



# Betapure™ AU Cartridges & Capsules

Rigid Filter Media

- ☑ Precise Contaminant Removal
- ☑ Improved Effluent Quality
- ☑ Reduced Operating Costs

## Applications

### Coating

- Magnetic Media
- High Quality Paint
- Film Coatings
- Resins
- Ink

### Electronics

- Pre RO
- Water Slurries
- Ceramic Slurries
- Chemical Mechanical Polishing
- Cathode Ray Tube Production
- Disc Cleaning

### General Industrial

- Desalination
- Plating
- Machine Tool Coolant
- Process Water

### Chemical/Petrochemical

- Process Water
- Pre RO
- Amine
- Fine Chemicals
- MTBE

### Food & Beverage

- Bottled Water
- Pre RO
- Blend Water
- Wash Water

### Pharmaceutical

- Water
- Solvents and Chemicals
- Pre RO

## Betapure AU Designed for Optimum Filtration Quality

Betapure AU Series filter cartridges and capsules set the standard for filtration performance. Offering more grades with absolute removal ratings than competitive filters, the controlled pore size of the Betapure AU filter matrix allow for absolute distinction between cartridge grades to provide the most accurate and consistent filtration.

The Betapure AU Series filter provides:

- Precise Contaminant Removal
- Consistent Effluent Quality
- Superior On-stream Service Life

Betapure AU filters, available in 18 distinct grades with absolute ratings from 2 to 190 microns to tailor the exact selection of performance characteristics for the greatest filtration economy by providing distinct removal cut-off points by particle size. Betapure AU filter manufacturing combines advanced incoming material quality assurance, exacting in-process controls and extensive final product testing and verification. The result is a filter product that provides consistent filtration lot-to-lot, filter-to-filter.

## Features and Benefits

### Absolute ratings

- Consistent and reproducible contaminant removal.
- To meet demanding filtration quality standards in today's market, absolute ratings will provide product consistency and product yields.

### Rigid structure

- Eliminates cartridge by-pass and unloading to provide consistent filtration from start to finish.
- The rigid filter structure retains consistent pore size even under severe process conditions. Changes such as those caused by pump fluctuations, stopping and restarting the system, or high differential pressure will have minimal, if any effect on product consistency.

### Depth filtration

- Excellent removal of deformable contaminants for consistent effluent.
- Depth filtration removes deformable contaminants to reduce or totally eliminate rework or product quality rejection.

### Gasket design

- Eliminates by-pass from poor or damaged seals.
- Critical to any filtration process is the elimination of filter by-pass. A closed cell polyethylene foam gasket ensures proper cartridge sealing when using knife-edge housing system.

### Lower pressure drop

- Provides long service life while using smaller filter housings.
- Minimising flow restriction dramatically reduces filtration cost. Lower pressure drops mean increased filter life, product throughput and permit the use of fewer filters to achieve a given flow vs. differential pressure.

### Available in standard cartridge and disposable capsules

- Wide range of filter sizes allows more appropriate filter sizing for batch and continuous processes.
- Filters appropriately sized for a specific application reduces total filtration costs including purchase, installation and disposal.

## Performance Construction for Precision Filtration

### The Rigid Construction Advantage

Betapure AU filter manufacturing utilises state-of-the-art technology to produce a clear, rigid, filter structure with consistent and reproducible filtration characteristics. The filter matrix is constructed using long bi-component fibres, each fibre having an inner core and an outer sheath (see picture at the right). Betapure AU filters are available in two bi-component fibre structures, polypropylene/polyethylene or polyester/co-polyester, to provide the greatest range of process compatibility.

The bi-component fibres of the filter matrix are thermally bonded by utilising the difference in melt temperatures of the two fibre components. Heating the matrix to the melt temperature of the polyethylene sheath, but below that of the polypropylene core, causes the fibre-to-fibre bond at every contact point. The high degree of fibre-to-fibre bonding provides a rigid structure that eliminates the need for a core support and any possibility of media migration.

The Betapure AU Series filter ensures that the unwanted particles are removed because:

- The rigid structure maintains its porosity throughout the filter life.
- The depth structure removes more difficult deformable contaminants.

