3M Purification continues a 100 year tradition of innovative cost effective solutions to challenging industrial filtration applications with Betapure™ BK-Z8, formerly known as CUNO Beta-Klean Z8. Betapure BK-Z8 is a truly absolute rated, rigid (non-compressible) resin bonded filter cartridge. Consistent quality and performance at absolute ratings from 5 to 70 μm make Betapure BK-Z8 the clear choice in the confusing world of indistinguishable „me-too“ cartridge filters.

**Consistent Performance**
Absolute rated rigid structure Betapure BK-Z8 provides consistent performance. Unlike many competitors, Betapure BK-Z8 does not unload or lose filtration efficiency throughout its usable life.

**Significant Life Advantage**
Betapure BK-Z8’s rigid graded density grooved structure provides a significant life advantage over the competition. 3M Purification provides quality solutions worldwide for the most challenging filtration applications. 3M Purification filtration systems include clarifying filters, pre-filters, final filters, stainless steel housings and engineered skid-mounted systems designed and sized for specific applications.

**What is Betapure BK-Z8 ?**
Betapure BK-Z8 is a rigid, graded-density filter cartridge constructed primarily of acrylic fibres, cellulose fibres and a tough chemically resistant thermosetting resin. The manufacturing process results in more fibres towards the centre core region creating a graded-density structure. The thermosetting resin „bonds“ the fibres into a permanent rigid matrix. Betapure BK-Z8 cartridges are grooved to significantly increase the surface area and extend the service life. Betapure BK-Z8 is manufactured and tested to deliver quality, consistency and absolute cost effective filtration performance. 3M Purification’s in-process quality assurance provides the control that results in consistent cartridges with defined absolute ratings time-after-time-after-time.

**Features and Benefits**

- **Absolute rated cartridge filters from 5 to 70 microns**
  - Absolute filtration efficiency at the specified removal rating
  - Consistent production yields with absolute contaminant retention

- **Rigid resin bonded structure**
  - No by-pass or unloading at high differential pressure
  - Consistent product quality throughout the filter’s life

- **Grooved surface with true graded-density internal structure**
  - Significantly longer life
  - Cost effective filtration with optimised yields

- **149 °C high temperature option**
  - Choice of temperature compatible options
  - Inventory one product for many applications

- **No metal or plastic cores**
  - Easy disposal, suitable for incineration or shredding
  - Disposal cost reduction

- **Available with polypropylene or polyester end modifications**
  - Retrofit any industrial housing
  - Usable in existing filter housings

**Applications**
Betapure™ BK-Z8 provides consistent reproducible filtration performance and longer life while meeting or exceeding quality specifications in a wide variety of industrial processing applications. Betapure™ BK-Z8 is particularly well suited for high viscosity fluids, high temperature processes and differential pressures to 4.8 bar.

Applications include:

- **Petroleum Products**
  - gasoline, kerosene, lube oil, fuel oil, wax

- **Chemical/Petrochemical**
  - acids, bases, organic solvents, catalysts, monomers, polymers, glycols

- **Water**
  - process water, produced water, boiler feed, demineralised feed, pre-reverse osmosis system, waste water

- **General Industrial**
  - paint, varnish, lacquer, inks, coatings, emulsions, magnetic media, resins, detergents, adhesives

- **Brines and aqueous salt solutions**
Consistent Performance

The initial Beta Ratio for all grades of Betapure™ BK-Z8 filter cartridges is equal to or greater than 1000 and each cartridge performs at or above this initial value throughout its usable (all the way to plugging) life. This defines Betapure BK-Z8’s absolute filtration performance. The Beta Ratio vs. Differential Pressure Graphs 1 and 2 illustrate how competitive filters do not achieve the consistent performance of Betapure BK-Z8. Filters that show a decrease in Beta Ratio as the differential pressure increases are exhibiting either unloading of previously held contaminants or a loss of filtration efficiency. This inconsistent performance results in a reduction in finished product quality, product yield and an increase in total filtration cost.

Comments

- As illustrated in Graphs 1 and 2, the performance of melt-blown polypropylene (Competitor A) degrades rapidly after a small (35 mbar) increase in differential pressure, indicating contaminant unloading and a loss of filtration efficiency typical of a compressible structure. In Graph 1, the generic cotton wound, Competitor C, exhibits erratic performance caused by media movement under increasing pressure and, in Graph 2, it exhibits minimal ability to retain contaminant throughout the test.
- In Graph 1, melt-blown Competitor B never approaches a Beta Ratio of 1000 and it shows a decreasing Beta Ratio at high differential pressure.
- Resin bonded Competitor D, as shown in Graph 2, exhibits very low Beta Ratios at low differential pressures indicating poor performance. Above 70 mbar, the contaminant builds a cake which accounts for the subsequent increase in Beta Ratio.
- Betapure BK-Z8 exhibits consistent Beta Ratios at all differential pressures.

