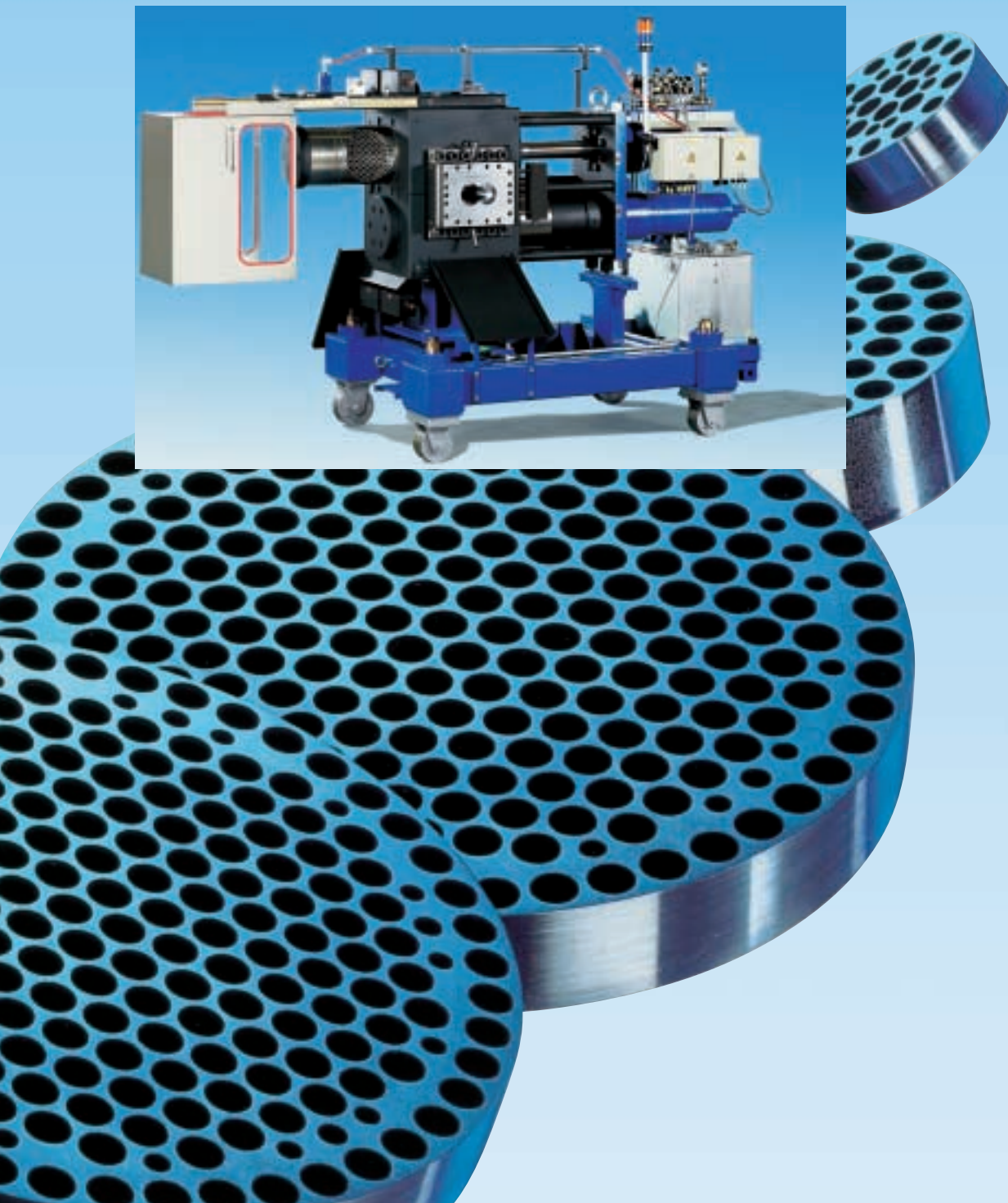




KREYENBORG 

Filtration Systems

for Processing of Thermoplastics



Our company philosophy

For more than 50 years innovative technology and trend-setting product developments, which have a definite place in the plastics industry, are associated with the name KREYENBORG. KREYENBORG has worked its way up to a world-wide acting company which has its place in the different fields of the plastics processing industry.



Our today's world requires a contribution to the conservation of natural resources, energy and waste reduction. We are not only responsible for the humanity of today, but also for our following generations.

We meet the world-wide demands and want to enlarge our position as market leader. Furthermore, we assure by our innovative solutions the economic and ecological sustainability of our customers.

A central role is attributed to our employees' quality conscientiousness and specialised knowledge. All priority is given to the observance of our customers' requirements and our internal quality aims.

Filtration Systems for Processing of Thermoplastics



KREYENBORG 

KREYENBORG GmbH
Coermühle 1-5
48157 Münster
Tel.: +49 (0)2 51/2 14 05-0
Fax.: +49 (0)2 51/2 14 05-6 67
e-mail: info@kreyenborg.de
www.kreyenborg.de



The quality management DIN EN ISO 9001: 2000 is an essential part of the company concept. It certifies quality capability and demonstrates that the operations of the company are controlled and well-structured.

Our customers can expect that we supply their equipment in impeccable condition – rapidly and at the date agreed on. Furthermore, they can be sure of a reliable function of our products, systems, lines, and services which have a long service life, even when intensively used.

In all fields of plastics processing we are a partner for our customers finding practice-oriented solutions, from the type construction to the individual special solution.

And yet our principle is quite simple: solid practical solutions – simple in handling, accurate and robust in use, economical in performance.

In the own technical laboratory of the BKG the particular task of our customers is simulated online. All production parameters are visualised. All information can be retained for later analyses or directly evaluated online.

Sales and service are realized by a world-wide network of sales partners. Our North American customers are attended by KREYENBORG INDUSTRIES in Lawrenceville, Atlanta. There a complete technical laboratory for individual customer trials is also available.



Principal office in Münster

**Discontinuous
Screen Changers
Type HS-Y, D- and LD-SWE**

12-15



**Continuous
Screen Changers
Type K- and LK-SWE**

16-19



**Continuous
Screen Changers
Type K-SWE-4K and
K-SWE-4K/75**

20-23



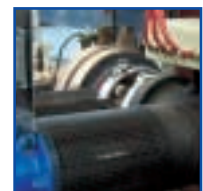
**Continuous
Backflush Screen Changers
Type K-SWE/RS,
K-SWE-4K/RS and
K-SWE-4K75/RS**

24-29



Power Backflush

30-31



**Breaker Plates,
Screen Retainers and
Accessories**

32-33



**Special and
Complete Solutions**

33-35



In-house and external production

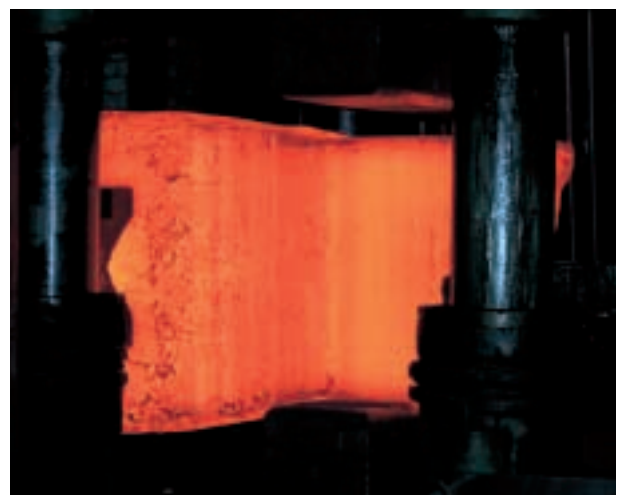
For more than 35 years, KREYENBORG has developed, designed and manufactured polymer melt filters. We attach importance to in-house manufacture, not just assembly, which is a general trend in the industry. For us, custom design means the sum of experience, design and, finally, in-house production.

Basically, a KREYENBORG screen changer is a steel housing in which a screen bearing piston is at 90° to the extrusion direction.



Metal-cutting machining of a screen bearing piston

The steels are grades that are commonly used in the plastics industry – DIN. 1.8519 or 1.2316 (stainless steel). All steels we use can be nitrided, with excellent results.



Open die forging of a housing blank



KREYENBORG's special processes assure the necessary fit between piston and housing because we work without seal. "The best seal is no seal."



Material DIN 1.8519 (31CrMoV9)	Material DIN 1.2316 (X36CrMo 17)
C 0,3 %	C 0,38 %
Si 0,3 %	Cr 16,0 %
Mn 0,6 %	Mo 1,0 %
Cr 2,5 %	Ni 0,8 %
Mo 0,2 %	
V 0,2 %	

The final borings in the housing are only made after they are pre-bored and subsequently stress-relieved. This guarantees that the tolerances can be kept (inside the boring) during fine boring.

After the fine or finest boring, the borings are honed and the screen bearing pistons are ground.



Honing of the housings



Machining of a housing on the boring machine

Filtration – a procedure

Polymer melts contain foreign substances and inhomogeneities which badly effect extrudate depending on dimension and quantity. Such contamination and inhomogeneity lead, for example, to breakage of fibres while spinning, hazes in blown film, changes of resistance in cable coating, or weak spots in pressure pipes.

Filtration in process engineering is defined as a means of trapping liquid and hard pieces in fluids by means of a filtration medium. Filtration has been used in the processing of plastics for a long time – not only since the 60's when we from KREYENBORG began to develop screen changers to suit the needs of our customers. The rapid development of plastics has demanded higher polymer quality standards and economic production, which KREYENBORG has been able to meet by ongoing development.

Filtration has met two challenges. On the one hand, the recycling of post consumer-material

and manufacturing waste have gained in economic importance, while on the other hand the constantly increasing quality standards necessitate the filtration when processing an ever increasing range of plastics. An example is the production of polyamide or polycarbonate pellets for optical applications such as mobile displays. Filtration is very important in compliance to high quality standards and essential for high quality production.

Stainless steel screen cloth is the preferred filtration medium in extrusion.

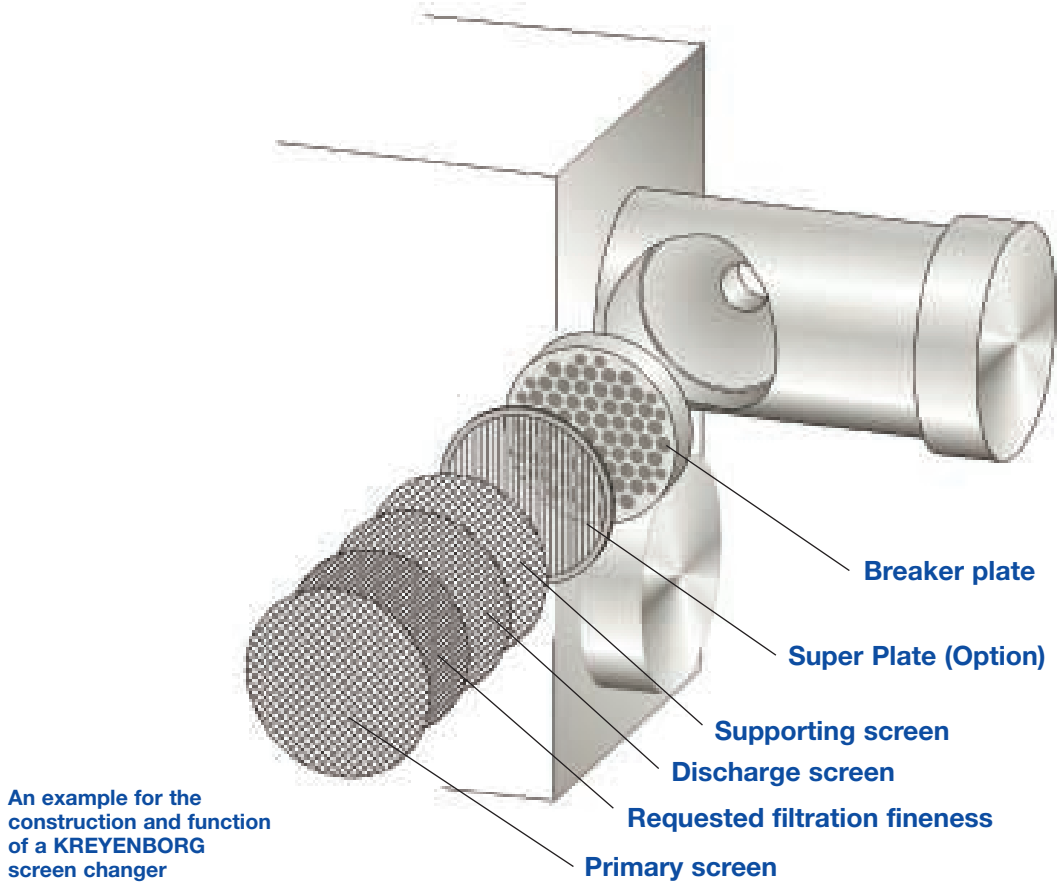
Screen packs (of several layers) are supported by a breaker plate within the screen changers' pistons. It goes without saying that screens of all qualities, weave and finenesses are available all over the world – a logical consequence of the sale of more than 10.000 KREYENBORG screen changers worldwide.



