

Special Filter

Special Filter

*All in this documentation described Filter
are Standard - Filter.*

*Environmental Systems also is designing
and manufacturing flexible and tailor made Filter,
according to customers requirements.*

In case of any assistant or question please contact:

**Environmental Systems GmbH
Mr. Sven Altenberg
Uhlandstraße 22
D - 27576 Bremerhaven**

Tel.: +49 - (0)471 - 50 10 451

Mobile: +49 - (0)170 - 96 77 302

Fax: +49 - (0)471 - 50 10 453

Email: info@environmental-systems.de

www: environmental-systems.de

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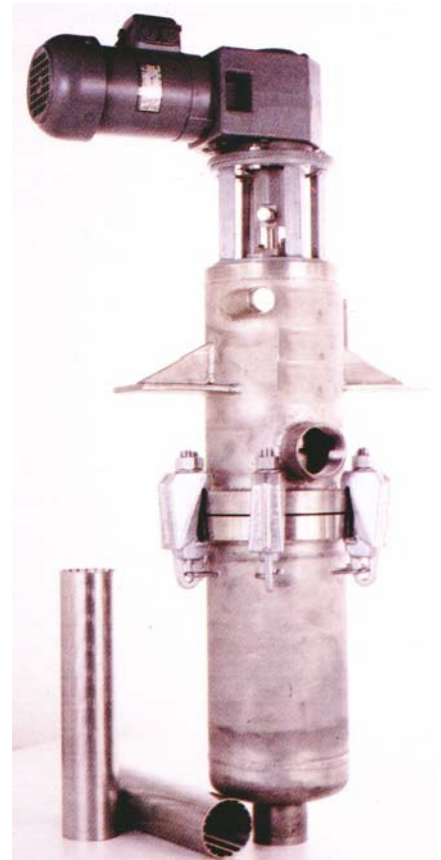
Crossflow Filter with integrated pressing and briquetting unit

Precoated Filter System

Self Cleaning Filter

Self-Cleaning Filter, type ES-DE-SC 35 / 326

- Self-Cleaning Filter without interruption of operation
- Robust design for extreme working conditions
- Compact Design
- Volume flow 10 l/h up to 216 m³/h
(at 50 µm up to 100 µm and clean water)
- Standard fineness 25 µm up to 3,0 mm
- No discharge costs of filter candles
- To -piece-cover with quick acting closure
- Easy and quick maintenance of filter
- No dismantling of pipes etc. for maintenance
- Less operation costs because of long lifetime
- **No special wear and tear parts necessary**
- Material:
 - Stainless Steel
 - Cast Iron
 - other material on request



Applications:

- Fuel Oil System
- Sewage System
- Grey-/Blackwater System
- Viscose and high viscose mediums
- all other aqueous mediums with fibrous material

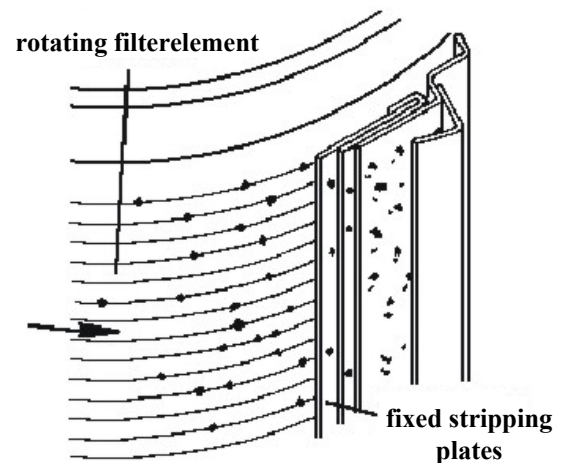
Working Principle:

The contaminated medium flows through the metallic and cylindrical filter insert. Particles bigger than the gaps in the filter will settle down on the filter's surface.

By rotation of the filter inserts the particles will be removed by the fixed stripping plates and guided downwards to the filter sump. The particles can be removed in intervals via a manual or automatic valve.

