

Depth Filtration
BECO® Standard Range



Depth Filter Sheets for Standard Applications

BECO depth filter sheet's standard range from Eaton's Begerow Product Line meets demanding liquid filtration requirements. The product's standard range seamlessly covers retention grades between 4.0 and 0.1 µm, this ensures exact adaptation to the requirements within this separation range.

The specific advantages of the BECO standard range depth filter sheets:

- Ideal pore structure for reliable retention of the components to be separated
- Use of high-quality raw materials for high clarification performance
- Economic service life through high dirt holding capacity
- Comprehensive quality control of all raw and auxiliary materials
- In-process monitoring ensures consistent quality

Microbe Reduction and Removal

BECO Steril S 100, Steril S 80, Steril 60, Steril 40
 BECO depth filter sheets with a high germ retention rate. These sheet types are particularly suitable for cold-sterile bottling or storing of liquids. The high germ retention rate is achieved through the fine-pored structure of the BECO depth filter sheet and an electrokinetic potential with an adsorptive effect.

Due to their high retention capacity for colloidal ingredients, these sheet types are particularly suitable as prefilters for subsequent membrane filtration.

Microbe Reduction and Fine Filtration

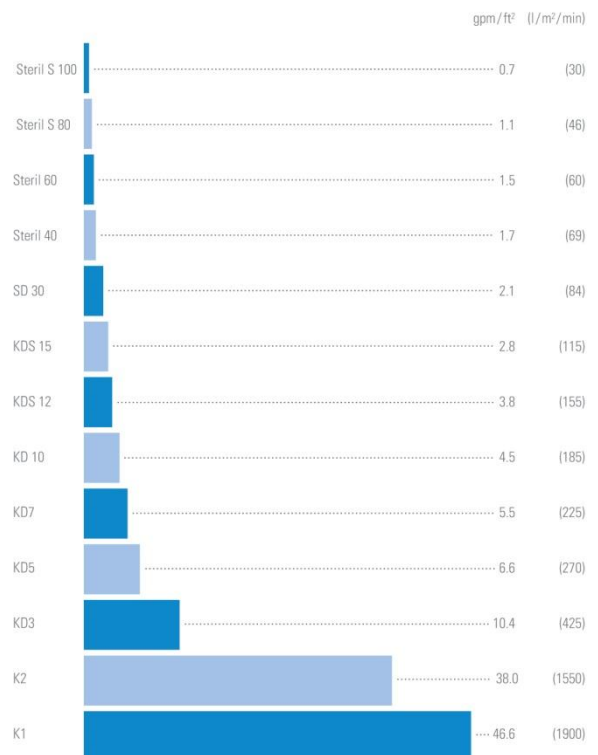
BECO SD 30, KDS 15, KDS 12, KD 10, KD 7, KD 5
 BECO depth filter sheets for achieving a high degree of clarification. These sheet types reliably retain ultra-fine particles and have a germ-reducing effect, making them particularly suitable for haze-free filtering of liquids prior to storing and bottling.

Clarifying Filtration and Coarse Filtration

BECO KD 3, K 2, K 1
 BECO depth filter sheets with large-volume cavity structure. These depth filter sheets have a high holding capacity for particles and are especially suitable for clarifying filtration applications.



Water throughput BECO standard range



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

Physical Data

This information is intended as a guideline for the selection of BECO depth filter sheets.

Type	Article no.	Nominal retention rate μm	Thickness in (mm)	Ash content %	Bursting strength wet psi (kPa)	Water throughput at	
						$\Delta p = 14.5 \text{ psi}$ gpm/ft^2	$(\Delta p = 100 \text{ kPa}^*)$ $\text{l/m}^2/\text{min}$
Steril S 100	26950	0.1	0.15 (3.9)	58.0	> 7.3 (50)	0.7	(30)
Steril S 80	26800	0.2	0.15 (3.9)	50.0	> 11.6 (80)	1.1	(46)
Steril 60	25600	0.3	0.15 (3.8)	50.0	> 7.3 (50)	1.5	(60)
Steril 40	25400	0.4	0.15 (3.8)	49.0	> 7.3 (50)	1.7	(69)
SD 30	24300	0.5	0.15 (3.8)	50.0	> 7.3 (50)	2.1	(84)
KDS 15	23150	0.6	0.15 (3.8)	50.0	> 7.3 (50)	2.8	(115)
KDS 12	23120	0.8	0.15 (3.8)	50.0	> 7.3 (50)	3.8	(155)
KD 10	22100	1.0	0.15 (3.8)	50.0	> 7.3 (50)	4.5	(185)
KD 7	22070	1.5	0.15 (3.8)	50.0	> 7.3 (50)	5.5	(225)
KD 5	22050	2.0	0.15 (3.8)	50.0	> 7.3 (50)	6.6	(270)
KD 3	22030	2.5	0.15 (3.8)	50.0	> 5.8 (40)	10.4	(425)
K2	21020	3.0	0.15 (3.8)	46.0	> 7.3 (50)	38.0	(1550)
K1	21010	4.0	0.15 (3.8)	42.0	> 8.7 (60)	46.6	(1900)

The water flow is a laboratory value characterizing the different BECO depth filter medium types. It is not the recommended flow rate.

* 100 kPa = 1 bar

Chemical Data

BECO depth filter sheets meet the requirements of LFGB*, Recommendation XXXVI/1 issued by BfR**, and the test criteria of FDA*** Directive CFR 21 § 177.2260.