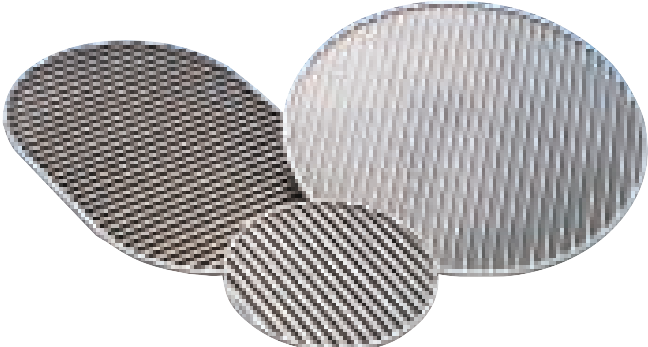
Contaminated and clean screen cloth



Screen packs can be assorted individually



Breaker plates made of special steel



Super Plates™ for the optimisation of the free filtration area

Construction and function of the KREYENBORG screen changers

We offer both continuous and discontinuous melt filtration systems.

Continuous screen changers offer economic efficiency as the manufacturing process is not interrupted during a screen change, the extruder continues to produce with a constant output.

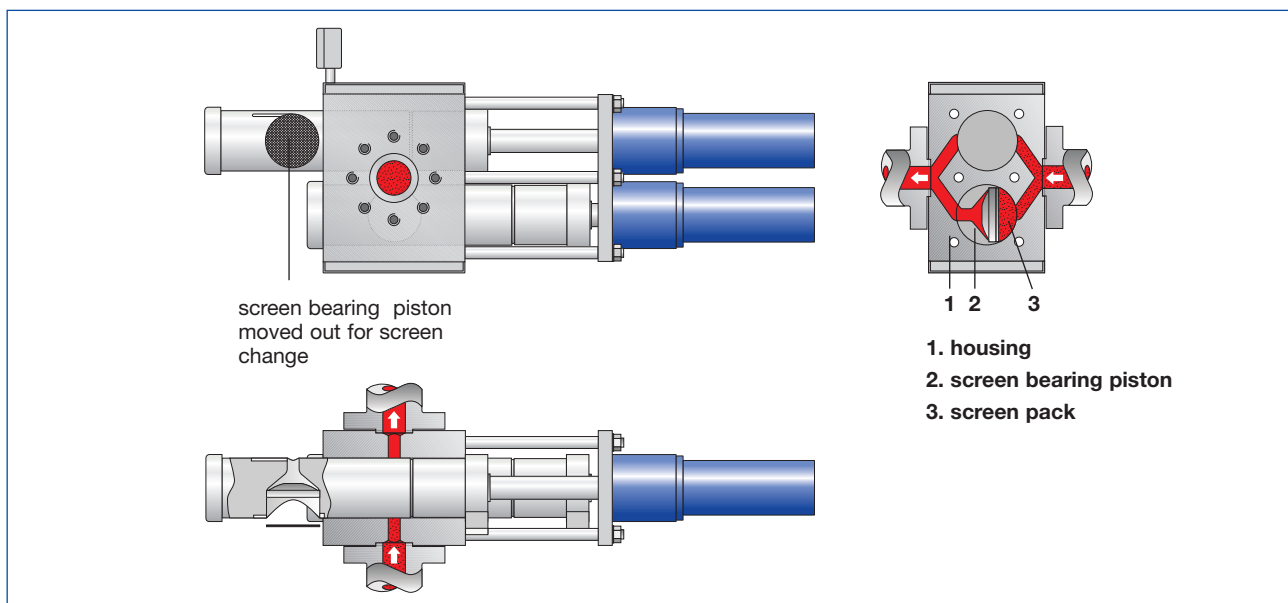
Discontinuous systems are only used for lightly contaminated polymers or if screens can conveniently be changed when the extruder is stopped for other reasons, i.e. change of polymer, colour or extrudate profiles etc.

KREYENBORG's K-SWE continuous operation screen changers have a housing with two tightly fitting screen bearing pistons.

Face to face sealing makes wearing seals obsolete, an enormous advantage for the customer as there are no leaks and maintenance is reduced to a minimum.

As a matter of principle, we in KREYENBORG feel responsible for the economic operation of our screen changers. A constant heating of the housing is achieved by heating cartridges or alternatively with gaseous or liquid heat transfer media. Insulation is fitted as standard, so there is minimal heat loss and protection.

The plastic melt is split evenly into two flow channels inside the screen changer housing and led to one screen cavity each. The screen packs in connection with the breaker plates act as a filter medium. To change a filter medium, the appropriate screen bearing piston is hydraulically moved out of the housing until the screen cavity is accessible. The contaminated screen pack can be removed and replaced by a clean pack. After this, the piston is moved back into the operating position. Venting the screen cavities reliably prevents the ingress of air into the manufacturing process avoiding, for instance, porous spots in the product or lines on a profile. During screen change the screen bearing piston which remains in the housing has enough capacity to take the complete melt flow. There is no disruption or interference of the manufacturing (during screen change).

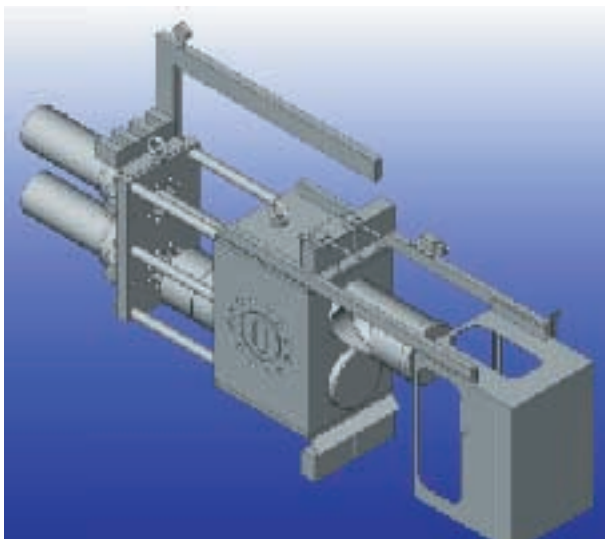


Construction and function of a continuous piston screen changer – schematic presentation of the screen change

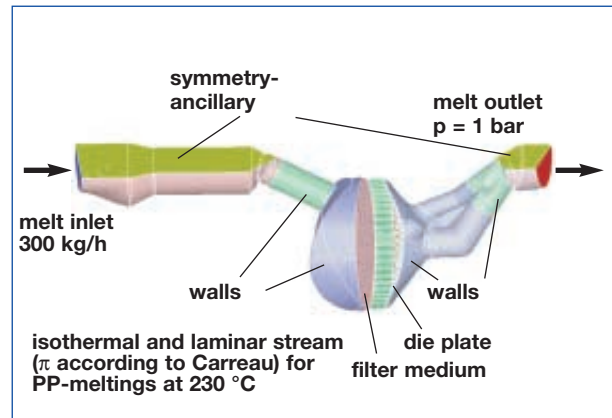
To define the size of screen changer we need to know the extruder output, polymer and grade, shear rate, expected contamination level and target pressure loss.

This data is fed into our computer modelling programme to indicate both the size of screen changer but also the optimum flow channel dimensions. The example shows the flow in a K-SWE-RS backflush screen changer. It clearly shows that the biggest part of the calculated pressure loss is produced by the filter element in front of the breaker plate.

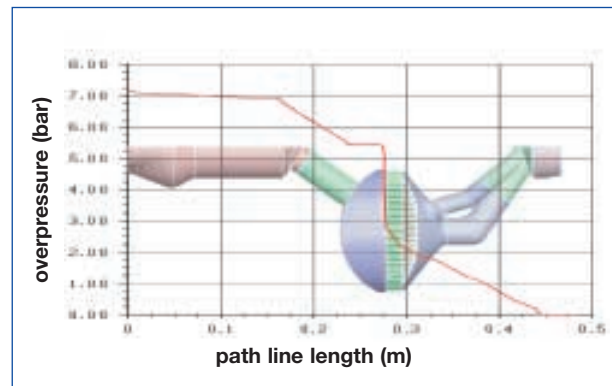
The inlet geometry of the screen changer interface to downstream components has to be designed to minimise shear the melt. For this, KREYENBORG offers adaptors taking into account the flow behaviour of the polymer to avoid high shear rates at the inlet into the screen changer.



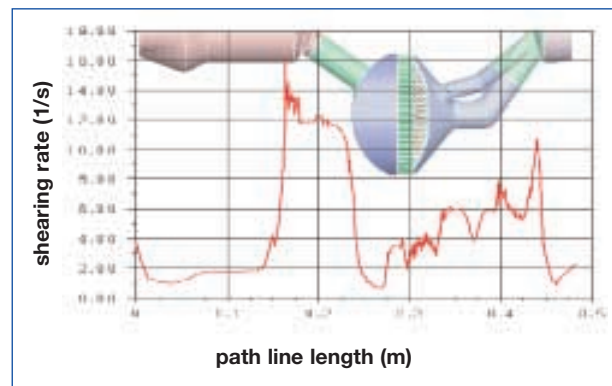
Construction of a continuous Screen Changer Type K-SWE



Boundary conditions for rheological design by means of CFD (Computational Fluid Dynamics)



Pressure loss in the flow channel



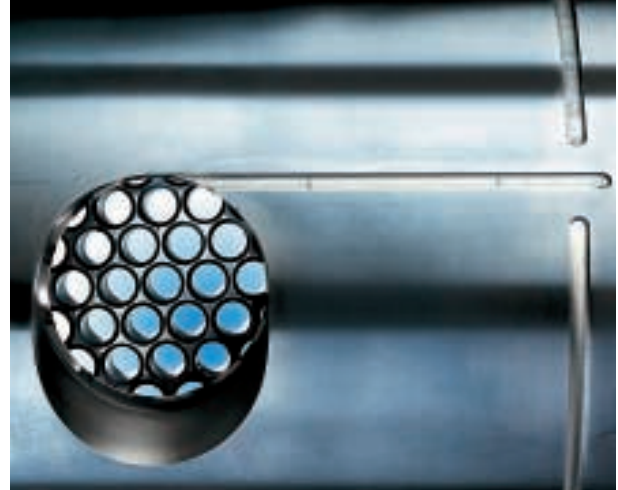
Shearing rate in the flow channel

Procedure to vent the screen cavity of continuously working screen changers after a screen change

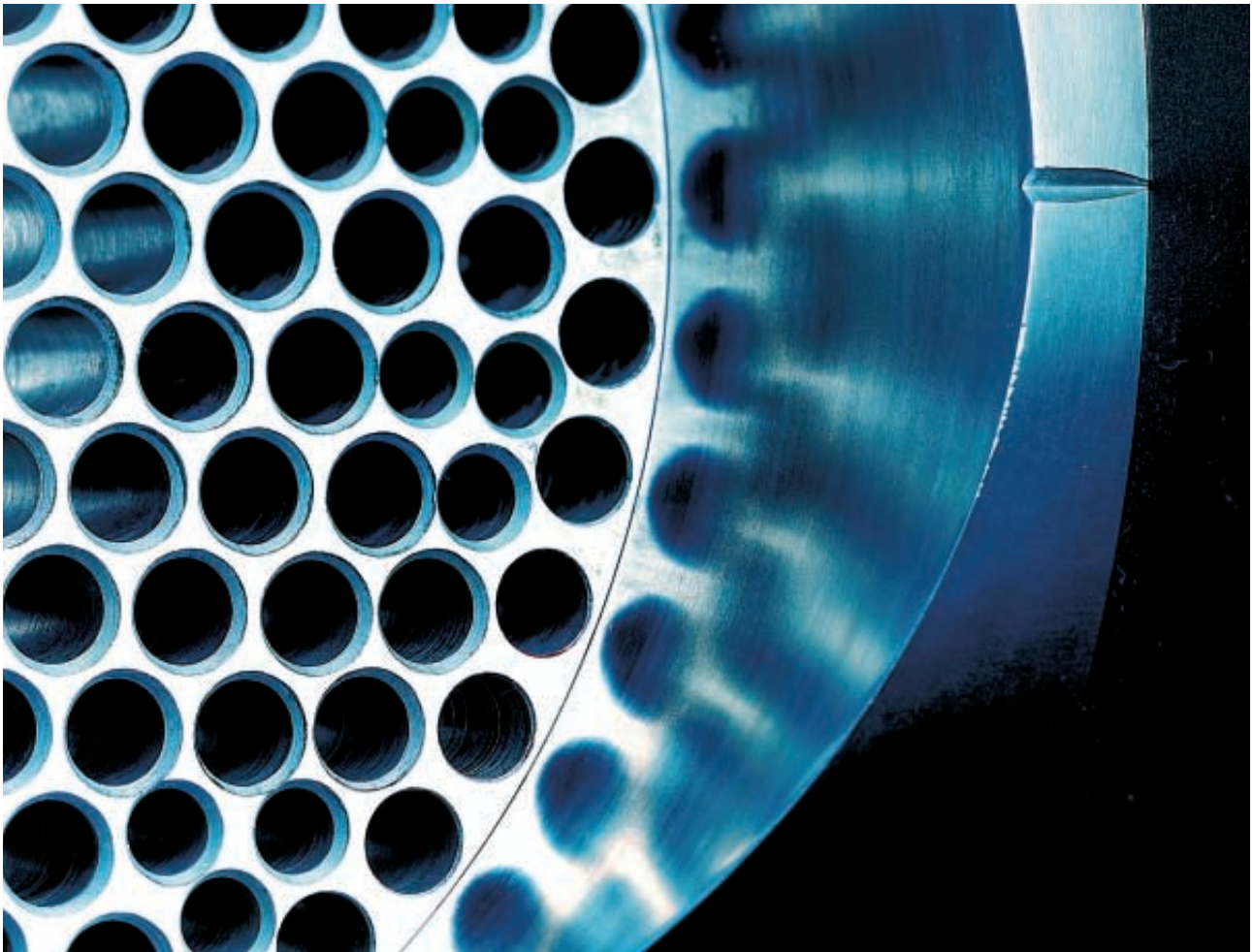
In almost all applications, when working with continuously working screen changers, air entrapment in the melt has to be avoided. KREYENBORG's continuous screen changers have venting grooves in the screen bearing piston which vent air from the screen cavity before the filter element returns to production.

