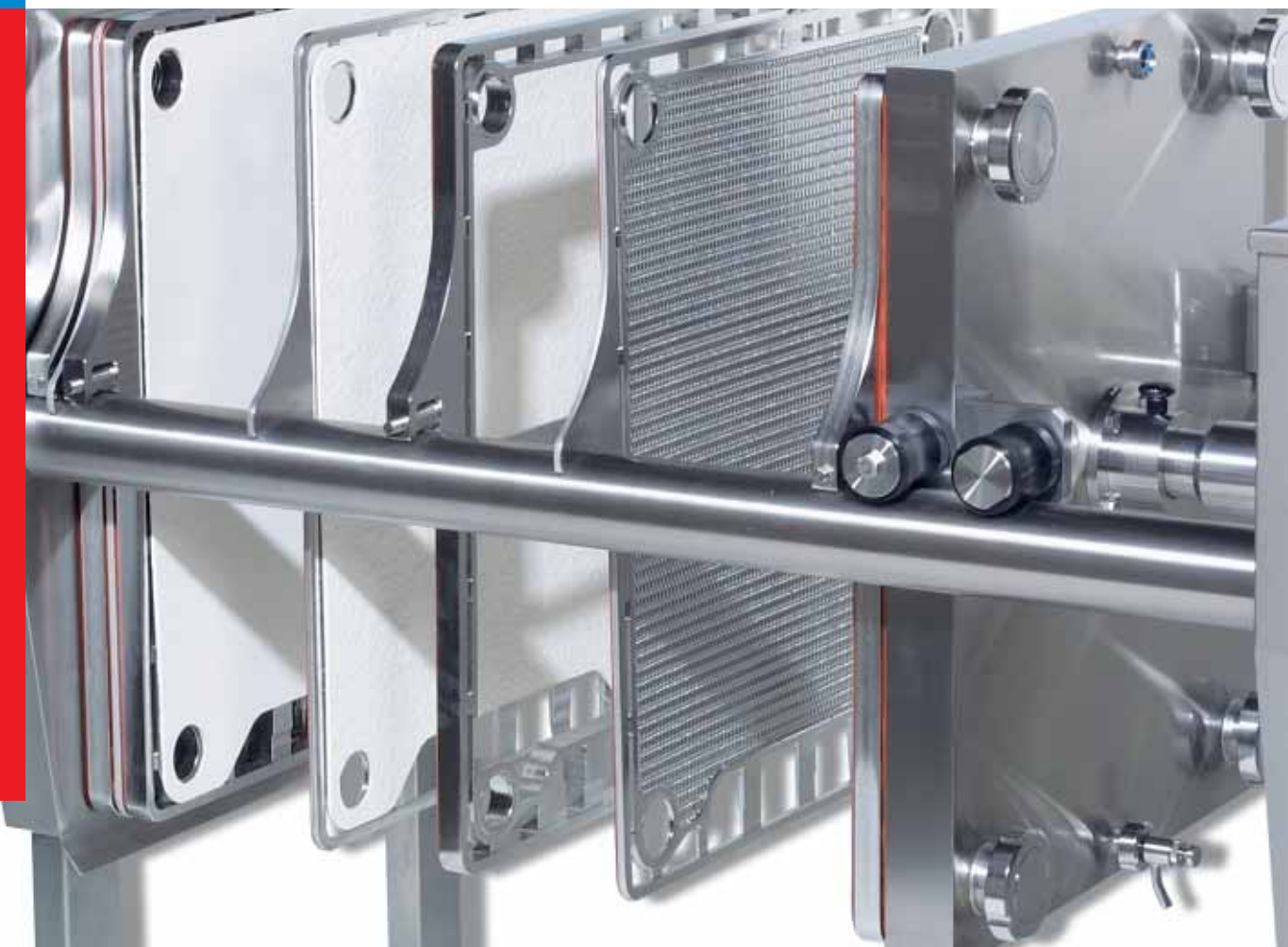
