

## Depth Filtration

### BECODISC® P Range

#### Premium Depth Filter Medium with High-Purity Cellulose

BECODISC P stacked disc cartridges are characterized by unparalleled purity. The ion and endotoxin content is significantly lower than for conventional depth filter media.

In Eaton's innovative BECODISC P stacked disc cartridge's range, high-purity celluloses form a unique structure, which even for microbe removal does not require mineral components.

The specific advantages of BECODISC P stacked disc cartridges:

- Minimum endotoxin contents. This ensures product safety
- Increased endotoxin retention
- Without the addition of mineral components, therefore minimum ion content particularly of calcium, magnesium and aluminum ions
- Very high chemical resistance and mechanical stability
- Rinsing volume reduced by up to 50%, resulting in reduced process costs
- A Validation Guide is available upon request

#### Ingredients

BECODISC P stacked disc cartridges are made only of high-purity cellulose and wet strength agents.

#### Areas of Application

BECODISC P stacked disc cartridges can be used for filtration of all liquid media. Application options range from coarse filtration to microbe removal.

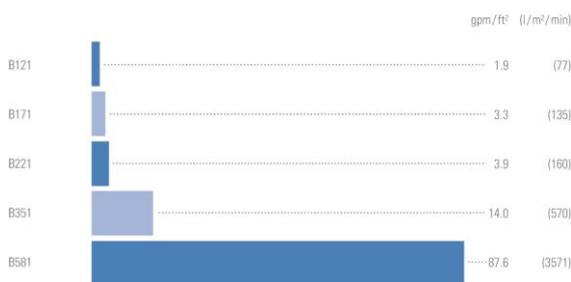
#### BECODISC P Stacked Disc Cartridges

BECODISC P stacked disc cartridges are cationic. They are characterized by adsorption charge-related during filtration. Additionally, the depth filter medium has a very low content of soluble ions, especially of calcium, magnesium and aluminum. The chemical resistance and bursting strength is extremely high.

BECODISC P stacked disc cartridges are suitable for applications involving mechanical separation of particles and adsorptive retention of negatively charged particles. Due to the minimum endotoxin contents and the increased endotoxin reduction the depth filter medium is ideal for pharmaceutical processes.



Water throughput BECODISC P range



Conditions: Δ p = 14.5 psi (100 kPa, 1 bar), Medium: Water at 68 °F (20 °C)

#### Guide to Choosing the Right BECODISC P Stacked Disc Cartridge

##### B171

Microbial removal and increased endotoxin retention

##### B271

Microbial and endotoxin reduction

##### B351

Fine filtration, activated carbon removal

##### B551

Clarifying filtration, particle separation

##### B581

Coarse filtration, particle separation



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## Physical Data

This information is intended as a guideline for the selection of BECODISC stacked disc cartridges. The water throughput is a laboratory value characterizing the different BECOPAD® P depth filter medium types. It is not the recommended flow rate.

Type*	Utilized depth filter sheet	Nominal retention range µm	Thickness in (mm)	Ash content %	Bursting strength wet psi (kPa**)	Water throughput at		Endotoxin content*** EU/ml
						Δ p = 14.5 psi gpm/ft <sup>2</sup>	(Δ p = 100 kPa** l/m <sup>2</sup> /min)	
B171	BECOPAD P 170	0.2 – 0.4	0.15 (3.9)	< 1	> 21.8 (150)	1.9	(77)	< 0.025
B271	BECOPAD P 270	0.5 – 0.7	0.15 (3.9)	< 1	> 21.8 (150)	3.3	(135)	< 0.025
B351	BECOPAD P 350	0.7 – 1.0	0.15 (3.9)	< 1	> 21.8 (150)	3.9	(160)	< 0.025
B551	BECOPAD P 550	2.0 – 3.0	0.15 (3.9)	< 1	> 21.8 (150)	14.0	(570)	< 0.025
B581	BECOPAD P 580	8.0 – 10.0	0.15 (3.9)	< 1	> 21.8 (150)	87.6	(3571)	< 0.025

\* B = Polypropylene version (e.g. B171)

