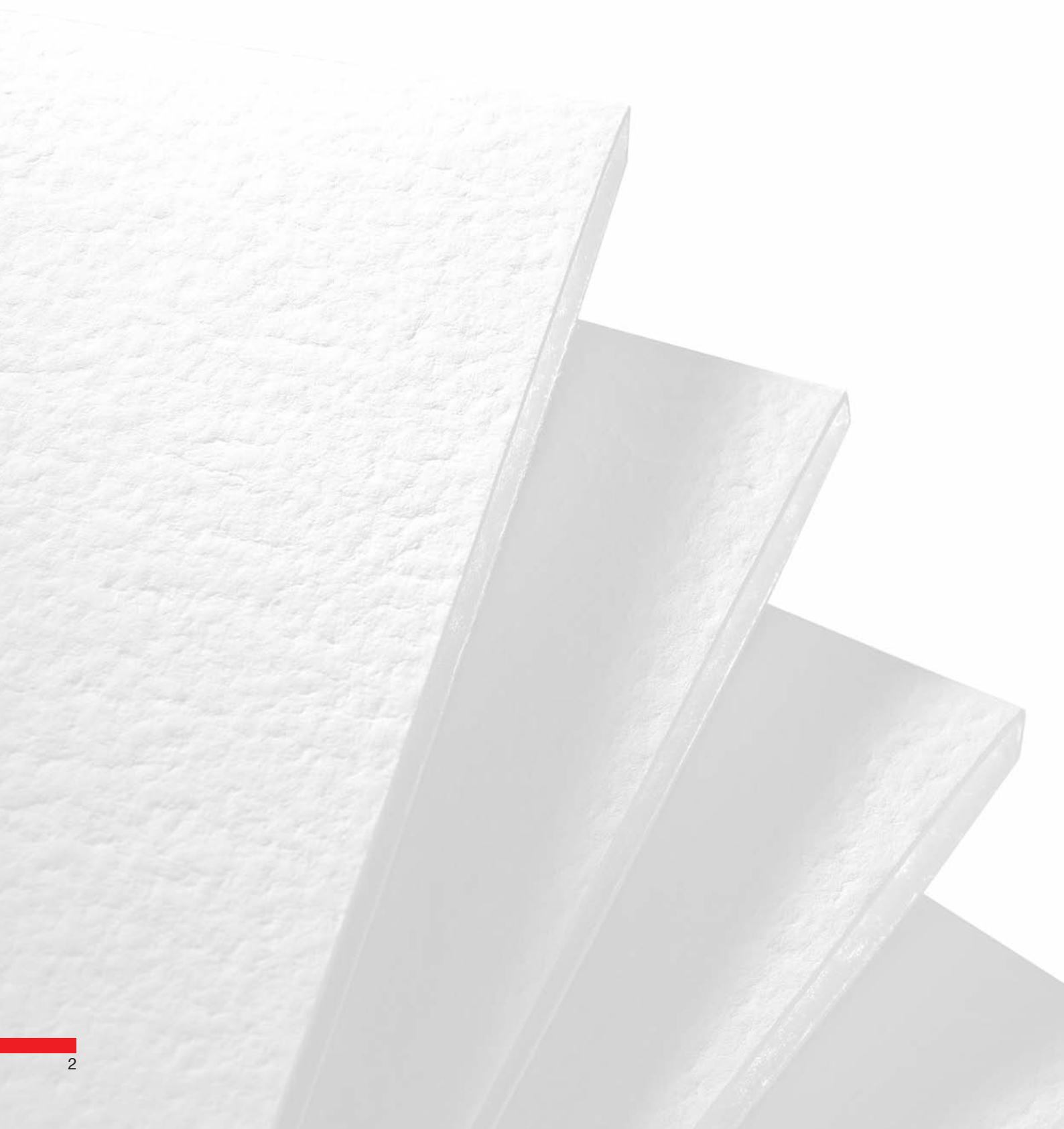


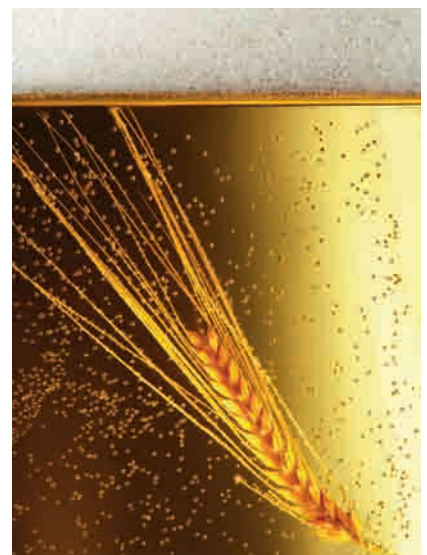
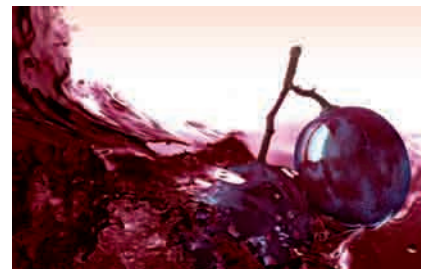
BECO Depth Filter Sheets





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Mechanism and Components

Depth filtration

Depth filtration is used as clarification filtration, fine filtration, or for removing microbiologicals. It is particularly suitable for the effective and safe separation of colloidal haze, very fine particles and micro-organisms. Depth filtration can also be used for classic solid liquid separation where the solids or the liquid phase can be the product or as support material for precoat filtration.

Mechanisms

The depth filtration mechanisms are both of a mechanical and adsorptive nature. Particles are mechanically retained in the asymmetric hollow space structure of the depth filter medium (gradually decreasing pore structure towards the outlet side). Particles that are significantly smaller than the pores of the depth filter medium are removed by means of