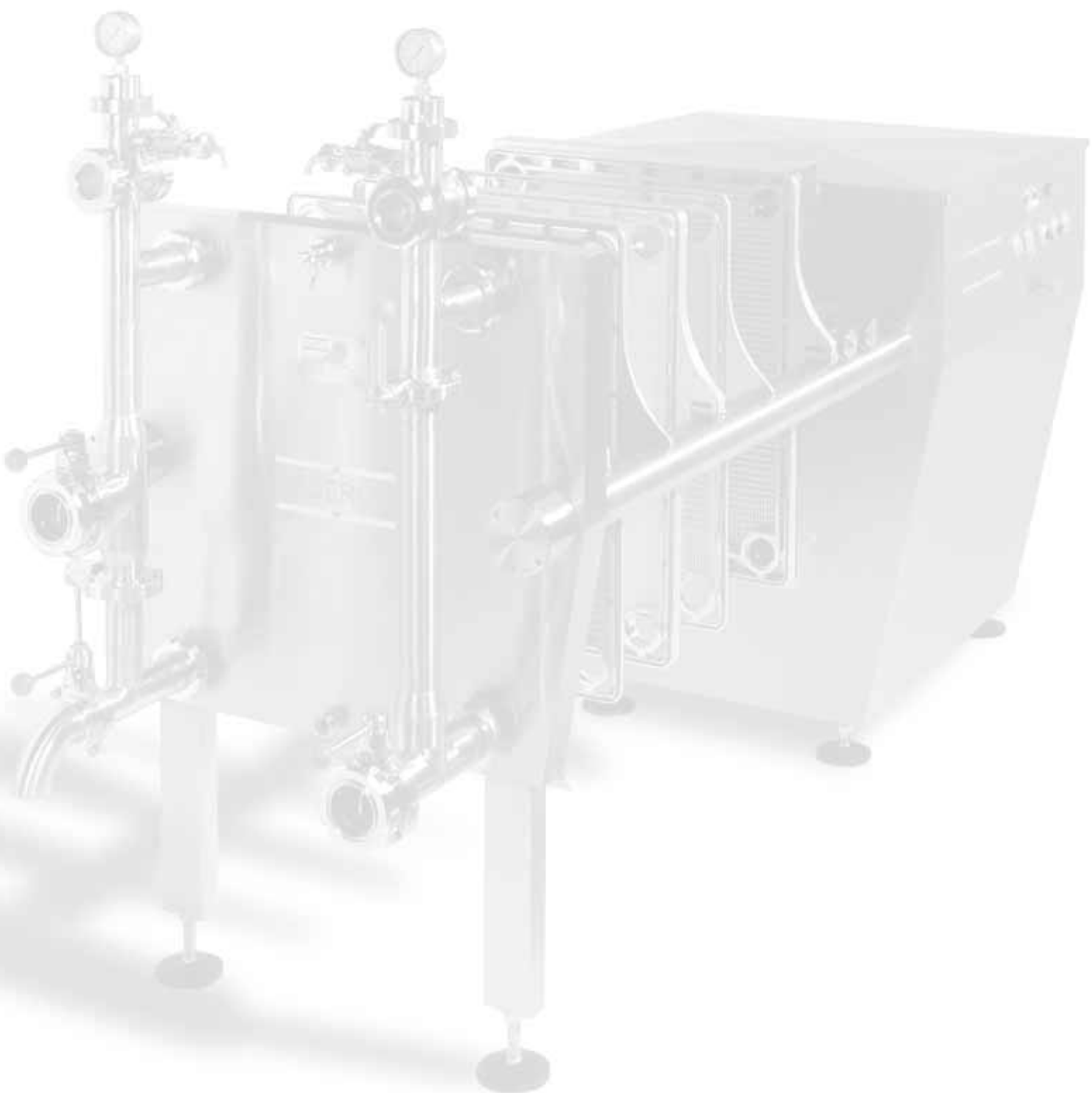


