

BECO filter cartridges for  
chemistry, cosmetics and  
biotechnology applications



*Powering Business Worldwide*

# Wide range of filter cartridges offer complete filtration solutions for chemistry, cosmetics and biotechnology applications

Eaton provides high-quality wrapped and pleated depth filter and membrane filter cartridges.

The BECO® filter cartridge selection offers a wide range of solutions from clarifying and fine filtration with depth filter cartridges (BECO PROTECT®) to the reduction and retention of microorganisms with membrane filter cartridges (BECO MEMBRAN).

To efficiently protect downstream membranes and extend their service life, Eaton can recommend the optimal combination of pre-filter and membrane filter cartridges.

BECO filter cartridges feature a variety of retention ratings, between 0.1 and 150 µm, suitable for an array of liquid filtration applications. In addition to sizes ranging from 10" (25 cm) to 40" (100 cm) and also various adapter codes, filter cartridges are available with different filter material. All BECO MEMBRAN filter cartridges are testable for integrity and therefore offer high process reliability for the user.

The product range contains numerous housings and system solutions for the use of depth filter and membrane filter cartridges, such as the BECO INTEGRA® CART stainless steel filter cartridge housings and complex, automatic StepFlow® filtration systems.

Eaton filter cartridges meet national and international quality standards, such as the LFGB standard (German Food, Commodity and Feed Act) in Germany and FDA guidelines (Food and Drug Administration) from the USA. The plastic components meet European Directive (EU) 10/2011.



# BECO Filter Cartridges

## Selection guide

### DEPTH FILTER CARTRIDGES



#### BECO PROTECT PG

Consist of up to 24 wrapped polypropylene fleeces that are graded from coarse to fine. The funnel design ensures that a wide particle spectrum can be absorbed, with a high retention rating and excellent backwashing capability.



#### BECO PROTECT CS Cellstream

Feature the innovative wrapped design with adapted BECOPAD® high-purity cellulose depth filter sheet material. These filter cartridges are characterized by a large filter surface and excellent thermal and mechanical stability.



#### BECO PROTECT FS FineStream

Provide optimal protection of downstream membrane filter cartridges through special pleated polypropylene fleeces. The innovative and unique special pleating increases the filter area and achieves unparalleled efficiency of retention. The variable flow rate is also unique.



#### BECO PROTECT PP Pure

Consist of pleated polypropylene filter material, featuring a high efficiency of retention and a large filter area for high flow rates.

### MEMBRANE FILTER CARTRIDGES



#### BECO MEMBRAN PS Aqua

Special polyethersulfone membrane filter cartridges with a retention rate of 0.2 µm and high flow rates and long service life for the filtration of water.



#### BECO MEMBRAN PS Pure

Excellent pleated membrane filter cartridges for sterile filtration constructed from special asymmetrical polyethersulfone (PES) material. They are testable for integrity and guarantee an excellent microbial retention and a long service life thanks to the excellent mechanical and thermal stability. With a wide range of retention rates from 0.2 to 1.0 µm, these filter cartridges generally meet all requirements for the final filtration in chemical, cosmetics and biotechnology industries.



#### BECO MEMBRAN PS Pure DL

Sterilizing membrane filter cartridges that are constructed with a double layer offer an absolute retention rate of 0.1 µm. The hydrophilic polyethersulfone membrane filter cartridges safely retain microorganisms.

### FILTER CARTRIDGES FOR SERVICE MEDIA



#### BECO PROTECT PB

Depth filter cartridges constructed of thermally bonded, melt-blown polypropylene filter material with high chemical resistance. The mechanical stability of this cartridge is so robust that no inner core or outer cage is required.



#### BECO PROTECT HF HighFlow

Depth filter cartridges made of pleated, multi-layer and thermally bonded polypropylene filter material, which offers a large surface area, maximum efficiency and exceptionally high flow rates.



#### BECO PROTECT CL Coreless

Depth filter cartridges made of wrapped polypropylene filter material with different layers from coarse to fine. The filter cartridges are manufactured without a core and with a large diameter to provide high flow rates.