The cleaning of the filter and the discharge of the particles will be done without interruption of operation. This allows a continuous operation of the filter.

For gel particles and fibrous like alga and long fibrous perforate filter elements will be used.



Options:

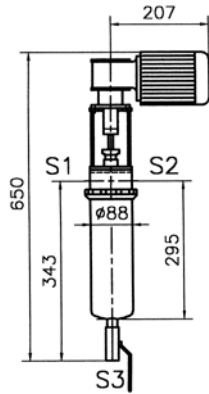
- Automatic sludge discharge
- Heating
- Special materials and coatings
- Ex-proof motor
- High pressure operation
- Special materials and coatings
- other filter fineness
- Perforated filter elements for:
 - fibers
 - gel particles
 - alga
 - etc

Technical Data

Two-piece, material-free operating filter system with a downwards removable filter sump with quick acting closures. For filter type ES-DE-SC 175 and ES-DE-SC 326 the filter insert will be removed completely with cover and motor. For cleaning the filter inserts can be removed completely without any special tools. For re-assembly no special position of filter insert is necessary.

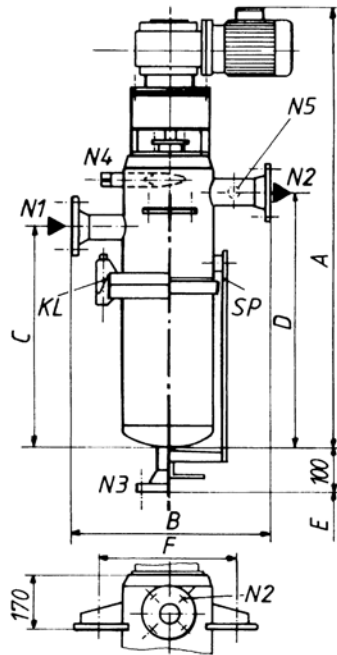
The filtered particles will be removed from the filter insert via flexible stripping plates and guided downwards to the filter sump. The particles can be removed out of the sump via a manual valve or optional with an automatic valve in conjunction with a time switch or differential pressure switch.

ES-DE-SC 35



Material	Filter head:	Stainless Steel 1.4571
	Filter sump:	Stainless steel 1.4401 outside polished
	Filter insert:	Stainless Steel 1.4435 / 1.4571
	other components:	Stainless Steel 1.4310 / 1.4571
Sealing:		O-Ring FPM
max. pressure		16 bar standard or on request
max. temperature:		120°C or on request
Filter fineness:		25 µm - 3,0 mm standard or on request
Inlet / Outlet:		R 1" outside thread
		optional with flange DN 25. PN 16
Sump outlet:		manual valve 1/2" material 1.4408
Motor:		rotary-current-wormgear-motor
		400 V 50 Hz 75 W IP 54 (standard)
		400 V 50 Hz 120 W IP 65 (ex-Proof)
Weight:		12 kg (empty)
Capacity:		10 l/h up to 4,0 m ³ /h
		(at 50µm - 100 µm and clean water)