adsorption. The electrokinetic potential (zeta potential) supports these depth filtration mechanisms.

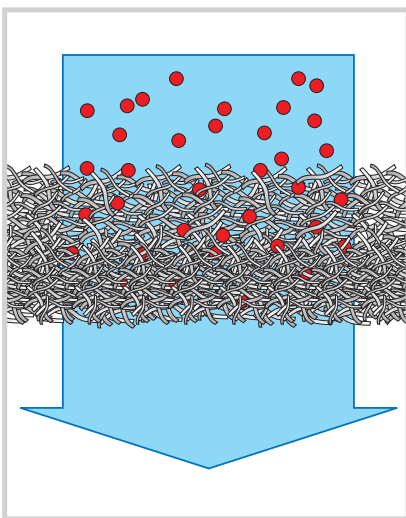
Components

Very pure, finely fibrillated cellulose fibers form the matrix of the BECO depth filter sheets. Different characteristics of the depth filter sheets are achieved in combination with filtration-active mineral components (e.g. kieselguhr).

Pre-trials are carried out to determine the optimum depth filter type for each task. Our filtration specialists are available to assist our customers with this task. Particularly complex problems can be solved in co-operation with our application engineers on site and with the BEGEROW filtration service center.

BECO depth filter sheets

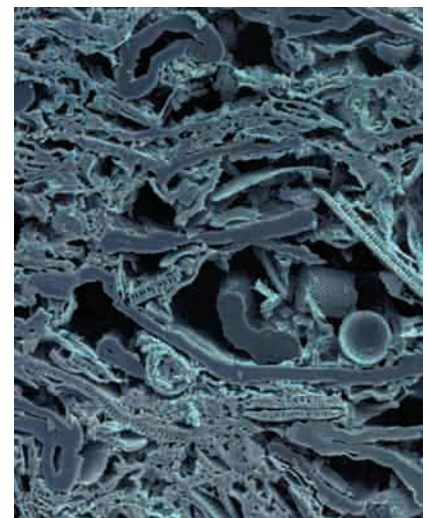
BEGEROW offers the right depth filter sheet for a wide range of filtration applications and for any clarifying level from coarse filtration to removing of microbiologicals. BEGEROW's basic aim is to provide high-quality customer products through optimum depth filter sheets, thus contributing to the cost effectiveness of the process.