#### BECO PROTECT KM

Stainless steel filter cartridges that are constructed from porous metal powder (316L) predominately used in steam filtration for the separation of rust particles and abraded matter. These cartridges are designed for liquid filtration at high temperatures.



#### BECO MEMBRAN H Air and H Air Mini

Membrane filter cartridges that retain contaminants up to 0.01 µm and are primarily used for sterile filtration of gases and air. Available in 1", 5", 10", 20" and 30".

### ADAPTER CODES



**Code X:** Double open end (DOE) without end caps



**Code F:** Double open end (DOE) with two flat gaskets



**Code 0:** Single open end (SOE), 2-222 O-ring without spear, external diameter 1.57 in (44 mm) (bottom-most point)



**Code 2:** Single open end (SOE), 2-222 O-ring, triple bayonet-adapter with spear, external diameter 1.57 in (44 mm) (bottom-most point)



**Code 7:** Single open end (SOE), 2-226 O-ring, double bayonet-adapter with spear, external diameter 2.2 in (56 mm) (bottom-most point)

# Technical data

	BECO PROTECT PG	BECO PROTECT CS	BECO PROTECT FS	BECO PROTECT PP Pure	BECO PROTECT PB	BECO PROTECT HF	BECO PROTECT CL	BECO PROTECT KM
Article number	PG002 – PG995	CS115	FS002 – FS200	PPPB6 – PPP10	PB005 – PB250	HF010 – HF100	CL050 – CL400	KM10
Filter material	Polypropylene (PP)	Special cellulose	Polypropylene (PP)	Polypropylene (PP)	Polypropylene (PP)	Polypropylene (PP)	Polypropylene (PP)	Stainless steel 316L (1.4404)
Retention rating (µm)	0.2, 0.3, 0.5, 0.6, 0.8 1, 2, 3, 5, 10, 15 20, 30, 40, 50, 75 100, 120, 150	0.2	0.2, 0.3, 0.5, 0.6, 0.8 1, 2, 3, 5, 10	0.6, 1.2, 3, 5, 10, 20	0.5, 1, 5, 10, 25	1, 3, 5, 10	5, 10, 20, 40	10
Retention efficiency	99.98%	Nominal	99.98%	99.98%	90%	99.98%	99.98%	Nominal
Lengths	9.75", 10", 19.5", 20", 29.5", 30", 40"	30", 40"	10", 20", 30", 40"	10", 20", 30", 40"	9.75", 10", 19.5", 20", 29.5", 30", 39", 40"	40"	40"	10", 20", 30"
Adapter codes	X, F, 0, 2, 7	2, 7	F, 0, 2, 7	0, 2, 7	X, F	U**	X	7
Cages	Yes	Yes	Yes	Yes	No	Yes	No	No
Backwashability	Up to 29 psig (200 kPa, 2 bar) at 176 °F (80 °C)	Up to 2.0 bar at 80 °C	Up to 29 psig (200 kPa, 2 bar) at 176 °F (80 °C)	Up to 29 psig (200 kPa, 2 bar) at 176 °F (80 °C)	Yes	–	–	Up to 14.5 psig (100 kPa, 1 bar) at 77 °F (25 °C)
Chemical resistance	pH 1 – 14	Limited	pH 1 – 14	pH 1 – 14	pH 1 – 14	–	–	pH 1 – 14
Max. operating temperature	176 °F (80 °C)	80 °C	176 °F (80 °C)	176 °F (80 °C)	149 °F (65 °C)	176 °F (80 °C)	176 °F (80 °C)	392 °F (200 °C)
Max. differential pressure in flow direction	69 psid (480 kPa, 4.8 bar) at 77 °F (25 °C) 29 psid (200 kPa, 2 bar) at 176 °F (80 °C)	1.5 bar at 20 °C	69 psid (480 kPa, 4.8 bar) at 77 °F (25 °C) 29 psid (200 kPa, 2 bar) at 176 °F (80 °C)	72.5 psid (500 kPa, 5 bar) at 68 °F (20 °C) 29 psid (200 kPa, 2 bar) at 176 °F (80 °C)	46.4 psid (320 kPa, 3.2 bar) at 68 °F (20 °C) 17.4 psid (120 kPa, 1.2 bar) at 140 °F (60 °C)	49 psid (340 kPa, 3.4 bar) at 68 °F (20 °C)	58 psid (400 kPa, 4 bar) at 86 °F (30 °C) 14.5 psid (100 kPa, 1 bar) at 176 °F (80 °C)	–
Steam cycles	> 100 at 212 °F (110 °C) in 30 minutes	> 100 at 110 °C in 30 minutes	> 100 at 212 °F (110 °C) in 30 minutes	> 100 at 212 °F (110 °C) in 30 minutes	Not recommended	Max. 10; at 250 °F (121 °C) in 15 minutes	–	–