ES-DE-SC 35 up to ES-DE-SC 326



		Type of Automatic Self-Cleaning Filter			
		ES-DE-SC 70	ES-DE-SC 110	ES-DE-SC 175	ES-DE-SC 326
Capacity	[m ³ /h]	12	24	36	72
Inlet N1	[-]	R 2" standard or Flange DN 50 PN 16, Form C	Flange DN 65 PN 16, Form C	Flange DN 80 PN 16, Form C	Flange DN 100 PN 16, Form C
Outlet N2	[-]	R 2" standard or Flange DN 50 PN 16, Form C	Flange DN 65 PN 16, Form C	Flange DN 80 PN 16, Form C	Flange DN 100 PN 16, Form C
Sludge discharge N3	[-]	R 2" standard or Flange DN 50 PN 16, Form C	R 2" standard or Flange DN 50 PN 16, Form C	R 2" standard or Flange DN 50 PN 16, Form C	R 2" standard or Flange DN 65 PN 16, Form C
Vent / cleaning N4 / N5	[-]	R 3/4" tangential N4	R 3/4" tangential N4	R 3/4" tangential N4	R 3/4" tangential N4 R 2" N5
housing lock up to 6 bar	[-]	quick tension bracket SP	quick tension bracket SP	mushroom head anchor screw KL	mushroom head anchor screw KL
housing lock > 6 bar	[-]	mushroom head anchor screw KL	mushroom head anchor screw KL	mushroom head anchor screw KL	mushroom head anchor screw KL
A	[mm]	800	925	990	1.420
B	[mm]	370	370	470	600
C	[mm]	290	415	465	970
D	[mm]	420	545	610	970
E	[mm]	350	450	450	800
F	[mm]	350	350	420	475
Power	[W]	180	180	180	180
Weight	[kg]	46	52	68	86

Material	Filter head:	Stainless Steel 1.4541 / 1.4571	max. temperature:	120°C or on request
		Cast Iron	Sealing:	O-Ring FPM
	Filter insert:	Stainless Steel 1.4435 / 1.4571	Filter fineness:	25 µm - 3,0 mm or on request
max. pressure:		6bar	Motor:	rotary-current-wormgear-motor
		10 bar		400 V 50 Hz IP 54 (standard)
		or on request		400 V 50 Hz IP 65 (ex-proof)

Self-Cleaning Filter, type ES-DE-SC 400

- Self-Cleaning Filter without interruption of operation
- Fixed filter insert with motor driven rotating stripping plates for self-cleaning of filter
- Robust design for extreme working conditions
- Compact design
- Volume flow 10 l/h up to 36 m³/h (at 50 µm up to 100 µm and clean water)
- Standard fineness 25 µm up to 3,0 mm
- Two-piece filter with clamps and conic filter sump
- Filter insert with stripping plates can be completely removed
- No discharge costs of filter candles
- Easy and quick maintenance of filter
- No dismounting of pipes etc. for maintenance
- Less operation costs because of long lifetime
- **No special wear and tear parts necessary**
- Material:
 - Stainless Steel
 - other material on request

Applications:

- Fuel Oil System
- Sewage System
- Grey-/Blackwater System
- Viscose and high viscose mediums
- all other aqueous mediums with fibrous material

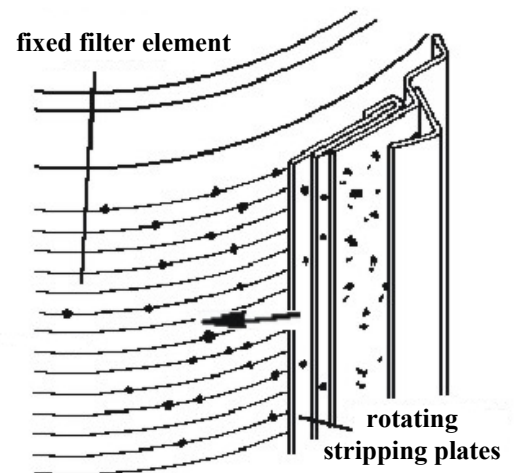
Working Principle:

The contaminated medium flows through the metallic and cylindrical filter insert. Particles bigger than the gaps in the filter will settle down on the filter's surface.

By rotation of the stripping plates the particles will be removed from the filter. The rotating stripping plates are designed as a helix which will support the guiding of the particles downwards to the filter sump. The particles can be removed in intervals via a manual or automatic valve.

The cleaning of the filter and the discharge of the particles will be done without interruption of operation. This allows a continuous operation of the filter.

For gel particles and fibrous like alga and long fibrous perforate filter elements will be used.



