

ZetaPlus™ S Series

Depth Filter Cartridges & Capsules



Applications

Zeta Plus S Series filters are optimized for clarification of pharmaceutical, biological, bioprocess, cosmetic, and food & beverage fluids. Examples of applications include:

Pharmaceuticals	Blood Products, Antibiotics, Cough Syrups, Intravenous Solutions, Growth Media & Bioprocess Fluid
Beverages	Wine, Beer, Juices, Soft Drinks & Cider
Distilled Spirits	Liquor, Cognac, Cordials
Food Products	Syrups, Brines, Broths, Vinegar, Edible Oils & Sugars
Cosmetics	Perfumes, Lotions, Shampoos, Oils, Deodorants & Colognes

Zeta Plus S Series filters are a family of advanced depth filters designed to provide optimal clarification of pharmaceutical, biological, bioprocess, cosmetic, and food and beverage fluids. Zeta Plus S Series filters are composed of inorganic filter aid, cellulose and a proprietary resin system that imparts a positive charge to the filter matrix, aiding its adsorption of negatively charged contaminants.

Pharmaceutical SP Grade Media

In addition to the features of the standard Zeta Plus S series, Zeta Plus SP Grade filters are manufactured to procedures prescribed in 3M Purification Drug Master Files on record at the United States Food and Drug Administration (FDA). Zeta Plus SP Grade Filter Media is non-toxic in accordance with systemic injection testing. The characteristics and filtration mechanisms of the SP Grades are the same as the standard Zeta Plus S Series. In addition, all SP Grade Filter Media meets the strict requirements specified in the Drug Master Files. The SP Grade has complete product control and traceability as set forth in the Drug Master File.

Superior Particle Removal

Zeta Plus filters are advanced cellulose-based depth filtration media, designed to retain contaminants by both mechanical entrapment and electrokinetic adsorption. Zeta Plus filter media is composed of high surface area filter aids embedded in a cellulose fiber matrix. During the manufacturing process, molecules carrying a positive charge are chemically bonded to the filter matrix permanently forming an interconnected filtration structure with positively charged electrokinetic capture sites. The resulting porous depth filter is a tortuous network of charge-enhanced flow channels capable of removing bacteria, particulate, cellular debris and submicronic contaminants to a level which mechanical screening alone cannot achieve.

Features & Benefits

Depth filtration media designed to retain contaminants by mechanical entrapment and electrokinetic adsorption.

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

Full range of scaleable capsule and cartridge filter configurations.

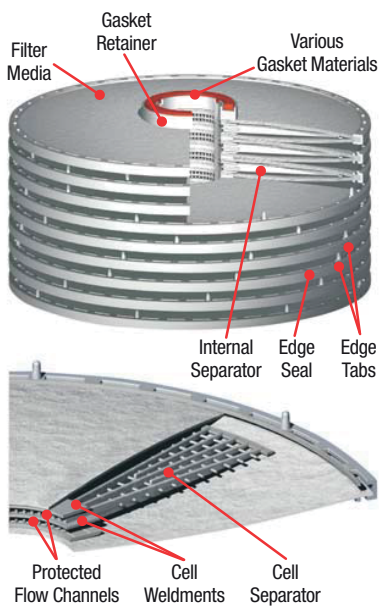
- Allows pilot testing and scale-up with the same materials that will be used in full scale systems.

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 labor time for changeouts and elimination of cleaning validation.



Above: Individual cells of Zeta Plus S Series filter medium are constructed using polypropylene moulded edge seals and separators for high performance. Cell separator.



Above: Zeta Plus BC capsule filters are ideal for pilot scale and low volume applications.

Cartridge Construction

Zeta Plus S Series cartridges are designed for use with 3M Purification Zeta Plus sanitary style stainless steel filter housings. Cartridges are constructed from individual cells of Zeta Plus S filter medium assembled together with polypropylene ring seals under predetermined compression and unitized by three, 316 stainless steel bands. Each cell is constructed using polypropylene moulded 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, with surface area ranging from 0.23 m² to 3.2 m² per cartridge.

Capsule Construction

Zeta Plus S Series filters are available in ready to use, fully disposable BC capsules. The Zeta Plus BC Series capsules are completely encapsulated disposable filters for small volume biological, bioprocess and pharmaceutical filtration. BC capsules are autoclavable and available in three sizes (25, 650, 1300 cm² filtration area) to provide a high degree of application flexibility.

Flow Rates

Graph 1 displays flow rates obtained with 21°C clean water. Optimum flow rates vary by application, but in general, the flow rate per unit area (flux) should not exceed 0.25 gpm/ft² (10 lpm/m²) of filter media for best performance. Lower flux rates often result in longer service life, greater throughputs and superior system economics.

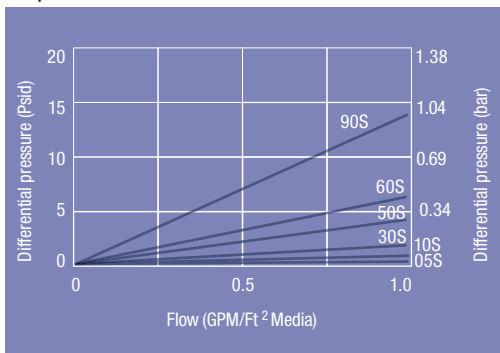
Grade Selection

The Zeta Plus S Series filters are available in a broad range of grades. Nominal removal rating is indicated in Table 1 and Chart 1 for each available grade. This information is intended for use as a guide to filter selection. Particles smaller than the rated pore size will be removed by Zeta Plus Filter Media due to electrokinetic adsorption. Actual operating conditions and the product to be filtered should be considered in grade selection. The optimal filtration system for your particular application can be determined by on-site test equipment or sample evaluation in our Applications Laboratory.

