

Zeta Plus™ A Series

Filter Media, Cartridges & Capsules

Zeta Plus A Series filter media was developed to meet the requirements of industrial, chemical, and utility process applications. The composition of the various grades offer efficient filtration in applications requiring the retention of particles in the 1 to 20 micron range.

The Zeta Plus 01A grade is an all cellulose, charged media suitable for applications not requiring sub-micron particle removal. This grade is also available as 01AP specifically for pharmaceutical applications that require filters with assigned FDA Drug Master File (DMF) numbers. The non-toxic cellulose composition of the medium and CFR Title 21 listed materials of construction provide a compatible prefilter for pharmaceutical, food & beverage, and cosmetic production applications.

Characteristics

Since our filters may be used with a wide range of solutions and under various filtration conditions, the extractable levels and/or other test data presented here should be used as a guide only. Extractable levels and/or other filter properties should be determined and compared with existing standards of acceptance for the particular application in which the filters will be used.

Superior Particle Removal

Zeta Plus A Series filter media offers unique advantages in contaminant removal because of its strong positive electro-kinetic properties. In addition to the mechanical sieving of particles by its depth loading feature, Zeta Plus A Series filter media removes contaminants too small for mechanical exclusion by taking advantage of the particle's charge. Since most particles in suspension have been shown to be negatively charged and Zeta Plus has a positive charge, virtually all contaminants can be removed by adsorption (attaching the negative particle to the positive charge site on the medium) and proper grade selection.

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 & 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 (01AP only).

- Eases validation and regulatory submissions by providing vital documentation and traceability.

Self-contained, single-use disposable capsule & cartridge modules.

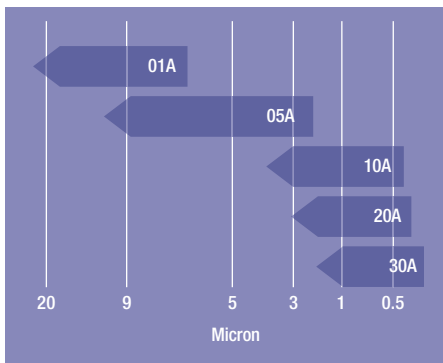
- Reduced labor time for changeouts and elimination of cleaning validation.



Applications

| | | |
|--------------------|--------------------------|------------------------|
| Acids | Brines | Chemicals |
| Cleaning Compounds | Dielectric Oils | Diagnostic Serums |
| Detergents | Fuels | Hydraulic Fluids |
| Inks | Insecticides | Lubrication Oils |
| Machine Oil | Machine Cutting Tool Oil | Photographic Solutions |
| Plastics | Plating Solutions | Quenching Oil |
| Solvents | Turbine Oil | Varnishes |

Chart 1: Media Grade Selection Guide



Grade Selection

Chart 1 provides nominal micron ratings, determined by the products mechanical sieving ability, for the Zeta Plus™ A Series grades. This chart serves as a guide only, since the additional contaminant removal provided by electro-kinetic adsorption is not considered. Compatible processing conditions and proper grade selection will result in the removal of particles smaller than the nominal rating.

Flow Rates

Graphs 1 and 2 show the clean water and 100 SSU oil flow capability of the Zeta Plus A Series filter media, other viscosity fluid flows will vary. For optimal filtration performance, it is recommended that the flow rate not exceed 1 gal/minute/ft² (40.7 liters/minute/m²) of filter area for all grades.

Extractables

Table 1 lists the extractables resulting from a 24-hour static soak of Zeta Plus A Series media in the test solvent.

Extraction tests were performed using 100 ml of fluid per 30 cm² of media. Inorganic extractables were quantified using atomic absorption analytical techniques. Organic materials were evaluated using infrared and ultraviolet spectrophotometric analytical methods. Figures are reported as milligrams per gram of media weight.

Wet Strength

Table 2 lists the wet tensile strength of Zeta Plus A Series filter media. The high wet strength exhibited by this media facilitates media change-out and indicates resistance to bursting or erosion.

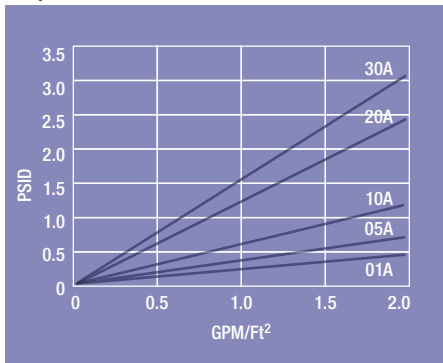
Filter Sheets and Discs

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 the 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 up to 50% in processing equivalent-volumes of product.