\*\* 100 kPa = 1 bar

\*\*\* Endotoxin content analysis after rinsing with 0.61 gal/ft<sup>2</sup> (25 l/m<sup>2</sup>) of WFI (Water for Injection)

## Ordering Information

B	171	6	2	S	F
<b>Design</b>	<b>BECOPAD depth filter sheet</b>	<b>Construction (overall height)<sup>1</sup></b>	<b>Size</b>	<b>Gasket material</b>	<b>Adapter</b>
B = Polypropylene	171 = P 170 271 = P 270 351 = P 350 551 = P 550 581 = P 580	6 = 16 filter cells (10.9/13.0 in) (276/329 mm) 4 = 14 filter cells (10.9/13.0 in) (276/329 mm) 7 = 9 filter cells <sup>2</sup> (10.9/13.0 in) (276/329 mm) 9 = 9 filter cells (7.7/10.0 in) (195/248 mm) 5 = 5 filter cells <sup>3</sup> (4.4 in) (101 mm)	2 = 12", Ø 11.6 in (295 mm) 4 = 16", Ø 15.8 in (402 mm)	E = EPDM F = FEP-coated silicone core S = Silicone V = Fluoroelastomer	F = Flat adapter S = Double O-ring adapter Y = Flat adapter with grounding devise

<sup>1</sup> Flat adapter/Double O-ring adapter | <sup>2</sup> With cell spacer rail | <sup>3</sup> Cannot be combined with double O-ring adapter

### Example: B17162SF

Polypropylene stacked disc cartridge with BECOPAD P170 depth filter sheets, nominal retention range from 0.2 to 0.4 µm, 16 filter cells, 10.9 in (276 mm) high, 12", with silicone gaskets and flat adapter.

	BECODISC 12", Ø 11.6 in (295 mm)					BECODISC 16", Ø 15.8 in (402 mm)				
Number of cells	16	14	9 <sup>1</sup>	9	5	16	14	9 <sup>1</sup>	9	5
Filter surface area [in (m <sup>2</sup> )]	20.5 (1.9)	17.8 (1.65)	11.8 (1.1)	11.8 (1.1)	6.4 (0.59)	39.8 (3.7)	34.4 (3.2)	22.6 (2.1)	22.6 (2.1)	12.4 (1.15)
Pre-coat volume [gal (l)] <sup>2</sup>	-	0.9 (3.6)	2.1 (8.0)	-	-	-	1.8 (7.0)	4.1 (15.4)	-	-
Overall height flat adapter [in (mm)]	10.9 (276)	10.9 (276)	10.9 (276)	7.7 (195)	4.4 (101)	10.9 (276)	10.9 (276)	10.9 (276)	7.7 (195)	4.4 (101)
Overall height double O-ring adapter [in (mm)]	13.0 (329)	13.0 (329)	13.0 (329)	10.0 (248)	-	13.0 (329)	13.0 (329)	13.0 (329)	10.0 (248)	-
Cell spacer rail	-	-	✓	-	-	-	-	✓	-	-

<sup>1</sup> Special stacked disc cartridge configuration with cell spacer rails providing increased mechanical stability for holding filter cake | <sup>2</sup> Calculated values (BECO depth filter sheets with 0.16 in/4.0 mm thickness)

## Compliance Notice

BECO depth filter sheets fulfill the requirements of Regulation (EC) 1935/2004 as well as the FDA Guideline 21 CFR § 177.2260 test criteria. The polypropylene components comply with Regulation (EU) 10/2011. The polypropylene meets FDA requirements, 21 CFR § 177.1520. The sealing materials (silicone, EPDM) meet FDA requirements, 21 CFR § 177.2600. The depth filter sheet and the polypropylene components of the BECODISC P stacked disc cartridges meet the requirements of the USP Plastic Class VI – 70 °C test. For further details on individual components and materials see the declaration of conformity.