Options:

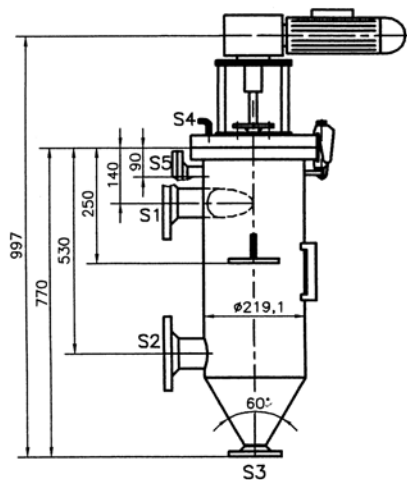
- Automatic sludge discharge
- Heating
- Special materials and coatings
- Ex-proof motor
- High pressure operation
- Special materials and coatings
- other filter fineness
- Perforated filter elements for:
 - fibers
 - gel particles
 - alga
 - etc

Technical Data

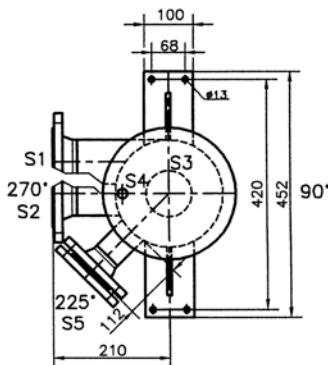
Two-piece, material-free operating filter system with an upwards removable motor and gearing. Closing of cover via clamp screws. The filter insert and stripping plates can be completely removed without any special tools as one unit.

The filtered particles will be removed from the fixed filter insert via two rotating stripping plates designed as a helix and guided downwards to the filter sump. The main flow direction in the filter will be from up to down. This will also support the guiding and settling of the solids to the filter sump.

The particles can be removed out of the sump via a manual operated valve or optional automatically in conjunction with a time switch or a differential pressure switch.



position of connection piece 0°



Material cover:	Stainless Steel 1.4571
Material inlet:	Stainless Steel 1.4435 / 1.4571
max. pressure:	6 bar 10 bar or on request
max. temperature:	80°C or on request
Sealing:	O-Ring FPM
Filter fineness:	25 µm - 3,0 mm
Weight:	72 kg (empty)
Motor:	geared motor 400 V 50 Hz 180 W IP 54 (standard) 400 V 50 Hz 180 W IP 65 (ex-proof)
Capacity:	36 m ³ /h (50 µm - 100 µm and clean water)

Inlet	S1	DN 80, PN16, Form C (Tangential)
Outlet	S2	DN 80, PN16, Form C
Discharge	S3	DN 80, PN16, Form C
Vent	S4	R 3/8" with ball valve
Cleaning	S5	DN 50, PN16, Form C

Other materials or design of filter on request

Self-Cleaning Filter, type ES-M

Compact self-cleaning filter / automatic filter for liquids, pastes or other high viscous liquids

