

# Zeta Plus™ S Series Filter Media

Zeta Plus™ S series media are advanced depth filter media designed to provide optimal clarification of food and beverage fluids. Zeta Plus S series filter medium is 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.

## Superior Particle Reduction

Zeta Plus filters are composed of advanced cellulose-based depth filtration media, designed to retain contaminants by both mechanical entrapment and electrokinetic adsorption. Zeta Plus filter media are 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 reduction.

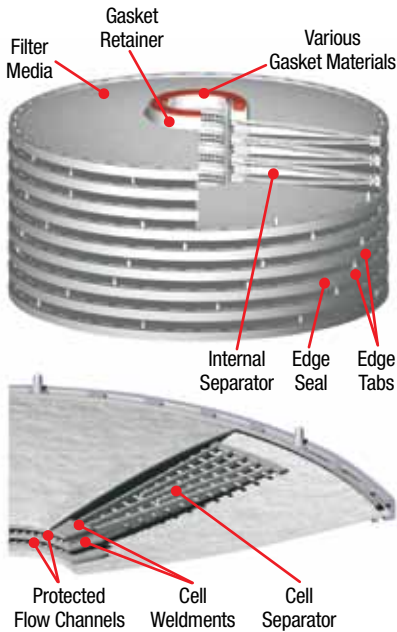
**Self-contained, single-use disposable capsule and cartridge modules.**

- Reduced labor time for change-outs and elimination of cleaning validation.

## Applications

Zeta Plus™ S series filter media are optimized for clarification of food & beverage fluids. Examples of applications include:

<b>Beverages</b>	Wine, Beer, Juices, Soft Drinks, and Cider
<b>Distilled Spirits</b>	Liquor, Cognac, Cordials
<b>Food Products</b>	Syrups, Brines, Broths, Vinegar, Edible Oils, and Sugars



Above: Individual cells of Zeta Plus™ S Series filter medium is 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.

## Cartridge Construction

Zeta Plus™ cartridges are designed for use with Zeta Plus sanitary style stainless steel filter housings. Cartridges are constructed from individual cells of Zeta Plus S series 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 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" diameters, with surface area ranging from 650 cm<sup>2</sup> to 3.9 m<sup>2</sup> (0.7 ft<sup>2</sup> to 42.2 ft<sup>2</sup>) per cartridge.

## Regulatory Information

When used in keeping with 3M's product use requirements, which include a minimum required pre-conditioning flush, and a minimum use volume, Zeta Plus™ S series filter products may be used in food processing applications as described below in full compliance with the Federal Food, Drug, and Cosmetic Act and the applicable regulations administered by the United States Food and Drug Administration (FDA) in 21 C.F.R. parts 170-190.

For additional information, please refer to 3M Purification Technical Brief: LIT 70-0203-4002-5

## Capsule Construction

Zeta Plus S series media are available in ready to use, fully disposable BC capsules. The Zeta Plus™ BC series capsules are completely encapsulated disposable filters for small volumes.

## Flow Rates

Graph 1 displays flow rates obtained with 21°C clean water. Optimum flow rates vary by application, but in general, lower flux rates often result in longer service life, greater throughputs and superior system economics.

## Grade Selection

The Zeta Plus S series filter media are available in a broad range of grades. Nominal reduction 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 reduced 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.

Graph 1: Clean Water Flow Rate at 21°C

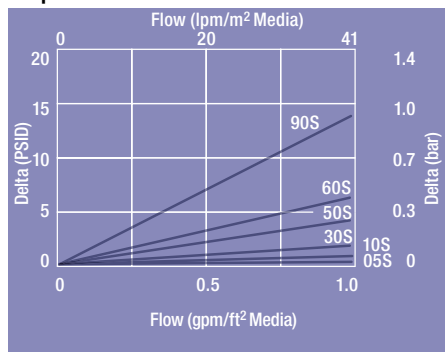


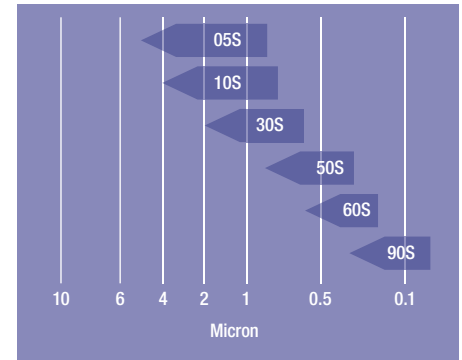
Table 1: Application Recommendations

Application	Recommended Grades	Nominal Micron Reduction (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