The principle of depth filtration



Depth filter sheet section under the microscope

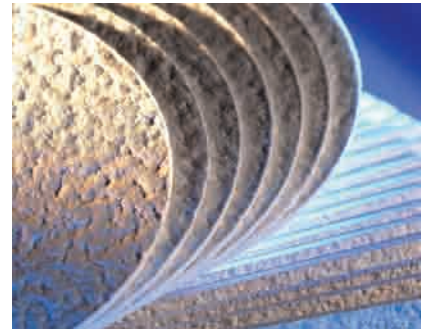


Areas of Application

Benefits for customer

BECO depth filter sheets feature a number of specific benefits for customers, for instance:

- High microbiological retention rate thanks to the defined pore matrix and sequential contaminant retention effect
- Superior cost-performance ratio thanks to high turbidity removal capacity
- Absolute preservation of active ingredients when filtering sensitive products to safeguard quality
- Measurable economy thanks to frequent backwashing and sterilizing cycles



Application example	BECO depth filter sheet type	from	– to
Beverage industry			
Beer	BECOPAD 170*	–	BECOPAD 550*
Wine	BECOPAD 170*	–	BECOPAD 550*
	Steril S	–	KD 3
Sparkling wine	BECOPAD 170*	–	BECOPAD 550*
	Steril S	–	KD 3
Fruit juice	BECOPAD 170*	–	BECOPAD 550*
	Steril S 80	–	K 2
Clear spirits	SELECT A 20	–	SELECT A 80
Brandy, Cognac	SELECT A 20	–	SELECT A 80
Whisky	SELECT A 20	–	SELECT A 80
Liqueurs	KD 10	–	K 1
Syrup	Steril 40	–	CP2KS
Mineral water	Steril S 100	–	KD 3
Food industry			
Gelatin	BECO ENDURA		
	KD 10	–	KD 3
Molasses	KD 10	–	KD 7
Cocoa butter	KD 10	–	CP02S
Vinegar	KD 10	–	KD 5
Liquid sugar	KDS 15	–	KD 7
Frying fats	CP03S	–	CP2KS
Sunflower oil	KD 10	–	KD 7
Carbonation juice	KD 7	–	KD 3
Vegetable oils	CP03S	–	CP2KS
Edible fats	K 2	–	CP2KS
Cheese rennet	Steril S 100	–	KD 3
Flavours	KDS 12	–	K 1



* Further details can be found in the Technical Information 1 A 2.7.1

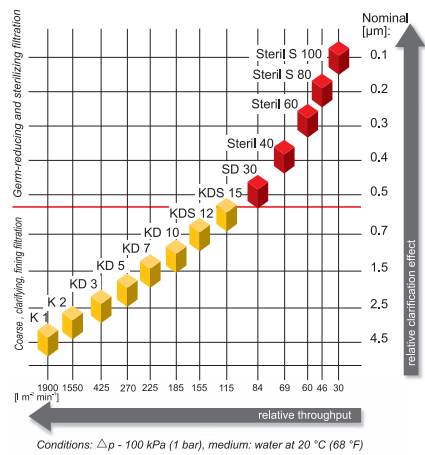
The main important BECO Depth Filter Sheet Types

Standard filters

BECO Standard range

The standard range is a broad range of different depth filter sheets. Numerous grades covering a wide retention range enable precise adaptation to the respective task of the used filtration step. The standard range is used for particle removal, removal of colloids and for the removal of microorganisms.