BECO INTEGRA PLATE

Enclosed Plate and Frame Filter BECO INTEGRA PLATE





The Concept

▶ BEGEROW – provider of complete solutions for depth filtration applications – develops, produces and sells top-quality depth filter media for a wide range of applications in the chemical, pharmaceutical and biotechnology industries. Further areas of application include the cosmetics industry and the beverage and food industries. Our process technology division offers a variety of equipment and system solutions for the application of BECO depth filter media.

With BECO INTEGRA PLATE, we offer an enclosed depth filtration system that optimally deals with demanding filtration tasks and guarantees safe process control.

The concept

BECO INTEGRA PLATE is an enclosed sheet filtration system, consisting of a filter chassis with hydraulic compression and a filter pack. The filter pack is made up of individual elements (optionally stainless steel or plastic). Depending on the filtration task, BECO depth filter sheets are used from coarse filtration to microbe removal. The BECO INTEGRA PLATE can optionally be used for cake filtration, sheet filtration or step filtration.

Three sizes are available:

- BECO INTEGRA PLATE 400 (filter elements 400 x 400 mm)
- BECO INTEGRA PLATE 600 (filter elements 600 x 600 mm)
- BECO INTEGRA PLATE 800 (filter elements 800 x 800 mm) with PP or PVDF available only

Filter types

1. Filter elements made from stainless steel with external chamber
BECO INTEGRA PLATE 400 EC
BECO INTEGRA PLATE 600 EC
2. Filter elements made from stainless steel with circumferential O-ring gasket
BECO INTEGRA PLATE 400 DC
BECO INTEGRA PLATE 600 DC
3. Filter elements made from plastic with external chamber
BECO INTEGRA PLATE 400 EP
BECO INTEGRA PLATE 600 EP
BECO INTEGRA PLATE 800 EP
4. Filter elements made from plastic (polypropylene or PVDF) with circumferential O-ring gasket
BECO INTEGRA PLATE 400 DP
BECO INTEGRA PLATE 600 DP
5. Filter elements made of plastic with external chamber, without gaskets
BECO INTEGRA PLATE 400 OEP
BECO INTEGRA PLATE 600 OEP
BECO INTEGRA PLATE 800 OEP

Customized types are available on request!



The Filter Pack

Configuration

Depending on the filtration task, the filter pack is made up of feed plates, filtrate plates or cake frames. For the filtration, BECO depth filter sheets are inserted between the filter elements and compressed.

For **sheet filtration**, a feed plate, a BECO depth filter sheet and a filtrate plate are used alternately.

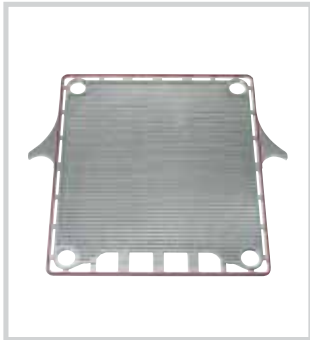
For **cake filtration**, the filter pack consists of a combination of cake frame and filtrate plate and an intermediate BECO depth filter sheet. The cake frame is used for holding the solids.

For step filtration, a baffle plate enables two-stage sheet filtration or primary precoat filtration followed by secondary sheet filtration.

The filter elements are designed to ensure secure insertion of the BECO depth filter sheet. Support rods below the filter pack are therefore not required.

The product channels of the filter elements are sealed via the BECO depth filter sheet; no additional gaskets are required. This ensures that only the filter element and the BECO depth filter sheet are in contact with the product.

The filter elements are manufactured following cGMP guidelines.



Your benefit

Minimized product loss through

- high safety due to enclosed design
- complete emptying thanks to specially designed filter elements

CIP/SIP capability

- the enclosed filter packet enables cleaning of the system without BECO depth filter sheets
- sterilization with BECO depth filter sheets
- no inaccessible corners or additional installation effort
- no dead spaces through special support of the BECO depth filter sheets
- easy to clean due to sanitary design of the filter elements
- cleaning validation possible on request (IQ/OQ)

High flexibility through

- different filter types
- three plate sizes 400 x 400, 600 x 600, and 800 x 800 mm¹⁾
- cake frames with different widths for cake filtration and separation of high particle concentrations
- comprehensive range of types available for selecting the appropriate BECO depth filter sheet



Pioneering filtration through

- ideal flow distribution and product supply due to optimum design and configuration of the supply channels
- uniform cake structure ensured by optimum distribution of the material to be filtered
- good ventilation due to the special design of the product channels situated at the top
- good dry-blowing of the cake
- optimum support of the BECO depth filter sheet based on tubular grid or ribbed plate
- sealing of the product channels via the BECO depth filter sheet

