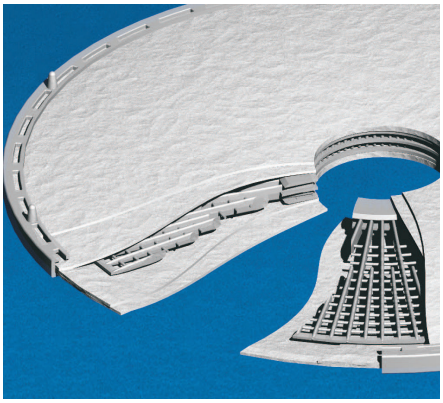
Zeta Plus™ MH Series

Dual Zone Depth Filter Cartridges and Capsules

Zeta Plus™ MH Series are a family of advanced, dual zone depth filters designed to provide optimal clarification and prefiltration in Food & Beverage applications. The Zeta Plus MH Series filter design consists of two distinct layers, or "zones" of filter media with the upstream zone more open than the downstream zone. This structure enhances the contaminant holding capacity of the filter media, since larger particles are trapped in the upper zone of the filter media and smaller particles are trapped in the lower zone, reducing premature plugging and extending service life. The two filter zones can be independently selected and combined to optimize performance.

Superior Particle Removal

Zeta Plus MH Series filter medium offers unique advantages in contaminant removal by combining mechanical entrapment with electrokinetic adsorption. Larger particulate and hazes are mechanically entrapped in the depth of the media, while negatively charged particles, such as bacteria, yeast, and submicronic hazes, are adsorbed to the positively charged Zeta Plus MH Series filter media.



Features and Benefits

Zeta Plus™ MH Series dual-zone filter media construction

- Higher throughput, lower processing costs, smaller filter assemblies
- Potential to condense two stages of filtration into one

Wide range of upstream/downstream combinations

- Customizable to meet product needs

High tensile strength media

- Withstands the rigours of hot water, steam, and chemicals for longer service life

Full range of cartridge and capsule configurations

- Scaleable from laboratory to full production

Totally enclosed system

- Eliminates leakage and external contamination common with filter sheets

Applications

The Zeta Plus™ MH series is ideally suited for clarification and prefiltration in food and beverage, cosmetic, and general applications where the exceptional high wet-tensile strength media, combined with the innovative dual-zone design, provides extended service life. These include aqueous, alcoholic, proteinaceous, and acidic solutions.

Clarification of:

- Beer
- Wine
- Spirits
- Syrups
- Edible Oils
- Flavour Concentrates
- High Fructose Corn Syrup
- Nutraceuticals

Chemical Compatibility

Compatibility with various chemicals is indicated in the table at left. It is recommended that Zeta Plus™ MH Series filter media be tested in the product under standard process conditions to confirm compatibility prior to use. All tests have been carried out at ambient temperature (20°C) unless otherwise indicated.

Product	Compatibility
Acetic Acid up to 20%	Satisfactory
Ethanol up to 98%	Satisfactory
Hypochlorite	Not recommended
Hydrogen Peroxide*	Satisfactory
Nitric Acid	Not recommended
Peracetic Acid*	Satisfactory
Sodium Hydroxide 2%	Not recommended
Sugar solution 10%	Satisfactory
Water up to 90°C	Satisfactory

*As found in commonly used sanitizing agents. Contact your local 3M representative for advice on maximum recommended concentration.

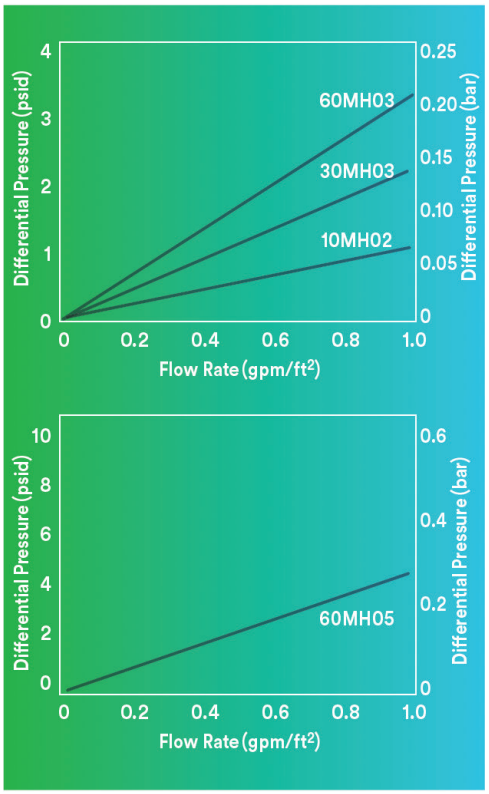
Cartridge Construction

Zeta Plus MH Series cartridges are designed for use with Zeta Plus sanitary style stainless steel filter housings. Cartridges are constructed from individual cells of Zeta Plus MH Series filter medium assembled together with polypropylene separators 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 the application. Filter cartridges are available in 12, and 16 inch diameters, with surface area ranging from 9.2 ft² to 42.2 ft² per cartridge. All components are listed in 21CFR as safe for food contact.