A prefill groove takes melt from the material flow (in the piston screen changer) to refill the screen cavity with polymer, after the filter change. The screen piston can be indexed gradually to permit gradual prefill so that even in very difficult applications there is no air entrapment downstream of the screen changer, e.g. in the manufacturing of monofilaments.

The air contained in the cavity is vented through the grooves. This venting procedure can only be finished and the new screen put into the production when melt free of blow holes comes out of the venting grooves.



Design of the prefill groove of a piston screen changer

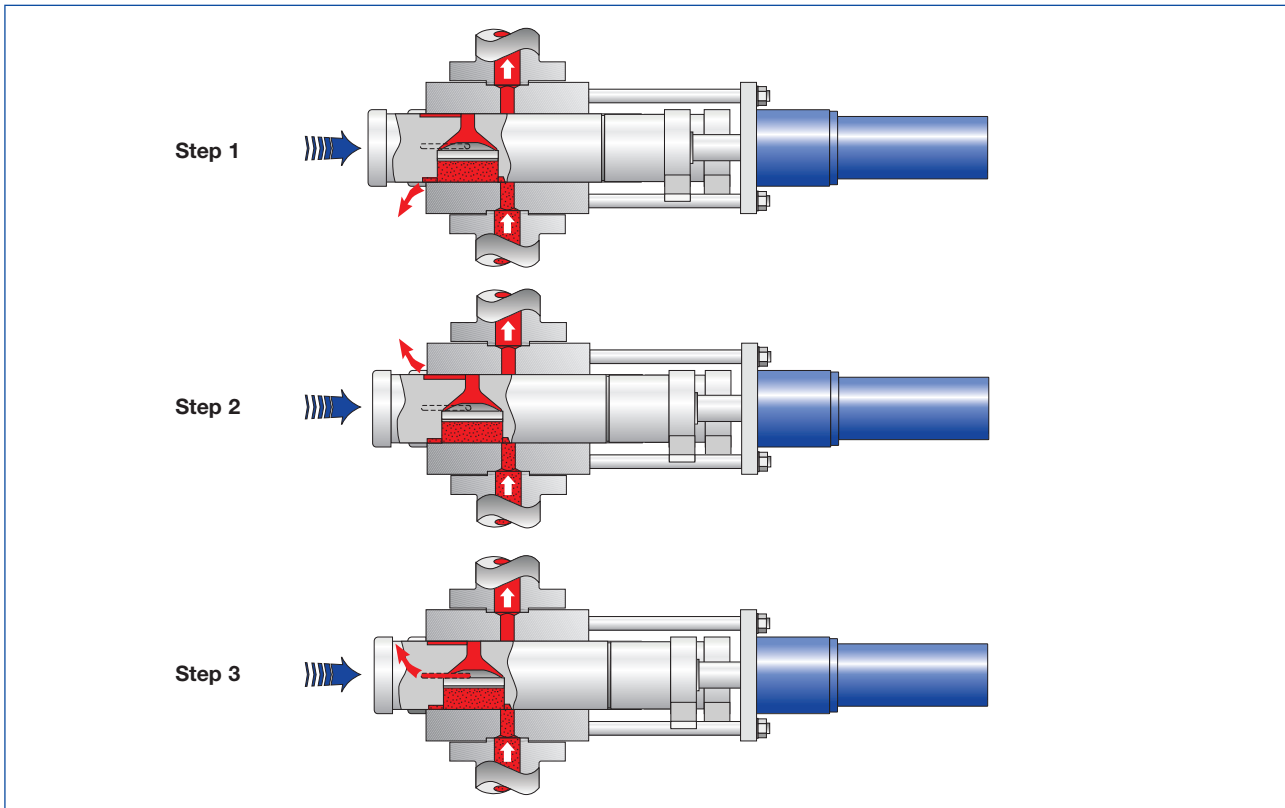


Presentation of the venting and cleaning grooves at the design of a piston screen changer for polycarbonate

The procedure of such a prefilling is displaced schematically in separate partial stages.

- Step 1: prefilling of the screen chamber by means of the prefill groove – the main part of the air is led outwards by the venting grooves

- Step 2: removal of bigger bubbles behind the screen cavity
- Step 3: removal of the last small bubbles behind the screen cavity



Procedure of the venting after a screen change in partial stages

ACS (Automatic Cycle System)

KREYENBORG filtration systems for sensitive processes can be supplied with ACS (Automatic Cycle System) control which fully automatically vents the screen cavity and returns the screen bearing piston into the production position.

Main components of the ACS-system are a Transsonar distance measuring device with an accuracy of 1/10 mm, a programmable controller (SPS) and an operator panel. During start-up, the factory preset parameters are optimised.

These parameters have always to be optimised for both the polymer and the process. The ACS control system can store up to 300 settings.

The KREYENBORG ACS-system has the following advantages:

- increased operating safety (less operator intervention)
- automatic venting
- absolute production safety because of unvarying screen changes
- constant quality in the final product
- easy handling



Operator panel for the ACS control system

KREYENBORG HS-Y Screen Changers

Screen Changer for discontinuous operation

The range of compact HS-Y Screen Changers are built to KREYENBORG's exacting quality standards and are the economic solution to filter polymers.

HS-Y discontinuous melt filters are used where screen changes are rarely needed, and it is no problem to stop production when changing screens.

Applications:

- quality filtration of virgin polymers
- protection of downstream equipment such as KREYENBORG gear pumps
- film extrusion with virgin polymer, co-extrusion etc.

Materials:

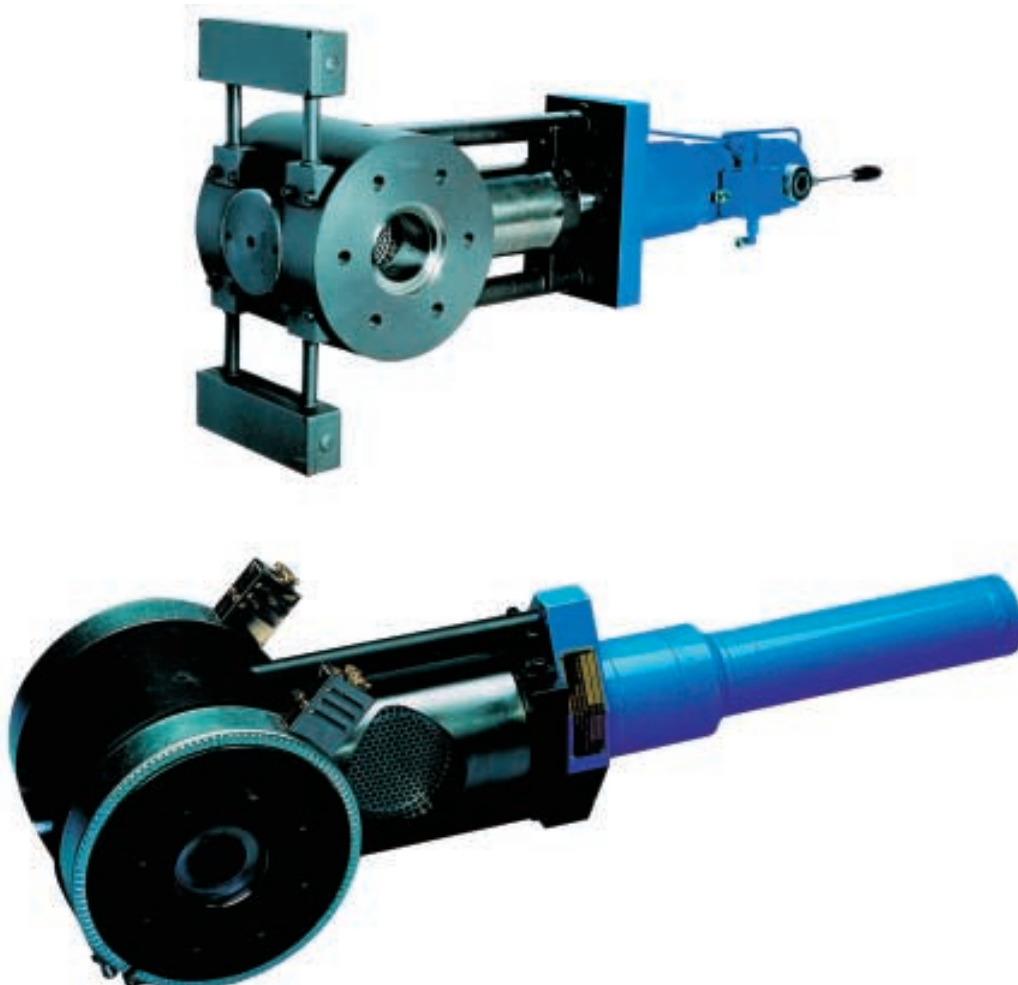
- suitable for all polyolefines as well as many technical polymers

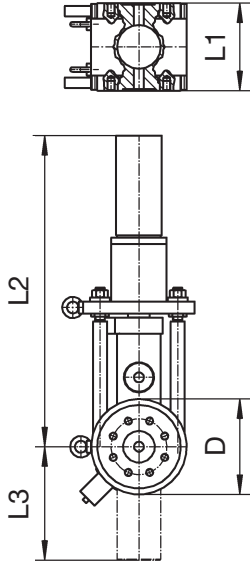
Customised special solutions:

- possibility to extract the extruder screw through the screen changer
- high pressure design (up to 600 bar)
- special die plates
- inexpensive integration of adaptors into and onto the round housing

Function:

- discontinuous melt filter
- the extruder has to be stopped momentarily (approx. 4 min.) for the screen change
- very simple handling for the operator
- piston is moved out of the housing hydraulically (the screen bearing piston remaining in the housing, blocks the flow channel). Once the new filter medium is inserted, the screen bearing piston is moved back into the operating position





Technical Data

Screen Changers Type HS-Y

Screen Changer Type	extruder output in kg/h	housing [mm]		deviations [mm]		screen Ø mm	screen cm²	weight kg	piece	heating by ring type heater		fitting	
		L1	D	L2	L3					dimensions mm	voltage Volt		heating capacity Watt
HS-Y-058	20- 80	190	200	737	230	58.3	27	70	2	D 170 x 36	220-240	910-1310	KA240
HS-Y-076	60-150	220	240	782	285	76.3	45	140	2	D 210 x 36	220-240	1130-1630	KA240
HS-Y-096	110-260	220	240	782	285	96.3	72	140	2	D 210 x 36	220-240	1130-1630	KA240
HS-Y-116	200-330	240	260	812	315	116.3	105	170	2	D 230 x 36	220-240	1210-1740	KA240
HS-Y-148	300-600	310	340	992	410	148.3	172	320	2	D 310 x 51	220-240	2340-3380	KA240

Screen Changer Type	extruder output in kg/h	housing [mm]		deviations [mm]		screen Ø mm	screen cm²	weight kg	piece	heating by heating cartridges		heating capacity Watt
		L1	D	L2	L3					dimensions mm	voltage Volt	
HS-Y-058	20- 80	190	200	737	230	58.3	27	70	4	20 x 120	220-240	910-1310
HS-Y-076	60-150	220	240	782	285	76.3	45	140	4	20 x 160	220-240	1130-1630
HS-Y-096	110-260	220	240	782	285	96.3	72	140	4	20 x 160	220-240	1130-1630
HS-Y-116	200-330	240	260	812	315	116.3	105	170	4	20 x 160	220-240	1210-1740
HS-Y-148	300-600	310	340	992	410	148.3	172	320	4	20 x 200	220-240	2340-3380

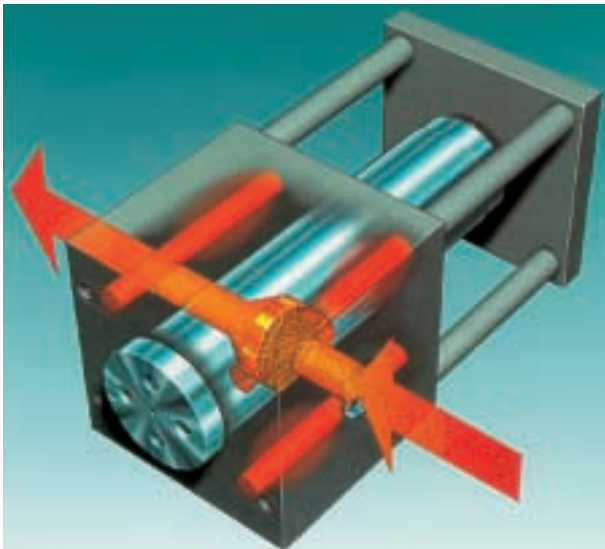
The output rates depend on the individual process parameters. Subject to design modifications.

KREYENBORG D-SWE and LD-SWE Screen Changers

Screen Changers for discontinuous operation

The discontinuously working melt filters type D-SWE and LD-SWE are used where screen changes are rarely needed, and it is no problem to stop production when changing screens.