Simple handling through

- placement and accurate positioning of the BECO depth filter sheet with the aid of the support noses/cams at the filter elements
- free cleaning of the filter (discharge of the BECO depth filter sheets and cakes downwards into a collecting tray)

¹⁾ 800 x 800 mm with PP or PVDF available only

The Filter Types

BECO INTEGRA PLATE EC	BECO INTEGRA PLATE DC	BECO INTEGRA PLATE EP BECO INTEGRA PLATE OEP	BECO INTEGRA PLATE DP
Filter elements	Filter elements	Filter elements	Filter elements
With external chamber and circumferential gasket	With circumferential O-ring gasket	With external chamber and circumferential O-Ring gasket (without gasket for OEP type)	With circumferential O-ring gasket
External chamber		External chamber	
<ul style="list-style-type: none"> – Optimum CIP/SIP of the filter pack – Separate application of inert gas to the external chamber for rinsing, heating or cooling of the filter pack during the filtration – Application of different BECO depth filter sheet types 		<ul style="list-style-type: none"> – Optimum CIP/SIP of the filter pack – Separate application of inert gas to the external chamber for rinsing or cooling of the filter pack during the filtration – Application of different BECO depth filter sheet types 	
Specific features	Specific features	Specific features	Specific features
Feed plates/Filtrate plate	Feed plates/Filtrate plate	Feed plates/Filtrate plate	Feed plates/Filtrate plate
<ul style="list-style-type: none"> – Optimum support of the BECO depth filter sheets (tubular grid) – Optimum distribution of the unfiltered liquid and filtrate, therefore optimum utilization of the filter area – Width: 8 mm – Support noses on one side of the upper product channels 	<ul style="list-style-type: none"> – Optimum support of the BECO depth filter sheets (tubular grid) – Optimum distribution of the unfiltered liquid and filtrate, therefore optimum utilization of the filter area – Width: 10 mm – Support noses on one side of the upper product channels 	<ul style="list-style-type: none"> – Optimum support of the BECO depth filter sheets (ribbed plate) – Good distribution of the unfiltered liquid and filtrate, therefore good utilization of the filter area – Width: 26 mm (28 mm) – Support pins on both sides of the upper product channels 	<ul style="list-style-type: none"> – Optimum support of the BECO depth filter sheets (ribbed plate) – Good distribution of the unfiltered liquid and filtrate, therefore good utilization of the filter area – Width: 25 mm – Support pins on both sides of the upper product channels
Cake frame	Cake frame	Cake frame	Cake frame
<ul style="list-style-type: none"> – Frame width 8, 18, 25 or 40 mm – Support noses on one side of the upper product channels 	<ul style="list-style-type: none"> – Frame width 10, 18, 25 or 40 mm – Support noses on one side of the upper product channels 	<ul style="list-style-type: none"> – Frame width 20, 30, 40 and 60 mm – Support pins on both sides of the upper product channels 	<ul style="list-style-type: none"> – Frame width 20, 30, 40 or 60 mm – Support pins on both sides of the upper product channels
Material	Material	Material	Material
Stainless steel 1.4435/1.4404 (316 L), electrolytically polished	Stainless steel 1.4435/1.4404 (316 L) electrolytically polished	Plastic (polypropylene or PVDF, FDA listed)	Plastic (polypropylene or PVDF, FDA listed)
Gaskets	Gaskets	Gaskets (for EP only)	Gaskets
Made of silicone, EPDM, viton	O-ring gasket made of silicone, EPDM, viton, silicone/FEP-coated	O-ring gasket made of silicone, EPDM, viton	O-ring gasket made of silicone, EPDM, viton

The Filter Chassis

Filter chassis

The filter chassis consists of a fixed front cover and two carrier bars that are connected to the cross member on the opposite side. The individual filter elements are hung on the carrier bars. Several elements and BECO depth filter sheets form the filter pack together with the fixed and movable cover.