Flow Rates

The graphs below display flow rates obtained with 20°C clean water. Optimum flow rates vary by application, but in general, the flow rate per unit area (flux) should not exceed 10 lpm/m² (0.25 gpm/ft²) of filter media in beer and 20 lpm/m² (0.5 gpm/ft²) in wine or similar beverage for best performance. Lower flux rates often result in longer service life, greater throughputs and superior system economics.

Flow vs. Differential Pressure



Grade Selection

Zeta Plus MH Series filter media are available in four standard grade combinations. The chart below is provided as a guide to correct grade selection based on nominal retention ratings and can be used in conjunction with the recommendations in Table 1 to determine the appropriate filter grade for your application. Operating conditions and the fluid being filtered impact retention performance. Small-scale pilot runs with Zeta Plus BC capsule filters can be performed to confirm grade selection prior to scale-up. 3M's Application Engineering staff can assist in grade selection as well as assist with on-site evaluations. Filter system optimization can also be conducted at 3M's laboratory facilities.

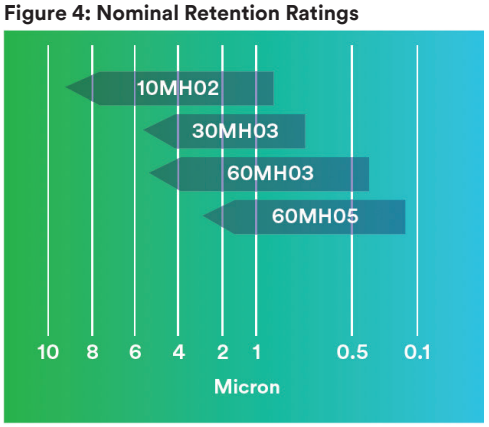
Table 3 references the nominal effective filtration area of Zeta Plus MH Series capsules and cartridges. For scale-up evaluations, it is strongly recommended that customers contact 3M's Application Engineers for assistance.

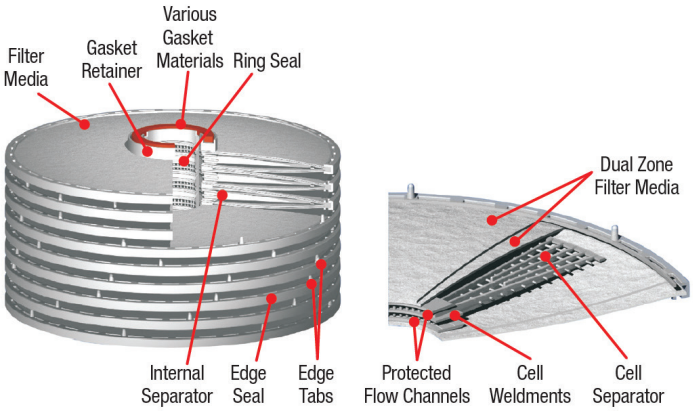
Table 1: Application Recommendations

Application	Recommended Grades
Rough clarification (particles, haze)	10MH02
Rough clarification (yeast, haze)	30MH03
Polishing clarification/membrane prefiltration (yeast, haze, bacteria)	60MH03, 60MH05

Table 1 is intended as a guide. Grade selection and performance should be confirmed with small-scale pilot trials.

Figure 4: Nominal Retention Ratings





3M's unique dual zone filter media and cell separator ensure fast flow rates, lower pressure drops, and greater throughputs.

Table 2: Recommended Operating Parameters

Maximum Temperature	80°C (176°F)
Hot Water Sanitization	90°C (194°F)
Change-out Differential Pressure	35 psid (2.4 bar)
Recommended Flow Rate*	10 - 20 lpm/m² (0.25 - 0.5 gpm/ft²)
Maximum Flow Rate	40 lpm/m² (1.0 gpm/ft²)
Rinse Volume	50 liters/m² (1.25 gallons/ft²)

*Consult 3M for the best flow rate for your application.

Table 2: Recommended Operating Parameters

Cartridge Configuration	Surface Area
BC0025 (Single Filter)	24 cm² (3.7 in²)
45244 (12" diameter, 9-cell)	0.90 m² (9.2 ft²)
45245 (12" diameter, 16-cell)	1.5 m² (16.4 ft²)
Z16P (16" diameter, 14-cell)	3.2 m² (34.7 ft²)

Sanitary Filter Housings

3M provides a wide array of standard and custom designed sanitary filter housings to accommodate Zeta Plus™ MH Series filter cartridges. All housings are designed with the food and beverage industries in mind and feature 316L mirror-polished surfaces and easy-to-clean components.

Zeta Plus™ BC Series capsule filters are ideal for pilot scale and low volume applications.

Zeta Plus™ MH Series Ordering Guide

BC Capsules

Cartridge Number	Grade
BC0025S (Sanitary)	10MH02 30MH03 60MH03 60MH05

12" Diameter Cartridges

Cartridge Number	Geometric Variation	Gasket Material	Grade
45244 (12" 9-cell) 45245 (12" 16-cell)	01 - Standard polypropylene	A - Silicone D - Nitrile	10MH02 30MH03 60MH03 60MH05

16" Diameter Cartridges

Cartridge Number	Gasket Material	Grade
Z16P (16" 14-cell)	A - Silicone D - Nitrile	10MH02 30MH03 60MH03 60MH05

Please Note: The Order Guide above is for reference only. Not all combinations are available.
Please consult with your 3M representative to determine the appropriate part number for your application.

Your local distributor:

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