Table 1: Application Recommendations

Application	Recommended Grades	Nominal Micron Removal (in microns)
Coarse clarification	05S, 10S	5 to 0.5
Medium clarification	30S, 50S, 60S	2 to 0.2
Fine clarification	90S	0.2 to 0.05

Graph 1: Clean Water Flow Rate at 21°C

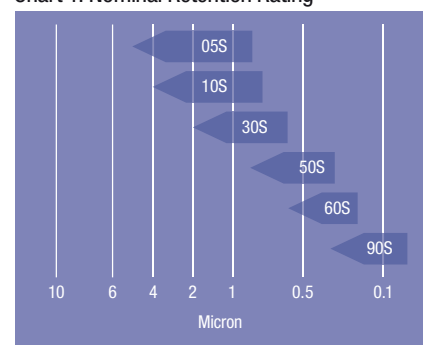


NOTE:
 1 bar = 100 kPa
 1 gpm/ft² = 40.7 lpm/m²

Recommended Operating Parameters

Maximum Operating Pressure	BC25 Capsules: 40 psig maximum inlet pressure, 35 psi maximum capsule pressure drop BC1000/2000 Capsules: 80 psig @25°C, 40 psig @ 60°C maximum inlet pressure; 35 psid maximum capsule pressure drop. Standard Zeta Plus Cartridges: 35 psid maximum cartridge pressure drop
Maximum Operating Temperature	BC25 Capsules: 40°C BC1000/2000 Capsules: 60°C Standard Zeta Plus Cartridges: 82°C
Recommended Pre-use Rinse	50 l/m ² at 20 lpm/m ²
Sterilization Parameters	Steam or autoclave sterilization is not recommended. Consult Cuno if sterilization is required
Recommended Flow Rates	BC25 Capsules: 3-30 ml/min BC1000 Capsules: 0.1 gpm (0.4 lpm) BC2000 Capsules: 0.2 gpm (0.8 lpm) Standard Zeta Plus Cartridges: 0.25 gpm/ft ² (10.2 lpm/m ²)

Chart 1: Nominal Retention Rating



Zeta Plus S Series Specifications

Configuration	Capsule & Cartridge Materials of Construction	Effective Filtration Surface Area
BC25	Polypropylene shell, glass filled polypropylene over-mould	25 cm ²
BC1000	Polysulfone shell, polypropylene cartridge support and vent cap	650 cm ²
BC2000		1300 cm ²
63A-08C (8" diameter cartridge, 9-cell)	Polypropylene cartridge support and edge seal	0.30 m ²
63A-P8B (8" diameter cartridge, 7-cell plug-in)		0.23 m ²
Z12C (12" diameter cartridge, 9-cell)		0.9 m ²
Z12D (12" diameter cartridge, 16-cell)		1.5 m ²
Z16M (16" diameter cartridge, 14-cell)		3.2 m ²

Sanitary Housings

3M Purification provides a wide array of standard and specially designed sanitary filter housings to hold Zeta Plus S Series filter cartridges. All housings are designed with the pharmaceutical and bioprocessing industries in mind and feature 316L mirror-polished surfaces and easy-to-clean components, along with accessories such as CIP spray-balls and the innovative Zeta Plus Lifting Device.



Zeta Plus™ S Series Ordering Guide

8" Diameter Cartridges

Catalogue Number	Gasket Material	Grade	Media
63A-08C (8" 9-cell DOE)	11- Nitrile 12- Neoprene 13- Fluorocarbon 14- EPR 22- Silicone 23- Teflon with PTFE	05S 10S 30S 50S 60S 90S	P- Pharmaceutical
63A-P8B (8" 7-cell plug-in)	11- Nitrile 13- Fluorocarbon 14- EPR 22- Silicone 23- PTFE Encapsulated Fluorocarbon		

12" Diameter Cartridges

Catalogue Number	Gasket	Grade	Media
Z12C (12" 9-cell DOE) Z12D (12" 16-cell DOE)	A - Silicone B - Fluorocarbon C - EPR D - Nitrile E - Teflon	10S 30S 50S 60S 90S	P- Pharmaceutical

16" Diameter Cartridges

Catalogue Number	Gasket	Grade	Media
Z16M (16" 14-cell DOE)	A - Silicone B - Fluorocarbon C - EPR D - Nitrile E - Teflon	10S 30S 50S 60S 90S	P- Pharmaceutical

Important Notice

The information described in this literature is accurate to the best of our knowledge. A variety of factors, however, can affect the performance of the Product(s) in a particular application, some of which are uniquely within your knowledge and control. INFORMATION IS SUPPLIED UPON THE CONDITION THAT THE PERSONS RECEIVING THE SAME WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR USE. IN NO EVENT WILL 3M PURIFICATION BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF OR RELIANCE UPON INFORMATION.

It is your responsibility to determine if additional testing or information is required and if this product is fit for a particular purpose and suitable in your specific application.

Limitation of Liability

3M Purification Pty Limited will not be liable, to the extent permitted by law, for any loss or damage from the use of the Product(s), whether direct, indirect, special, or consequential, regardless of the legal theory asserted, included warranty, contract, negligence or strict liability.



3M Purification Pty Limited

140 Sunnyside Road
Blacktown NSW 2148
AUSTRALIA

Tel. 1300 367 362
Fax. 1800 671 599

www.3mpurification.com.au

New Zealand

PO BOX 33-246
North Shore 0740
Auckland, NEW ZEALAND

Tel. 0800 362 886
Fax. 0800 362 880

www.3m.com/nz