



ZETA PLUS® “LOW ALUMINIUM” CA, SA & LA SERIES

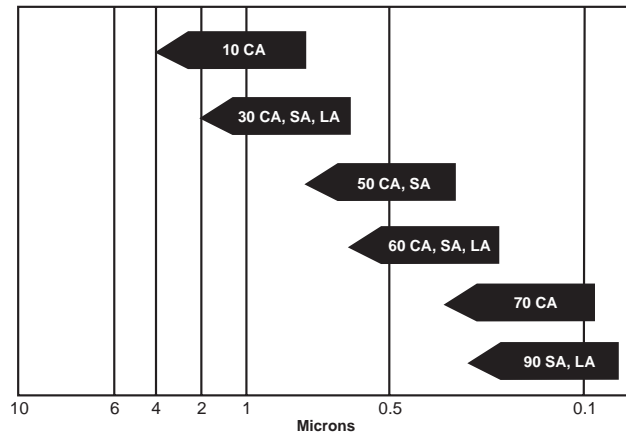


Zeta Plus® CA, SA, LA series filter media has been specifically designed for processes that require a high degree of filtration and low aluminium extractables. This media is made of inorganic filter aids cationic resin and cellulose.

GRADE SELECTION

The Zeta Plus® CA, SA & LA series filter media are available in a broad range of grades and configurations. Mechanical straining capability for each grade is indicated below. This is intended for use as a guide to nominal micron rating. Particles smaller than the rated pore size will be removed via electrokinetic adsorption. Actual operating conditions and the product to be processed must be considered. The optimal filtration system for your particular application can be determined by on-site testing or by sample evaluation in our Customer Service Laboratory (S.A.S.S. : Scientific Application Support Services).

Chart 1: Grade Selection

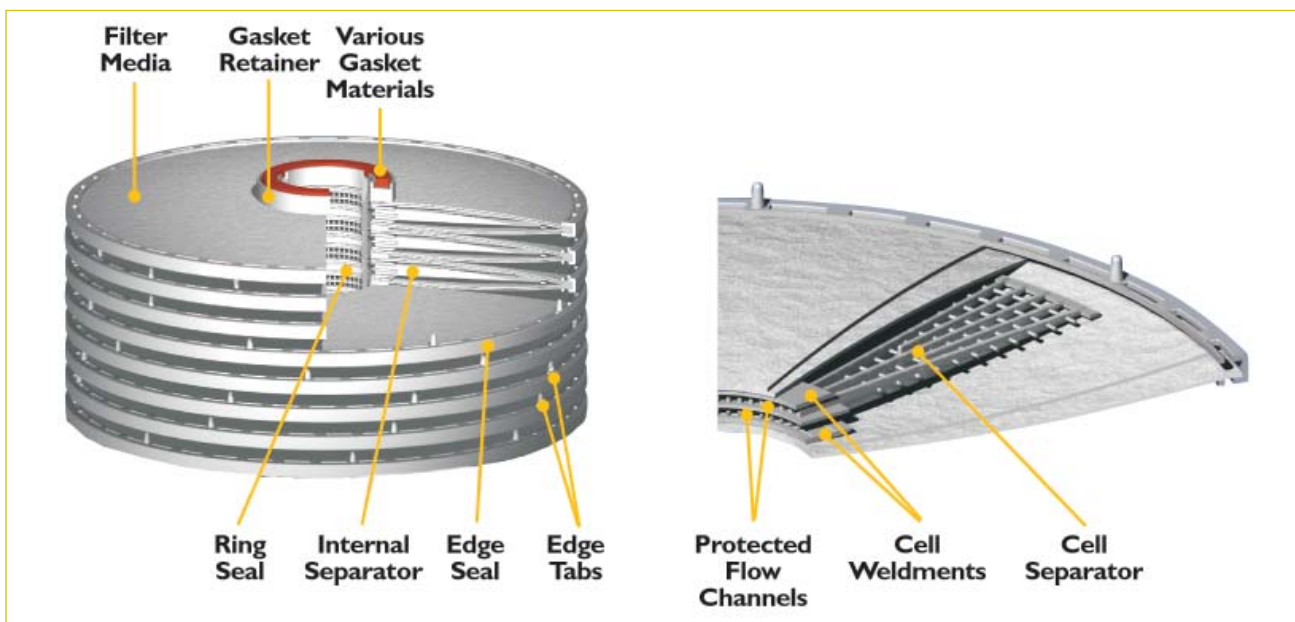


Applications

- Pharmaceutical: Small and Large Volume Parenterals, Dialysates, Blood Fractions
- Bioprocess : Fluids
- Food & Beverage: Infant Formula and Foods

