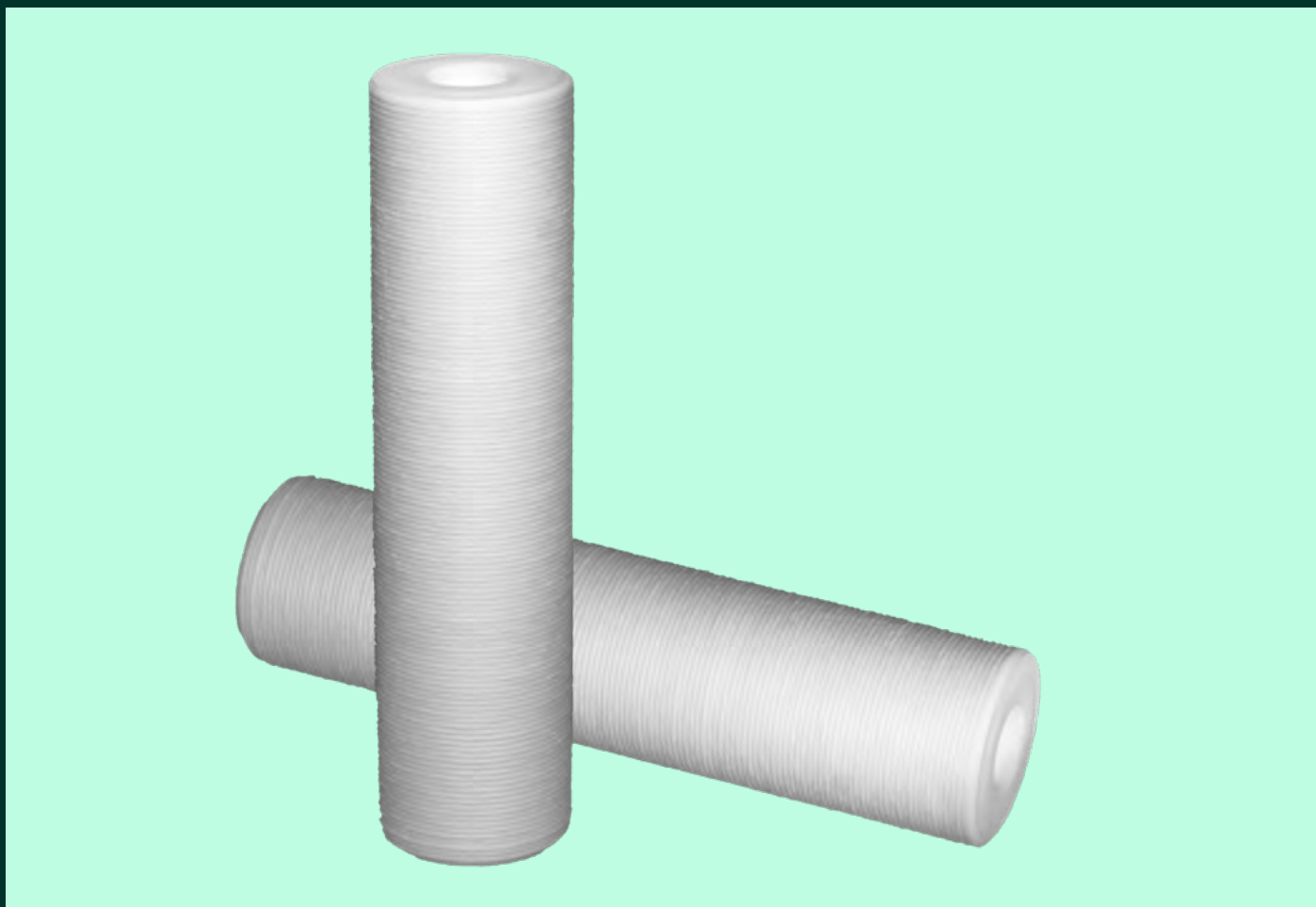


Purification and Filtration Solutions



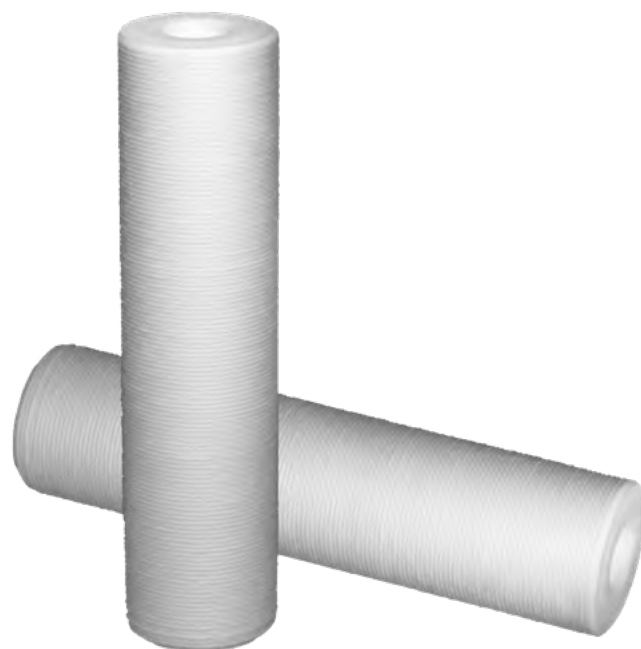
3M™ Betapure™ AU Series Filter Cartridges

Designed for optimum filtration quality

The controlled pore size of the filter matrix of the Betapure AU series allows for distinction between cartridge grades to provide consistent filtration. The Betapure AU series filters provide:

- Contaminant reduction
- Consistent effluent quality
- Consistent service life

Betapure AU series filters are available in several distinct grades with absolute ratings from 2 to 190 µm. By providing distinct cut-off points by particle size, exact filtration performance characteristics can be selected.



Features and benefits

Features	Benefits
Absolute ratings	Consistent and reproducible contaminant reduction
Rigid structure	Reduces cartridge by-pass and offloading to provide consistent filtration from start to finish
Depth filtration	Excellent reduction of deformable contaminants for consistent effluent
Gasket design	Reduces by-pass from poor to damaged seals
Lower pressure drop	Provides long service life within a small filter housing
Available in standard cartridge sizes	Wide range of filter sizes allows appropriate filter sizing for batch and continuous processes

Applications

Coatings	High quality paint, film coatings, resins and inks
General industrial	Desalination, plating, process water
Electronics	Pre-RO, ceramic slurries, chemical mechanical polishing
Chemical/Petrochemical	Process water, pre-RO
Lithium ion battery manufacturing	Lithium ion battery cathode and anode slurry filtration

The rigid construction advantage

To meet demanding filtration quality standards in today's market, absolute ratings provide product consistency.

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 have minimum effect on product consistency, if any. Depth filtration reduces deformable contaminants to help eliminate rework or product quality rejection.

The reduction of filter by-pass is critical to any filtration process. A closed cell polyethylene foam gasket provides proper cartridge sealing when using knife-edge housing systems.