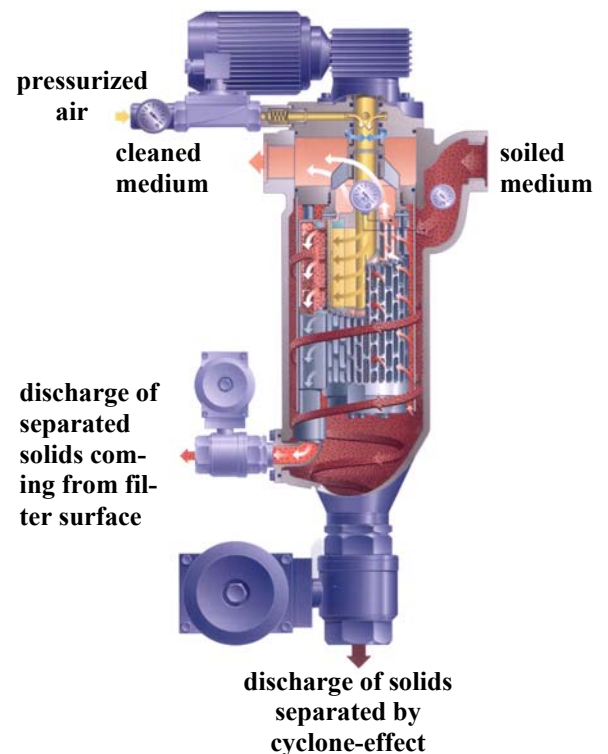
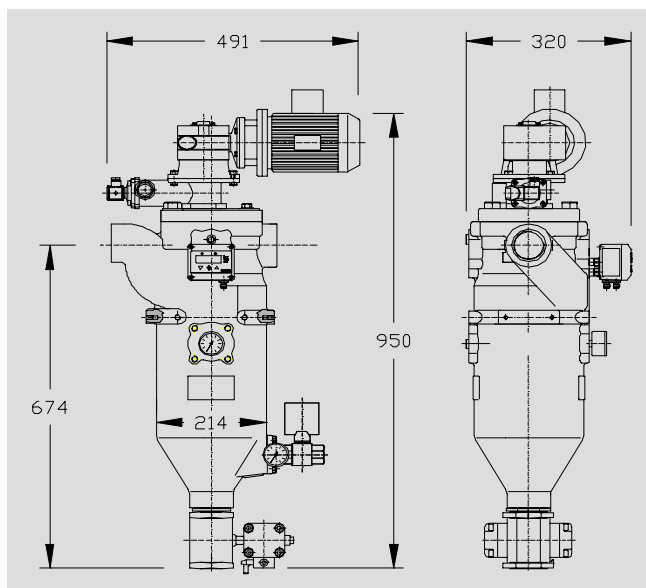
- Very flexible filter – concept
- Filter can be easily adapted to different applications / demands
- Also a variation of the cleaning principle is possible
- pressurized air
- scraper
- filter fineness between 2 mm down to 3 micron
- different filter material for an optimal filtration result
- robust design



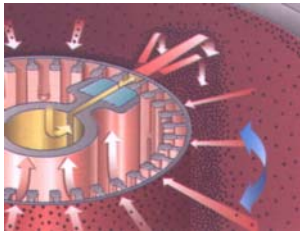
Applications

- | | |
|----------------------|---------------------------|
| ➤ Low viscous oil | ✓ Marine industry |
| ➤ High viscous oils | ✓ Metalworking industry |
| ➤ Fuel oils | ✓ Petrochemical industry |
| ➤ Cooling lubricants | ✓ Automotive industry |
| ➤ Lube oils | ✓ Vegetable oil industry |
| ➤ Emulsions | ✓ Pharmaceutical industry |

Technical data	
flow rate	100 l/h up to 60m ³ /h
el consumption	0,18 - 0,22 kW 50 / 60 Hz 0,4 - 1,2 A
weight	75 – 100 kg



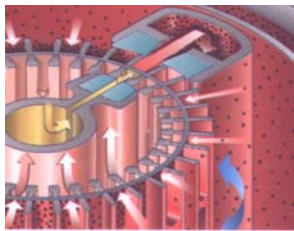
Cleaning with integrated cyclone effect



After a differential pressure threshold has been reached or after a pre-determined interval, the segment element is turned in the opposite direction for brief cleaning with compressed air or filtered fluid, and both the external pressure valve and the drain are opened. The segments pass the external pressure nozzle in sequence, and the nozzle is alternately opened and sealed. When the nozzle is sealed, the integrated external pressure reservoir is pre-loaded, so that when the nozzle is opened, an outward pressure surge causes the deposited particle to be cleaned off the filter material in each segment.

One revolution is sufficient to clean all segments. During this brief cleaning period the residue in the collection cone and particles that have been cleaned off the element are transported out through the drain valve.

