

## Depth Filtration BECODISC® BC Range

### Activated Carbon Stacked Disc Cartridges

BECODISC BC stacked disc cartridges with BECO CARBON™ activated carbon depth filter sheets have a high adsorptive capacity due to the use of immobilized activated carbon and are used for decolorization as well as for the removal of undesired by-products or for taste and odor correction.

The BECODISC BC activated carbon stacked disc cartridges offer a wide range of applications in the filtration of liquids in fine chemicals, pharmaceutical, cosmetics, food and beverage industries as well as in biotechnology.

The specific advantages of BECODISC BC stacked disc cartridges:

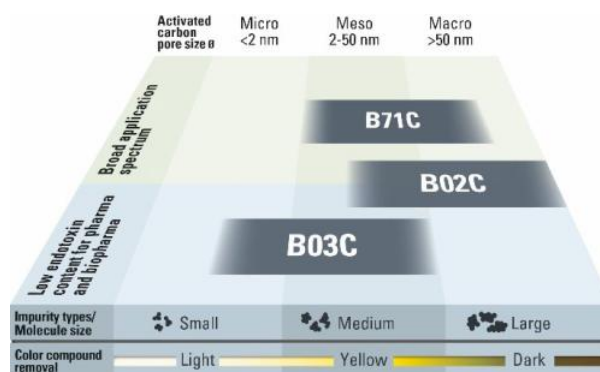
- Due to the dust-free handling, the application is simple and clean.
- Stacked disc cartridges with activated carbon types of different porosity meet the requirements of a broad range of applications.
- Filtration-active and adsorptive properties are ideally combined in the BECODISC B71C stacked disc cartridge
- The adsorption performance in the BECODISC B02C and B03C activated carbon stacked disc cartridges is maximized through a carbon content of up to 1000 g/m<sup>2</sup> and the low endotoxin content ensures high product safety. A Validation Guide for BECODISC B03C activated stacked disc cartridge is available on request.
- BECODISC stacked disc cartridges in polyamide and with Teflon™-based E-PTFE gaskets are specifically available for chemical applications.

#### Application Examples

- Decolorization and removal of organic impurities from active ingredient solutions:
  - Decolorization of antibiotic solutions
  - Protein and endotoxin removal
  - Purification of blood plasma products
  - Treatment of contrast media
- Decolorization of natural extracts and cosmetics
- Removal of unwanted by-products from food or dietary supplements, e.g., decolorization of glucose, enzyme and vitamin solutions.
- Correction of taste and color of beverages (spirits, fruit juices, hard seltzer, etc.).
- Decolorization and removal of organic impurities from chemicals, organic solvents and synthetic oils, e.g., removal of „off-flavor“ and unwanted by-products from silicone oils.



#### Selection Guide for BECODISC BC Activated Carbon Stacked Disc Cartridges



The activated carbon of the BECODISC BC stacked disc cartridges is a microporous, inert material with a very large inner surface of up to 2000 m<sup>2</sup>/g of activated carbon. The activated carbon used can be divided into different porosity ranges:

#### Macroporous (Ø >50 nm)

Decolorization of dark discolorations (brown to yellow) and for the separation of large molecules (e.g., protein separation).

#### Mesoporous (Ø 2-50 nm)

Decolorization of medium discoloration (yellow to yellowish) and impurities, as well as for correcting the taste of food.

#### Microporous (Ø <2 nm)

Decolorization of light discolorations (yellowish to whitish-gray), for odor correction and for the separation of smaller molecules (e.g., endotoxins).



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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 BECO CARBON activated carbon depth filter sheets. It is not the recommended flow rate.

Type*	Utilized BECO CARBON depth filter sheet	Ash content %	Bursting strength wet		Water throughput at		Endotoxin content***	Activated carbon content
			psi	(kPa**)	$\Delta p = 14.5$ psi gpm/ft <sup>2</sup>	$\Delta p = 100$ kPa** l/m <sup>2</sup> /min)	EU/ml	(g/m <sup>2</sup> )
B71C	ACF 07.10	15	>11.6	(80)	34.7	(1415)	-	420
B02C	ACF 02	2.5	>11.6	(80)	6.75	(275)	< 0.125	1000
B03C	ACF 03	5	>11.6	(80)	7.4	(300)	< 0.125	1000