D-SWE and LD-SWE have differing shapes of screen. While D-SWE screen changers have round screens, LD-SWE models have elongated screens which are significantly larger. These screen changers offer customers an attractive price/filtration area.



Applications:

- quality filtration of new products
- protection of downstream equipment
- compounding, semi-finished production, manufacturing of fibres, polymerisation, film extrusion (with virgin polymer), or reclaim with the LD-SWE

Materials for the D-SWE:

- suitable for almost all polymers
- special design for PMMA and PC available

Materials for the LD-SWE:

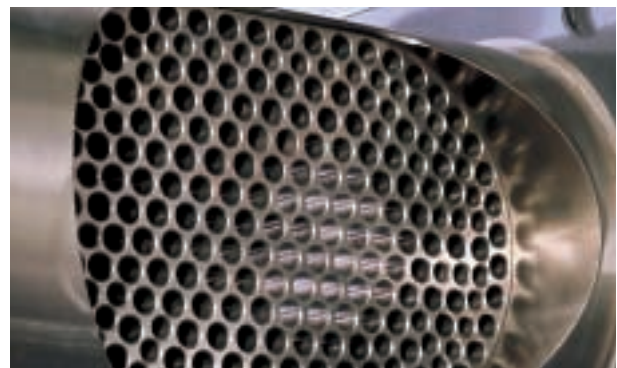
- suitable for all polyolefines including the most technical plastics

Customised special solutions:

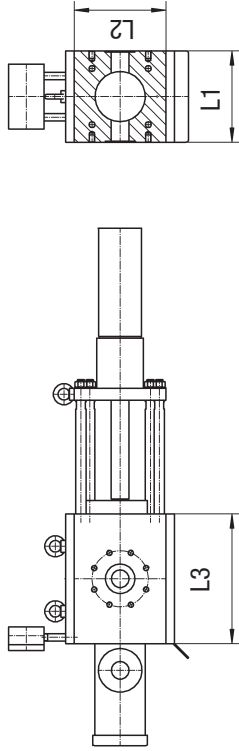
- possibility to extract the extruder screw through the screen changer
- different coating possibilities of the flow channels
- high pressure design (up to 1000 bar)
- inexpensive integration of a diverter boring in the screen bearing piston
- special die plates

Function:

- discontinuous melt filter
- the extruder has to be stopped momentarily (approx. 4 min.) for the screen change
- very simple handling for the operator
- piston is moved out of the housing hydraulically (the screen bearing piston remaining in the housing, blocks the flow channel). Once the new filter medium is inserted, the screen bearing piston is moved back into the operating position



Oval screen form of the LD-SWE



Technical Data

Screen Changers Type D-SWE and LD-SWE

Screen Changer Type	extruder output in kg/h	housing [mm]		L3	screen ∅ [mm]	screen cm ²	piece	heating by standard cartridges	
		L1	L2					voltage Volt	heating capacity Watt
D-SWE-030	5 - 30	110	110	200	30.0	7	4	220-240	
D-SWE-062	20 - 80	170	170	230	58.3	27	4	220-240	910-1090
D-SWE-080	60 - 150	220	220	250	76.3	45	4	220-240	1460-1740
D-SWE-100	110 - 260	220	220	250	96.3	72	4	220-240	1460-1740
D-SWE-120	200 - 330	250	250	310	116.3	105	4	220-240	1440-1760
D-SWE-152	300 - 600	310	310	440	148.3	172	4	380-420	2890-3530
D-SWE-180	410 - 820	380	380	440	176.3	244	4	380-420	3610-4410
D-SWE-200	610 - 1300	410	410	480	200.0	314	8	380-420	2890-3530
D-SWE-250	850 - 2800	460	460	540	230.3	415	8	380-420	2890-3530
D-SWE-280	1000 - 3500	500	500	590	250.0	490	8	380-420	3610-4410
D-SWE-300	1600 - 4600	580	580	640	270.0	572	8	380-420	4510-5510
D-SWE-380	2600 - 7000	695	695	750	340.0	908	12	380-420	4510-5510
D-SWE-410	4000 -10000	820	820	920	410.0	1320		recommendation oil/steam heating	
D-SWE-450	5000 -15000				450.0	1590		recommendation oil/steam heating	
LD-SWE-180	300 - 600	270	380	330	125 x 170	179	4	220-240	2260-2760
LD-SWE-290	600 - 1200	310	310	440	145 x 230	288	4	380-420	2890-3530
LD-SWE-405	800 - 2500	380	380	480	175 x 270	406	4	380-420	3610-4410
LD-SWE-515	1000 - 3500	410	410	560	200 x 300	514	8	380-420	3610-4410
LD-SWE-600	1600 - 4600	460	460	620	230 x 310	600	8	380-420	3610-4410
LD-SWE-730	2000 - 6000	500	500	680	250 x 345	734	8	380-420	4510-5510
LD-SWE-975	2600 - 8000	580	580	750	270 x 420	976	8	380-420	4510-5510
LD-SWE-1200	4000 -10000	695	695	950	340 x 430	1213	12	380-420	4960-6060
LD-SWE-1600	5000 -13000	695	695	950	340 x 550	1621	12	380-420	4960-6060
LD-SWE-2000	6000 -15000	820	820	1000	410 x 580	2020		recommendation oil/steam heating	

The output rates depend on the individual process parameters. Subject to design modifications.

KREYENBORG K-SWE and LK-SWE Screen Changers

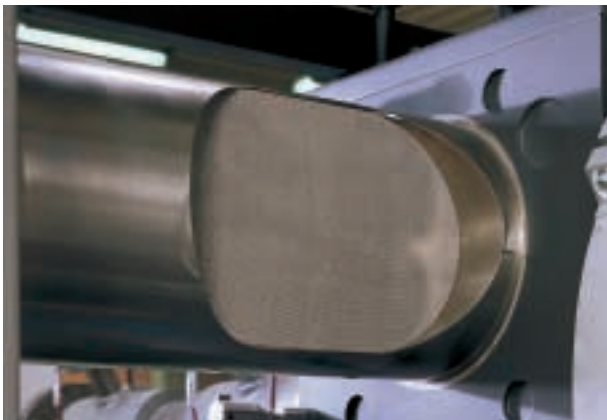
Screen Changers for continuous, process constant operation

Continuous operation means that during screen change the screen bearing piston, which remains in the housing, has enough capacity to take the complete melt flow. There is no disruption or interference to manufacturing (during screen change). KREYENBORG continuous screen changers are well proven, having been on the market for more than 35 years.



K-SWE with eight-to-round adaptor

Exemplary the K-SWE-160 is compared with the LK-SWE 290: For the LK-SWE is determined for the same installation size a screen area increasing of 68 %.

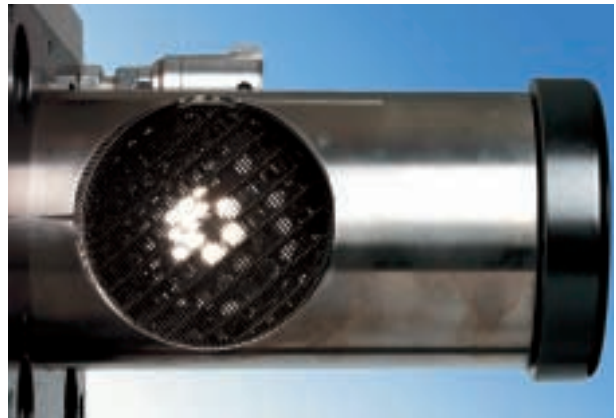


Screen cavities of a LK-SWE



Series production K-SWE 100

The construction of the LK-SWE is similar to the construction of the K-SWE with the difference that it possesses two elongated screen cavities which are significantly larger. These screen changers offer customers an attractive price/filtration area.



Screen cavities of a K-SWE

Applications for the K-SWE:

- laboratory applications up to large polymerisation lines
- compounding, semi-finished production, recycling, manufacturing of fibres, polymerisation, film extrusion

Materials:

- suitable for almost all polymers
- special design for PMMA and PC available

Applications for the LK-SWE:

- higher outputs and greater contamination
- for semi-finished production, recycling, polymerisation

Materials:

- suitable for all polyolefines as well as for most of the technical plastics

Customised special solutions:

- various coatings in the flow channels
- special breaker plates
- customised adaption
- rheologically optimised adaption
- different installation options
- high pressure design – up to 800 bar (K-SWE)

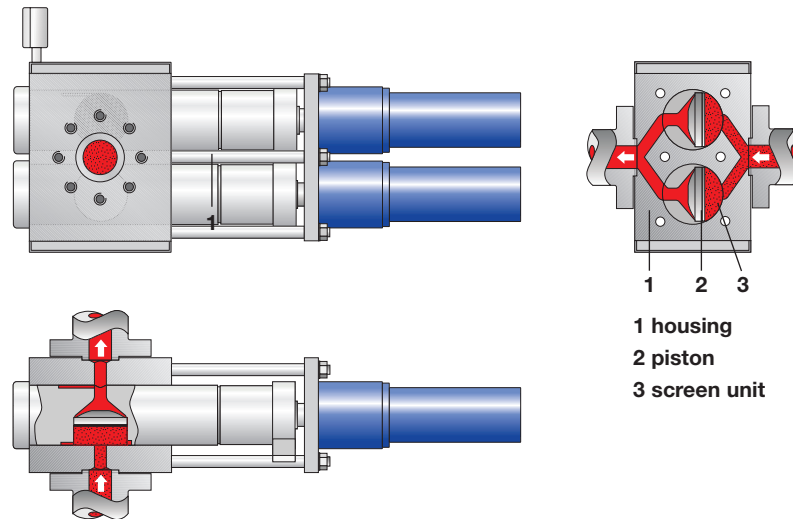
Function:

- continuous operation melt filter
- 100 % venting by venting grooves (see page 10)
- 2 screen cavities
- operation and screen change on one side
- simple handling for the operator (optionally manual or automatic)

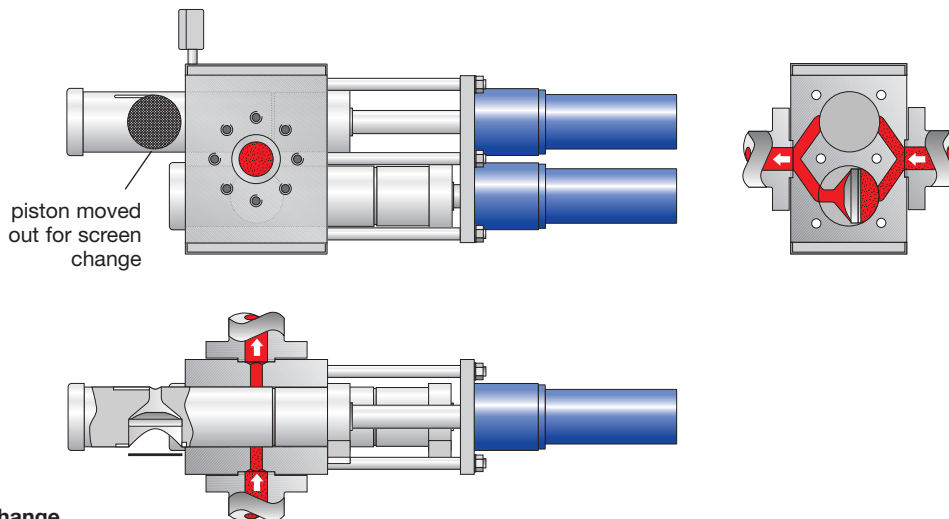


Cut-away drawing of a K-SWE (screen cavities, heating cartridges and flow channels viewable)

Functional description



The heated steel housing has two screen bearing pistons each with one screen cavity. The plastic melt is split evenly into two flow channels inside the screen changer housing and led to one screen cavity each before being brought together again after filtration. The exchange of the screens is effected when reaching a chosen Delta-p.



Screen change

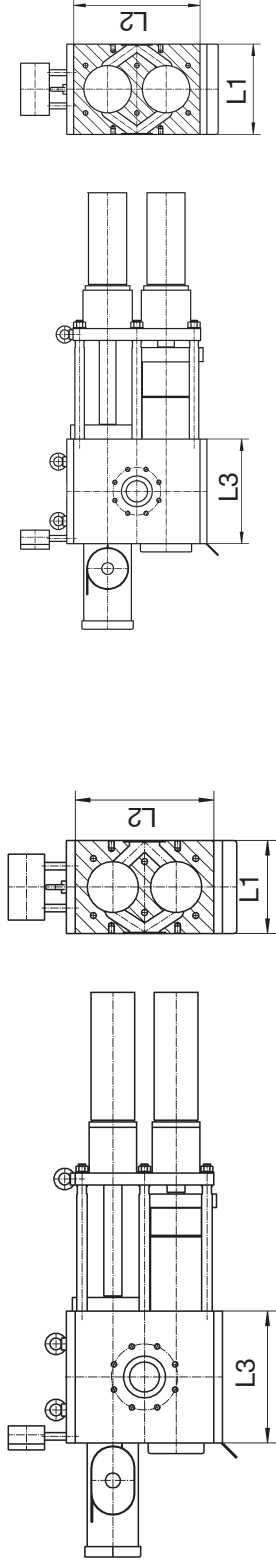
To change a filter medium, the appropriate screen pack bearing piston is hydraulically moved out of the housing until the screen cavity is accessible. The contaminated screen pack can be removed and replaced by a clean pack. After this, the piston is moved back into the operating position. During screen change the screen bearing piston which remains in the housing has enough capacity to take the complete melt flow.