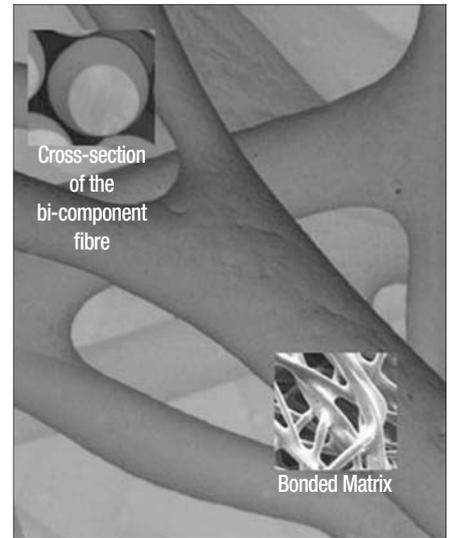
With 18 distinct grades with absolute ratings from 2 to 190 microns to permit the exact filter performance selection, Betapure AU filters provide the greatest filtration economy available.

### Enhanced Effluent Consistency

The sole purpose of filtration is to remove contaminants or materials that compromise product quality - throughout the entire service life of the filter. A non-rigid filter's pore structure changes as the system differential pressure increases. The result is changing filtration efficiency and inconsistent performance during the filter service life. This can only be corrected by a filter that retains its pore structure. Betapure AU Series filters are manufactured with precise control of the filter porosity coupled with the rigid Betapure AU structure to maintain its porosity throughout its service life. The result is consistent filtrate quality that is reproducible time after time, week after week, year after year.

### Removal Ratings

3M Purification uses a Multiple Parameter Characterisation (MPC) that, unlike single point evaluations, determines a removal rating over a range of particle sizes (multi-value) and the filter's service life (multi-point). The parameters measured include particle counts, turbidimetric efficiencies and removal efficiencies.



Grade	Rating (µm)		Grade	Rating (µm)	
	Absolute	Nominal		Absolute	Nominal
Z13 - 020	2	0.2	B11	20	5
Z13 - 030	3	0.3	C11	30	10
Z13 - 050	5	0.5	E11	40	20
Z11 - 060	6	0.6	G11	70	30
Z11 - 070	7	0.7	L11	90	50
Z11 - 080	8	0.8	Q11	100	75
Z11 - 100	10	0.9	V11	140	100
Z11 - 120	12	1	W11	160	150
Z11 - 150	15	3	X11	190	175

Grade	Rating (µm)	
	Absolute	Nominal
A12	8	3
B12	20	5
C12	30	10
E12	40	20
G12	70	30



## Filtration Advantage - Rigid Construction

### Comparing Filtration Characteristics

The unique structure of the Betapure AU Series cartridge provides filtration characteristics that are more consistent than competitive filter cartridges. The following curves show the filtration characteristics of the Betapure AU Series cartridge compared to other polyolefin cartridges and typical polypropylene melt-blown and string-wound cartridges of equivalent removal rating.

### Scientific Applications Support Services (SASS)

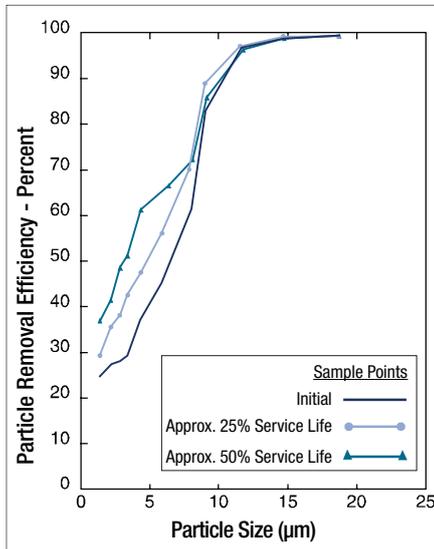
The cornerstone of 3M Purification's philosophy is service to customers, not only in product quality and prompt delivery, but also in validation, application support and the sharing of scientific information.