\* B = Polypropylene version (e.g. B02C), C = Polyamide version (e.g. C02C)

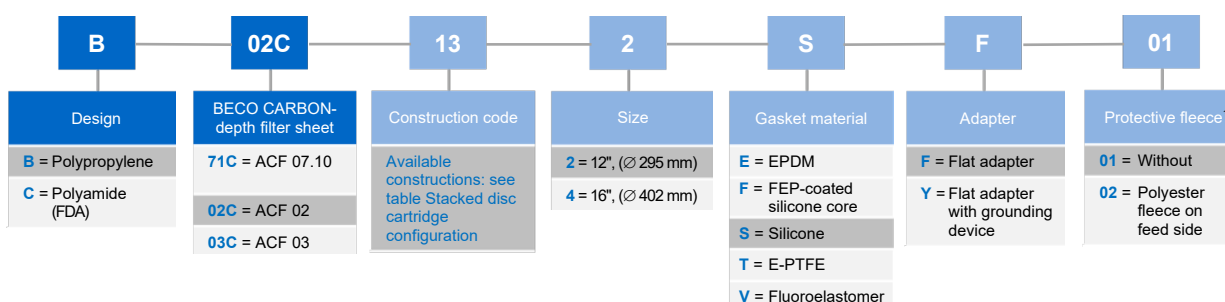
\*\* 100 kPa = 1 bar

\*\*\* Endotoxin content analysis after rinsing with 1.23 gal/ft<sup>2</sup> (50 l/m<sup>2</sup>) of WFI (Water for Injection)

## Stacked Disc Cartridge Configuration<sup>1</sup>

	BECODISC 12", Ø 11.6 in (295 mm)			BECODISC 16", Ø 15.8 in (402 mm)		
Filter type design in polypropylene	B71C	B02C	B03C	B71C	B02C	B03C
in polyamide (FDA)	C71C	C02C	C03C	C71C	C02C	C03C
Construction code/ Number of cells	16	13		16	13	
Filter surface area [ft <sup>2</sup> (m <sup>2</sup> )]	20.5 (1.9)	16.7 (1.55)		39.8 (3.7)	32.3 (3.0)	
Activated carbon content [lbs (kg)]	1.8 (0.8)	3.4 (1.55)		3.3 (1.5)	6.6 (3.0)	
Overall height flat adapter [in (mm)]	10.9 (276)	10.9 (276)		10.9 (276)	10.9 (276)	

## Ordering Information



### Example: B02C132SF01

Polypropylene stacked disc cartridge with BECO CARBON ACF 02 activated carbon depth filter sheets, 13 filter cells, 10.9 in (276 mm) high, 12", with silicone gaskets, flat adapter and without protective fleece.

<sup>1</sup> Other stacked disc cartridge configurations on request:

- Different number of cells:
  - 14 cells available in polypropylene (B71C, B03C) and in polyamide (C71C, C02C, C03C)
  - 9 cells available (B71C, C71C) with cell spacer rails providing increased mechanical stability for holding filter cake (10.9 in/276 mm overall height with flat adapter)
  - 5 cells (B71C) and 3 cells (B02C, B03C) available for small volume filtration or pilot-scale-testing (4.0 in/101 mm overall height with flat adapter)
- Protective fleece optional for filter type B71C

## Compliance Notice

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BECO CARBON activated carbon depth filter sheets meet the requirements of the Regulation (European Commission) 1935/2004 and the LFGB standard (German Food, Commodity and Feed Act) as well as the test criteria of FDA (U.S. Food and Drug Administration) Directive 21 CFR § 177.2260.

The polypropylene components comply with regulation (EU) 10/2011 and meet the requirements of FDA, 21 CFR § 177.1520.

The polyamide meets the requirements of FDA, 21 CFR § 177.1500.

The gasket materials (silicone) meet the requirements of the FDA, 21 CFR § 177.2600.

BECO CARBON ACF 03 and the polypropylene components of the BECODISC BC stacked disc cartridges also meet the requirements of the USP Class VI tests.

For further details on individual components and materials see the Declaration of Conformity.