LK-SWE 1600



LK-SWE 600



Technical Data

Screen Changers Type K-SWE and LK-SWE

Screen Changer Type	extruder output in kg/h	L1	housing [mm]	L3	screen Ø [mm]	screen cm ²	weight in kg	piece	heating by standard cartridges voltage Volt	heating capacity Watt
K-SWE-030	5 - 30	110	160	200	30.0	2 x 7	60	4	220-240	630
K-SWE-050	25 - 60	130	200	230	46.3	2 x 17	110	4	220-240	800
K-SWE-080	40 - 180	170	260	230	58.3	2 x 27	200	6	220-240	910-1090
K-SWE-100	80 - 280	220	310	250	76.3	2 x 45	290	6	220-240	1460-1740
K-SWE-101	140 - 380	220	310	250	96.3	2 x 72	290	6	220-240	1460-1740
K-SWE-121	200 - 530	250	360	310	116.3	2 x 105	410	6	220-240	1440-1760
K-SWE-125	300 - 700	270	380	330	125.0	2 x 122	470	6	220-240	2260-2760
K-SWE-160	420 - 1080	310	460	440	148.3	2 x 172	820	6	380-420	2890-3530
K-SWE-180	700 - 1500	380	530	440	176.3	2 x 244	1100	6	380-420	3610-4410
K-SWE-200	840 - 1900	410	600	480	200.0	2 x 314	1650	10	380-420	3610-4410
K-SWE-250	1100 - 2600	460	680	540	230.3	2 x 415	2200	12	380-420	2890-3530
K-SWE-280	2400 - 4400	500	760	590	250.0	2 x 490	2950	12	380-420	3610-4410
K-SWE-300	3000 - 6000	580	850	640	270.0	2 x 572	3700	16	380-420	4510-5510
K-SWE-380	5000 - 15000	695	1020	750	340.0	2 x 908	6800	20	380-420	4510-5510
K-SWE-410	6500 - 25000	695	1230	920	410.0	2 x 1320	8100	recommenda- tion oil/steam heating	recommenda- tion oil/steam heating	4510-5510
K-SWE-450	8000 - 30000	900	1350	1010	450.0	2 x 1590	10000	recommenda- tion oil/steam heating	recommenda- tion oil/steam heating	4510-5510
LK-SWE-180	420 - 1080	270	380	330	125 x 170	2 x 179	475	6	220-240	2260-2760
LK-SWE-290	700 - 1500	310	460	440	145 x 230	2 x 288	835	6	380-420	2890-3530
LK-SWE-405	1100 - 2600	380	530	480	175 x 270	2 x 406	1150	6	380-420	3610-4410
LK-SWE-515	2400 - 4400	410	600	560	200 x 300	2 x 514	1800	10	380-420	3610-4410
LK-SWE-600	3000 - 6000	460	680	620	230 x 310	2 x 600	2400	12	380-420	3610-4410
LK-SWE-730	4000 - 10000	500	760	680	250 x 345	2 x 734	3400	12	380-420	4510-5510
LK-SWE-975	6000 - 16000	580	850	750	270 x 420	2 x 976	4200	16	380-420	4510-5510
LK-SWE-1200	6500 - 24000	695	1020	950	340 x 430	2 x 1213	8000	recommenda- tion oil/steam heating	recommenda- tion oil/steam heating	4960-6060
LK-SWE-1600	80000 - 300000	695	1020	950	340 x 550	2 x 1621	10000	recommenda- tion oil/steam heating	recommenda- tion oil/steam heating	4960-6060
LK-SWE-2000	10000 - 35000	820	1230	1000	410 x 580	2 x 2020	10000	recommenda- tion oil/steam heating	recommenda- tion oil/steam heating	4960-6060

The output rates depend on the individual process parameters. Subject to design modifications.

KREYENBORG K-SWE-4K and K-SWE-4K/75 Screen Changers

Continuous operation Screen Changers with 4 screens

Continuous operation polymer melt filters K-SWE-4K and 4K/75 are used for processes requiring a large filtration area and high throughput rates.



K-SWE-4K

Equipped with 2 screen cavities per screen bearing piston, these screen changers offer a large filtration area with a compact design. The 4 screen cavities guarantee absolute constant polymer filtration even for sensitive processing processes.

The K-SWE-4K/75 differs from the K-SWE-4K in that during a screen change 75 % of the filtration area remains in production, giving constant pressure.

Applications of the K-SWE-4K:

- processes with high throughput rates
- compounding, semi-finished production, recycling, manufacturing of fibres, polymerisation, film extrusion

Applications of the K-SWE-4K/75:

- processes which require a large filtration area and process stability, e.g. manufacturing of fibres

Materials:

- suitable for almost all polymers
- special design for PMMA and PC available

Customised special solutions:

- various coatings in the flow channels
- special breaker plates

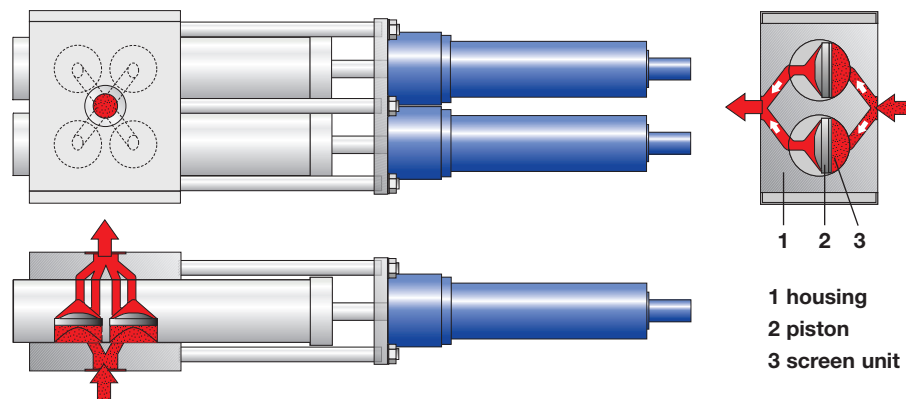
Function:

- continuous operation melt filter
- 100 % venting by venting grooves (see page 10)
- 4 screen cavities
- simple handling for the operator
- for the K-SWE-4K optional ACS control system
- for the K-SWE-4K/75 standard ACS control system

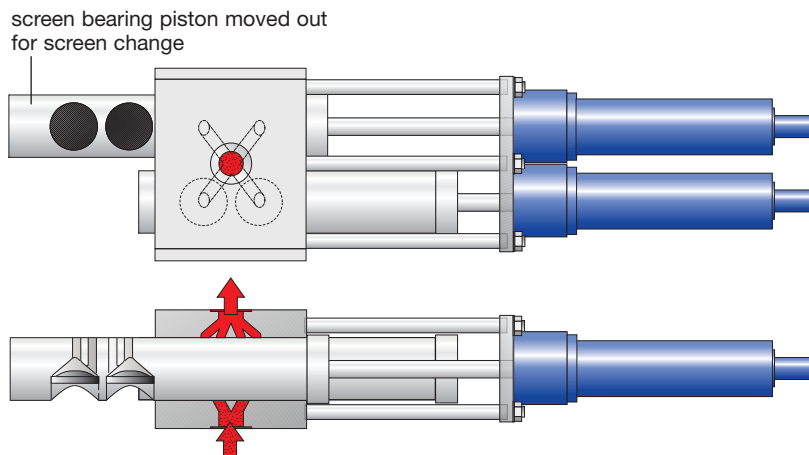


K-SWE-4K/75

Functional description of the K-SWE-4K



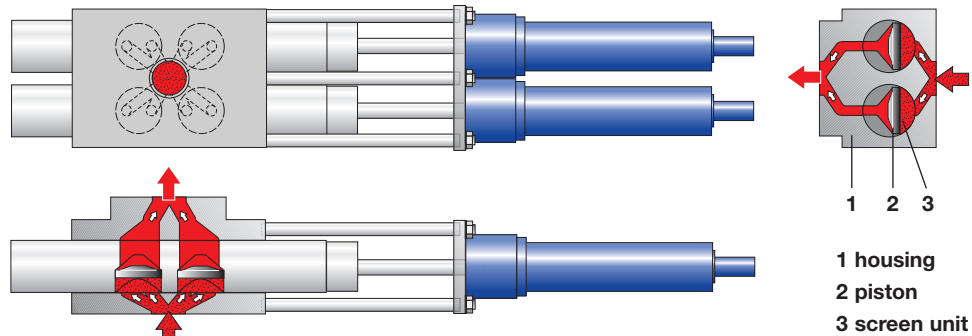
The heated steel housing has two screen bearing pistons each with two screen cavities. The plastic melt is split evenly into four flow channels inside the screen changer housing and led to one screen cavity each before being brought together again after filtration. The exchange of the screens is effected when reaching a chosen Delta-p.



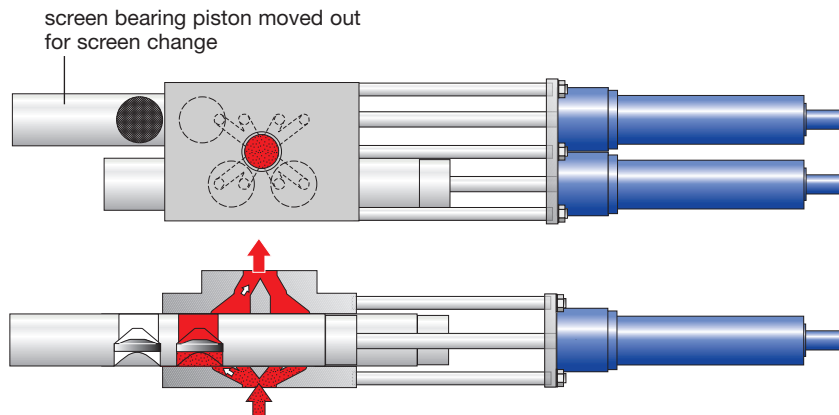
Screen change

To change a filter medium, the appropriate screen bearing piston is hydraulically moved out of the housing until the screen cavity is accessible. The contaminated screen pack can be removed and replaced by a clean pack. After this, the piston is moved back into the operating position. During screen change the screens remaining in the housing have enough capacity to take the complete melt flow.

Functional description of the K-SWE-4K/75



The heated steel housing has two screen bearing pistons each with two screen cavities. The plastic melt is split evenly into four flow channels inside the screen changer housing and led to one screen cavity each before being brought together again after filtration. The exchange of the screens is effected when reaching a chosen Delta-p.

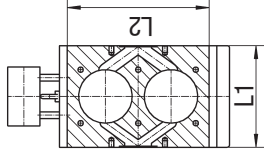
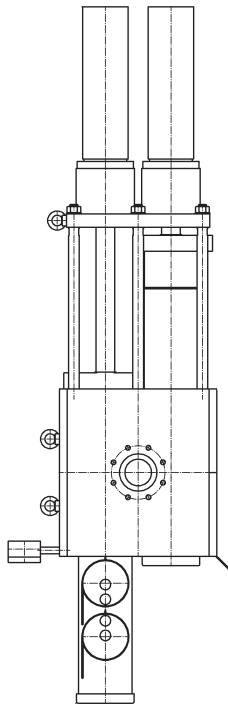


Screen change

To change a filter medium, the appropriate screen bearing piston is hydraulically moved out of the housing until the screen cavity is accessible. The contaminated screen pack can be removed and replaced by a clean pack. After this, the piston is moved back into the operating position. During screen change the three screens remaining in the housing have enough capacity to take the complete melt flow.



Adaptor connection



Technical Data

Screen Changers Type K-SWE- 4K and K-SWE-4K-75

Screen Changer Type	extruder output in kg/h	L1	L2	housing [mm]	screen	cm ²	piece	dimensions [mm]	voltage Volt	heating cartridges heating capacity Watt
K-SWE-080-4K-75	80 - 360	170	260	L2	Ø mm	4 x 27	6		220-240	
K-SWE-100-4K-75	160 - 560	220	310			4 x 45	6		220-240	
K-SWE-101-4K-75	280 - 760	220	310			4 x 72	6		220-240	
K-SWE-121-4K-75	400 - 1100	250	360			4 x 105	6		220-240	
K-SWE-125-4K-75	600 - 1400	270	380			4 x 122	6	20 x 450	220-240	3660-4360
K-SWE-160-4K-75	800 - 2000	310	460			4 x 154	6		380-420	
K-SWE-180-4K-75	1400 - 3000	380	530			4 x 244	6	20 x 600	380-420	4510-5510
K-SWE-200-4K-75	1700 - 3800	410	600			4 x 314	10	20 x 700	380-420	4510-5510
K-SWE-250-4K-75	2200 - 5200	460	680			4 x 415	12	20 x 800	380-420	4510-5510
K-SWE-280-4K-75	4800 - 8800	500	760			4 x 490	12		380-420	
K-SWE-300-4K-75	6000 - 12000	580	850			4 x 572	16	20 x 900	380-420	4960-6060
K-SWE-380-4K-75	10000 - 30000	695	1020			4 x 908	40		recommendation oil/steam heating	
K-SWE-410-4K-75	13000 - 40000	820	1230			4 x 1320	48		recommendation oil/steam heating	
K-SWE-450-4K-75	16000 - 60000	900				4 x 1590			recommendation oil/steam heating	
K-SWE-080-4K	80 - 360	170	260			4 x 27	6		220-240	
K-SWE-100-4K	160 - 560	220	310			4 x 45	6		220-240	
K-SWE-101-4K	280 - 760	220	310			4 x 72	6		220-240	
K-SWE-121-4K	400 - 1100	250	360			4 x 105	6		220-240	
K-SWE-125-4K	600 - 1400	270	380			4 x 122	6		220-240	
K-SWE-160-4K	800 - 2000	310	460			4 x 154	6	20 x 550	380-420	4510-5510
K-SWE-180-4K	1400 - 3000	380	530			4 x 244	6		380-420	
K-SWE-200-4K	1700 - 3800	410	600			4 x 314	10		380-420	
K-SWE-250-4K	2200 - 5200	460	680			4 x 415	12		380-420	
K-SWE-280-4K	4800 - 8800	500	760			4 x 490	12		380-420	
K-SWE-300-4K	6000 - 12000	580	850			4 x 572	16	20 x 800	380-420	4510-5510
K-SWE-380-4K	10000 - 30000	695	1020			4 x 908	20	20 x 900	380-420	4960-6060
K-SWE-410-4K	13000 - 40000	820	1230			4 x 1320	48	20 x 550	380-420	3610-4410
K-SWE-450-4K	16000 - 60000	900	1350			4 x 1590			recommendation oil/steam heating	

The output rates depend on the individual process parameters. Subject to design modifications.