Filters appropriately sized for a specific application provide longer service life, thereby reducing costs associated with frequency of purchase, installation, and disposal.

Designed for optimum filtration quality

Betapure AU series filter manufacturing technology produces a clean, rigid, filter structure with consistent and reproducible filtration characteristics. The filter matrix is constructed using long bicomponent fibers, each fiber having an inner core and an outer sheath. Betapure AU series filters are available in two bicomponent fiber structures, polypropylene/polyethylene or polyester/co-polyester, for compatibility in a wide range of industrial processes.

The bicomponent fibers of the filter matrix are thermally bonded by utilizing the difference in melt temperatures of the two fiber components. Heating the matrix to the melt temperature of the polyethylene sheath, but below that of the polypropylene core, causes the fiber-to-fiber bond at every contact point. The high degree of fiber-to-fiber bonding provides a rigid structure that does not require a core support.

The Betapure AU series filter efficiently reduces unwanted particles by:

- a rigid structure which maintains its porosity throughout the filter life.
- a depth structure which reduces more difficult deformable contaminants.

With several distinct grades in absolute ratings from 2 to 190 µm, Betapure AU series filters provide filtration economy through exact filter performance selection.

Enhanced effluent consistency

The sole purpose of filtration is to help 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's 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 series structure to maintain its porosity throughout its service life. The result is reproducible, consistent filtrate quality.

Removal ratings

Solventum uses a Multiple Parameter Characterization (MPC) that, unlike single point evaluations, determines a reduction 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.

