

Depth Filtration BECO CARBON™ Range

Activated Carbon Depth Filter Sheets

Depth filter sheets of the BECO CARBON range 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 BECO CARBON activated carbon depth filter sheets 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 the BECO CARBON range:

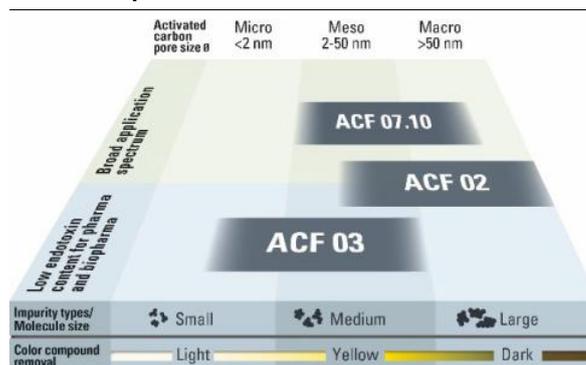
- Due to the dust-free handling, the application is simple and clean.
- Depth filter sheets with activated carbon types of different porosity meet the requirements of a broad range of applications.
- In the BECO CARBON ACF 07.10 depth filter sheet filtration-active and adsorptive properties ideally combined.
- The adsorption performance in the BECO CARBON ACF 02 and ACF 03 depth filter sheets is maximized through a carbon content of up to 1000 g/m² and the low endotoxin content ensures high product safety. A Validation Guide for BECO CARBON ACF 03 is available on request.

Application Examples

- Decolorization and removal of organic impurities from active pharmaceutical ingredients (API) 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 BECO CARBON Activated Carbon Depth Filter Sheets



The activated carbon of the BECO CARBON depth filter sheets is a microporous, inert material with a very large inner surface of up to 2000 m²/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).



Powering Business Worldwide

Physical Data

This information is intended as a guideline for the selection of BECO depth filter sheets. 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	Article no.	Thick-ness in (mm)	Ash content %	Bursting strength wet		Water throughput at		Endotoxin content** EU/ml	Activated carbon content (g/m ²)
				psi	(kPa*)	$\Delta p = 14.5$ psi gpm/ft ²	$\Delta p = 100$ kPa* l/m ² /min		
ACF 07.10	19607	0.15 (3.8)	15	> 11.6	(80)	34.7	(1415)	-	420
ACF 07.10S***	19707	0.16 (4.0)	15	> 11.6	(80)	29.8	(1215)	-	420
ACF 02	19602	0.21 (5.3)	2.5	> 11.6	(80)	6.75	(275)	< 0.125	1000
ACF 03	19603	0.20 (5.1)	5	> 11.6	(80)	7.4	(300)	< 0.125	1000

* 100 kPa = 1 bar

** Endotoxin content analysis after rinsing with 1.23 gal/ft² (50 l/m²) of WFI (Water for Injection)

*** With protective paper on the outlet side for format 140 (15.7 x 15.7 in/400 x 400 mm)

Compliance Notice

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.

BECO CARBON ACF 03 activated carbon depth filter sheets meet the requirements of USP Class VI tests.

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

Components

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:

- BECO CARBON ACF 07.10(S): acid-washed, steam-activated carbon and high-quality diatomaceous earth
- BECO CARBON ACF 02: chemically activated carbon
- BECO CARBON ACF 03: acid-washed, steam-activated carbon

Instructions for Correct Use

BECO CARBON activated carbon depth filter sheets require careful handling when inserting them into the plate and frame filter. Avoid banging, bending, and rubbing the sheets. Do not use damaged depth filter sheets.

Inserting

Each BECO CARBON activated carbon depth filter sheet has a rough side and a smooth side. The rough side is the unfiltrate side; the smooth side is the filtrate side. Always ensure that the filtrate side is in contact with the clear filtrate plate when inserting the sheets.

Sanitizing and Sterilizing (Optional)

BECO CARBON activated carbon depth filter sheets can be sanitized with hot water or sterilized with saturated steam.

The pressed filter package should be loosened slightly. Make sure to sterilize the entire filter system thoroughly. Do not apply final pressure until after the filter package has cooled down.

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: **Max. 185°F (85°C)**

Duration: 30 minutes after the temperature has reached 185°F (85°C) at all valves.

Operating pressure: At least 7.2 psi (50 kPa, 0.5 bar) at the filter outlet.

Sterilizing with Steam

The wetted BECO CARBON activated carbon depth filter sheets can be sterilized with saturated steam 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 escapes from all filter valves.

Rinsing: After sterilizing with 1.23 gal/ft² (50 l/m²) at 1.25 times the flow rate.

Filter Preparation and Filtration

Unless already completed after sterilization, Eaton recommends pre-rinsing the closed filter with 1.23 gal/ft² (50 l/m²) 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 a 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/m²/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

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

Due to their composition BECO CARBON activated carbon depth filter sheets are biodegradable. Comply with relevant current regulations, depending on the filtered product.

Storage

BECO CARBON activated carbon depth filter sheets are comprised of strongly adsorbent materials. The product must be handled carefully during shipping and storage.

Store BECO CARBON activated carbon depth filter sheets in a dry, odor-free, and well-ventilated place. Do not expose depth filter sheets to direct sunlight.

BECO CARBON activated carbon depth filter sheets are intended for immediate use and should be used within 36 months after production date.

Available Formats

BECO CARBON activated carbon depth filter sheets are available for delivery in all common sizes. Special formats are available on request.

When changing the filter type or using a thicker filter sheet, it is important to check the suitability of the filter system in terms of sealing (special gaskets or filter elements may be required) and the size of the system (number of filter elements).

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.

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
or visit www.eaton.com/filtration**

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