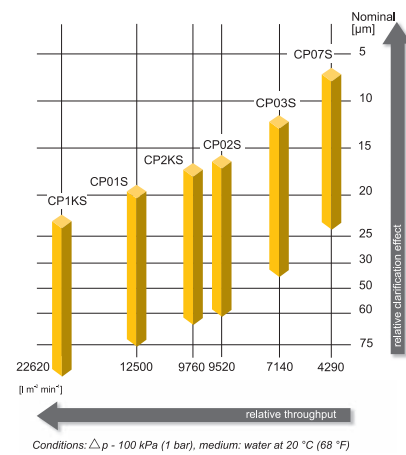
Further details can be found in the *Technical Information 1 A 2.2.2*
 Main applications: wine, beer, fruits juices, spirits and food industry




BECO CPS range

The CPS range of BECO depth filters was optimized for the filtration of highly colloidal, highly viscous liquids and liquids containing particles. The CPS range is therefore mainly used for the filtration of highly viscous liquids and liquids with a high particle load.

Further details can be found in the *Technical Information 1 A 2.1.6.3.14*
 Main applications: fruit juices, sugar syrup, gelatin and other food and beverages





**Special filters with reduced Calcium and Magnesium content
BECO SELECT A**

These BECO SELECT A depth filter sheets are used wherever low Ca and Mg ion contents are important. BECO SELECT A depth filter sheets are used for the demanding filtration of coloured spirits such as cognac, armagnac, barrel-matured brandy and whisky. The product range is graded from coarse particle separation to fine filtration and enables adaptation to the requirements of spirit filtration.

Further details can be found in the Technical Information 1 A 2.1.3.2

Main applications: whisky, cognac, vodka and others spirits

**Support sheet for precoat filtration
BECO ENDURA**

BECO ENDURA is used for classic solid liquid separation where the solids or the liquids phase can be the product or as support material for precoat filtration. High wet strength and an optimized surface enable a service life up to 30 precoat cycles, depending on the liquid to be filtered and the filter aid used.

Further details can be found in the Technical Information 1 A 2.3.4

Main applications: beer, gelatin, edible oil and others

**Filters containing activated carbon
BECO ACF 07**

The BECO ACF 07 depth filter sheet has a high adsorption capacity, achieved through a high content of particularly highly active activated carbon. These adsorptive characteristics enable, for example, the decolourisation of fruit juices. The ACF 07 is also very suitable for the removal of negative sensoric effects in beverages. A protective sheet can be positioned on the outlet side to ensure that the filtrate is free from carbon particles.

Further details can be found in the Technical Information 1 A 2.1.6.5

Main applications: vodka, white spirits, apple juices and sugar syrup

BEGEROW-Process Technology: Filtration Systems

BECO depth filter sheets are used in the following different filtration systems: in enclosed plate and frame filters, stacked disc cartridge housings and laboratory filters, and in a range of classic plate and frame filters. These BEGEROW filtration systems are developed by BEGEROW process technology. They meet even the most stringent filtration demands and are available in a variety of sizes and types, depending on the application and on customer requirements.

Enclosed filtration systems

As an enclosed system, the product line BECO INTEGRA is the alternative to classic filtration systems, wherever the protection of operating personnel and product is a priority.

BECO INTEGRA PLATE

Enclosed plate and frame filters

Type 400, 600 and 800 – hermetically enclosed depth filtration system with sterilizable external chamber. Only plastic versions of type 800 filter elements are available (PP and PVDF). Suitable for use with BECO depth filter sheets. Format: 400 x 400 mm (15.7 x 15.7 in), 600 x 600 mm (23.6 x 23.6 in) and 800 x 800 mm (31.5 x 31.5 in), filter areas between 0.24 m² (2.58 ft²) and 66 m² (710.42 ft²) are available.

BECO INTEGRA DISC

Stacked disc cartridge housing 12"

For holding 1–4 BECODISC stacked disc cartridges with filter areas from 0.59 m² (6.4 ft²), 1.1 m² (11.8 ft²), 1.65 m² (17.8 ft²), 1.9 m² (20.4 ft²), to a maximum of 7.6 m² (81.8 ft²).