KREYENBORG K-SWE/RS Screen Changers

Backflush Screen Changers for continuous operation

KREYENBORG Backflush Screen Changers are used where longer filter life is needed. Of course there is no disruption or interference of the manufacturing during a screen change or the backflush. The backflush starts automatically when a pre-defined pressure level is reached.

Applications:

- laboratory applications up to large polymerisation lines
- compounding, semi-finished production, recycling, manufacturing of fibres, polymerisation, film extrusion

Materials:

- suitable for almost all polymers
- special design for PMMA and PC available

Customised special solutions:

- various coatings in the flow channels
- special breaker plates and screen retainers
- customised adaption
- rheologically optimised adaption

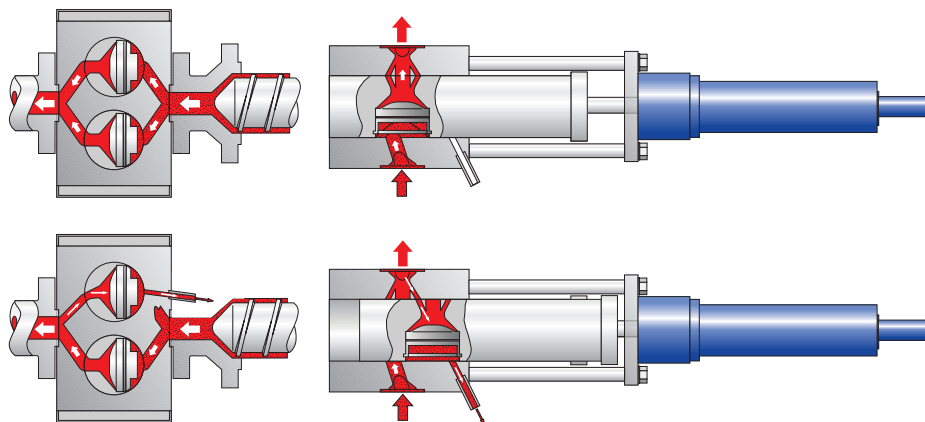
Function:

- continuously working melt filter
- 100 % venting by venting grooves, no interference of the process during the backflush
- 2 screen cavities
- simple adjustment of the ACS control system by the operator – 100 % reproducible automatic screen cleaning that is independent from the operator
- high lifetimes of the filtration media owing to up to Ø 100 times backflushings

Functional description

Filtration

The heated steel housing takes in two screen bearing pistons which can be moved cross to the melt flow and possess one screen cavity each. The melt flow is subdivided into two part flows, led via the screen cavities and brought together after the filtration in the material outlet.



Automatic backflush

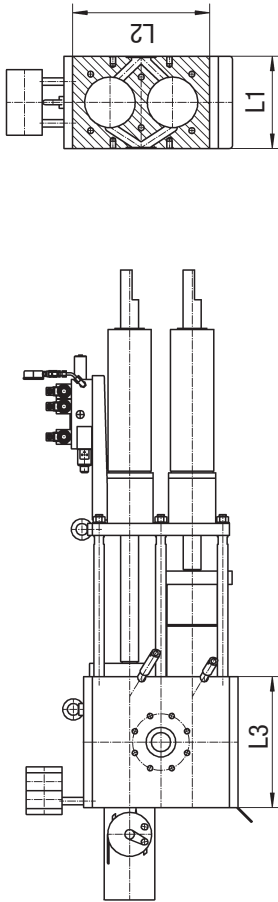
If the pressure difference over the screen changer increases through the contamination of the filtration screens to an afore-defined limit value, the pistons will move automatically into the backflush position one after another. It is important that the following process is not interfered.

Through a reversal of the flow inside of the screen changer the contaminations from the screen pack are led outwards via a spillway.

The screen pack is fixed with the screen retainer.

Screen change

The screen bearing piston with the changeable filtration element is moved out of the housing so far that the screen pack of the piston can be removed and exchanged by the new filtration element. During the screen change, the screen bearing piston remaining in the housing arranges for the filtration of the complete melt.



Technical Data

Screen Changers Type K-SWE/RS

Screen Changer Type	extruder output in kg/h	housing [mm]		screen \varnothing [mm]	screen cm ²	weight in kg	piece	heating by standard cartridges	
		L1	L2					heating voltage	heating capacity Watt
K-SWE-080/RS	40 - 180	170	260	58.3	2 x 27	200	6	220-240	910-1090
K-SWE-100/RS	80 - 280	220	310	76.3	2 x 45	300	6	220-240	1460-1740
K-SWE-101/RS	140 - 380	220	310	96.3	2 x 72	300	6	220-240	1460-1740
K-SWE-121/RS	200 - 530	250	360	116.3	2 x 105	470	6	220-240	1440-1760
K-SWE-125/RS	300 - 700	270	380	125.0	2 x 122	640	6	220-240	2260-2760
K-SWE-160/RS	420 - 1080	310	460	148.3	2 x 172	820	6	380-420	2890-3530
K-SWE-180/RS	700 - 1500	380	530	176.3	2 x 244	1330	6	380-420	3610-4410
K-SWE-200/RS	840 - 1900	410	600	200.0	2 x 314	2020	10	380-420	3610-4410
K-SWE-250/RS	1100 - 2600	460	680	230.3	2 x 415	2600	12	380-420	2890-3530
K-SWE-280/RS	2400 - 4400	500	760	250.0	2 x 490	3510	12	380-420	3610-4410
K-SWE-300/RS	3000 - 6000	580	850	270.0	2 x 572	5500	16	380-420	4510-5510
K-SWE-380/RS	5000 - 15000	695	1020	340.0	2 x 908	9100	20	380-420	4510-5510
K-SWE-410/RS	6500 - 25000	820	1230	410.0	2 x 1320			recommendation oil/steam heating	

The output rates depend on the individual process parameters. Subject to design modifications.

KREYENBORG K-SWE-4K/RS and K-SWE-4K-75/RS Screen Changers

Backflush Screen Changers for continuous operation with 4 screens

The continuously working melt filters of the type K-SWE-4K/RS and 4K-75/RS are further developments of the K-SWE Backflush Series. Provided with 2 screen cavities per screen bearing piston, they offer a big filtration area and at the same time a compact construction.

They permit polymer filtration with a high rate of contamination or high throughput rates (especially sensitive processes).

You find the difference of these two screen changer types in the efficiency of the filtration area during backflushing and screen change.

The K-SWE-4K/RS shows extreme low pressure variations during backflushing, as 75 % of the filtration area is available for production. During screen change, 50 % of the filtration area are available.

75 % of the filtration area of the K-SWE-4K-75/RS is available for production during backflushing and screen change.

Applications:

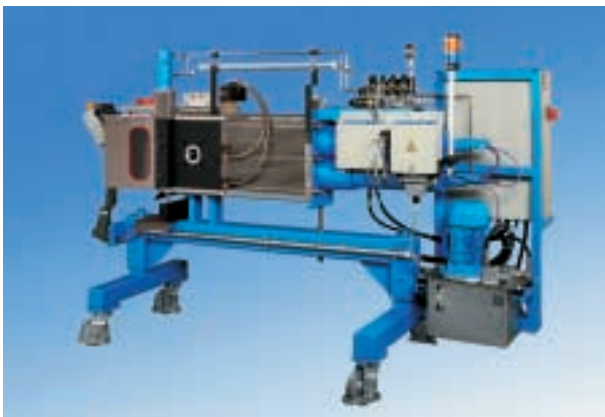
- applications with high throughput rates
- constant pressure processes, e. g. manufacturing of monofilaments
- compounding, production of profiles, recycling, production of fibres, polymerisation, film extrusion

Materials:

- suitable for nearly all kinds of polymers
- special design for PMMA and PC available

Function:

- continuously working melt filter
- 100 % venting through venting grooves
- 4 screen cavities, handling and screen change on one side
- 75 % of the total filtration area is kept in the product flow during the replacement of a screen
- easy handling of the ACS control system by the operator
- 100 % reproducible automatic flushing of screens independent of the operator
- longlife filter mediums owing to 100 times backflushing



K-SWE-4K/RS



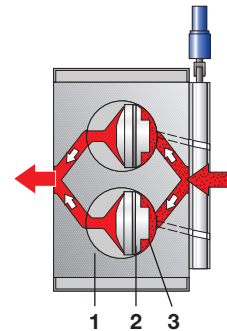
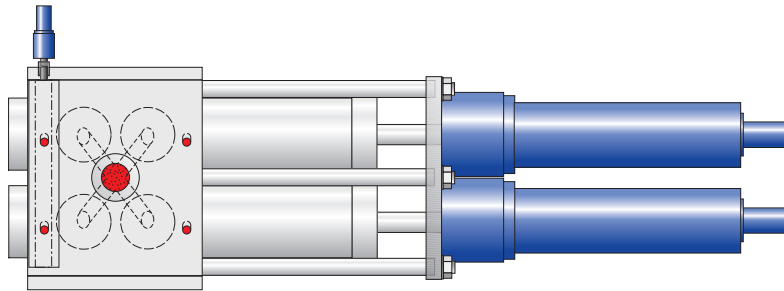
Screen bearing piston moved out for a screen change

Use of melt filter type K-SWE-4K/RS

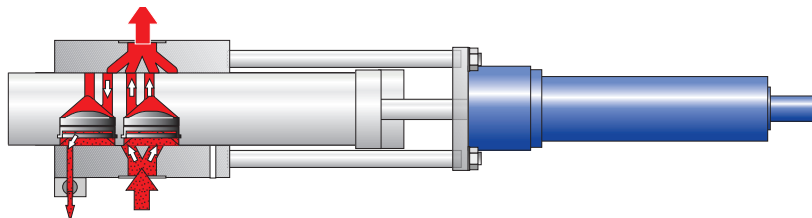
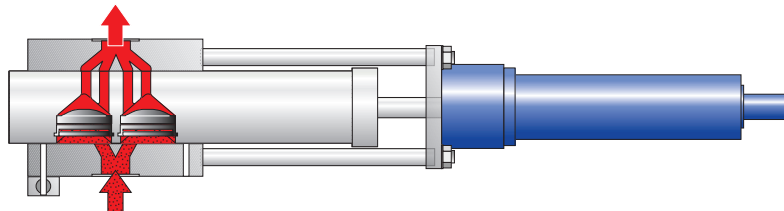
Filtration

All four filtration units are in the melt flow. The filters are secured in the carrier piston by screen retainers (3), so they are held against the breaker plate (4) during backflushing.

The pollution of the melt and the resulting deposits on the screen packs lead to an increase of the through-flow resistance. When a pre-defined pressure limit is reached, the screens are cleaned by backflushing.



- 1 Housing
- 2 Screen bearing piston
- 3 Screen unit

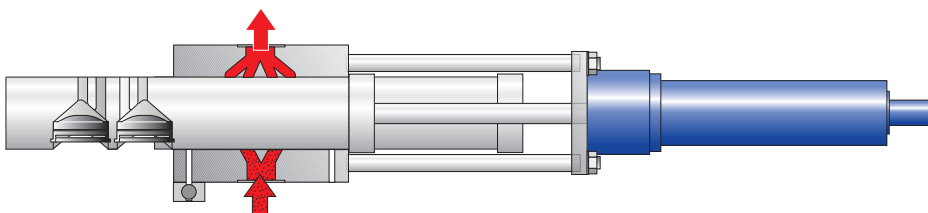


Backflushing

When the pressure limit is reached backflush is activated, first one screen is driven into backflush position. At the same time a part of the filtered mass is diverted to flow from downstream, back through the screen which has to be cleaned. The dirt particles on the screen are flushed away through the discharge port.

After successful cleaning of the first filter element, the other screen in the same carrier piston is similarly cleaned by driving the piston in the opposed direction.

75 % of the total filtration area is kept in the product flow during the replacement of a screen.