3M Purification's Scientific Applications Support Services (SASS) works closely with customers to solve difficult filtration challenges and to recommend the most efficient, economical filter systems. SASS specialists can perform on-site testing and utilise filtration applications expertise to partner with customers. 3M Purification resolves filtration problems promptly and efficiently in a cost-effective, confidential manner with a commercial support group consisting of 3M Purification's in-house customer service staff, application specialists, and engineering services. 3M Purification's broad distributor base and sales offices provide worldwide customer service, local inventory and field support in virtually every major centre of manufacturing.

### Betapure AU Series Filter

Note that the Betapure AU filter exhibits excellent filtration capability during its service life. This is evident by the close proximity of the curves to one another. From start to finish, the filter performance does not vary. The rigid Betapure AU filter structure resists deformation, particle unloading or filter by-pass and provides consistently high particle removal efficiency.

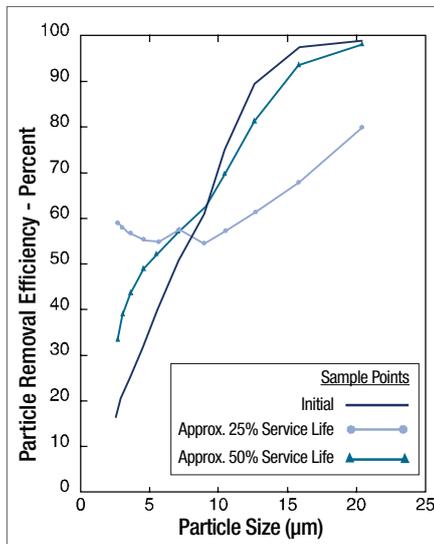
Betapure AU Series Filter



### Other Polyolefin Bi-component Filters

Other bi-component filters may look like Betapure AU Series cartridges, but they can't match the performance. Note that immediately after the filter is put into service, the efficiency drops but then recovers to the initial efficiency. The inconsistent efficiency exhibited during the service life is reflected in poor effluent and is not reliable enough to satisfy the demand for exceptional product quality.

Other Polyolefin Bi-component Filters



How these tests were conducted...

3M Purification uses a Multiple Parameter Characterisation (MPC) that, unlike single point evaluations, determines a removal rating over a range of particle sizes (multi-value) and the filter's service life (multi-point). The parameters measured include particle counts, turbidimetric efficiencies and removal efficiencies.

Conditions of Test:	
Flow:	11.4 litres/min
Fluid:	water

## Filtration Advantage - Rigid Construction

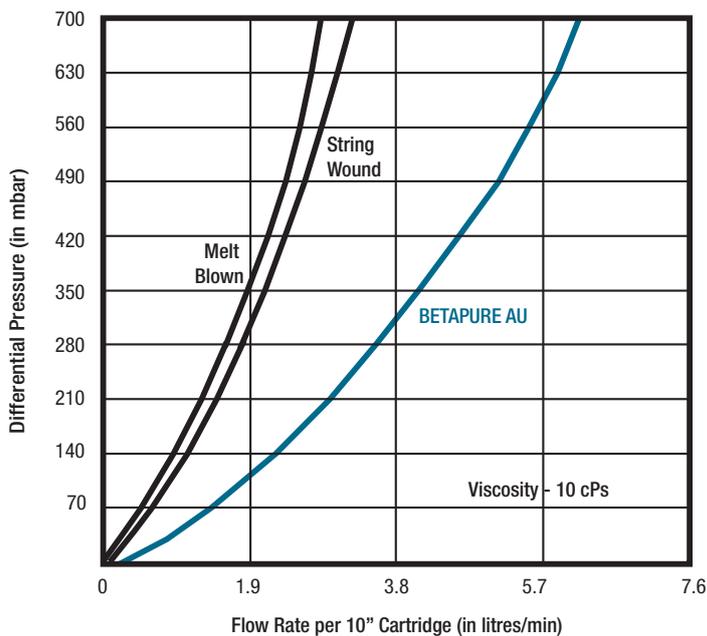
### Flow Characteristics

Betapure AU Series exhibits superior flow characteristics for the same removal rating as other polyolefin fibre based cartridges.