Absolute Betapure BK-Z8

Absolute Betapure BK-Z8 removal ratings are determined for the entire cartridge life using a new filter performance test developed by 3M Puriﬁcation that complies with the general procedure outlined in ASTM 975. Test conditions available on request. 3M Puriﬁcation deﬁnes Absolute Rating as „the particle size (x) providing an initial Beta Ratio (ßx) = 1000“. At this Beta Ratio the removal efﬁciency is equal to 99.9%. Beta Ratio (ßx) is deﬁned by the following equation:

$$ß(x) = \frac{\text{Cumulative Number of Particles Larger than } x \text{ in the Influent Challenge}}{\text{Cumulative Number of Particles Larger than } x \text{ in the Effluent}}$$

Betapure BK-Z8 filters achieve a minimum Beta Ratio (ßx) value of 1000 at the specified ratings seen in Table 1.

High Temperature Betapure BK-Z8

Standard Betapure BK-Z8 provides consistent performance at temperatures to 120 °C and differential pressures to 4.8 bar.

High temperature (HT) Betapure BK-Z8 extends the temperature rating to 149 °C for those processes that require service under extreme conditions.

NOT RECOMMENDED FOR HOT DI WATER. This HT version requires NYLON flat gasket (DOE) or polyester end cap. (SOE). Please see ordering guide.

Reproducible cost effective filtration

Betapure BK-Z8 is manufactured to rigid speciﬁcations and subjected to stringent process and quality controls to ensure consistency in filtration performance and ultimately, end-user process consistency - run after manufacturing run.
Rigid graded density Betapure BK-Z8
Betapure™ BK-Z8 filter cartridges are manufactured using an exclusive process that achieves a true „graded density“ fibre structure with a clean and smooth inside diameter. Each fibre is locked in this arrangement by a thermosetting resin binder to create a rigid structure, eliminating the need for a metal or plastic centre core. Larger particles are trapped in the outer area and finer particles towards the inner area. Figure 1 illustrates how in a graded-density structure the overall effect is to clarify and retain particles by size as they progress through the cartridge.

Betapure BK-Z8: High surface area
Betapure BK-Z8 cartridges also feature an optimised groove pattern that increases the surface area by over 65% when compared to smooth cylindrical cartridges (see Figure 2). The grooved surface prevents premature blinding of the outer surface by large particles and allows full utilisation of the depth structure. Maximum surface area with a true graded-density structure means that Betapure BK-Z8 can provide 3 times or greater service life than competitive filter cartridges.

Betapure BK-Z8 Product Specifications
See Table 2

Cartridge End Modifications
• Standard temperature: Polypropylene bonding with polypropylene end modifications
• High temperature: Thermoset epoxy bonding with polyester end modifications

Operating parameters
• Maximum operating temperature
  1. High temperature - 149 °C (DOE version)
     * With polyester end modifications - 120°C
  2. Standard - 120 °C (DOE version)
     * With polypropylene end modifications - 82 °C
     * With polyethylene gasket - 93 °C
     * With polyester end modifications - 120 °C
• Maximum differential pressure: 4.8 bar at 20°C
• Recommended change-out differential pressure: 2.4 bar

Dimensions
* Inside diameter: 26.9 mm (1 1/16“)
* Outside diameter: 65.9 mm (2 19/32“)
* Cartridge length: 9 3/4“ through 40“ (from 248 to 1016 mm)

Betapure BK-Z8 flow rates
Table 3 provides flow information for Betapure BK-Z8 in aqueous fluids. For liquids other than water, multiply the specific pressure drop value (in column 3) by the viscosity in centipoise. The specific pressure drop values may be effectively used when three of the four variables (Viscosity, Flow, Differential Pressure and Cartridge Grade) are set.

Waste Management
Betapure BK-Z8 cartridges contain no metal or plastic cores. They can be incinerated, shredded, or crushed after use to reduce overall disposal costs.

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* Specific aqueous pressure drop at ambient temperature for a single equivalent 10” cartridge. For multiple cartridge lengths, divide total flow by the number of single length equivalents.
** Optimal efficiency and life is achieved at aqueous flow rates less than the maximum flow indicated.
**Betapure™ BK-Z8 Chemical Compatibility**

Table 4 shows Betapure™ BK-Z8’s wide range of chemical compatibility. Betapure BK-Z8 exhibits excellent resistance to petroleum products, organic solvents, water, acids, brines and aqueous salt solutions. Betapure BK-Z8 is not recommended for strong acids or bases at temperatures over 38 °C. The data presented in Table 4 is for general guidance only. Testing under specific application conditions is recommended. For various end modifications and multi-length cartridges, consult your local distributor.