Chemical resistance of the BECO depth filter sheets to different solvents over a contact time of 3 hours at 68 °F (20 °C). The chemical compatibilities listed in the table below are a guide only.

Solvent	Mechanical strength	Solvent appearance	Solvent	Mechanical strength	Solvent appearance	Solvent	Mechanical strength	Solvent appearance
Aqueous solutions:						Organic solvents:		
Sugar solution, 10%	r	nc	Hydrochloric acid, 1%	r	nc	Methanol	r	nc
With 1% free chlorine	r	nc	Hydrochloric acid, 3%	r	nc	Ethanol	r	nc
With 1% hydrogen peroxide	r	nc	Hydrochloric acid, 5%	r	nc	Isopropanol	r	nc
With 30% formaldehyde	r	nc	Hydrochloric acid, 10%	r	nc	Toluene	r	nc
With 10% ethanol	r	nc	Nitric acid, 1%	r	nc	Xylene	r	nc
With 40% ethanol	r	nc	Nitric acid, 3%	r	nc	Acetone	r	nc
With 98% ethanol	r	nc	Nitric acid, 5%	r	nc	Methyl ethyl ketone	r	nc
Caustic soda, 1%	r	nc	Nitric acid, 10%	r	nc	n-hexane	r	nc
Caustic soda, 2%	r	nc	Sulfuric acid, 1%	r	nc	Dioxan	r	nc
Caustic soda, 4%	r	0	Sulfuric acid, 3%	r	nc	Cyclohexane	r	nc
Ammonia solution, 1%	r	nc	Sulfuric acid, 5%	r	nc	Tetrachloroethylene	r	nc
Ammonia solution, 3%	r	nc	Sulfuric acid, 10%	r	nc	Ethylene glycol	r	nc
Ammonia solution, 5%	r	nc	Acetic acid, 1%	r	nc	Dimethyl sulfide	r	nc
			Acetic acid, 3%	r	nc	N, N-Dimethyl formamide	r	nc
			Acetic acid, 5%	r	nc			
			Acetic acid, 10%	r	0			
<i>r = resistant</i>			<i>nc = no change</i>			<i>0 = slight opalescence</i>		
* = German Food, Commodity, and Feed Act			** = Federal Institute of Risk Assessment			*** = Food and Drug Administration; USA		

Components

BECO depth filter sheets are made from particularly pure natural materials and cationic charge carriers. Finely fibrillated cellulose fibers from deciduous and coniferous trees and different quantities of high-quality diatomaceous earth are used.

Instructions for Correct Use

BECO 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

The depth filter sheets have a rough side and a smooth side. The rough side of the filter sheet 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)

The wetted BECO depth filter sheets may be sterilized with hot water or saturated steam up to a maximum temperature of **273.2 °F (134 °C)**. 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.

Sterilizing with Hot Water

The flow velocity should at least equal the filtration capacity.

Water quality: The water should be softened and free of impurities.

Temperature: > 185 °F (85 °C)

Duration: 25 minutes after the temperature has reached 185 °F (85 °C) at all valves.

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

Sterilizing with Steam

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

Temperature: Max. **273.2 °F (134 °C)**
(saturated steam)

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

Rinsing: After sterilizing with 13.2 gal/sqm (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 13.2 gal (50 l) of water per square meter at 1.25 times the flow rate prior to the first filtration. Depending on the application, this usually equals a rinsing time of 10 – 20 minutes. Test the entire filter for leakage at maximum operating pressure.

High-proof alcohol solutions and chemical products that do not allow pre-rinsing with water should be circulated for 10 to 20 minutes. Dispose of the rinsing solution after rinsing.

Differential Pressure

Terminate the filtration process when a differential pressure of 43.5 psi (300 kPa, 3 bar) is reached.

For safety reasons, a differential pressure of 21.8 psi (150 kPa, 1.5 bar) should not be exceeded in applications for separating microorganisms.

Regeneration/Backwashing

The high capacity of the BECO depth filter sheets can be used to a greater or lesser degree for filtration under wet conditions through trouble-free backwashing with softened water, which contributes considerably to reducing the cost of filtration.

Proceed as follows to regenerate:

Cold rinsing: In the direction of filtration

Temperature: 59 – 68 °F (15 – 20 °C)

Duration: Approx. 5 minutes

Hot rinsing: Opposite to the direction of filtration

Temperature: 140 – 176 °F (60 – 80 °C)

Duration: Approx. 10 minutes

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.

Waste Disposal

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

Storage

BECO depth filter sheets consist of strongly adsorbing materials. The product must be handled carefully during shipping and storage. Store the depth filter sheets in a dry, odor-free, and well-ventilated place.

Do not expose the depth filter sheets to direct sunlight.

BECO depth filter sheets are intended for immediate use and should be used within 24 months of delivery.

Available Formats

All common square or round filter sizes are available for delivery. Special formats are available on request.

HS Customs Tariff: 4812 00 00

Quality Assurance According to DIN EN ISO 9001

Eaton's Begerow Product Line comprehensive Quality Management System 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 contained herein is current as of the issue of this document. Subject to change in the interest of technical progress.

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For more information, please e-mail us at filtration@eaton.com or visit us online at eaton.com/filtration for a complete list of Eaton's filtration products.

Not all products in Eaton's Begerow Product Line are available in all regions. Please contact your local Eaton office to determine availability.

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