Table 1. Betapure AU series polyester filter, ratings, from 8 to 70 µm absolute (3 to 30 nominal)

Grade	Rating (µm) Absolute	Rating (µm) Nominal
A12	8	3
B12	20	5
C12	30	10
E-12	40	20
G12	70	30

Table 2a. Betapure AU series polyolefin filter, Z grade ratings, from 0.5 to 15 µm absolute (0.05 to 3 nominal)

Grade	Rating (µm) Absolute	Rating (µm) Nominal
Z15-SF5	0.5	0.05
Z15-SF6	0.6	0.06
Z13-007	0.7	0.07
Z13-020	2	0.2
Z13-030	3	0.3
Z13-050	5	0.5
Z11-070	7	0.7
Z11-100	10	0.9
Z11-120	12	1
Z11-150	15	3

Table 2b. Betapure AU series polyolefin filter, ratings, from 20 to 190 µm absolute (5 to 175 nominal)

Grade	Rating (µm) Absolute	Rating (µm) Nominal
B11	20	5
C11	30	10
E11	40	20
G11	70	30
L11	90	50
Q11	100	75
V11	140	100
W11	160	150
X11	190	175

Conditions of test	
Flow	3 gpm/11.36 lpm
Fluid	Water

Filtration advantage — rigid construction

Comparing filtration characteristics

The structure of the Betapure AU series cartridge provides filtration characteristics that demonstrate consistency. The particle removal efficiency curves show the filtration characteristics of the Betapure AU series cartridge compared to other polyolefin cartridges of equivalent removal rating.

Betapure AU series filter

Note that the Betapure AU series filter exhibits excellent filtration capability during its service life. This is evident by the close proximity of the curves to one another (see Figure 1). From start to finish, the filter performance does not vary. The rigid Betapure AU series filter structure resists deformation, particle unloading or filter by-pass, and provides consistently high particle removal efficiency.

Other polyolefin bicomponent filters

Other bicomponent filters may look like Solventum's, but their performance is a clear indication they are not Betapure AU series cartridges. Note that immediately after the other filters are put into service, the efficiency drops but then recovers to the initial efficiency. Inconsistent efficiency exhibited during a filter's service life affects effluent quality, which may not be reliable enough to satisfy the demand for exceptional product quality (see Figure 2).

Flow characteristics

Betapure AU series filters offer superior flow characteristics while maintaining the same removal rating as other polyolefin fiber-based cartridges. At a given flow rate, Betapure AU series filters exhibit lower pressure drop, resulting in longer cartridge life, higher throughput, smaller housing requirements, and reduced overall ownership costs.

Chemical compatibility

Betapure AU series filters are composed of a bicomponent fibers, either polypropylene / polyethylene or polyester/ copolyester, 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, Solventum recommends that the filter be tested. For more general information about Betapure AU series filter chemical compatibility, contact your Solventum representative.

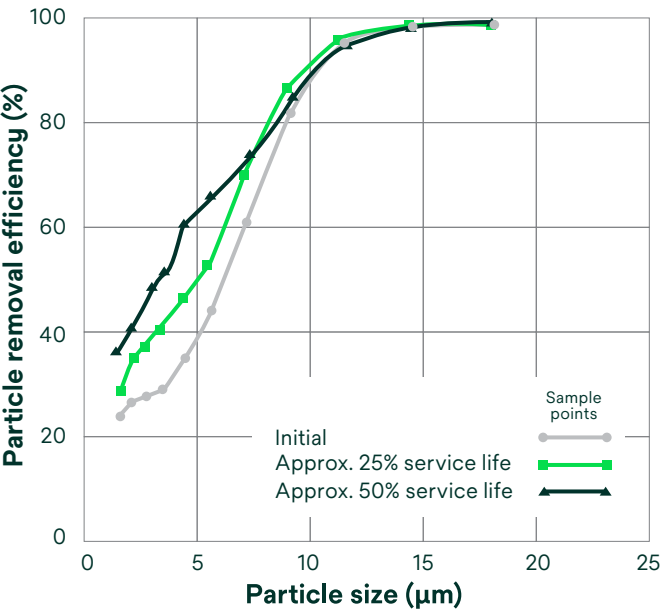


Figure 1. Betapure AU series filter exhibits consistent effluent quality as differential pressure increases