## Ion Concentration after Extraction with 40% Ethanol

Ions	Content [ppb]*
Ca	< 50
Mg	< 25
Fe	< 5
Al	< 5

\* After rinsing with 0.61 gal/ft<sup>2</sup> (25 l/m<sup>2</sup>) of 40% Ethanol

## Recommendations for Avoiding Damage

BECODISC stacked disc cartridges can be used only in the specified flow direction. This applies to product filtering as well as sanitizing with hot water, and sterilizing with the stacked disc cartridges with saturated steam. In order to avoid damage to the filter cells, the system should be protected with a suitable non-return valve.

Refer to the insert included with each BECODISC stacked disc cartridge carton for detailed application information.

Depending on the filtered liquids, the operating temperature should not exceed 176 °F (80 °C). Please contact Eaton regarding filtration applications at higher temperatures.

## Intermediate Plates

If more than two BECODISC stacked disc cartridges (12" or 16") with double O-ring adapters are stacked in the housing, install a central spindle for safety reasons. In the event, more than one 16" BECODISC stacked disc cartridge (flat adapter/double O-ring adapter) is used in the housing, Eaton recommends the installation of stainless steel intermediate plates between the BECODISC stacked disc cartridges. When silicone/FEP coated gaskets are used the stainless steel plates are mandatory.

## Sanitizing and Sterilizing (Optional)

### Sterilizing with Hot Water

The hot water temperature should be 185 °F (85 °C). A differential pressure of 21.8 psi (150 kPa, 1.5 bar) must not be exceeded when sterilizing with hot water.

Sterilization time: At least 30 minutes once a temperature of 185 °F (85 °C) is reached at all filter openings. In the interest of energy conservation, the water may be circulated provided the specified temperatures are maintained.

### Sterilizing with Steam

The wetted BECODISC stacked disc cartridges can be sterilized with saturated steam up to a maximum temperature of **250 °F (121 °C)** as follows:

Steam quality: The steam must be free of foreign particles and impurities.

Temperature: Max. **250 °F (121 °C)** (saturated steam)

Duration: Approx. 20 minutes after steam exits from all filter valves

Rinsing: After sterilizing with 0.61 gal/ft<sup>2</sup> (25 l/m<sup>2</sup>) at 1.25 times the flow rate

## Filter Preparation and Filtration

Unless already completed after sterilization, rinse the stacked disc cartridges with 0.61 gal/ft<sup>2</sup> (25 l/m<sup>2</sup>) of water at 1.25 times the flow rate prior to the first filtration. Check the entire filter for leakage at maximum operating pressure.

High-proof alcoholic solutions and products that cannot be rinsed with water should be circulated with the product. Discard the rinsing solution after rinsing.

## Differential Pressure

Terminate the filtration process once the maximum permitted differential pressure of 43.5 psi (300 kPa, 3 bar) is reached. A higher differential pressure could damage the depth filter sheet material. For safety reasons, a differential pressure of 21.8 psi (150 kPa, 1.5 bar) should not be exceeded in applications for separating microorganisms.

## Safety

When used and handled correctly, there are no known unfavorable effects associated with this product.

Further safety information can be found in the relevant Material Safety Data Sheet, which can be downloaded from our website.

## Disposal

Due to their composition, BECODISC stacked disc cartridges can be disposed of as harmless waste. Comply with relevant current regulations, depending on the filtered product.

## Storage

BECODISC stacked disc cartridges must be stored in a dry, odor-free, and well ventilated place.

Do not expose the BECODISC stacked disc cartridges to direct sunlight.

BECODISC stacked disc cartridges are intended for immediate use and should be used within 36 months after production date.

## Quality Assurance According to DIN EN ISO 9001

The Quality Management System of Eaton Technologies GmbH has been certified according to DIN EN ISO 9001.

This certification verifies that a fully functioning comprehensive Quality Assurance System covering product development, contract controls, choice of suppliers, receiving inspections, production, final inspection, inventory management, and shipment has been implemented.

Extensive quality assurance measures incorporate adherence to technical function criteria and chemical purity and quality recognized as safe under the German legislation governing the production of foods and beverages.

All information is given to the best of our knowledge. However, the validity of the information cannot be guaranteed for every application, working practice and operating condition. Misuse of the product will result in all warranties being voided.

Subject to change in the interest of technical progress.

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