System benefits

Good adaptation to the filtration task through

- three filter types
- different plate sizes
- different chassis sizes
- step filtration using a baffle plate

High safety through

- automatic hydraulic pressure regulation
- low closing speed - no additional safety devices are required
- optional safety pressure transmitters

- two-hand operation of the function switches
- defined contact pressure
- pilot-openable non-return valve (prevents the filter pack from opening under operating pressure)

Simple handling and easy to clean through

- ergonomic design
- downwards cleaning into a collecting tray
- hanging support of the BECO depth filter sheet



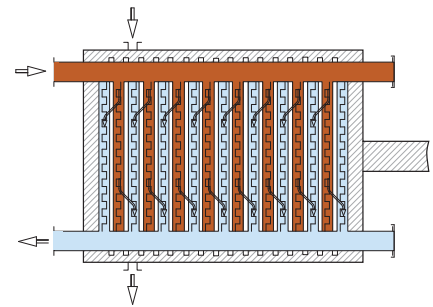
The Operating Principles



Sheet filtration

The material to be filtered is fed into two distribution channels of the filter pack via the riser. These distribute the liquid via openings into the feed plates/cake frames. The fluid to be filtered flows through the BECO depth filter sheet.

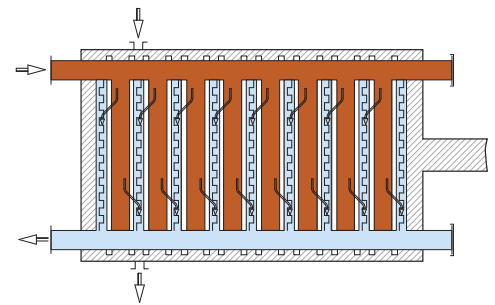
Particles and colloids are separated. The filtrate is fed to the collection channels via the filtrate plates and flows to the filter outlet via the riser pipe.



Sheet filtration

Cake filtration

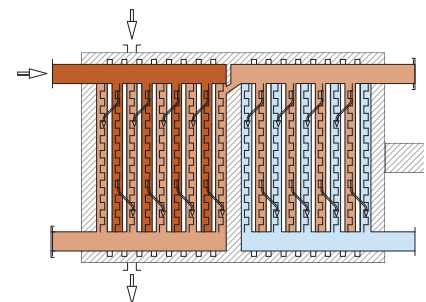
The unfiltrate with high particle concentration to be filtered is fed into the two distribution channels via the riser. These distribute the material to be filtered and the solids into the cake frames via the supply channels. Solids and liquid are separated by the depth filter medium. During the filtration cycle, the solids build up a cake at the BECO depth filter sheet. The liquid is clarified during this process. The filtrate is fed to the collection channels via the filtrate plates and flows to the filter outlet via the riser pipe.



Sheet filtration with wide cake frames

Step filtration (with baffle plate)

The baffle plate can be used to separate the filter into two areas. This enables two-stage sheet filtration or primary cake filtration followed by secondary sheet filtration.



Step filtration

The Comprehensive BEGEROW Service



Our service

BECO INTEGRA PLATE, the enclosed depth filtration system, offers optimum benefits through the combination with BECO depth filter sheets.

The following product ranges are available for selecting the optimum depth filter medium for the filtration task at hand:

		BECO depth filter sheets
In compliance with pharmaceutical processes	Mineral-free, high-purity depth filter medium for pharmaceutical applications	BECOPAD P range
	Depth filters with low endotoxin content for pharmaceutical applications	BECO PR range
	Support sheets for cake filtration in the pharmaceutical industry	BECO PR ENDURA BECO PR ENDURA S
	Filters containing activated carbon	BECO ACF 07
	Mineral-free, high-purity, depth filter medium for industrial applications	BECOPAD range
	Depth filters for standard applications	BECO standard range
	Depth filters for filtration of viscous liquids	BECO CP1
	Depth filters for filtration of highly viscous liquids	BECO CPS range
	Support sheets for cake filtration	BECO ENDURA

The BEGEROW range is complemented by our comprehensive service. Our process specialists will

provide support for the preparation of the requirement profile, its implementation in practice, the delivery

documentation including IQ/OQ, and staff training.

The Quality

Our customers' end products are subject to very rigorous and precisely defined quality requirements and different regulations.