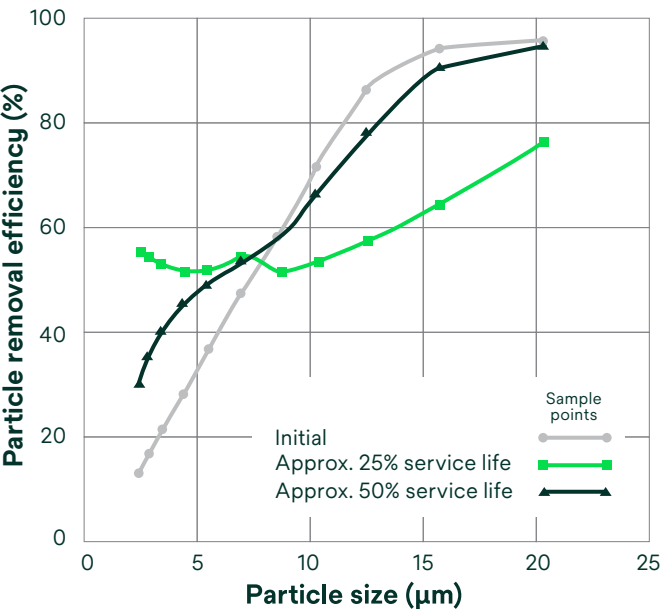


Figure 2. Other polyolefin bicomponent filters exhibit inconsistent effluent quality as differential pressure increases

Betapure AU series filters operating data

Operating parameter	Description
Polyolefin Betapure AU series filters	
Maximum temperature	175°F (80°C)
Maximum differential pressure*	80 psid (551.5 kPa) @ 68°F (20°C)
Polyester Betapure AU series filters	
Maximum operating temperature*	250°F (120°C)
Maximum differential pressure*	80 psid (551.6 kPa) @ 68°F (20°C)

* Betapure AU series filter's rigid structure tolerates up to 80 psid (551.6 kPa). Normally Solventum recommends the use of the lowest possible flow rate and filter replacement at 35 psid (241.3 kPa) to enhance both filter life and filtration efficiency.

Disposal

Depending upon the substance contained within the used filter cartridges, and in accordance with federal, state, and local regulations regarding its handling and disposal, Betapure AU series filter cartridges can be incinerated, shredded or crushed after use to reduce disposal costs related to volume.

Cartridge configurations

All Betapure AU series filter cartridges are available in continuous multiple lengths, with various end treatments to fit your current housing (see ordering guide).

Table 3. Betapure AU series filter cartridge parameters

Parameter	Description
Length*	9 3/4" to 40" (24.8 - 101.6 cm)
Inside diameter	1.0" (2.54 cm)
Outside diameter	2.5" (6.35 cm)

Table 4. Betapure AU series filter flow information

Grade	Absolute rating (µm)	Specific pressure drop per 10" cartridge* psid/gpm	Specific pressure drop per 10" cartridge* kPa/lpm
Polyolefin Betapure AU series filters			
B11	20	0.28	0.51
C11	30	0.12	2.2
E11	40	0.05	0.09
G11	70	0.03	0.05
L11	90	0.02	0.04
Q11	100	0.01	0.02
V11	140	0.007	0.13
W11	160	0.005	0.01
X11	190	0.004	0.007
Polyester Betapure AU series filters			
A12	8	0.14	0.25
B12	20	0.11	0.2
C12	30	0.08	0.14
E12	40	0.03	0.05
G12	70	0.02	0.04
Polyolefin Betapure AU series filters			
Z15-SF5	0.5	3	5.25
Z15-SF6	0.6	2.5	4.38
Z13-007	0.7	2	3.5
Z13-020	2	0.88	1.6
Z13-030	3	0.47	0.86
Z13-050	5	0.29	0.53
Z11-070	7	0.29	0.53
Z11-100	10	0.27	0.5
Z11-120	12	0.22	0.4
Z11-150	15	0.19	0.35

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

How to determine cartridge flow rates/pressure drop sizing

Betapure AU series filters exhibit superior flow characteristics compared to other fiber-based cartridges of the same μm rating. This allows for longer cartridge life, higher throughput, and smaller housing requirements. Table 4 provides flow information for Betapure AU series filters in aqueous fluids.

The specific pressure drop values (psid/gpm) 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 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.

Example 1: Determine the initial pressure drop for water flowing at 15 gpm (57 lpm) per 30" (C11) 30 μm cartridge.