| Features | Benefits |
|--|--|
| <ul style="list-style-type: none"> • Depth filtration media designed to retain contaminants by mechanical entrapment and electrokinetic adsorption. | <ul style="list-style-type: none"> • High contaminant holding capacity for economical filtration and reliable particle removal. |
| <ul style="list-style-type: none"> • CUNO high purity pre-extracted filter aid. | <ul style="list-style-type: none"> • Low extractable, fast rinse-up. |
| <ul style="list-style-type: none"> • Full range of scaleable capsule and cartridge filter configurations. | <ul style="list-style-type: none"> • Allows pilot testing and scale-up with the same materials that will be used in full-scale systems. |
| <ul style="list-style-type: none"> • FDA Drug Master File and USP Class VI Biological Safety. | <ul style="list-style-type: none"> • Eases validation and regulatory submissions by providing vital documentation and traceability. |
| <ul style="list-style-type: none"> • Self-contained, single-use disposable capsule and cartridge modules. | <ul style="list-style-type: none"> • Reduced labour time for change-outs and elimination of cleaning validation. |

CARTRIDGE CONSTRUCTION :



CARTRIDGE AND CAPSULE CONSTRUCTION

Cartridges and capsules are constructed from individual cells of Zeta Plus® Filter Media assembled together with polypropylene separators under predetermined compression. Standard cartridges are unitised by three 316 stainless steel bands. Plug-in cartridges and BioCap® 1000/2000 utilise a polypropylene post. 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.

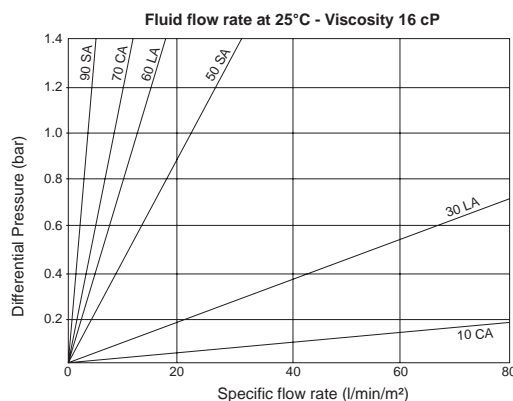
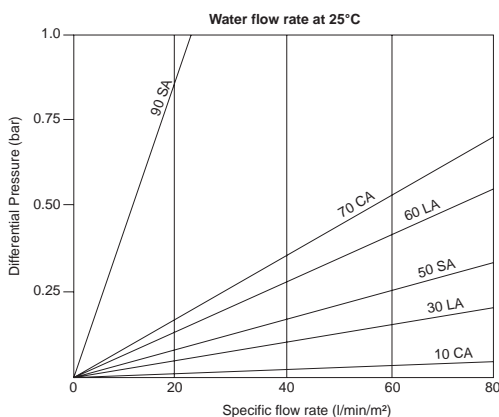
FILTER SHEETS AND DISCS

Zeta Plus® Filter Media is available in die-cut discs and sheets for use in plate and frame filter presses. Because of the higher flow capabilities and greater contaminant retention of Zeta Plus® Filter Media as compared to other types of filter sheets, it is often possible for filter press users to reduce their filter sheet usage by 20 to 50 percent in processing equivalent volumes of products.



EFFICIENT FLOW RATES

The graphs depict the flow rates for clean water and a 16 cP fluid. Although the flow capacity is decreased by high viscosity solutions, an efficient flow rate can be achieved with proper media type selection.



QUALITY CONTROL

The Zeta Plus® CA, SA and LA 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® CA, SA or LA cartridge packaging is labelled with a lot identification number to provide complete traceability.

| CHEMICALS | LA Max. (82°C) | CA Max. (60°C) | SA Max. (82°C) | GASKETS | | | |
|-------------------------------|----------------|----------------|----------------|---------|---------------|--------------------|----------|
| | | | | Nitrile | Fluoro carbon | Ethylene Propylene | Silicone |
| Ethyl Acetate | G | G | G | P | P | P | F |
| Acetone 100% | G | G | G | P | G | G | G |
| Acetic Acid 5% -20% | G | G | G | G | G | G | G |
| Benzene | G | G | G | P | F | P | F |
| Chloroform Dry | G | G | G | P | G | P | F |
| Chlorothene | No Data | G | G | P | G | P | F |
| Methylene chloride | G | G | G | P | F | P | P |
| 1,4 - Dioxane | G | G | G | P | P | P | P |
| Dimethyl Formamide | G | G | G | F | P | P | No Data |
| Ethanol 50% | G | G | G | G | F | G | G |
| Ethanol 10% | G | G | G | G | F | G | F |
| Ethyl Acetate | G | G | G | F | G | P | G |
| n-Heptane | G | G | G | G | G | P | F |
| Hexane | G | G | G | G | G | P | F |
| Methyl Ethyl Ketone (MEK) | G | G | G | P | P | G | G |
| Methanol | G | G | G | G | P | G | G |
| Methyl Isobutyl Ketone (MIBK) | G | G | G | P | P | G | G |
| Petroleum Ether | G | G | G | F | G | P | F |
| Sodium Hydroxide 2% | F/P | F/P | F/P | F | G | G | G |
| Toluene | G | G | G | P | G | P | F |
| 1,1,1 Trichlorethane | G | G | G | P | G | P | F |
| Water (ambient) | G | G | G | G | G | G | G |
| Water (82°C) | G | P | G | G | G | G | G |
| Xylene | G | 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.

