



**ZETA PLUS® CP & SP SERIES**

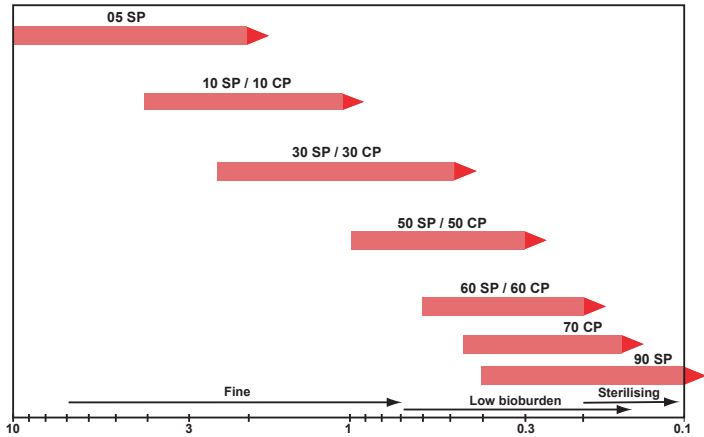


Zeta Plus® CP & SP pharmaceutical grade depth filter media is made from inorganic filter aids, refined cellulose and cationic resin.

**GRADE CHOICE**

The Zeta Plus® series filter are available in several grades, that meet the different filtration needs required by your applications. Filtration ratings are given in the following table for the various grades. The optimal filtration system for your particular application can be determined by on-site testing or by sample evaluation by a member of our Scientific Application Support Services group (S.A.S.S.).

Zeta Plus® CP & SP - Filtration Grades

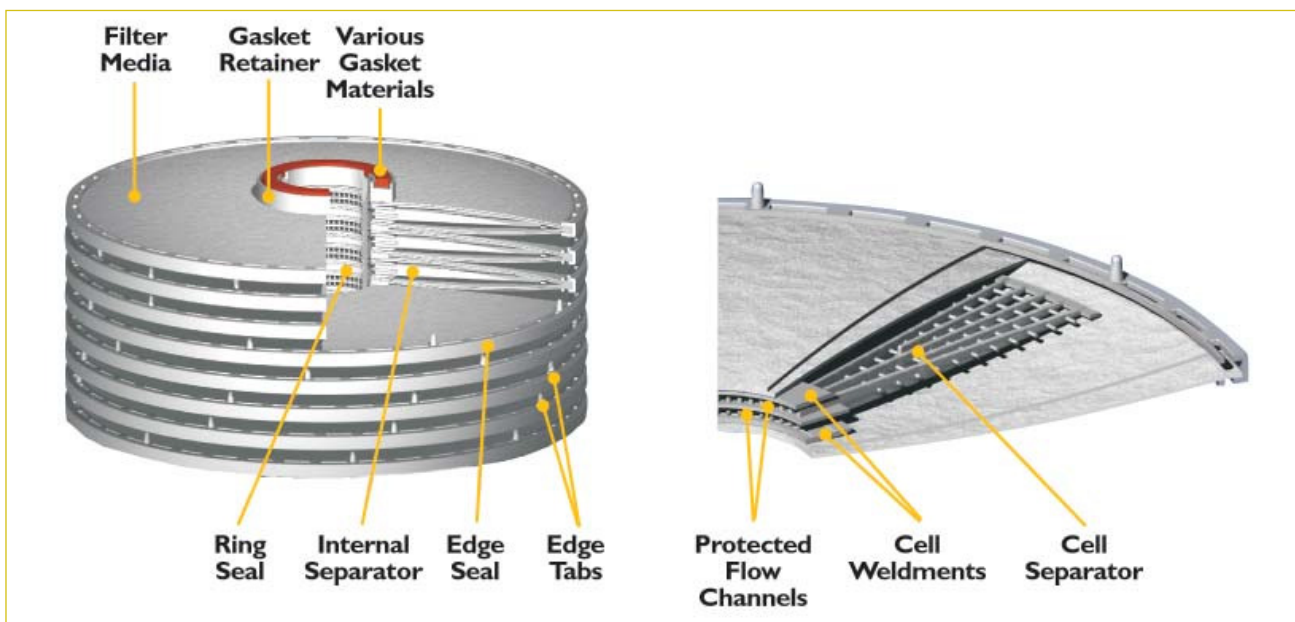


**Pharmaceutical Applications**

- Blood fractions
- Antibiotics
- Filtration of cell culture
- Growth media purification
- Depyrogenation