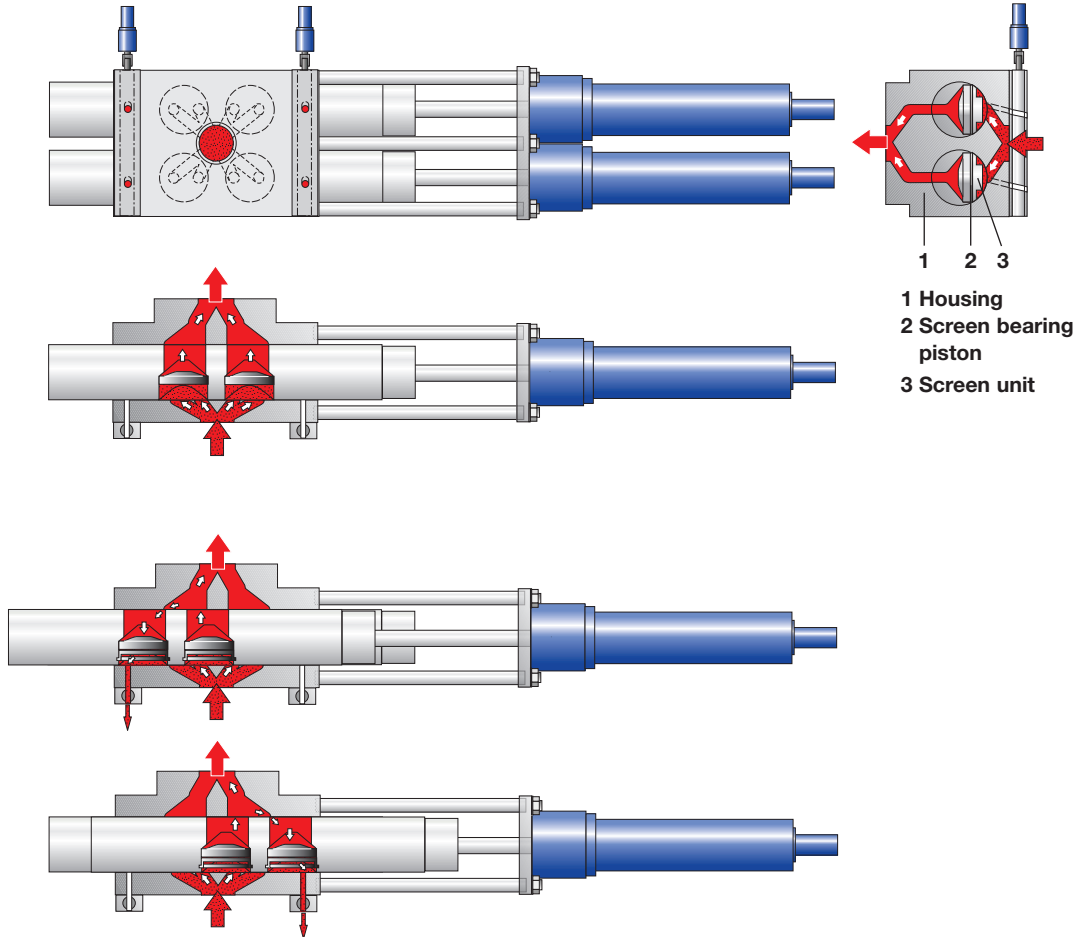
Filter exchange

The carrier piston with the dirty filter elements is driven out of the housing so that both can be taken out and be replaced by new filter elements.

Use of melt filter type K-SWE-4K-75/RS

Filtration

All four filtration units are usually in the melt flow. The filters are locked in the carrier piston by screen retainers (3) so that they cannot be removed from the breaker plate (4) during backflushing. Ongoing filtering leads to a rise in the resistance of the flow rate. When a defined pressure limit is reached, the screens have to be cleaned by backflushing.

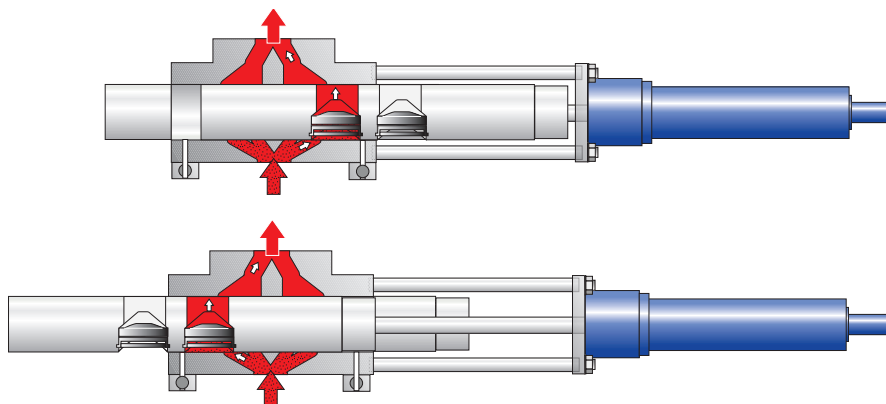


Backflushing

When the pressure limit is reached, backflush is activated, first one screen is driven into backflush position. At the same time a part of the filtered mass is diverted to flow from downstream back through the screen which has to be cleaned. The dirt particles on the screen are flushed away through the discharge port.

After successful cleaning of the first filter element, the other screen in the same carrier piston is similarly cleaned by driving the piston in the opposed direction.

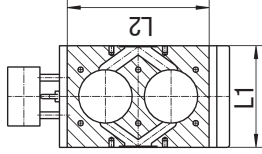
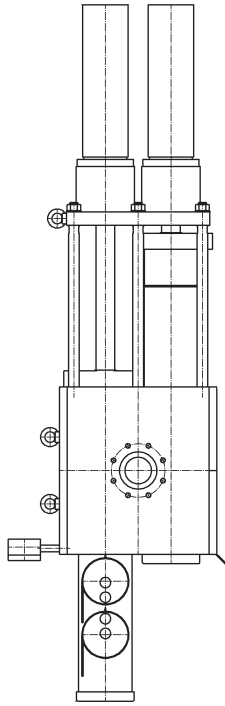
75 % of the total filtration area is kept in the product flow during the replacement of a screen.



Filter exchange

The carrier piston with the dirty filter elements is driven out of the housing so that both can be taken out and be replaced by new filter elements.

During change of the screens, the other screen of this piston and the other piston stay in the operating position, so that the melt flow is not interrupted. 75 % of the total filtration area continues be in the melt.



Technical data

Screen changers Type K-SWE- 4K and K-SWE 4K-75/RS

Screen changer Type	extruder output in kg/h	housing [mm] L1	L2	screen Ø mm	screen cm²	heating cartridges voltage Volt
K-SWE-080-4K/RS	80 - 360	170	260	58.3	4 x 27	220-240
K-SWE-100-4K/RS	160 - 560	220	310	76.3	4 x 45	220-240
K-SWE-101-4K/RS	280 - 760	220	310	96.3	4 x 72	220-240
K-SWE-121-4K/RS	400 - 1100	250	360	116.3	4 x 105	220-240
K-SWE-125-4K/RS	600 - 1400	270	380	125.0	4 x 122	220-240
K-SWE-160-4K/RS	800 - 2000	310	460	148.3	4 x 154	380-420
K-SWE-180-4K/RS	1400 - 3000	380	530	176.3	4 x 244	380-420
K-SWE-200-4K/RS	1700 - 3800	410	600	200.0	4 x 314	380-420
K-SWE-250-4K/RS	2200 - 5200	460	680	230.3	4 x 415	380-420
K-SWE-280-4K/RS	4800 - 8800	500	760	250.0	4 x 490	380-420
K-SWE-300-4K/RS	6000 - 12000	580	850	270.0	4 x 572	380-420
K-SWE-380-4K/RS	10000 - 30000	695	1020	340.0	4 x 908	recommendation oil/steam heating
K-SWE-410-4K/RS	13000 - 40000	820	1230	410.0	4 x 1320	recommendation oil/steam heating
K-SWE-450-4K/RS	16000 - 60000	900	1350			recommendation oil/steam heating

The output rates depend on the individual process parameters. Subject to design modifications.

KREYENBORG Power Backflush Screen Changers

Backflush screen Changers with adjustable backflush pressure

The quasi continuous working Power Backflush melt filter is complementary to our K-SWE 2-Piston Backflush Screen Changers.

The inlet melt flows into a screen chamber which can contain filter cartridges or woven wire filters. A displacement piston pushes a defined melt volume, from downstream of the screen chamber, back through the filter medium and out of a discharge port during backflushing.

The advantage of these screen changers is that you can avoid frequent screen changes as the backflushing is especially effective and easy to work with.

Applications:

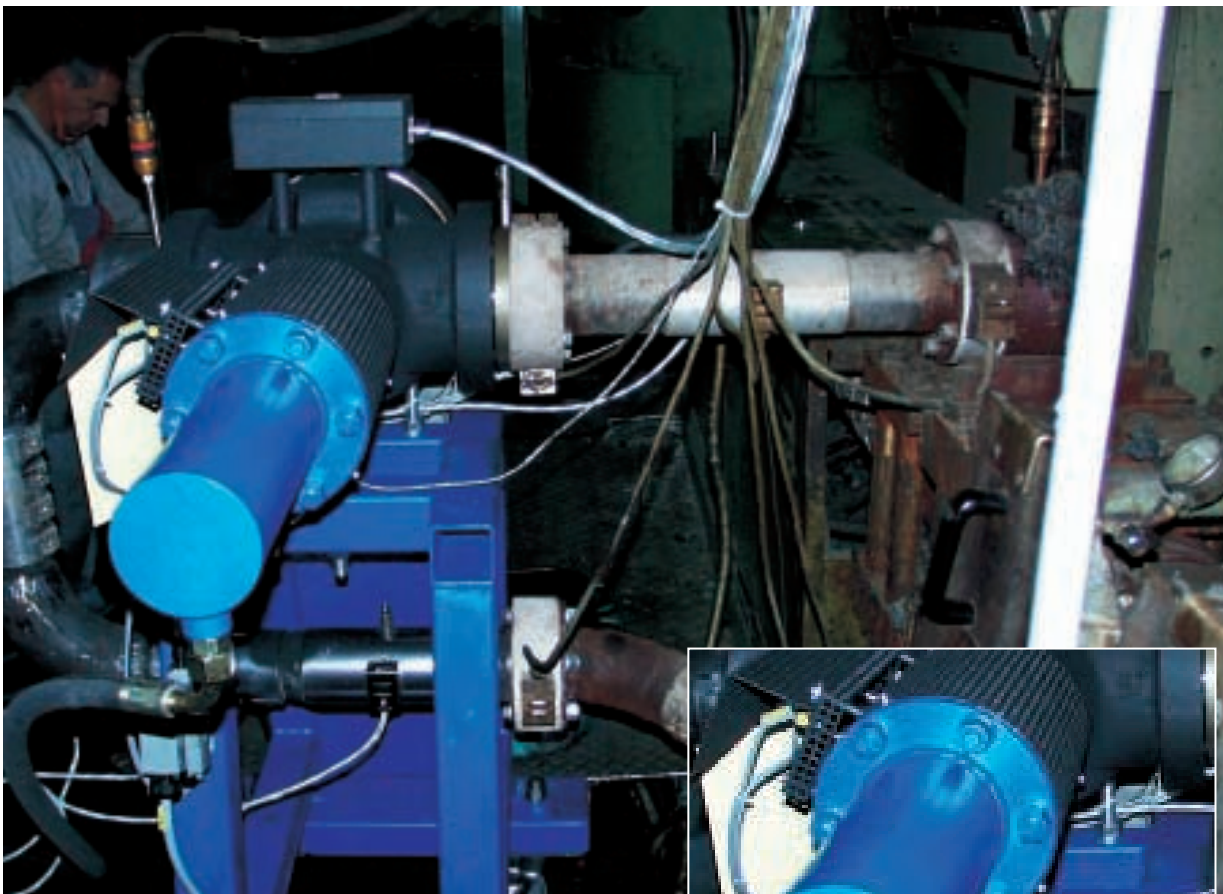
- Recycling and Pelletizing Processes with a high level of contamination

Materials:

- Suitable for all Polyolefines and most of the technical plastics

Function:

- quasi continuous working melt filter (even though there is a very short interruption of production during backflushing, the extruder does not need to be switched off)
- longlife filter media because they can be backflushed up to 100 times
- large filtration area – compact construction
- very effective backflushing because of definable backflush pressure

