85 m²) B = Special precoat 12 cells (1.1 m²) D = Standard 16 cells (1.5 m²) S = Special 7 cells (0.7 m²)	Options A = Silicone (MVQ)* B = Fluorocarbon (FPM)* C = EPR (EPDM)*			
		16	M = Standard diffusion netting 14 cells (3.2 m²) D = Standard 15 cells (3.4 m²) S = Special precoat 9 cells (2.1 m²)			*ISO Designation

2. Zeta Plus BC Capsules

Catalogue Number	Grade and Formulation
BC 0025L (Luer) - 25 cm ² area BC 0025S (Sanitary) - 25 cm ² area BC 1000A (single pack) - 650 cm ² area BC 1000B (3-pack) - 650 cm ² area BC 2000A (single pack) - 1300 cm ² area BC 2000B (3-pack) - 1300 cm ² area	30 LP 50 LP 60 LP 90 LP

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Z 08 P A 30 LP	Z 16 M A 30 LP	Z 12 B D 50 LP	BC 0025L 30 LP
Z 08 P A 50 LP	Z 16 M A 50 LP	Z 12 B D 60 LP	BC 0025L 50 LP
Z 08 P A 60 LP	Z 16 M A 60 LP	Z 12 B D 90 LP	BC 0025L 60 LP
Z 08 P A 90 LP	Z 16 M A 90 LP	Z 12 D A 30 LP	BC 0025L 90 LP
Z 08 D A 30 LP	Z 16 M B 30 LP	Z 12 D A 50 LP	BC 0025S 30 LP
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Z 08 D D 30 LP	Z 16 M C 30 LP	Z 12 D B 50 LP	BC 1000A 30 LP
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