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>

## CARTRIDGE CONSTRUCTION :



## CARTRIDGE CONSTRUCTION

Zeta Plus® CP and SP Series cartridges are designed for use with CUNO Zeta Plus® sanitary style stainless steel filter housings. Cartridges are constructed from individual cells of Zeta Plus® CP or SP filter medium assembled together with polypropylene ring seals under predetermined compression and unitised by three 316 stainless steel bands. Each cell is constructed using polypropylene molded edge seals and separators for high performance. Various gasket materials are available depending upon application. Filter cartridges are available in 8, 12 and 16-inch diameters.

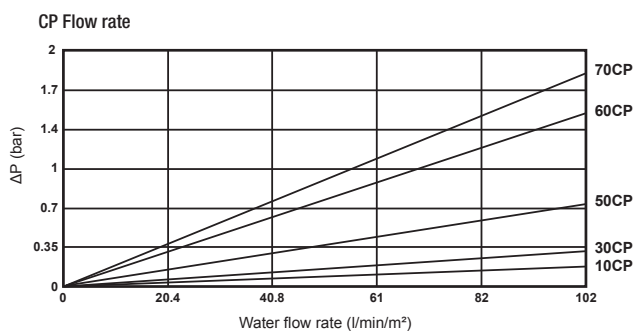
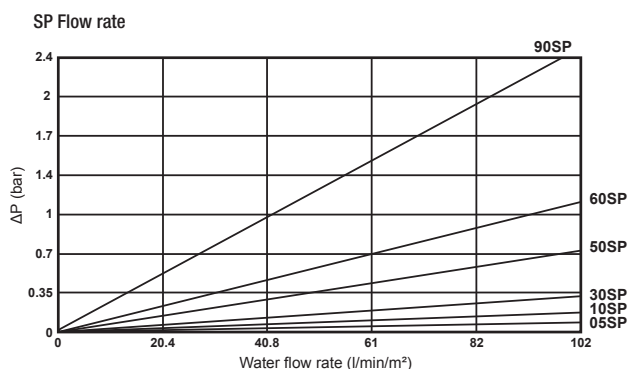
## CAPSULE CONSTRUCTION

Zeta Plus® CP and SP Series filters are available in ready to use, fully disposable BioCap® capsules. The BioCap® Series capsules are completely encapsulated disposable filters for small volume biological, bioprocess and pharmaceutical 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.



## FLOW RATE CHARACTERISTICS

The graph shows initial  $\Delta P$  values for Zeta Plus® CP & SP series filter media versus specific flow rates (l/min/m<sup>2</sup>), obtained with clean water.



## QUALITY CONTROL

The Zeta Plus® CP & SP cartridges and sheets are manufactured following an ISO quality certified assurance scheme. All the cartridges are labelled with a lot identification number to provide complete traceability.

CHEMICALS	SP Max. (82°C)	CP Max. (60°C)	GASKETS			
			Nitrile	Fluoro carbone	Ethylene Propylene	Silicone
Ethyl Acetate	G	G	P	P	P	F
Acetone 100%	G	G	P	G	G	G
Acetic Acid 5%-20%	G	G	G	G	G	G
Benzene	G	G	P	F	P	F
Chloroform	G	G	P	G	P	F
Chlorothene	G	G	P	G	P	F
Methylene chloride	G	G	P	F	P	P
1,4 - Dioxane	G	G	P	P	P	P
DMF	G	G	F	P	P	No Data
Water (25°C - 82°C)	G	G	G	G	G	G
Ethanol 10%	G	G	G	F	G	G
Ethanol 50%	G	G	G	F	G	G
Hexane	G	G	G	G	P	F
Sodium Hydroxide 2%	F-P	F-P	F	G	G	G
Methanol	G	G	G	P	G	G
Methyl Ethyl Ketone (MEK)	G	G	P	P	G	G
Methyl Isobutyl Ketone (MIBK)	G	G	P	P	G	G
n-Heptane	G	G	G	G	P	F
Carbon Tetrachloride pure	G	G	F	G	P	F
1,1,1 - Trichloroethane	G	G	P	G	P	F
Xylene	G	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.