The curve shows that at a given flow rate the pressure drop across Betapure AU Series is considerably lower than competitive products.

The benefits of lower pressure drops are:

- Longer cartridge life
- Higher throughputs
- Smaller housing requirements
- Lower overall costs



### Chemical Compatibility

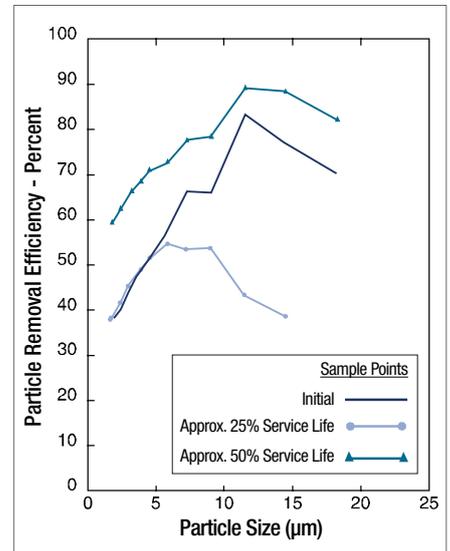
Betapure AU Series filters are composed of bi-component fibres, either polypropylene/polyethylene or polyester, both offering broad chemical compatibility. Note that compatibility is always a function of exposure time, operating temperature and chemical concentration. If compatibility is in question, 3M Purification recommends that the filter be tested. For more general information about Betapure AU Series filter chemical compatibility, contact your local distributor.

### Regulatory Compliance

Standard Betapure AU Series filters (polypropylene / polyethylene) comply with FDA regulation CFR 21. Betapure AU filters have also been USP XXI Class VI (Safety Test for Plastics) tested and have been deemed suitable for pharmaceutical application. Detailed information about application compatibility and samples for testing are available by contacting your local 3M Purification representative.

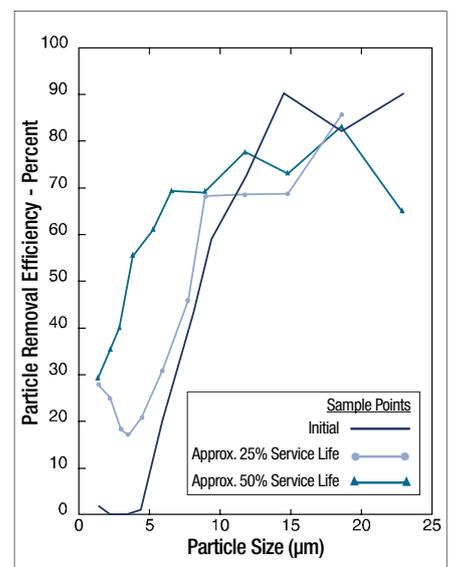
### String-Wound Filter

The competitive cartridge exhibits erratic filtration characteristics that dramatically fluctuate in response to increasing differential pressures.



### Melt-Blown Filter

The compressible structure of a melt-blown filter exhibits wide fluctuations in performance efficiency as the system pressure changes. Such filtration characteristics lead to inconsistent and unpredictable product quality.



**Table 4: Betapure AU filter flow information**

Grade	Absolute Rating (µm)	Specific Pressure Drop per 10" Cartridge (mbar / litre per min)
<b>Polyolefin Betapure AU (11 Series)</b>		
B11	20	5.10
C11	30	2.18
E11	40	0.89
G11	70	0.55
L11	90	0.36
Q11	100	0.18
V11	140	0.127
W11	160	0.091
X11	190	0.074
<b>Polyester Betapure AU (12 Series)</b>		
A12	8	2.55
B12	20	2.00
C12	30	1.44
E12	40	0.55
G12	70	0.36
<b>Polyolefin Betapure AU (Z13 Series)</b>		
Z13-020	2	16.00
Z13-030	3	8.6
Z13-050	5	5.3
<b>Polyolefin Betapure AU (Z11 Series)</b>		
Z11-060	6	5.6
Z11-070	7	5.3
Z11-080	8	5.1
Z11-100	10	1.9
Z11-120	12	1.0
Z11-150	15	3.5

\* For multiple cartridge lengths, divide total flow by the number of single length equivalents.