### Table 4: Chemical Compatibility

<table>
<thead>
<tr>
<th>Category</th>
<th>Example</th>
<th>Rating*</th>
<th>Category</th>
<th>Example</th>
<th>Rating*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>Gasoline - Kerosene - Diesel Fuel</td>
<td>R</td>
<td>Inorganic Acids</td>
<td>Hydrochloric (Muriatic) Acid 5%</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Lube Oil - Fuel Oil - Wax</td>
<td>R</td>
<td></td>
<td>Sulphuric 5% - Sulphurous 5-10% - Nitric</td>
<td>R</td>
</tr>
<tr>
<td>Organic Solvents</td>
<td>MEK - Benzene - Toluene</td>
<td>R</td>
<td>Brines and Aqueous Salt Solutions</td>
<td>Sodium Chloride - Sodium Sulphate - Sodium Nitrate</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Xylene - Alcohols - Glycols</td>
<td>R</td>
<td></td>
<td>Weak Alkalis</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Dimethyl Formamide (DMF)</td>
<td>N</td>
<td></td>
<td>Aluminium Hydroxide</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Amines (DEA, MDEA, MEA) (20% - 50% up to 71 °C)</td>
<td>N</td>
<td></td>
<td>Ferric Hydroxide - Magnesium Hydroxide</td>
<td>R</td>
</tr>
<tr>
<td>Water</td>
<td>Process - Produced</td>
<td>R</td>
<td>Fatty Acids</td>
<td>Detergents - Mineral Oil - Silicone Oil</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Boiler Feed - De-mineralizer Feed</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potable water - WFI</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Acids</td>
<td>Acetic (100%) - Tannic (10%)</td>
<td>R</td>
<td>Oxidisers</td>
<td>Hydrogen Peroxide 90%</td>
<td>R</td>
</tr>
</tbody>
</table>

* R = Generally Recommended up to 121 °C unless otherwise noted. 
  N = Not recommended 
  L = Likely compatible, test before use.

**Betapure™ BK-Z8 Series Filter Cartridges - Ordering Guide**

### Range Cartridge Length (1) Absolute Micron rating Beta ratio = 10,000 Finishing Packaging (2) Temperature End Modification Flat gasket or O-ring material

<table>
<thead>
<tr>
<th>Range</th>
<th>Cartridge Length</th>
<th>Absolute Micron rating</th>
<th>Beta ratio = 10,000</th>
<th>Finishing</th>
<th>Packaging (2)</th>
<th>Temperature</th>
<th>End Modification</th>
<th>Flat gasket or O-ring material</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK</td>
<td>09 = 9 ¾&quot;</td>
<td>Z8050 = 5 μm</td>
<td></td>
<td>U = Ungrooved</td>
<td>1 = Standard shrink wrap</td>
<td></td>
<td>DOE Length</td>
<td>N = No end cap</td>
</tr>
<tr>
<td></td>
<td>10 = 10&quot;</td>
<td>Z8070 = 7 μm</td>
<td></td>
<td>G = Grooved</td>
<td>2 = Bulk pack</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>19 = 19 ½&quot;</td>
<td>Z8100 = 10 μm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>20 = 20&quot;</td>
<td>Z8140 = 14 μm</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>29 = 29 ¼&quot;</td>
<td>Z8150 = 15 μm</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>30 = 30&quot;</td>
<td>Z8200 = 20 μm</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>39 = 39&quot;</td>
<td>Z8300 = 30 μm</td>
<td></td>
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<tr>
<td></td>
<td>40 = 40&quot;</td>
<td>Z8400 = 40 μm</td>
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<td></td>
<td></td>
<td>Z8500 = 50 μm</td>
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<td></td>
<td></td>
<td>Z8700 = 70 μm</td>
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</table>

**NOTES ON ORDERING:**

(1) Lengths are multiples of either 9 ¾" or 10".
(2) (option 1) Standard packaging is shrink wrapping for cartridge length from 9 ¾" to 30". (For 40", only option 2 is available).
(2) (option 2) Bulk pack polyethylene bagged with divider is available on request.
(For cartridge length from 9 ¾" to 40")

Betapure BK-Z8 is new name for CUNO Beta-Klean Z8.

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**Important Notice**

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