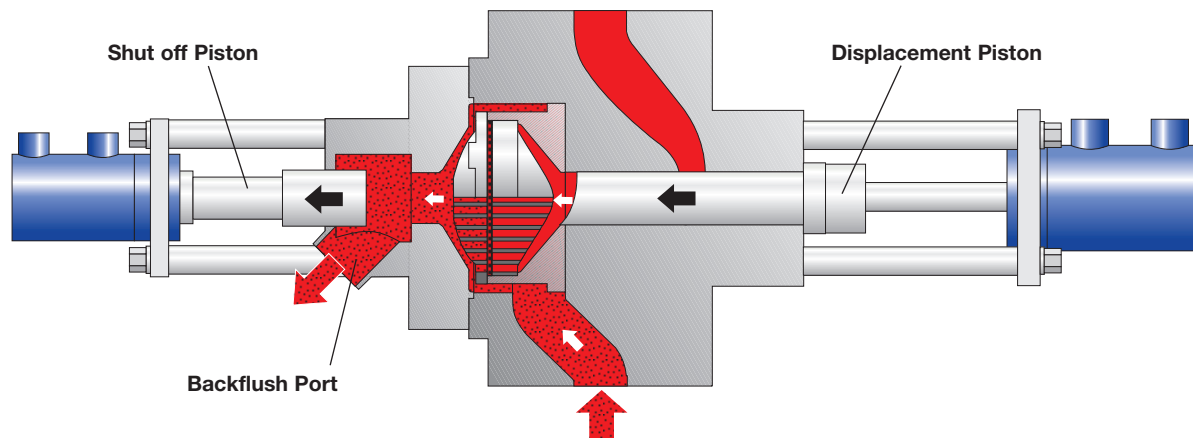
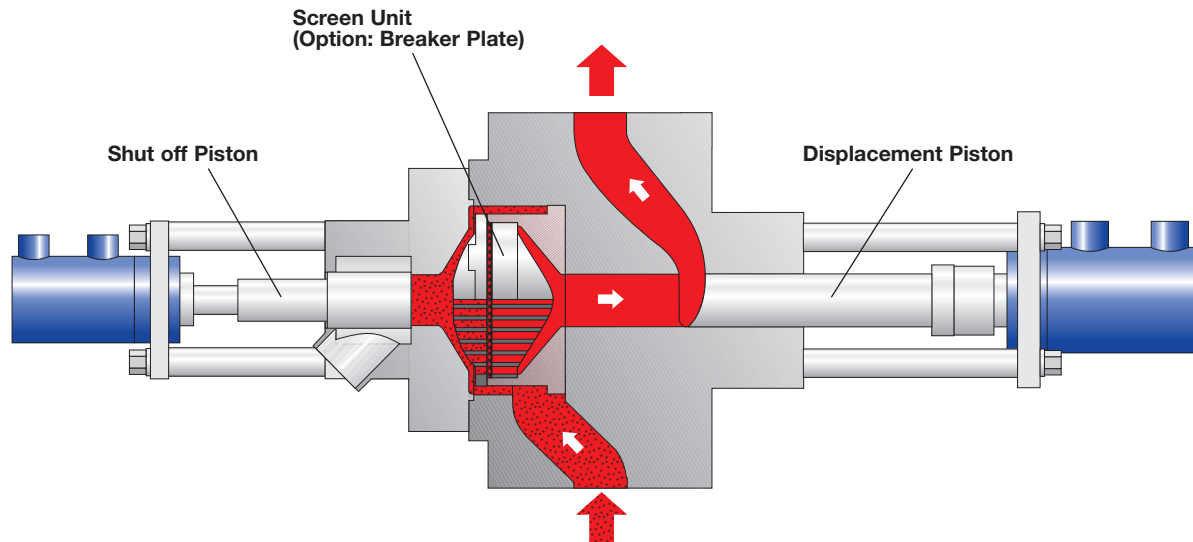


Power Backflush in use in a recycling line

Functional description of the Power Backflush

Filtration

When the displacement piston and the shut off piston are in the operating position, the melt continues downstream, after filtration



Backflushing

The shut off piston is drawn back to open the backflush port.

The displacement piston (with adjustable pressure and speed) moves forward to flush the filter elements, while the melt coming from the extruder helps flush the dirt from the screen chamber out of the backflushing port. The extruder is not switched off with this discontinuous filtration system.

The whole backflushing process requires 1–2 seconds. After this time, the backflushing port is closed again and the displacement piston returns to the operating position under the pressure of the melt.

This short interruption of the melt flow stream during backflushing causes no problem when using underwater or watering pelletizing.

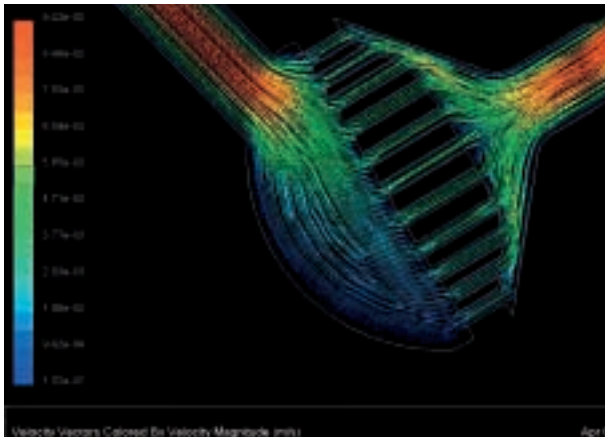
In some cases this screen changer can also be used for strand pelletizing.

Breaker plates / Screen retainers / Accessories

Breaker Plates

Breaker plates support the filter medium in the screen bearing piston. KREYENBORG breaker plates give optimum rheological distribution of the polymer over the whole filtration area and a constant velocity downstream of the breaker plate.

Flow Simulation modelling is used for the design of these breaker plates.



Flow speeds in a screen cavity

Screen Retainers

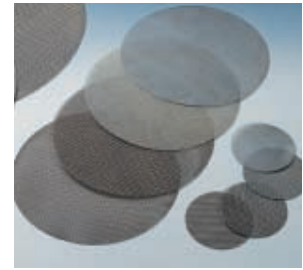
Screen retainers secure the filter medium in the screen cavity, so it cannot move out of its position during backflushing.

Super plates

Using a Super plate in a screen changer allows to utilize the total screen area and not just the open area of the breaker plate borings. In addition, the Super plate can reduce the DP, depending on the viscosity of the material to be processed.



Breaker plates made of special steel



Screen packs as actual filter medium



Screen retainers for backflush screen changers



Super plates™ for optimizing the free filtration area



Strainer construction with quick clamping fixtures

Screens

Screen packs are normally made of spot welded woven wire cloth of different mesh, although they can also have a containing rim bordered in a ring. KREYENBORG screen changers accept single or multiple screen meshes.

xptsensors melt pressure sensors

KREYENBORG xptsensors melt pressure sensors are essential components for the pressure and temperature control in the extrusion, die casting and polymer industry.

KREYENBORG xptsensors are available for different pressure and temperature areas and applicable for unfavorable space circumstances or high ambient temperatures.

Whether you only want to measure the pressure or pressure and temperature – we have your individual solution.



xpt-sensors

Customised Solutions

- Breaker plates and screen retainers can be supplied with a variety of coatings
- Special Breaker plates with different boring diameters for varying polymers available
- Pressure-Reduced Breaker plates for very sensitive polymers

KREYENBORG Special Purpose Solutions

Special Purpose Solutions

Our customers can choose from the variety of Screen Changers in our Standard Programme.

However, should you be unable to find what you want for your special application, we would be pleased to study your project with you.

We have already supplied more than 10.000 screen changers and have the team to offer you just what you need.

Please contact us!

High Output

Screen changers suitable for up to 30.000 kg/h.



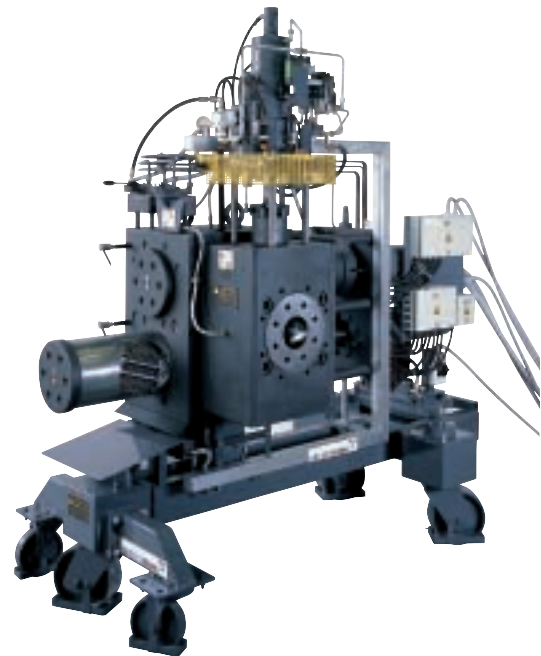
K-SWE-4K/75

Retrofit of Backflushing

If you already have a KREYENBORG continuous Screen Changer, but you want to produce a higher rate of reclaim with it, we can retrofit the backflush device.

Screen life will increase dramatically showing you considerable economies.

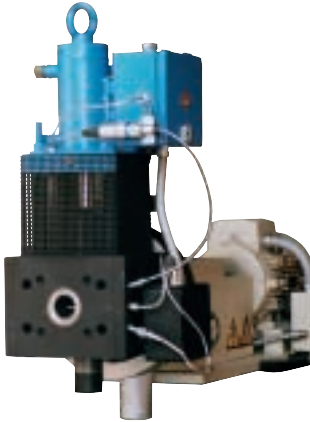
Please contact us!



Filtration System K-SWE with RSV

KREYENBORG Valve Technique

A Diverter valve will help to make die-face cutting or underwater pelletizing more cost-effective. Diverter valves also make sense in many other processes such as reactor-based or extrusion lines, or where intermittent severe contamination has to be flushed out of the system. With hundreds of Diverter valves (in different sizes) sold, we are sure that we can offer you the Diverter valve that suits your need.



Diverter valve DV 20

KREYENBORG Oblique extruding

KREYENBORG offers optimally designed oblique extruding heads for strand pelletizing systems. The die guide rails can be exchanged easily and consequently the oblique extruding head is all-purpose for different materials and outputs.



KREYENBORG Adaptors

Our scope of supply does not stop with the Screen Changer.

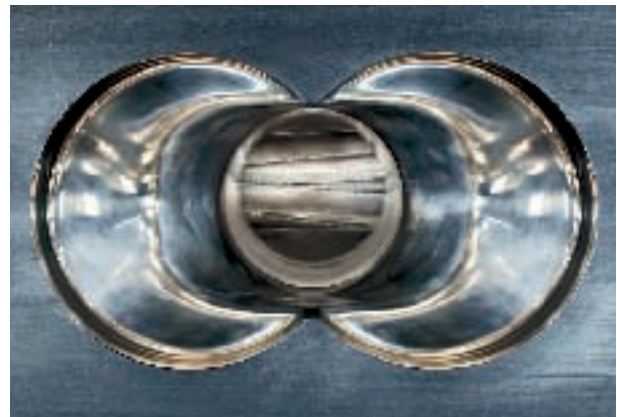
We frequently supply a variety of adaptors with different diameters and connection dimensions for:

- all known gear pumps, extruders and melt pipes.

We are working very closely with OEM's, which means that we are able to deliver, for instance, complicated eight-to-round adaptors quickly.



Modularly constructed discharge unit



Eight-to-round adaptor

Complete lines for the world of plastics



Complete discharge unit for a polymerisation line for high outputs

BKG Bruckmann & KREYENBORG Granulierteknik GmbH, the BSG Bruckmann Steuerungstechnik and the ips Intelligent Pelletizing Solutions GmbH & Co. KG are members of the KREYENBORG Group.

These four partners are able to offer not only single components such as

- Gear Pumps
- Continuous and Discontinuous Filtration Systems
- Control and Automation Systems
- Mixing technique
- Special Silos
- Infrared Drums
- Plastics Recycling Lines
- Strand and Underwater Pelletizing Systems with accessories such as Diverter Valves, Breaker Plates, Screens, Strand cooling troughs
- Complete Automation

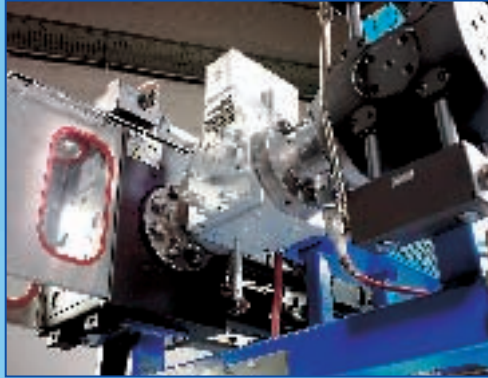
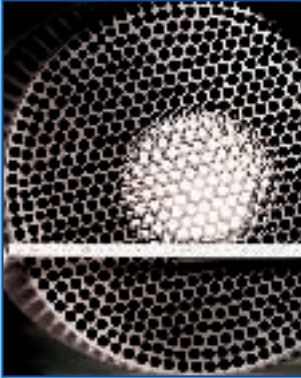
and much more from one source.

Having four production sites in Germany, more than 250 employees and a world-wide sales and service network, the KREYENBORG Group is a **global partner of the plastic industry.**



Our Group philosophy is:

- easy integration of all components into the customers' complex lines
- minimisation of all process relevant interfaces
- process guarantees for our customers' success
- synergy for the supply of complete lines
- solutions from flange to flange



KREYENBORG

KREYENBORG GmbH
Coermühle 1-5
48157 Münster
Tel.: +49 (0)2 51/2 14 05-0
Fax.: +49 (0)2 51/2 14 05-6 67
e-mail: info@kreyenborg.de
www.kreyenborg.com



BKG

UNDERWATER PELLETTIZING SYSTEMS

BKG Bruckmann & Kreyenborg
Granuliertechnik GmbH
Hessenweg 3
48157 Münster
Tel.: +49 (0)2 51/2 65 01-0
Fax.: +49 (0)2 51/2 65 01-98
e-mail: info@bkg.de
www.bkg.de



BSG

BRUCKMANN STEUERUNGSTECHNIK GMBH

BSG Bruckmann
Steuerungstechnik GmbH
Crispinusstraße 6
47589 Uedem
Tel.: +49 (0)28 25/70 44-0
Fax: +49 (0)28 25/70 43
e-mail: info@bsg.de
www.bsg.de



ips Intelligent Pelletizing Solutions
GmbH & Co. KG
Am Fliegerhorst 2
63762 Großostheim
Tel.: +49 (0)60 26/99 04 20
Fax: +49 (0)60 26/99 04 23
e-mail: info@pelletizing.de
www.pelletizing.de