## Operating Data

Operating Parameter	Description
<b>Polyolefin Betapure AU</b>	
Max. operating temperature	80 °C
Max. differential pressure*	5.5 bar at 20 °C
<b>Polyester Betapure AU</b>	
Max. operating temperature*	120 °C
Max. differential pressure*	5.5 bar at 20 °C

\* Betapure AU's rigid structure will tolerate up to 5.5 bar. Normally 3M Purification recommends the use of the lowest possible flow rate and filter re-placement at 2.4 bar to enhance both filter life and filtration efficiency.

## Disposal

Betapure AU Series filter cartridges can be incinerated, shredded or crushed after to reduce the overall disposal costs. For more information about Betapure AU disposal, ask your local 3M Purification distributor.

## Cartridge Configurations

All Betapure AU Series cartridges are available in continuous multiple lengths up to 60" (1524 mm) long, with various end treatments to fit your current housing (see ordering guide).

**Table 3: Betapure AU Series Cartridge Parameters**

Parameter	Description
Length * (nominal)	9" ¾ to 60" (248 mm to 1524 mm)
Inside Diameter (nominal)	25.4 mm
Outside Diameter (nominal)	63.5 mm

\* Other sizes available on request, consult factory

## Special Configurations

Betapure AU is available in special configurations upon request. The length, inside and outside diameters can be modified for your specific needs. Consult your local 3M Purification distributors for more information.

### How to determine Cartridge Flow Rates/Pressure Drop Sizing

Betapure AU exhibits superior flow characteristics for the same micron rating compared to other fibre based cartridges. This allows for longer cartridge life, higher throughput and smaller housing requirements. Table 4 provides flow information for Betapure AU filters in aqueous fluids.

The specific pressure drop values (mbar/ litre per min) per 10" cartridge at 1 centipoise are provided for each filter grade. For fluids other than water, multiply the specific pressure drop value by the viscosity in centipoises. The specific pressure drop values may be effectively used when three of the four variables (viscosity, flow, differential pressure and cartridge grade) are set.

#### Example 1:

Determine the initial pressure drop for water flowing at 30 litre/min per 30" (C11) 30 µm cartridge.  
 Fluid = Water (1 centipoise)  
 Flow = 30 litre/min  
 Flow per 10" cartridge = 30 : 3 = 10 litre/min  
 Specific pressure drop from column 3 of Table 4 = 2.18 mbar / litre per min  
 Calculate: 2.18 x 10 = 21.8 mbar

#### Example 2:

Determine the oil flow rate at an initial pressure drop of 140 mbar per 10" (E11) 40 µm cartridge.  
 Fluid = 100 centipoises oil  
 Initial differential pressure = 140 mbar  
 Specific pressure drop from column 3 of Table 4 = 0.89 mbar / litre per min  
 Multiply psi/gpm x viscosity in centipoises = 0.89 x 100 = 89  
 Calculate: 140 mbar/89 (mbar/litre per min) = 1.57 l/min

## Filter Systems

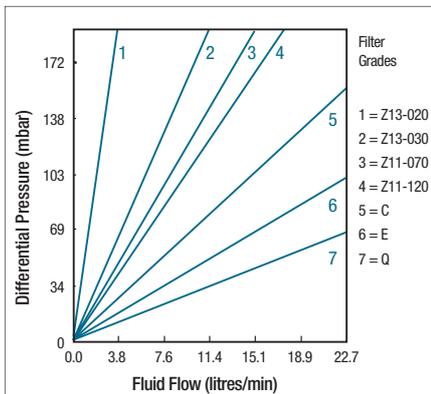
3M Purification manufactures a full line of Betapure AU compatible filter housings and a wide variety of industrial filter media to meet most application requirements. Housing Models are available for both air and liquid applications in a wide range of construction materials, from plastics to PED Cat. IV and ATEX compliant 316L stainless steel, to suit a variety of application needs. For more information about 3M Purification filter housings and other filter media, consult your local 3M Purification distributor.