## COMPATIBILITY

The gaskets compatibility with different chemicals is indicated in the table below. It is advisable to test a product under service conditions. *These recommendations are intended as a guide only.*

## SANITARY HOUSINGS

CUNO provides a wide range of standard and specially designed sanitary filter housings to hold Zeta Plus CP and SP Series filter cartridges.



## EXTRACTABLES

A static soak test of Zeta Plus® CP & SP materials was performed to determine the maximum amount of organic and inorganic compounds extracted by various solvents. Extraction tests were performed using 100 ml of fluid per 20 cm<sup>2</sup> of media.

Zeta Plus® SP series extractables (mg/g of media)							
Solvents	Na	K	Ca	Mg	Fe	Heavy metals	Organics
Water	0.075	0.039	0.160	0.070	0.0009	<0.0001	<0.005
Water (82°C)	0.077	0.133	0.066	0.014	0.0011	<0.0001	<0.005
Ethanol 10%	0.013	0.004	0.017	0.002	<0.0005	<0.0001	<0.005
Ethanol 50%	0.014	0.002	0.012	0.002	<0.0005	<0.0001	<0.005
Acetic Acid	0.062	0.157	0.490	0.936	0.170	<0.0001	<0.005
n-Heptane	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0001	<0.005

Zeta Plus® CP series extractables (mg/g of media)							
Solvents	Na	K	Ca	Mg	Fe	Heavy metals	Organics
Water	0.175	0.042	0.045	0.008	<0.0005	<0.0001	0.031
Ethanol 10%	0.210	0.065	0.080	0.014	0.0011	<0.0001	0.014
Ethanol 50%	0.165	0.025	0.063	0.010	0.0008	<0.0001	0.009
Acetic Acid	0.255	0.130	0.115	0.019	0.0050	<0.0001	0.067
n-Heptane	0.007	0.003	0.012	0.002	<0.0005	<0.0001	0.002

< = limits of detection

NOTE : Extractable levels will vary from sample to sample as the raw materials are natural products.

## RECOMMENDED OPERATING PARAMETERS

<b>Maximum Operating Pressure</b>	Standard and Special precoat 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>

## ZETA PLUS® CP & SP 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)*	05	SP
		D - Standard 8 cells 0.26 m <sup>2</sup>		10 30 50 60	SP CP
Z	12	C - 9 cells / small 0.9 m <sup>2</sup> B - Special precoat 12 cells 1.1 m <sup>2</sup> D - Standard 16 cells 1.5 m <sup>2</sup> S - Special 7 cells 0.7 m <sup>2</sup>	D - Nitrile (NBR)*  Options: A - Silicone (MVQ)* B - Fluorocarbon (FPM)* C - EPR (EPDM)*	70	CP
Z	16	M - Standard diffusion netting 14 cells - 3.2 m <sup>2</sup> D - Standard diffusion netting 15 cells - 3.4 m <sup>2</sup> S - Special precoat 9 cells 2.1 m <sup>2</sup>		90	SP

### BIOCAP® CAPSULES

#### CATALOGUE NUMBER

#### GRADE & FORMULATION

**BC 0025L** (Luer) - 25 cm<sup>2</sup> area  
**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

**10 CP 60 CP**  
**30 CP 70 CP**  
**50 CP**  
  
**05 SP 50 SP**  
**10 SP 90 SP**  
**30 SP**

### 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.

#### Important Notice

CUNO MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Since a variety of factors can affect the use and performance of a CUNO product in a particular application, some of which are uniquely within the user's knowledge and control, user is responsible for determining whether or not the CUNO product is fit for a particular purpose and suitable for user's method of application.