Fluid = Water (1 centipoise)

Flow = 15 gpm (57 lpm)

Flow per 10" cartridge = $15 \div 3 = 5$ gpm (18.9 lpm)

Specific pressure drop from column 3 of Table 4 = 0.12

Calculate: $0.12 \times 5 = 0.6$ psi initial pressure drop (30" cartridge)

Example 2: Determine the oil flow rate at an initial pressure drop of 2.0 psi per 10" (E11) 40 μm cartridge.

Fluid = 100 centipoise oil

Initial differential pressure = 2 psi (13.8 kPa)

Specific pressure drop from column 3 of Table 4 = 0.05

Multiply psi/gpm x viscosity in centipoise = $0.05 \times 100 = 5$

Calculate: $2.0 \text{ (psi)} / 5 \text{ (psi/gpm per 10" ctg)} = 0.4$ gpm (10" ctg)



Filter systems

Solventum manufactures a full line of Betapure AU series compatible filter housings and a wide variety of industrial filter media to meet most application requirements. Housing models are available for fluid applications in a wide range of construction materials, to suit a variety of application needs. For more information about filter housings and other filter media, consult your Solventum representative.

Ordering guides

3M™ Betapure™ AU Series Filter Cartridge ordering guide

Cartridge type	Length	Grade/removal rating (µm)	Media	End modification	Gasket or O-ring material
AU	09 - 9 ¾" 10 - 10" 19 - 19 ½" 20 - 20" 29 - 29 ¼" 30 - 30" 39 - 39" 40 - 40"	A* / 8, 20, 30, 40, 70 B / 20 C / 30 E / 40 G / 70 L** / 90 Q** / 100 V** / 140 W** / 160 X** / 190	11 - Polyolefin 12 - Polyester	B - Code 7 Bayonet lock C - Code 8 double O-ring F - Code 3 double O-ring N - No end modification J - 226 with flat cap	A - Silicone B - Fluorocarbon C - EPR G - Polyethylene (with Polyolefin media only) N - None

*Available in Polyester only, requires end modification. **Available in Polyolefin only.

Part number example: AU09B11CA is a Betapure AU series filter cartridge, 9 ¾" long, 20 µm, Polyolefin Media, Code 8 Double O-ring style with Silicone O-ring.

Betapure AU series "Z" Grade polyolefin filter cartridge ordering guide

Cartridge type	Length	Grade designation	End modification	Gasket or O-ring material	Grade/removal rating (µm)
AU AUL*	09 - 9 ¾"	Z11 - Polypropylene insert	B - Code 7 Bayonet lock	A - Silicone B - Fluorocarbon C - EPR G - Polyethylene	Z15 - materials only
	10 - 10"	Z13 - Binderless glass insert	C - Code 8 double O-ring		SF5 - 0.5µm Abs.
	19 - 19 ½"		D - Double open end w/ hard cap 10" nom. length		SF6 - 0.6µm Abs.
	20 - 20"	Z15 - Binder glass insert	E - Double open end w/ hard cap 9 ¾" nom. length		Z13 - materials only
	29 - 29 ¼"		F - Code 3 double O-ring		007 - 0.7µm Abs.
	30 - 30"		N - No end modification		020 - 2µm Abs.
	39 - 39"				030 - 3µm Abs.
	40 - 40"				050 - 5µm Abs.
					Z11 - materials only 070 - 7µm Abs. 100 - 10µm Abs. 120 - 12µm Abs. 150 - 15µm Abs.

*AUL is available only in 2.9 inch diameter with Z13 and Z15

Part number example: AU09Z11CA070 is a Betapure AU series "Z" grade filter cartridge, 9 ¾" long, Polypropylene insert, Code 8 Double O-ring style with Silicone O-ring, 7 µm.

Please note: The ordering guides above are for reference only. Not all combinations are available. Please consult with your Solventum representative to determine the appropriate part number for your application.

Intended Use: Betapure AU series filter products are intended for use in industrial, chemical and electronics filtration applications of aqueous and non-aqueous fluids in accordance with the applicable product instructions, specifications and where materials of construction are compatible.

Since there are many factors that can affect a product's use, the customer and user remain responsible for determining whether the Solventum product is suitable and appropriate for the user's specific application, including user risk assessments and evaluation of the Solventum product in the user's application.

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Solventum Corporation
2510 Conway Avenue East
St. Paul, MN 55144-1000

Phone 1-800-243-6894
1-203-237-5541
Web [Solventum.com](https://www.solventum.com)

3M Purification is now part of Solventum

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