

Depth Filtration

BECO Depth Filter Sheets – Standard Range

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BECO depth filter sheets of the standard range were developed to meet demanding liquid filtration requirements. The product range seamlessly covers retention grades between 4.0 and 0.1 μm , so that exact adaptation to the requirements can be ensured within this separation range.

The specific advantages of the BECO standard range:

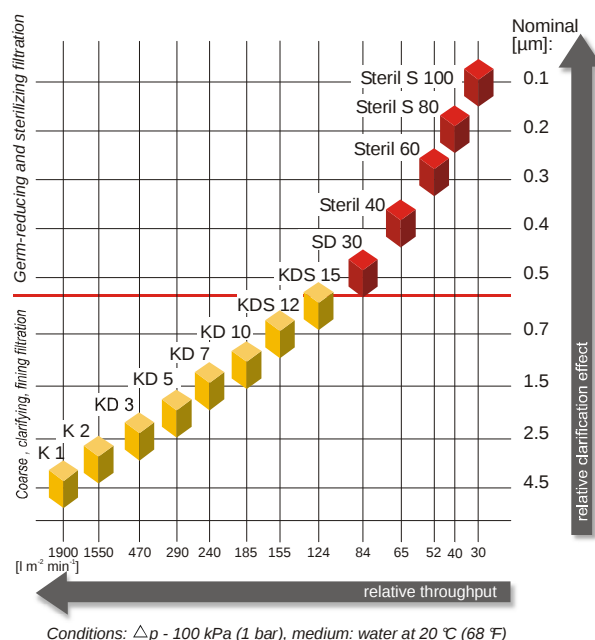
- ▶ Ideal pore structure for reliable retention of the components to be separated
- ▶ Use of high-quality raw materials for high clarification performance
- ▶ Economic service life through high dirt holding capacity
- ▶ Comprehensive quality control of all raw and auxiliary materials
- ▶ In-process monitoring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

Sterilizing Filtration

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.

Overview of BECO Standard Range types



Low-germ 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

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.

Physical Data

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

Type	Article No.	Nominal retention rate μm	Thickness mm (in)	Ash content %	Bursting strength wet kPa (psi)	Water permeability at $\Delta p = 100 \text{ kPa}$ $\text{l m}^{-2} \text{ min}^{-1}$
Steril S 100	26950	0.1	3.9 (0.15)	58.0	> 50 (> 7.3)	30
Steril S 80	26800	0.2	3.9 (0.15)	50.0	> 80 (> 11.6)	40
Steril 60	25600	0.3	3.8 (0.15)	50.0	> 50 (> 7.3)	52
Steril 40	25400	0.4	3.8 (0.15)	49.0	> 50 (> 7.3)	65
SD 30	24300	0.5	3.8 (0.15)	50.0	> 50 (> 7.3)	84
KDS 15	23150	0.6	3.8 (0.15)	50.0	> 50 (> 7.3)	124
KDS 12	23120	0.8	3.8 (0.15)	50.0	> 50 (> 7.3)	155
KD 10	22100	1.0	3.8 (0.15)	50.0	> 50 (> 7.3)	185
KD 7	22070	1.5	3.8 (0.15)	50.0	> 50 (> 7.3)	240
KD 5	22050	2.0	3.8 (0.15)	50.0	> 50 (> 7.3)	290
KD 3	22030	2.5	3.8 (0.15)	50.0	> 40 (> 5.8)	470
K2	21020	3.0	3.8 (0.15)	46.0	> 50 (> 7.3)	1550
K1	21010	4.0	3.8 (0.15)	42.0	> 60 (> 8.7)	1900

The figures indicated are based on the current standard of knowledge. Subject to modification in the interest of further development of BECO depth filter sheets to improve quality. A manufacturer's certificate according to DIN EN 10204 can be issued on request.

Chemical Data

BECO depth filter sheets meet the requirements of LFGB*, Recommendation XXXVII/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 20 °C (68 °F).

Solvent	Mechanical strength	Solvent appearance	Solvent	Mechanical strength	Solvent appearance	Solvent	Mechanical strength	Solvent appearance
Aqueous solutions:						Organic solvents:		
Sugar solution, 10%	r	kV	Hydrochloric acid, 1%	r	nc	Methanol	r	nc
With 1% free chlorine	r	nc	3%	r	nc	Ethanol	r	nc
With 1% hydrogen peroxide	r	nc	5%	r	nc	Isopropanol	r	nc
With 30% formaldehyde	r	nc	10%	r	nc	Toluene	r	nc
With 10% ethanol	r	nc	Azonic acid 1%	r	nc	Xylene	r	nc
With 40% ethanol	r	nc	3%	r	nc	Acetone	r	nc
With 98% ethanol	r	nc	5%	r	nc	Methyl ethyl ketone	r	nc
Caustic soda 1%	r	nc	10%	r	nc	n-hexane	r	nc
2%	r	nc	Sulfuric acid 1%	r	nc	Dioxan	r	nc
4%	r	0	3%	r	nc	Cyclohexane	r	nc
Ammonia solution 1%	r	nc	5%	r	nc	Tetrachloroethylene	r	nc
3%	r	nc	10%	r	nc	Ethylene glycol	r	nc
5%	r	nc	Acetic acid 1%	r	nc	Dimethyl sulfide	r	nc
			3%	r	nc	N N-Dimethyl formamide	r	nc
			5%	r	nc			
			10%	r	0			

r = resistant

* = German Food, Commodity, and Feed Act

nc = no change

** = German Institute of Risk Assessment

0 = slight opalescence

Components

BECO depth filter sheets are made from particularly pure natural materials and cationic charge carriers. Different quantities of finely fibrillated cellulose fibers obtained from deciduous and coniferous trees, kieselguhr, and perlite are used.

Instructions for Correct Use

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 Sheets

Each depth filter sheet has a rough side and a smooth side. The rough side of the depth filter sheet is the unfiltrate side; the smooth side is the filtrate side. When inserting the sheets, always ensure that the filtrate side is in contact with the clear filtrate plate.

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 **134 °C (273.2 °F)**. 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:	> 85 °C (185 °F)
Duration:	25 minutes after the temperature has reached 85 °C (185 °F) at all valves.
Pressure:	At least 0.5 bars at the filter outlet.

Sterilizing with steam:

Steam quality:	The steam must be free of foreign particles and impurities.
Temperature:	Max. 134 °C (273.2 °F) (saturated steam)
Duration:	Approx. 20 minutes after steam exits from all filter valves.
Rinsing:	After sterilizing with 50 l/m ² at 1.25 times the flow rate.

Filter Preparation and Filtration

Unless already completed after sterilization, we recommend pre-rinsing the closed filter with 50 liters (13.2 gal) 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 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 300 kPa (3 bars) is reached.

For safety reasons, a differential pressure of 150 kPa (1.5 bars) 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:	15 – 20 °C (59 – 68 °F)
Duration:	Approx. 5 minutes
Hot rinsing:	Opposite to the direction of filtration
Temperature:	60 – 80 °C (140 – 176 °F)
Duration:	Approx. 10 minutes

Safety

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

An EC safety data sheet is available on request.

Waste Disposal

Due to their composition BECO, depth filter sheets are biodegradable. Relevant current regulations must be followed, depending on the filtered product.

Storage

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 36 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 number: 4812 00 00

Quality Assurance According to DIN EN ISO 9001

BEGEROW's 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.

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