#### Limitation of Remedies and Liability

If the CUNO product is proved to be defective, THE EXCLUSIVE REMEDY, AT CUNO'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OR TO REPAIR OR REPLACE THE DEFECTIVE PRODUCT. CUNO shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including, but not limited to, contract, negligence, warranty or strict liability.

#### WARRANTY

Seller warrants its equipment against defects in workmanship and material for a period of 12 months from date of shipment from the factory under normal use and service and otherwise when such equipment is used in accordance with instructions furnished by Seller and for purposes disclosed in writing at the time of purchase, if any. Any unauthorised alteration or modification of the equipment by Buyer will void this warranty. Seller's liability under this warranty shall be limited to the replacement or repair, F.O.B., point of manufacture, of any defective equipment or part which, having been returned to the factory, transportation charges prepaid, has been inspected and determined by Seller to be defective. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR USE, OR ANY OTHER MATTER. Under no circumstances shall Seller be liable to Buyer or any third party for any loss of profits or other direct or indirect costs, expenses, losses or consequential damages arising out of or as a result of any defects in or failure of its products or any part or parts thereof or arising out of or as a result of parts or components incorporated in Seller's equipment but not supplied by the Seller.

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Z 08 PA 05	BC 0025L 10 CP	BC 2000A 10 CP
Z 08 DA 10	BC 0025L 30 CP	BC 2000A 30 CP
Z 08 DA 30	BC 0025L 50 CP	BC 2000A 50 CP
Z 08 DA 50	BC 0025L 60 CP	BC 2000A 60 CP
Z 08 DA 60	BC 0025L 70 CP	BC 2000A 70 CP
Z 08 DB 10	BC 0025L 05 SP	BC 2000A 05 SP
Z 08 DB 30	BC 0025L 10 SP	BC 2000A 10 SP
Z 08 DB 50	BC 0025L 30 SP	BC 2000A 30 SP
Z 08 DB 60	BC 0025L 50 SP	BC 2000A 50 SP
Z 08 DC 10	BC 0025L 90 SP	BC 2000A 90 SP
Z 08 DC 30	BC 0025S 10 CP	BC 2000B 10 CP
Z 08 DC 50	BC 0025S 30 CP	BC 2000B 30 CP
Z 08 DC 60	BC 0025S 50 CP	BC 2000B 50 CP
Z 08 DD 10	BC 0025S 60 CP	BC 2000B 60 CP
Z 08 DD 30	BC 0025S 70 CP	BC 2000B 70 CP
Z 08 DD 50	BC 0025S 05 SP	BC 2000B 05 SP
Z 08 DD 60	BC 0025S 10 SP	BC 2000B 10 SP
Z 12 CA 70	BC 0025S 30 SP	BC 2000B 30 SP
Z 12 CB 70	BC 0025S 50 SP	BC 2000B 50 SP
Z 12 CC 70	BC 0025S 90 SP	BC 2000B 90 SP
Z 12 CD 70	BC 1000A 10 CP	BC 1000A 90 SP
Z 12 BA 70	BC 1000A 30 CP	BC 1000B 10 CP
Z 12 BB 70	BC 1000A 50 CP	BC 1000B 30 CP
Z 12 BC 70	BC 1000A 60 CP	BC 1000B 50 CP
Z 12 BD 70	BC 1000A 70 CP	BC 1000B 60 CP
Z 12 DA 70	BC 1000A 05 SP	BC 1000B 70 CP
Z 12 DB 70	BC 1000A 10 SP	BC 1000B 05 SP
Z 12 DC 70	BC 1000A 30 SP	BC 1000B 10 SP
Z 12 DD 70	BC 1000A 50 SP	BC 1000B 30 SP
Z 12 SA 70	BC 1000B 90 SP	BC 1000B 50 SP
Z 12 SB 70	Z 16 DC 90	Z 16 MD 90
Z 12 SC 70	Z 16 DD 90	Z 16 DA 90
Z 12 SD 70	Z 16 SA 90	Z 16 DB 90
Z 16 MA 90	Z 16 SB 90	
Z 16 MB 90	Z 16 SC 90	
Z 16 MC 90	Z 16 SD 90	