	BECO MEMBRAN PS Aqua	BECO MEMBRAN PS Pure	BECO MEMBRAN PS Pure DL	BECO MEMBRAN H Air	BECO MEMBRAN H Air Mini
Article number	PSA02	PSP02, PSP04, PSP06, PSP10	PSP01	PTC02	PTM02
Filter material	Polyethersulfone	Polyethersulfone	Double layer polyethersulfone (PES)	Teflon (PTFE)	Teflon (PTFE)
Retention rating (µm)	0.2	0.2, 0.45, 0.65, 1.0	0.1	0.2	0.2
LRV (Titer reduction/cm²)*	> 7	> 7 1 µm: 6	> 7	> 7	> 7
Lengths	20", 30", 40"	10", 20", 30", 40"	10", 20", 30"	10", 20", 30"	1", 5"
Adapter codes	2, 7	0, 2, 7	7	7	1, 4, 7
Cages	Yes	Yes	Yes	Yes	Yes
Pressure hold test Test pressure in bar and diffusion rate per 10"	<b>PSA02</b> 36 psig (2.5 bar) ≤ 20 ml/min	<b>PSP02</b> 36 psig (2.5 bar) ≤ 20 ml/min <b>PSP04</b> 21.8 psig (1.5 bar) ≤ 15 ml/min <b>PSP06</b> 14.5 psig (1 bar) ≤ 10 ml/min <b>PSP10</b> 10.2 psig (0.7 bar) ≤ 15 ml/min	<b>PSP01</b> 58.0 psig (4 bar) ≤ 35 ml/min	<b>PTC02</b> Nitrogen diffusion at 68 °F (20 °C) per 10" ≤ 7 ml/min at 10.2 psig (70 kPa, 700 mbar) with 60% isopropanol	<b>PTM02</b> Bubble point test at 73 °F (23 °C) ≥ 10.2 psig (1000 mbar) with 60% isopropanol
Backwashability	Limited 29 psid (200 kPa, 2 bar) at 68 °F (20 °C)	Limited 29 psid (200 kPa, 2 bar) at 68 °F (20 °C)	–	–	–
Chemical resistance	pH 1 – 14	pH 1 – 14	pH 1 – 14	pH 1 – 14	pH 1 – 14
Max. operating temperature	176 °F (80 °C)	176 °F (80 °C)	176 °F (80 °C)	176 °F (80 °C)	176 °F (80 °C)
Max. differential pressure in flow direction	72.5 psid (500 kPa, 5 bar) at 68 °F (20 °C) 4 psid (30 kPa, 0.3 bar) at 250 °F (121 °C)	72.5 psid (500 kPa, 5 bar) at 68 °F (20 °C) 4 psid (30 kPa, 0.3 bar) at 250 °F (121 °C)	72.5 psid (500 kPa, 5 bar) at 68 °F (20 °C) 29 psid (200 kPa, 2 bar) at 176 °F (80 °C)	72.5 psid (500 kPa, 5 bar) at 68 °F (20 °C) 7.25 psid (50 kPa, 0.5 bar) at 273 °F (134 °C)	72.5 psid (500 kPa, 5 bar) at 68 °F (20 °C) 7.25 psid (50 kPa, 0.5 bar) at 273 °F (134 °C)
Steam cycles	≥ 100 at 221 °F (105 °C) in 30 minutes	≥ 100 at 221 °F (105 °C) in 30 minutes	≥ 30 at 250 °F (121 °C) in 30 minutes	≥ 150 at 273 °F (134 °C) in 20 minutes	50 273 °F (134 °C) in 20 minutes