Some production processes have to be protected from external influences and validated according to the FDA or cGMP requirements. For other production processes, the emissions released by the product are of particular concern. In these cases, the maximum allowable concentrations (MAK values) have to be complied with, and general emissions to the environment have to be prevented and the relevant conditions met.

As part of the overall manufacturing process, depth filtration has to produce safely reproducible and therefore economic results, in order to ensure uniform quality according to the respective requirements.

The BEGEROW quality policy therefore aims to produce and offer products and services with uniform and outstanding quality.

The processes required to achieve this are described, regularly checked for their performance and further developed. Staff at all levels of our company contribute to ensuring and continuously improving the quality of our products and services.

The procedures for the verification and documentation of our product quality are based on more than eighty years of experience in the production of depth filter media and are compatible with internationally recognized standard methods. Our devices and system solutions comply with national and international standards, directives and laws such as cGMP, FDA, EC, VDI, as well as internal client-specific regulations.

The scope of the qualification and verification activities and of the documentation is specified by the client within the design qualification (DQ) in form of a requirements specification.

The verification of the delivery, i.e.

- the acceptance from the manufacturer
- the verification of the technical documentation such as material certificates, conformity with FDA/cGMP relevant documents/forms, are defined and recorded in the installation qualification (IQ).

The operation qualification (OQ) comprises

- functional test
- commissioning
- training
- data logging/protocols
- data evaluation
- final report.

Innovative concepts for product development and quality assurance ensure maximum safety for your filtration tasks.



Technical Data

	BECO INTEGRA PLATE 400 EC	BECO INTEGRA PLATE 600 EC
Connections (round threaded connecting piece DIN 11851, flange DIN 2633, Tri-Clamp ISO 2852):		
– Inlet	DN 25/1"	DN 65/1"
– Outlet	DN 25/1"	DN 65/1"
– External chamber	DN 10/0.4"	DN 15/0.6"
Operating pressure	Max. 600 kPa (6 bar/87 psi)	Max. 600 kPa (6 bar/87 psi)
Differential pressure	Max. 400 kPa (4 bar/58 psi)	Max. 400 kPa (4 bar/58 psi)
Operating temperature	Max. 140 °C/284 °F	Max. 140 °C/284 °F
Materials:		
– Parts in contact with the product	1.4435	1.4435
– Other parts	1.4301	1.4301
– Gaskets	Silicone, EPDM, viton	Silicone, EPDM, viton
Filter area:		
– Sheet filtration	Max. 12 m ² /129.2 ft ²	Max. 50 m ² /538.2 ft ²
– Cake filtration	Max. 5.52 m ² /59.4 ft ² (40 mm cake frame)	Max. 21.33 m ² /229.6 ft ² (40 mm cake frame)
Effective filter area/filter element	0.12 m ² /1.3 ft ²	0.33 m ² /3.6 ft ²
Cake volume (usable)	Max. 98.9 l/26.1 gal	Max. 373 l/98.5 gal

	BECO INTEGRA PLATE 400 DC	BECO INTEGRA PLATE 600 DC
Connections (round threaded connecting piece DIN 11852, flange DIN 2633, Tri-Clamp ISO 2852):		
– Inlet	DN 25/1"	DN 65/1½"
– Outlet	DN 25/1"	DN 65/1½"
Operating pressure	Max. 600 kPa (6 bar/87 psi)	Max. 600 kPa (6 bar/87 psi)
Differential pressure	Max. 400 kPa (4 bar/58 psi)	Max. 400 kPa (4 bar/58 psi)
Operating temperature	Max. 140 °C/284 °F	Max. 140 °C/284 °F
Materials:		
– Parts in contact with the product	1.4435	1.4435
– Other parts	1.4301	1.4301
– Gaskets	Silicone, EPDM, viton, FEP coated	Silicone, EPDM, viton, FEP coated
Filter area:		
– Sheet filtration	Max. 12 m ² /129.2 ft ²	Max. 48 m ² /516.7 ft ²
– Cake filtration	Max. 5.52 m ² /59.4 ft ² (40 mm cake frame)	Max. 21.33 m ² /229.6 ft ² (40 mm cake frame)
Effective filter area/filter element	0.12 m ² /1.3 ft ²	0.33 m ² /3.6 ft ²
Cake volume (usable)	Max. 97 l/25.6 gal	Max. 352 l/93.0 gal