Since Zeta Plus filters may be used with a wide range of solutions and under varying conditions the extractable levels and/or other test data presented here should be used as a guide only.

Extractable levels and/or other filter properties should be determined and compared with existing standards of acceptance for the particular application in which the filters will be used.

Graph 1: Water Flow vs. Differential Pressure



Graph 2: 100 SSU Oil Flow vs. Differential Pressure

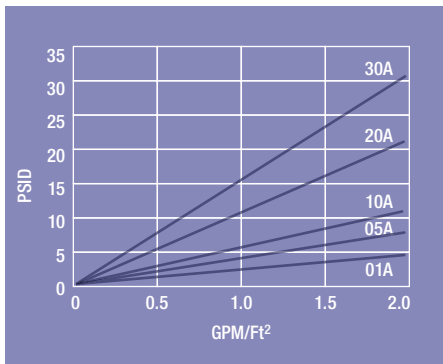


Table 1: Extractables

| Solvents | Na | K | Ca | Mg | Fe | Heavy Metals | Organics |
|---------------|-----|-------|-----|-------|-------|--------------|----------|
| Water (Amb) | .88 | .18 | .02 | .01 | <.001 | <.001 | .018 |
| Ethanol (10%) | .94 | .15 | .04 | .01 | <.001 | <.001 | <.001 |
| Ethanol (50%) | .92 | .07 | .02 | .01 | <.001 | <.001 | <.001 |
| Acetic Acid | .85 | .24 | .24 | .10 | .02 | <.001 | .058 |
| n-Heptane | .02 | <.001 | .01 | <.001 | <.001 | <.001 | <.001 |

< = Limit of Detection. Note specific extractable level may vary from sample to sample as the raw materials are natural products.

Table 2: Wet Tensile Strength

| Grade | Tensile Strength (lb/in) |
|-------|--------------------------|
| 01A | 2.2 |
| 05A | 3.3 |
| 10A | 3.3 |
| 20A | 2.2 |
| 30A | 2.2 |