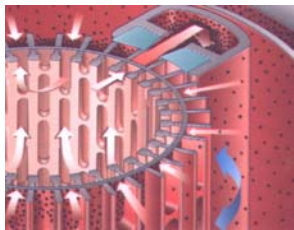
Pulsating external pressure surge segment cleaning with cyclone effect during constant filtrate flow



The external pressure surge segment cleaning system is also used during continuous filtrate flow with low-viscosity fluids for very fine and fine filtration. However with this method, the filtrate flow is not interrupted or noticeably reduced during the cleaning process. Rotation of the filter elements causes the segments to sequentially pass the external pressure nozzle on the inside and the rinsing channel on the outside.

The particles are cleaned off by the external pressure surge, collected on the outside in the rinsing channel and transported away in a medium made up almost exclusively of foreign matters.

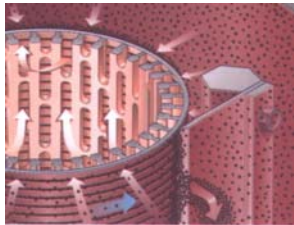
Inherent pressure segment cleaning



In a matter similar to the external pressure principle, the inherent pressure principle is also used for very fine and fine filtration. In this case, however, the inherent pressure or a low partial flow of the filtrate itself in the opposite direction is used instead. The segment element is rotated briefly and the cleaning valve is opened. The segments are sequentially moved past the cleaning channel. Differential pressure between the filtrate side and the cleaning channel causes particles to be cleaned off and transported out via the cleaning channel. The inherent pressure segment cleaning principle requires a

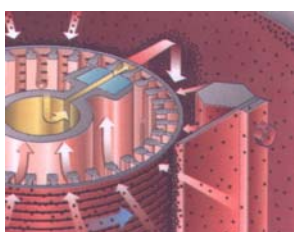
pressure of least 2 bar in front of the filter so that a cleaning pressure of approx. 1 bar can be created on the filtrate side using a regulating choke. Residue in the collection cone can be emptied via the drain valve during process stoppage phases or ongoing operation.

Metal edge filters with scraper cleaning



The metal edge filters with scraper cleaning is used for low to high viscosity fluids, pastes and similar substances ranging from fine right up to coarse filtration. It enables a continuous flow of filtrate in the pressure and suction area when cleaning is performed during ongoing filtration. The scrapers collect particles or substances on the edge gaps of the filter and strip them lengthways off the gaps, which widen towards the inside. The drain valve can be opened during the cleaning process or when cleaning is not taken place.

Metal edge filter with combined pulsating pressure surge

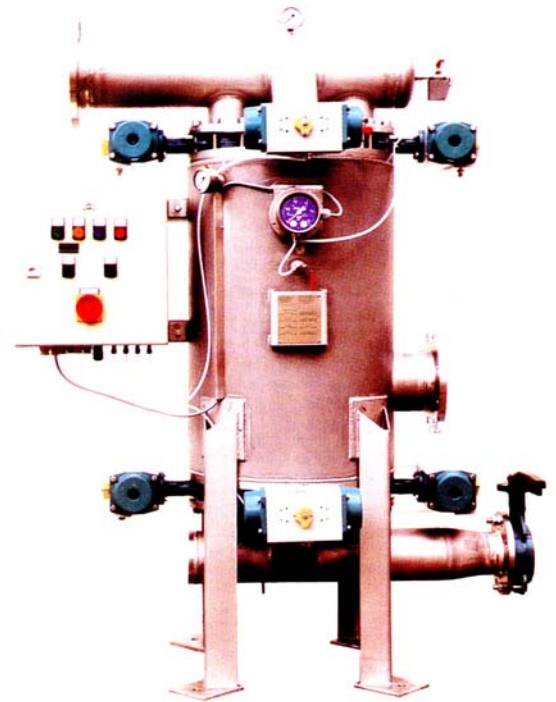


The combination scraper and pulsating pressure surge is used in special circumstances when complementary mechanical stripping and subsequent non-contact external pressure cleaning are both required to achieve a satisfactory cleaning effect.

