

# Zeta Plus™ C Series

## Depth Filter Cartridges & Capsules

Zeta Plus™ C 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 C Series filters are composed of inorganic filter aid, cellulose and a resin system that imparts a positive charge to the filter matrix, aiding its adsorption of negatively charged contaminants.

### Pharmaceutical CP Grade Media

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

### Superior Particle Removal

Zeta Plus C Series filters are advanced cellulose-based depth filtration media, designed to retain contaminants by both mechanical entrapment and electrokinetic adsorption. Zeta Plus C Series filter media is composed of high surface area filter aids embedded in a cellulose fiber matrix.

## 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.

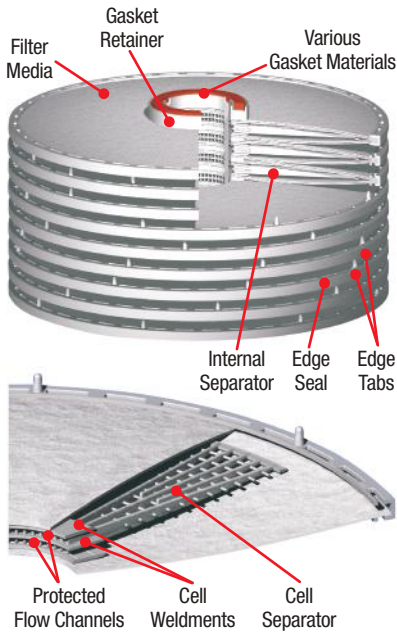
- Reduced labor time for changeouts and elimination of cleaning validation.



## Applications

Zeta Plus C Series filters are optimized for clarification of pharmaceutical, biological, bioprocess, cosmetic, and food & beverage fluids.

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



Above: Individual cells of Zeta Plus C Series filter medium are constructed using polypropylene molded edge seals and separators for high performance.



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

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.

### Cartridge Construction

Zeta Plus™ C Series cartridges are designed for use with Zeta Plus sanitary style stainless steel filter housings. Cartridges are constructed from individual cells of Zeta Plus C Series filters medium assembled together with polypropylene ring seals under predetermined compression and unitized 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, with surface area ranging from 0.7 ft<sup>2</sup> to 42.2 ft<sup>2</sup> per cartridge.

### Capsule Construction

Zeta Plus C Series filters are available in ready to use, fully disposable BC capsules. The 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 cm<sup>2</sup> 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/ft.<sup>2</sup> (10 lpm/m<sup>2</sup>) 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 C 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 C Series filter media due to electrokinetic adsorption. Actual operating conditions and the product to be filtered should be considered in grade selection. Technical support in optimal grade selection is provided by your local Distributor or the 3M Purification Applications Engineers. The optimal filtration system for your particular application can be determined by on-site test equipment or sample evaluation in our Applications Laboratory.

Graph 1: Clean Water Flow Rate @ 21°C

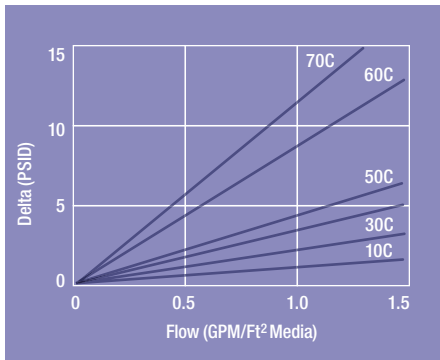


Table 1: Application Recommendations

Application	Recommended Grades	Nominal Micron Removal (in microns)
Coarse clarification	10C	4 to 0.75
Medium clarification	30C, 50C, 60C	2 to 0.2
Fine clarification	70C	0.3 to 0.05