Stacked disc cartridge housing 16"

For holding 1–4 BECODISC stacked disc cartridges with filter areas from 1.15 m² (12.4 ft²), 2.1 m² (22.6 ft²), 3.2 m² (34.4 ft²), 3.7 m² (39.8 ft²) to a maximum of 14.8 m² (159.31 ft²). Further stacked disc cartridge housings with a filter area up to a maximum of 88.8 m² (955.84 ft²) are available.

The 12" and 16" stacked disc cartridge housings are equipped with a quick release fastener or clamp screws according to DGR 97/23/EC.

BECO INTEGRA LAB

Enclosed laboratory filter **Type 60 P, 140 P, 220 P** and **Type 200**

BECO INTEGRA SOLO

Enclosed single-sheet filters with a filling space designed as a pressure vessel, suitable for packing of a depth filter medium. Types with diameters between 300 mm (11.8 in) and 1200 mm (47.2 in) correspond to a filter area from 0.06 m² (0.6 ft²) to a maximum of 1.12 m² (12.0 ft²).



Classic filtration systems

BECO COMPACT PLATE

Plate and frame filter

Type 200, 400 and 600 SF/ASF

Filter elements in sizes of 200 x 200 mm (7.87 x 7.87 in), 400 x 400 mm (15.7 x 15.7 in) and 600 x 600 mm (23.6 x 23.6 in) and in various frame sizes with filter areas between 0.07 m² (7.54 ft²) and 67.32 m² (724.6 ft²) or 28.38 m² (305.5 ft²) with a solids volume of 496 l (131.03 gal) are available.

Filtration systems

StepFlow

BEGEROW process technology offers a wide range of components and devices, including complex filtration systems.

Using these resources, the engineering specialists from BEGEROW process technology develop optimized solutions for each customer. They offer competent and practical support from the preparation of the requirements profile and its implementation in practice, from delivery documentation to customer staff training.

BEGEROW Quality: more than just a Word

We are committed to providing consistently high product quality, in order to meet our customers' quality requirements. As part of the manufacturing process, the depth filter medium helps to ensure safe, reproducible, and economical results for our customers.

We meet this responsibility by ensuring that our products comply with national and international quality standards such as the German LFGB¹⁾, the FDA²⁾ guidelines, the hygiene guidelines according to HACCP³⁾. As early as 1993, BEGEROW was certified according to DIN EN ISO 9001 and has been complying with DIN EN ISO 9001 since 2002. Moreover, we make ourselves available for regular audits through external, independent institutes and customers.

The procedures for development, production, and testing of our products are based on more than 70 years of experience with depth filter media. Staff at all levels of our company contribute to ensuring and continuously improving the quality of our products and services.

BECO depth filter sheets are listed with the FDA under the following master file numbers:

- Drug Master File DMF 9926,
- Biological Master File BB-MF 4797,

Furthermore, BECO depth filter sheets meet the following requirements:

- FDA guideline CFR, Part 177.2260
- Regulation (EC) 1935/ 2004
- Recommendation XXXVI/1 of the BfR⁴⁾ for boiling and hot filter papers and depth filter sheets