	BECO INTEGRA PLATE 400 EP/OEP	BECO INTEGRA PLATE 600 EP/OEP	BECO INTEGRA PLATE 800 EP/OEP
Connections (Tri-Clamp ISO 2852 / ASM BSP):			
– Inlet	1"	1½"	2"
– Outlet	1"	1½"	2"
– External chamber	1"	1½"	2"
Operating pressure	Max. 500 kPa (5 bar/72.5 psi) at max. 40 °C/104 °F	Max. 500 kPa (5 bar/72.5 psi) at max. 40 °C/104 °F	Max. 500 kPa (5 bar/72.5 psi) at max. 40 °C/104 °F
Differential pressure	Max. 300 kPa (3 bar/43.5 psi) at max. 40 °C/104 °F	Max. 300 kPa (3 bar/43.5 psi) at max. 40 °C/104 °F	
Operating temperature	Max. 85 °C/185 °F at max. 1 bar/14.5 psi	Max. 85 °C/185 °F at max. 1 bar/14.5 psi	Max. 85 °C/185 °F at max. 1 bar/14.5 psi
Materials:			
– Filter pack	PP (FDA listed)	PP (FDA listed)	PP (FDA listed)
– Parts in contact with the product	1.4435, PP	1.4435, PP	PP (FDA listed)
– Other parts	1.4301	1.4301	1.4301
– Gaskets	Silicone, EPDM, viton	Silicone, EPDM, viton	Silicone, EPDM, viton
Filter area:			
– Sheet filtration	Max. 7.60 m ² /81.8 ft ²	Max. 36.18 m ² /312.2 ft ²	Max. 58.96 m ² /634.6 ft ²
– Cake filtration	Max. 7.00 m ² /75.4 ft ² (30 mm cake frame)	Max. 33.48 m ² /175 ft ² (30 mm cake frame)	Max. 56.32 m ² /606.2 ft ² (30 mm cake frame)
Effective filter area/filter element	0.10 m ² /1.1 ft ²	0.27 m ² /3.12 ft ²	0.44 m ² /4.7 ft ²
Cake volume (usable)	Max. 126 l/33.3 gal (60 mm cake frame)	Max. 626 l/117.8 gal	Max. 1065 l/281.3 gal (60 mm cake frame)

	BECO INTEGRA PLATE 400 DP	BECO INTEGRA PLATE 600 DP
Connections (round threaded connecting piece DIN 11851, flange DIN 2633, Tri-Clamp ISO 2852):		
– Inlet	DN 25/1"	DN 65/1½"
– Outlet	DN 25/1"	DN 65/1½"
Operating pressure	Max. 500 kPa (5 bar/72.5 psi) at max. 20 °C/68 °F	Max. 500 kPa (5 bar/72.5 psi) at max. 20 °C/68 °F
Differential pressure	Max. 300 kPa (3 bar/43.5 psi) at max. 20 °C/68 °F	Max. 300 kPa (3 bar/43.5 psi) at max. 20 °C/68 °F
Operating temperature	Depending on material	Depending on material
Materials:		
– Filter pack	PP, PVDF	PP, PVDF
– Parts in contact with the product	1.4435, PP or PVDF	1.4435, PP or PVDF
– Other parts	1.4301	1.4301
– Gaskets	Silicone, EPDM, viton	Silicone, EPDM, viton
Filter area:		
– Sheet filtration	Max. 6.60 m ² /71 ft ²	Max. 29.00 m ² /312.2 ft ²
– Cake filtration	Max. 5.50 m ² /59.2 ft ² (30 mm cake frame)	Max. 22.68 m ² /244.1 ft ² (30 mm cake frame)
Effective filter area/filter element	0.11 m ² /1.18 ft ²	0.29 m ² /3.12 ft ²
Cake volume (usable)	Max. 102 l/27 gal (60 mm cake frame)	Max. 446 l/118 gal (60 mm cake frame)

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 whatever can be accepted. Misuse of the product will result in all warranties being voided, including any third-party commercial property rights.

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