## Zeta Plus C Series Specifications

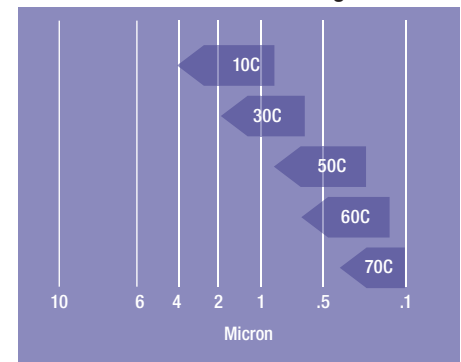
Configuration	Capsule & Cartridge Materials of Construction	Effective Filtration Surface Area
<b>BC25 Capsule</b>	Polypropylene capsule shell, glass filled polypropylene over-mold	3.9 in <sup>2</sup> (25 cm <sup>2</sup> )
<b>BC1000 Capsule</b>	Polysulfone capsule shell, polypropylene cartridge support and vent cap	0.7 ft <sup>2</sup> (650 cm <sup>2</sup> )
<b>BC2000 Capsule</b>		1.4 ft <sup>2</sup> (1300 cm <sup>2</sup> )
45109 (8 diameter cartridge, 8-cell)	Polypropylene cartridge support and edge seal	2.8 ft <sup>2</sup> (0.26 m <sup>2</sup> )
<b>45167</b> (8 diameter cartridge, 7-cell plug-in)		2.5 ft <sup>2</sup> (0.23 m <sup>2</sup> )
<b>Z8FA2NPX2</b> (8" diameter, 2-cell plug-in)		0.7 ft <sup>2</sup> (650 cm <sup>2</sup> )
<b>Z8FA4NPX2</b> (8" diameter, 4-cell plug-in)		1.4 ft <sup>2</sup> (1300 cm <sup>2</sup> )
<b>45237</b> (12" diameter cartridge, 12-cell)		12.3 ft <sup>2</sup> (1.1 m <sup>2</sup> )
<b>45245</b> (12" diameter cartridge, 16-cell)		16.4 ft <sup>2</sup> (1.5 m <sup>2</sup> )
<b>Z16P</b> (16" diameter cartridge, 14-cell)		34.7 ft <sup>2</sup> (3.2 m <sup>2</sup> )
<b>Z16P</b> (16" diameter cartridge, 16-cell)		39.7 ft <sup>2</sup> (3.7 m <sup>2</sup> )
<b>Z16H</b> (16" diameter cartridge, 17-cell)		42.2 ft <sup>2</sup> (3.9 m <sup>2</sup> )*

\*60, 70 grades only

## Recommended Operating Parameters

<b>Maximum Operating Pressure</b>	<b>BC25 Capsules:</b> 40 psig maximum inlet pressure, 35 psi maximum capsule pressure drop <b>BC1000/2000 Capsules:</b> 80 psig @25°C, 40 psig @ 60°C maximum inlet pressure; 35 psid maximum capsule pressure drop. <b>Standard Zeta Plus Cartridges:</b> 35 psid maximum cartridge pressure drop
<b>Maximum Operating Temperature</b>	<b>BC25 Capsules:</b> 40°C <b>BC1000/2000 Capsules:</b> 60°C <b>Standard Zeta Plus Cartridges:</b> 82°C
<b>Recommended Pre-use Rinse</b>	1.3 gal/ft <sup>2</sup> at 0.5 gpm/ft <sup>2</sup> , 50 l/m <sup>2</sup> at 20 lpm/m <sup>2</sup>
<b>Sterilization Parameters</b>	Steam or autoclave sterilization is not recommended. Consult 3M Purification if sterilization is required.

Chart 1: Nominal Retention Rating



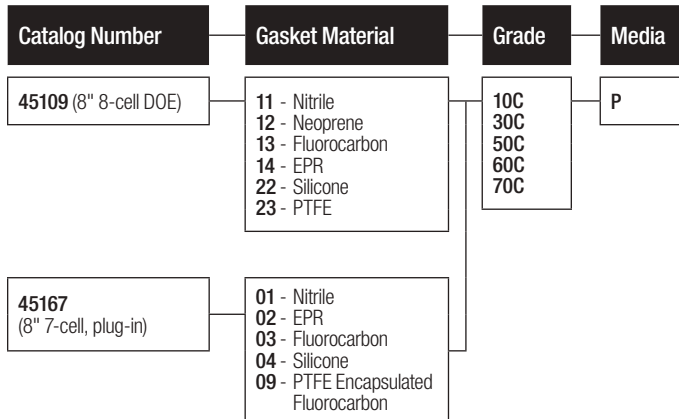
## Sanitary Housings

3M Purification provides a wide array of standard and specially designed sanitary filter housings to hold Zeta Plus C 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.