## Components

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BECO CARBON activated carbon depth filter sheets are made from particularly pure materials. Finely fibrillated cellulose fibers and cationic charge carriers are used. The materials for each filter type in particular are as follows:

- BECODISC B71C activated carbon stacked disc cartridges: acid-washed, steam-activated carbon and high-quality diatomaceous earth
- BECODISC B02C activated carbon stacked disc cartridges: chemically activated carbon
- BECODISC B03C activated carbon stacked disc cartridges: acid-washed, steam-activated carbon

## Instruction for Correct Use

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BECODISC BC activated carbon 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 of the stacked disc cartridges with saturated steam. To avoid damage to the filter cells, the system should be protected with a suitable non-return valve.

Refer to our 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 BC activated carbon 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 BC activated carbon 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 BC activated carbon stacked disc cartridges. When silicone/FEP coated gaskets are used the stainless-steel plates are mandatory.

## Sanitizing and Sterilizing (Optional)

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BECODISC BC activated carbon stacked disc cartridges can be sanitized with hot water or sterilized saturated steam.

### Sanitizing with Hot Water

The hot water flow velocity should be at least equal to the product filtration velocity.

Water quality:	The water should be softened and free of impurities.
Temperature:	<b>Max. 185°F (85°C)</b>
Duration:	30 minutes after the temperature has reached 185°F (85°C) at all valves.
Operating pressure:	At least 14.5 psi (100 kPa, 1.0 bar) at the filter outlet.
Differential pressure:	Max. 21.8 psi (150 kPa, 1.5 bar)

### Sterilizing with Steam

The wetted BECODISC BC activated carbon stacked disc cartridges can be sterilized **one time** with saturated steam as follows:

Steam quality:	The steam must free of foreign particles and impurities.
Temperature:	<b>Max. 250°F (121°C) (saturated steam)</b>
Duration:	Approx. 20 minutes after steam exits from all filter valves.
Differential pressure:	Max. 5.0 psi (35 kPa, 0.35 bar)
Rinsing:	After sterilizing with 1.23 gal/ft <sup>2</sup> (50 l/m <sup>2</sup> ) at 1.25 times the flow rate.

## Filter Preparation and Filtration

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Unless already completed after sterilization, Eaton recommends pre-rinsing the closed filter with 1.23 gal/ft<sup>2</sup> (50 l/m<sup>2</sup>) of water or in exceptional cases with product appropriate solution at 1.25 times the flow rate prior to the first filtration. Depending on the application, this usually equals a rinsing time of 10 to 20 minutes.

Only in exceptional cases which, for example do not allow rinsing with water, product or product appropriate solution should be circulated for 10 to 20 minutes and disposed after rinsing.

Test the entire filter for leakage at maximum operating pressure.

### Filtration Velocity

Adsorption processes are decisively affected by the contact time between the product and the adsorbing substance. The adsorption performance can thus be controlled by the velocity of filtration. Slow filtration velocities 85–145 gfd (150–250 l/m<sup>2</sup>/h) and extended periods of contact result in optimum utilization of the adsorption capacity.

### Differential Pressure

Terminate the filtration process once the limit of adsorption capacity or the maximum permitted differential pressure of 43.5 psi (300 kPa, 3.0 bar) is reached. A higher differential pressure could damage the depth filter sheet material.

## Safety

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

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

## Waste Disposal

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

## Storage

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

Do not expose BECODISC BC activated carbon stacked disc cartridges to direct sunlight.

BECODISC BC activated carbon 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

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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.

*Teflon™ is a registered trademark of The Chemours Company FC, LLC.*

**North America**  
44 Apple Street  
Tinton Falls, NJ 07724  
Toll Free: 800 656-3344  
(North America only)  
Tel: +1 732 212-4700

**Greater China**  
No. 7, Lane 280,  
Linhong Road  
Changning District, 200335  
Shanghai, P.R. China  
Tel: +86 21 2899-3687

**Europe/Africa/Middle East**  
Auf der Heide 2  
53947 Nettersheim, Germany  
Tel: +49 2486 809-0  
  
Friedensstraße 41  
68804 Altlußheim, Germany  
Tel: +49 6205 2094-0

**Asia-Pacific**  
100G Pasir Panjang Road  
#07-08 Interlocal Centre  
Singapore 118523  
Tel: +65 6825-1620

An den Nahewiesen 24  
55450 Langenlonsheim, Germany  
Tel: +49 6704 204-0



**For more information, please  
email us at [filtration@eaton.com](mailto:filtration@eaton.com)  
or visit [www.eaton.com/filtration](http://www.eaton.com/filtration)**

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