## Betapure AU Series Capsules

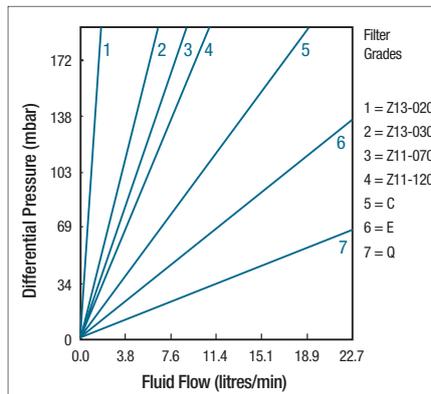
The Betapure AU Series capsule is a polypropylene encapsulated filter that eliminates the need for a separate filter vessel. Available in a wide range of configurations (see ordering guide) including sanitary flange and hose barb connections, the 2.5" and 5" capsules are ideal for small batch and filter test applications. The following are typical water flow rates for Betapure AU capsules with 1 1/2" sanitary flange connections. Other end connections will affect maximum flow rates, see table below. Consult factory representative for flow rates using optional end connections or visit [www.3MPurification.com](http://www.3MPurification.com).



Flow Rates for 5" Capsules  
with 1 1/2" Sanitary Flanges at 20 °C



Flow Rates for 2.5" Capsules  
with 1 1/2" Sanitary Flanges at 20 °C



Betapure AU Capsule Max. Recommended Flow by Configuration		
End Connection	Maximum Recommended Flow Rate (litre/min)	Housing Pressure Loss (mbar)
1 1/2" Sanitary Flange	22.7 l/min	69 mbar
3/8" FNPT	22.7 l/min	69 mbar
1/2" Hose barb	11.4 l/min	103 mbar
1/4" MNPT	5.7 l/min	165 mbar

Betapure AU Capsule - Materials of Construction	
All Betapure AU Series Filter Media	Bi-component polypropylene/polyethylene fibres
Z11 Filter Media	Includes a polypropylene insert
Z13 Filter Media	Includes a glass paper insert
Capsule Body	Polypropylene
Vent/drain O-rings	See ordering guide

## Betapure AU Series filter capsule ordering guide

Type	Grade * Absolute rating (µm)	Configuration	Nominal length	End connections	Vent O-ring option	Packaging Option
AU = Betapure AU	Z13020 = 2 µm Z13030 = 3 µm Z13050 = 5 µm Z11060 = 6 µm Z11070 = 7 µm Z11080 = 8 µm Z11100 = 10 µm Z11120 = 12 µm Z11150 = 15 µm B11 = 20 µm C11 = 30 µm E11 = 40 µm G11 = 70 µm L11 = 90 µm Q11 = 100 µm V11 = 140 µm W11 = 160 µm X11 = 190 µm	C = Capsule	01 = 2.5" 02 = 5"	A = 1 1/2" sanitary flange B = 1/2" hose barb (14 mm) C = 1/4" MNPT D = 3/8" FNPT E = 1/4" - 5/16" - 3/8" tapered hose barb	A = Silicone (MVQ)** B = Fluorocarbon (FPM)** C = Ethylene Propylene (EPDM)**	01 = 1 capsule 03 = box of 3 capsules 20 = box of 20 capsules