\* Please see technical data sheets for further information about the used test organisms \*\* Code U (SOE) for large diameter filter cartridges only





## Segments and Applications

### Biotechnology

Coarse and fine filtration, particle removal, polishing filtration, catalyst recovery, water and process liquid filtration, filtration of buffer and solvents, chromatography prefiltration, sterile process filtration.

### Fine chemical / API

Coarse and fine filtration for organic and inorganic compounds, catalyst removal, clarifying filtration, amine filtration, silicone oil filtration, RO and UF prefiltration. Prefiltration and final filtration of acids and bases, organic and inorganic solvents, buffer solutions, filtration of feed water,

activated carbon removal, sterile filtration, sterile gas filtration and tank venting.

### Cosmetic, flavour and fragrances

Clarifying and fine filtration, water and process liquid filtration, solvent filtration, winterizing, germ removal, sterile air and gas filtration.

### Paint and resins

Particle removal, selective filtration, solvent filtration, colloid filtration, salt removal and haze reduction, particle filtration.

### Oils and fats

Particle removal, polishing, haze reduction and tank venting.

		Filter Cartridges											Filter Cartridge Housings						
		BECO PROTECT							BECO MEMBRAN				For Liquid			For Air, Steam & Gas			
		PG	CS	FS	PP Pure	PB	HF	CL	KM	PS Aqua	PS Pure	PS Pure DL	H Air/H Air Mini	KA	KB	KHF/KCL	KK	KLAV	
Segment	Biotechnology	■		■	■					■	■	■	■	■	■		■	■	
	Fine chemical / API	■	■	■	■					■	■		■	■			■	■	
	Cosmetic	■		■	■	■				■	■	■		■	■				
	Flavour and fragrances	■	■	■	■	■					■			■	■				
	Paint and resins	■		■		■			■	■	■			■	■				
	Oils and fats		■			■									■				
Application	Coarse filtration	■		■		■	■	■						■	■	■			
	Fine filtration	■	■	■	■									■	■				
	Sterile filtration									■	■	■	■	■	■				
	Solvent filtration	■	■	■	■	■			■	■	■	■	■	■	■				
	Water treatment (Utilities)	■		■		■	■	■							■	■			
	Water filtration (Process)	■		■	■		■	■		■	■	■			■	■			
	Activated carbon retention	■		■											■	■			
	Upstream bioreactor	■	■	■	■				■	■	■	■	■	■	■	■		■	■
	Final filtration	■	■	■	■					■	■	■	■	■	■	■		■	■
	Buffer filtration									■	■	■		■	■				
	Steam filtration									■								■	■
	Air and gas filtration	■			■					■				■				■	■
	Tank venting filtration													■				■	■

## FILTER CARTRIDGE HOUSINGS



### BECO INTEGRA CART KA/KB

These filter cartridge housings are manufactured from AISI 316L stainless steel and can be used for the liquid filtration in chemistry, cosmetics and biotechnology industries. They are available in 1-, 3-, 5-, 8-, 12-, 18-, 24- and 30-fold cartridge versions for pre-filtration or sterile filtration purposes.



### BECO INTEGRA CART KHF/KCL

Are manufactured of stainless steel AISI 316L and can be applied for the filtration of liquids with high flow rates in Life Science applications. This series is available as a 1 x 40" version.



### BECO INTEGRA CART KK

These filter cartridge housings are manufactured from AISI 316L stainless steel and designed for pressurized air or steam filtration applications.



### BECO INTEGRA CART KLAV

These filter cartridge housings are manufactured from AISI 316L stainless steel and are used as vent filter housings for gas filtration. This series is suitable for sterile filtration for filter cartridges with a code 1 adapter.

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02-2021