**Table 2: Recommended Operating Parameters**

Maximum Operating Pressure	BC25 Capsules:	2.8 bar (40 psig) maximum inlet pressure, 2.4 bar (35 psid) maximum capsule pressure drop
	Standard Zeta Plus™ Cartridges	2.4 bar (35 psid) maximum cartridge pressure drop
Maximum Operating Temperature	BC25 Capsules	40°C (104°F)
	Standard Zeta Plus™ Cartridges:	82°C (180°F)
Required Pre-use Rinse	All Products	54 l/m <sup>2</sup> (1.3 gal/ft <sup>2</sup> )
Sterilization Parameters	BC25 Capsules	autoclave, 30 minutes @ 121°C (250°F) (1 cycle)
	Standard Zeta Plus™ Cartridges	autoclave or <i>in situ</i> steam sterilization, 1 hour @ 121°C (250°F)

**Chart 1: Nominal Retention Rating**



**Table 3: Zeta Plus™ S Series Specifications**

Configuration	Capsule & Cartridge Materials of Construction	Effective Filtration Surface Area
<b>BC25 Capsule</b>	Polypropylene capsule shell, glass filled polypropylene over-mold  Polypropylene cartridge support and edge seal	25 cm <sup>2</sup> (3.9 in <sup>2</sup> )
<b>45109</b> (8" diameter cartridge, 8-cell)		0.26 m <sup>2</sup> (2.8 ft <sup>2</sup> )
<b>45167</b> (8" diameter cartridge, 7-cell plug-in)		0.23 m <sup>2</sup> (2.4 ft <sup>2</sup> )
<b>45237</b> (12" diameter cartridge, 12-cell)		1.1 m <sup>2</sup> (12.3 ft <sup>2</sup> )
<b>45245</b> (12" diameter cartridge, 16-cell)		1.5 m <sup>2</sup> (16.4 ft <sup>2</sup> )
<b>Z16P</b> (16" diameter cartridge, 14-cell)		3.2 m <sup>2</sup> (34.7 ft <sup>2</sup> )
<b>Z16P</b> (16" diameter cartridge, 16-cell)		3.7 m <sup>2</sup> (39.7 ft <sup>2</sup> )
<b>Z16H</b> (16" diameter cartridge, 17-cell)		3.9 m <sup>2</sup> (42.2 ft <sup>2</sup> )

\*60, 70 grades only



# Zeta Plus™ S Series Filter Media Ordering Guide

## 8" Diameter Cartridges

Catalog Number	Gasket Material	Grade
45109 (8" 8-cell DOE)	11 - Nitrile 12 - Neoprene 13 - Fluorocarbon 14 - EPR 22 - Silicone 23 - Fluoropolymer	05S 10S 30S 50S 60S 90S
45167 (8" 7-cell, plug-in)	01 - Nitrile 02 - EPR 03 - Fluorocarbon 04 - Silicone 09 - Fluoropolymer Encapsulated Fluorocarbon	

## Zeta Plus™ BC Capsule S Series

Catalog Number	Configuration	Grade
BC0025	L - Luer S - Sanitary	05S 10S 30S 50S 60S 90S

## 12" Diameter Cartridges

Catalog Number	Material	Gasket	Grade
45237 (12" 12-cell DOE) 45244 (12" 9-cell DOE) 45245 (12" 16-cell DOE)	01 - Polypropylene 02 - Talc-filled Polypropylene 03 - Polypropylene, Hastelloy® bands	A - Silicone B - Fluorocarbon C - EPR D - Nitrile E - Fluoropolymer	05S 10S 30S 50S 60S 90S

## 16 Diameter Cartridges

Catalog Number	Configuration	Gasket	Grade
Z16	P - 14 cell H - High area*** R - 14 cell with Hastelloy® bands T - High area with Hastelloy® bands	A - Silicone B - Fluorocarbon C - EPR D - Nitrile E - Fluoropolymer	05S 10S 30S 50S 60S 90S

\*\*\*High Area Cell Count - 30S & 50S 16 cell; 60S & 90S 17 cell; Not available for 05S & 10S. Bodyfeed cartridge available, please order 45802 (16", 9 cell)

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