Example: AU Z13050 C 01 A A 03

\* Grades Z13020 through Z13050 employ a glass paper insert

- Grades Z11060 through Z11150 employ a polypropylene insert

\*\* ISO Designation

## Polyolefin Betapure AU cartridge ordering guide

Cartridge Type	Cartridge Length*	Grade / Micron rating Absolute (Nominal)	Betapure AU Media	End Modification	Flat Gasket or O-ring material
AU = Betapure AU	09 = 9 3/4" 10 = 10" 19 = 19 1/2" 20 = 20" 29 = 29 1/4" 30 = 30" 39 = 39" 40 = 40"	B = 20 µm abs (5 µm) C = 30 µm abs (10 µm) E = 40 µm abs (20 µm) G = 70 µm abs (30 µm) L = 90 µm abs (50 µm) Q = 100 µm abs (75 µm) V = 140 µm abs (100 µm) W = 160 µm abs (150 µm) X = 190 µm abs (175 µm)	11 = Polyolefin	A = Millipore B = Code 7 Bayonet Lock C = Code 8 double O-ring D = DOE with hard cap (Length = 10" nominal) E = DOE with hard cap (Length = 9 3/4" nominal) F = Code 3 Double O-ring flat cap	A = Silicone (MVQ)** B = Fluorocarbon (FPM)** C = Ethylene Prop. (EPDM)** D = Nitrile (NBR)**
				N = No End modification	G = Polyethylene N = None

\* other lengths on request

\*\* ISO Designation

Example: AU 29 C11 NG

## Polyester Betapure AU cartridge ordering guide

Cartridge Type	Cartridge Length*	Grade / Micron rating Absolute (Nominal)	Betapure AU Media	End Modification	Flat Gasket or O-ring material
AU = Betapure AU	09 = 9 3/4" 10 = 10" 19 = 19 1/2" 20 = 20" 29 = 29 1/4" 30 = 30" 39 = 39" 40 = 40"	A*** = 8 µm abs (3 µm) B = 20 µm abs (5 µm) C = 30 µm abs (10 µm) E = 40 µm abs (20 µm) G = 70 µm abs (30 µm)	12 = Polyester	A = Millipore B = Code 7 Bayonet Lock C = Code 8 double O-ring D = DOE with hard cap (Length = 10" nominal) E = DOE with hard cap (Length = 9 3/4" nominal) F = Code 3 Double O-ring flat cap	A = Silicone (MVQ)** B = Fluorocarbon (FPM)** C = Ethylene Prop. (EPDM)** D = Nitrile (NBR)**
				N = No End modification	G = Polyethylene N = None

\* other lengths on request

\*\* ISO Designation

\*\*\*require D or E end modification

Example: AU 09 B12 NN

## Betapure AU Z grade cartridge ordering guide

Cartridge Type	Cartridge Length*	Betapure AU Media	End Modification	Flat Gasket or O-ring material	Absolute Removal rating
AU = Betapure AU	09 = 9 3/4" 10 = 10" 19 = 19 1/2" 20 = 20" 29 = 29 1/4" 30 = 30" 39 = 39" 40 = 40"	Z 13 = Polyolefin/Glass Z 11 = Polyolefin/Polyolefin	B = Code 7 Bayonet Lock C = Code 8 double O-ring D = DOE with hard cap (Length = 10" nominal) E = DOE with hard cap (Length = 9 3/4" nominal) F = Code 3 Double O-ring flat cap	A = Silicone (MVQ)** B = Fluorocarbon (FPM)** C = Ethylene Prop. (EPDM)** D = Nitrile (NBR)**	Z13 material only 020 = 2 µm abs 030 = 3 µm abs 050 = 5 µm abs
			N = No End modification	G = Polyethylene	Z11 material only 060 = 6 µm abs 070 = 7 µm abs 080 = 8 µm abs 100 = 10 µm abs 120 = 12 µm abs 150 = 15 µm abs

\* other lengths on request

\*\* ISO Designation

Example: AU 20 Z11 BB 100

### Important Notice

3M Purification MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Since a variety of factors can affect the use and performance of a 3M Purification product in a particular application, some of which are uniquely within the user's knowledge and control, user is responsible for determining whether or not the 3M Purification product is fit for a particular purpose and suitable for user's method of application.

### Limited Warranty

3M Purification warrants it this product to be free from defects in material and workmanship during normal use for a period of one (1) year from the date of shipment from the factory. If the Product(s) is (are) defective within this warranty period, your exclusive remedy and 3M Purification's sold obligations shall be, at 3M Purification's option, to replace or repair the Product(s) or refund the original purchase price of the Product(s). This warranty does not apply to failures that result from abuse, misuse, alteration or damage not caused by 3M Purification Inc. or failure to properly follow installation and use instructions.

Limitation of Liability: 3M Purification will not be liable for any loss or damage arising from the use of the Product(s), whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

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