¹⁾ German Food, Commodity and Feed Act

²⁾ Food and Drug Administration, USA

³⁾ Hazard Analysis of Critical Control Points

⁴⁾ Federal Institute of Risk Appreciation

Technical Data

BECO Standard range					
Type	Article no.	Thickness	Ash content	Bursting strength wet	Water permeability at $\Delta p = 100 \text{ kPa}$ $\text{l m}^{-2} \text{ min}^{-1}$
		mm (in)	%	kPa (psi)	
Steril S 100	26950	3.9 (0.15)	58.0	> 50 (7.25)	30
Steril S	15090	3.8 (0.15)	51.0	> 50 (7.25)	36
Steril S 80	26800	3.9 (0.15)	50.0	> 80 (11.6)	46
Steril 60	25600	3.8 (0.15)	50.0	> 50 (7.25)	60
Steril 40	25400	3.8 (0.15)	49.0	> 50 (7.25)	69
SD 30	24300	3.8 (0.15)	50.0	> 50 (7.25)	84
KDS 15	23150	3.8 (0.15)	50.0	> 50 (7.25)	115
KDS 12	23120	3.8 (0.15)	50.0	> 50 (7.25)	165
KD 10	22100	3.8 (0.15)	50.0	> 50 (7.25)	185
KD 7	22070	3.8 (0.15)	50.0	> 50 (7.25)	225
KD 5	22050	3.8 (0.15)	50.0	> 50 (7.25)	270
KD 3	22030	3.8 (0.15)	50.0	> 40 (5.8)	425
K2	21020	3.8 (0.15)	46.0	> 50 (7.25)	1550
K1	21010	3.8 (0.15)	42.0	> 60 (8.7)	1900

BECO CPS range					
Type	Article no.	Thickness	Ash content	Bursting strength wet	Water permeability at $\Delta p = 100 \text{ kPa}$ $\text{l m}^{-2} \text{ min}^{-1}$
		mm (in)	%	kPa (psi)	
CP07S	27108	3.6 (0.14)	35.0	> 110 (15.95)	4290
CP03S	27123	3.7 (0.15)	35.0	> 90 (13.05)	7140
CP02S	27122	3.3 (0.13)	17.0	> 90 (13.05)	9520
CP01S	27121	4.6 (0.18)	16.0	> 110 (15.95)	12500
CP2KS	27031	2.9 (0.11)	< 1.0	> 150 (21.76)	9760
CP1KS	27021	4.3 (0.17)	< 1.0	> 150 (21.76)	22620

BECO SELECT A range

Type	Article no.	Thickness	Ash content	Bursting strength wet	Water permeability at $\Delta p = 100 \text{ kPa}$ $\text{l m}^{-2} \text{ min}^{-1}$
		mm (in)		%	
SELECT A 15	27615	4.4 (0.17)	53.0	> 40 (5.80)	50
SELECT A 20	27620	4.4 (0.17)	43.0	> 40 (5.80)	160
SELECT A 40	27640	4.4 (0.17)	43.0	> 60 (8.70)	300
SELECT A 80	27680	2.9 (0.11)	< 1.0	> 110 (15.94)	10120

BECO ENDURA

Type	Article no.	Thickness	Ash content	Bursting strength wet	Water permeability at $\Delta p = 100 \text{ kPa}$ $\text{l m}^{-2} \text{ min}^{-1}$
		mm (in)		%	
ENDURA	29200	3.4 (0.14)	< 1.0	> 700 (101.5)	4290

BECO ACF 07

Type	Article no.	Thickness	Ash content	Bursting strength wet	Water permeability at $\Delta p = 100 \text{ kPa}$ $\text{l m}^{-2} \text{ min}^{-1}$
		mm (in)		%	
ACF 07	19207	3.8 (0.15)	15.0	> 40 (5.8)	1455

*This information is intended for orientation during the selection of depth filter sheets.
Please contact your distributor for information about further special types and formats.*

Part numbers – BECO depth filter sheets

Note for orders:
our 8-digit item no. consists of two parts:

- the 5-digit article no. and
- the 3-digit format no.

Examples for the format no. code:

Format 200 x 200 = format no. 120

Format 400 x 400 = format no. 140

Format 600 x 600 = format no. 160

Example for item no.

BECO Steril S 100 in format 600 x 600 = 160 (code)

Article no.

2	6	9	5	0
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1	6	0
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 Format no.

All information is given to the best of our knowledge.

They reflect current know-how and do not claim to be complete.

No warranty is expressed or implied.

The application of our products outside the test criteria specified in the technical information requires separate verification by the customer. In such cases, no liability for any damage whatsoever can be accepted. Further detailed information can be found in the respective technical information sheets, instruction manuals and user notes. Misuse of the product will result in all warranties being voided, including any third-party commercial property rights.

Subject to change in the interest of technical progress.



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