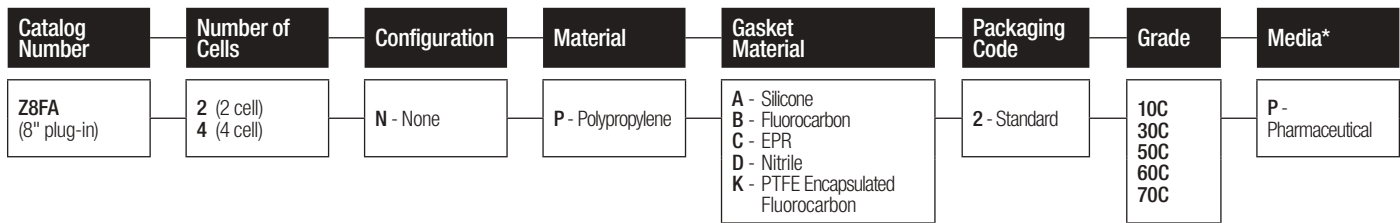
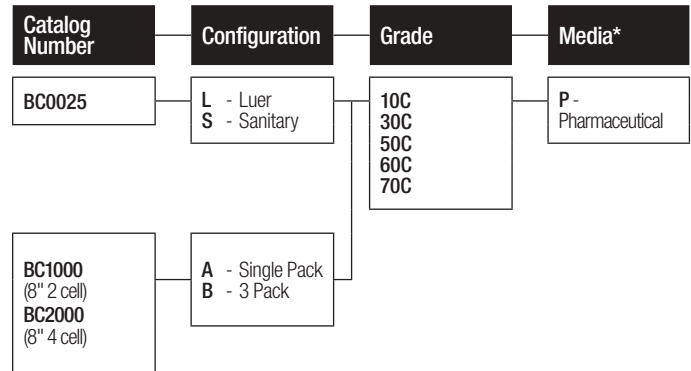


# Zeta Plus™ C Series Ordering Guide

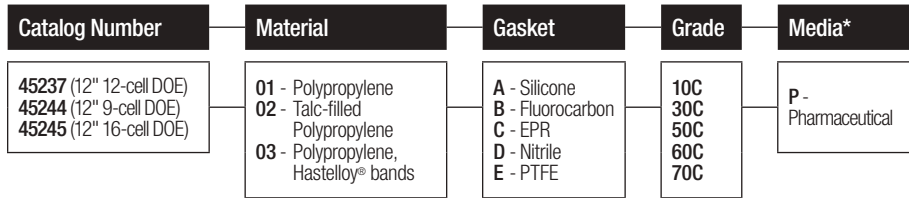
## 8" Diameter Cartridges



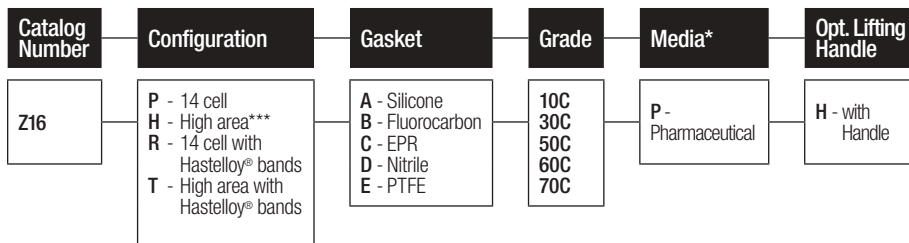
## Zeta Plus BC Capsule C Series



## 12" Diameter Cartridges



## 16" Diameter Cartridges



\*Omit "P" from part number for standard C media. \*\*Omit "H" from part number if lifting handle is not required.  
\*\*\*High Area Cell Count - 30C & 50C 16 cell; 60C & 70C 17 cell; not available for 10C.  
Bodyfeed cartridge available, please order 45802 (16", 9 cell)

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