CHEMICAL COMPATIBILITY

Excellent results have been achieved with the use of Zeta Plus® in the purification of a wide range of products. Refer to Table for detailed information about Zeta Plus® chemical compatibility. *These recommendations are intended as a guide only.* Maximum temperatures or concentrations are listed when known. Since compatibility may be seriously affected by these factors, and by variables such as flow velocity, degree of aeration, turbulence, and fluid stability, it is advisable to test a product under service conditions, or conditions simulating service conditions.

Compatibility data was generated from standard soak test methodology. Each tested media pad was performance tested by standard quality control procedures at the completion of the soaking period. Except where noted, no decrease in performance was observed. When reviewing cartridge compatibility, gasket material must also be taken into consideration. Ratings are supplied for nitrile, fluorocarbon, Ethylene propylene, and silicone gaskets.

EXTRACTABLES

A static soak test of Zeta Plus® filter materials was performed to determine the amount of organic and inorganic compounds extracted by various solvents. Testing of most extracts was completed by Atomic Adsorption Spectrophotometry (Graphite Furnace Analytical Technique). The values in the following table are the average amounts to be expected in ppb/m² of media after a 54 l/m² rinse with clean water or product.

| 90 mm Disc Media | | | |
|------------------|------------------------------|-------|-------|
| Extractables | Extractables Quantity in ppb | | |
| | 90 LA | 90 SA | 70 CA |
| Aluminium | <107 | <107 | <107 |
| Iron | 104 | 156 | 66 |
| Zinc | 102 | 78 | 68 |
| Copper | <54 | <54 | <54 |
| Nickel | <161 | <161 | <161 |
| Lead | <107 | <107 | <107 |
| Cadmium | <10 | <10 | <10 |
| Chromium | <32 | <32 | <32 |

Note: Extractable levels will vary from sample to sample

RECOMMENDED OPERATING PARAMETERS

| | |
|--------------------------------------|---|
| Maximum Operating Pressure | 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. |
| Maximum Operating Temperature | Standard and Special precoat Zeta Plus® SA & LA Cartridges : 82°C. Standard Zeta Plus® CA Cartridges : 60°C. BioCap® 25 Capsules : 40°C. BioCap® 1000 / 2000 Capsules : 60°C. |
| Recommended Pre-use Rinse | 54 l/m ² @ 20 lpm/m ² |
| Sterilization Parameters | 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). |
| Operating FLUX range | 1.2 - 12 lpm/m ² |

ZETA PLUS® CA, SA & LA SERIES - ORDERING GUIDE

CARTRIDGES

| ZETA PLUS® | DIAMETER (inch) | CARTRIDGE DESIGN | GASKET TYPE | GRADE | FORMULATION |
|------------|-----------------|---|--|----------------------|---|
| Z | 08 | P - Plug-in 7 cells 0.23 m ² | Standard: A - Silicone (MVQ)* | 30 50 60 90 | LA S resin special "L" cellulose Low Aluminium |
| | | D - Standard 8 cells 0.26 m ² | | | |
| Z | 12 | C - 9 cells / small 0.85 m ² B - Special precoat 12 cells 1.1 m ² D - Standard 16 cells 1.5 m ² S - Special 7 cells 0.7 m ² | Standard: D - Nitrile (NBR)* Options: A - Silicone (MVQ)* B - Fluorocarbon (FPM)* C - EPR (EPDM)* | 30 50 60 90 | SA S resin special Low Aluminium |
| | | M - Standard diffusion netting 14 cells - 3.2 m ² D - Standard no diffusion netting 16 cells - 3.7 m ² S - Special precoat 9 cells 2.1 m ² | | | |
| Z | 16 | | | 10 30 50 90 | CA C resin special Low Aluminium |

*ISO Designation

BIOCAP® CAPSULES

| CATALOGUE NUMBER | GRADE & 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 | 10 CA 60 CA 30 CA 70 CA 50 CA |
| | 30 SA 50 SA 60 SA 90 SA |
| | 30 LA 60 LA 90 LA |

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.



3M Europe SA Filtration CUNO

Hermeslaan 7
1831 Diegem
Belgium
Tel.: +32-2-7224500
Fax: +32-2-7224518
E-mail: inofcuno-europe@mmm.com
Web: www.3m.eu/filtration

For more contact addresses visit our website
www.3m.eu/filtration or www.cuno.com/international.

Data may be subject to change without further notice.

© 3M 2007. All rights reserved.

LITZPLA2.E - 0208