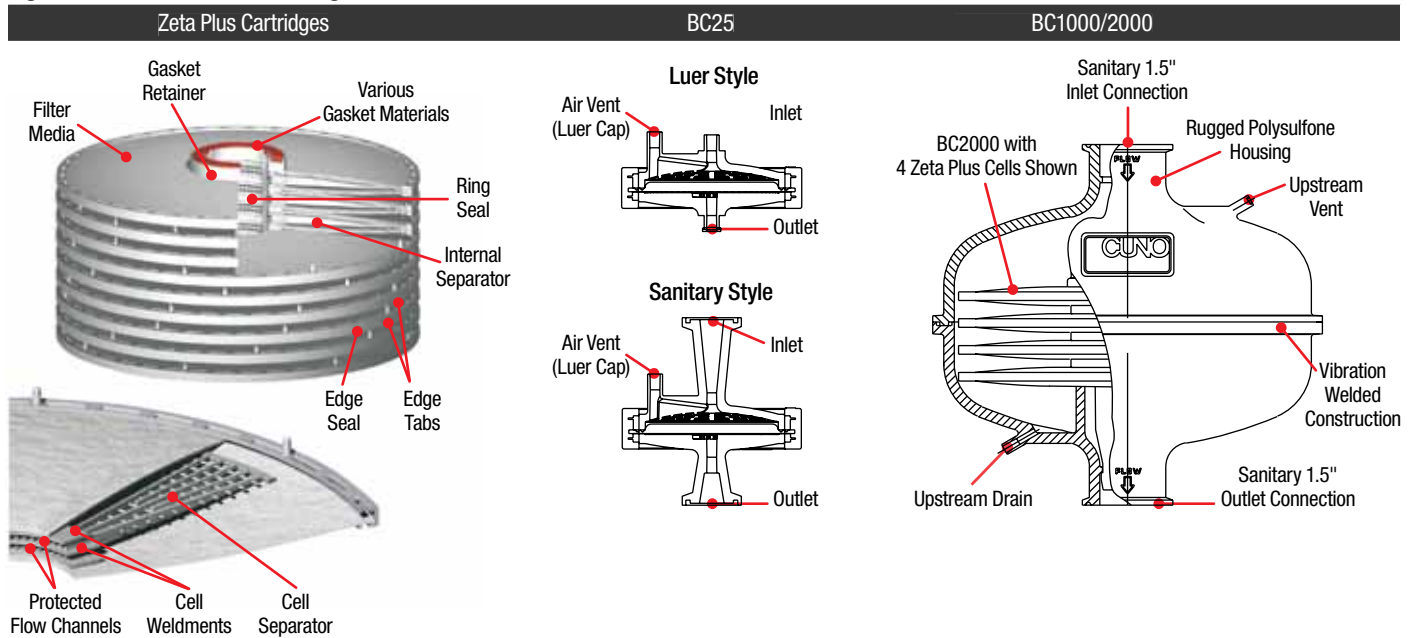
Cartridge Construction

Zeta Plus A Series media is available in cartridges of various size and configuration. Cartridges are constructed from individual cells of Zeta Plus filter media assembled with preset compression (Figure 1). The cells are unitized by three 316 stainless steel bands with polypropylene separators and cell edge seals. Various gasket or o-ring materials are available to ensure application compatibility (see ordering guide).

Operating Parameters

| | |
|--------------------------|--------------------------|
| Max. Operating Temp. | 140°F (60°C) in water |
| Max. Differential Press. | 30-35 psid (2.1-2.5 bar) |
| Rec. Rinse Volume | 5 liters/ft² of media |

Figure 1: Zeta Plus A Series Configurations



Zeta Plus Series A Specifications

| Configuration | Capsule & Cartridge Materials of Construction | Effective Filtration Surface Area |
|--|---|-----------------------------------|
| BC25 Capsule | Polypropylene capsule shell, glass filled polypropylene over-mold | 3.9 in² (25 cm²) |
| BC1000 Capsule | Polysulfone capsule shell, polypropylene cartridge support and vent cap | 0.7 ft² (650 cm²) |
| BC2000 Capsule | | 1.4 ft² (1300 cm²) |
| 45109 (8 diameter cartridge, 9-cell) | Polypropylene cartridge support and edge seal | 2.8 ft² (0.26 m²) |
| 45167 (8 diameter cartridge, 7-cell plug-in) | | 2.5 ft² (0.23 m²) |
| 45113 (12 diameter cartridge, 18-cell) | | 18.4 ft² (1.7 m²) |
| 45114 (12 diameter cartridge, 10-cell) | | 10.2 ft² (1.0 m²) |
| Z16P (16 diameter cartridge, 14-cell) | | 34.7 ft² (3.2 m²) |

Table 3: Cartridge Configurations

| Catalog Number | Nominal Diameter (Inches) | Height (Inches) | Number of Cells | Standard Packaging Units/Carton |
|----------------|---------------------------|-----------------|-----------------|---------------------------------|
| 45109 | 8 | 6 11/16 | 9 | 15 |
| 45167 | 8 | 6 5/8 | 7 | 8 |
| 45113 | 12 | 10 3/4 | 18 | 2 |
| 45114 | 12 | 7 11/16 | 10 | 2 |
| Z16P | 16 | 10 3/4 | 14 | 1 |

Zeta Plus A Series Ordering Guide

Zeta Plus BC Series Ordering Guide

| Catalog Number | Configuration | Media Grade |
|--------------------|--------------------------|-------------|
| BC0025 | L - Luer S - Sanitary | 01AP |
| BC1000 (8" 2 cell) | A - Single Pack | |
| BC2000 (8" 4 cell) | B - 3 Pack | |

12" Diameter Cartridges

| Catalog Number | Gasket Material | Media Grade |
|--|--|----------------------------------|
| 45113 (12" 18 cell DOE) 45114 (12" 10 cell DOE) | 01 - Nitrile 02 - Neoprene* 03 - Fluorocarbon 04 - EPR 05 - Cork* 11 - Silicone | 01AP 01A 05A 10A 20A |

*Not available with 01AP

16" Diameter Cartridges

| Catalog Number | Configuration | Gasket Material | Media Grade | Optional Lifting Handle |
|----------------|---|---|---|-------------------------|
| Z16 | P - 14 cell R - 14 cell with Hastelloy® bands | A - Silicone B - Fluorocarbon C - EPR D - Nitrile E - Expanded PTFE F - Neoprene** | 01AP 01A 05A 10A 20A 30A | H - with Handle |

*Omit "H" from part number if lifting handle is not required

** Not available with 01AP

8" Diameter Cartridges

| Catalog Number | Configuration | Media Grade |
|---------------------------|--|----------------------------------|
| 45109 (8" 9 cell DOE) | 11 - Nitrile 13 - Fluorocarbon 14 - EPR 22 - Silicone 23 - Expanded PTFE | 01AP 01A 05A 10A 20A |
| 45167 (8" 7 cell plug-in) | 01 - Nitrile 02 - EPR 03 - Fluorocarbon 04 - Silicone 09 - PTFE Encapsulated Fluorocarbon | |

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