Automatic Backwash Filter

Automatic Backwash Filter, type ES-DE-ABF

- Automatic Backwash Filter without interruption of operation
- Robust design for extreme working conditions
- Compact Design
- 4 - 6 filter inserts
- Volume flow 10 l/h up to 800 m³/h (at 50 µm up to 100 µm and clean water)
- Standard fineness 50 µm up to 3,0 mm
- No rotating parts, therefore long lifetime and less operation costs
- Whole profile for medium discharge. Thus short cleaning times and low lost of cleaning medium
- Easy and quick maintenance of filter
- Disassembly of filter insert without dismounting of housing
- Flexible connections of inlet, outlet and slurry outlet
- **No special wear and tear parts necessary**
- Material:
 - Stainless Steel
 - Cast Iron
 - other material on request
- Control of operation via SPS
- Control box with indication lamps
- potential free contacts
- Optional backwashing via water or high pressure air



Applications:

- Cooling System
- Emulsions
- Water
- All other aqueous mediums with particles

Working Principle:

Three-piece, material-free operating filter system with upwards removable inlet, cylindrical filter insert and a downwards removable flushing unit. The filter consists of 4 -6 backwash filter inserts independent from each other. After reaching the adjusted differential pressure the backwash - process will start automatically. Therefore one of the filter inserts will be closed by automatic or manual valves and cleaned via overpressure of the filtered medium around the filter. All other filter inserts will operate normally during the cleaning process of one filter insert.

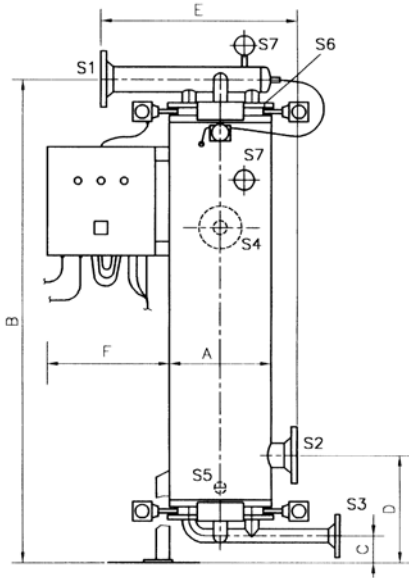
The particles will be removed from the filter surface quickly and will flow through the whole profile of the flushing unit.

This advantage results in short cleaning times and a low amount of cleaning medium.

Options:

- Heating
- Special materials and coatings
- High pressure operation
- Special materials and coatings
- Other filter fineness
- Higher capacities
- backwashing via water or high pressure air

Technical Data



Material:	housing	Stainless Steel 1.4541
	filter insert	Stainless Steel 1.4435 / 1.4571
	inlet / outlet	Stainless Steel 1.4541
Valves:	housing	GG 25
	inlets	Stainless Steel 1.4408 / 1.4021
max. pressure:		6 bar
max. temperature:		80°C
Sealings:		O-Ring FPM
Filter fineness:		50, 100, 200, 300, 500, 1000, 3000µm
el. connection:		400 V 50 Hz 750 W IP 54
Control Air:		6 - 8 bar

		Type of Automatic Backwash Filter						
		ES-DE-ABF 40	ES-DE-ABF 80	ES-DE-ABF 140	ES-DE-ABF 220	ES-DE-ABF 350	ES-DE-ABF 500	ES-DE-ABF 800
Capacity*	[m ³ /h]	0 - 40	41 - 80	81 - 140	141 - 220	221 - 350	351 - 500	501 - 800
Inlet	[S 1]	Flange DN 80 PN 16, Form C	Flange DN 100 PN 16, Form C	Flange DN 150 PN 16, Form C	Flange DN 200 PN 16, Form C	Flange DN 250 PN 16, Form C	Flange DN 300 PN 16, Form C	Flange DN 350 PN 16, Form C
Outlet	[S 2]	Flange DN 80 PN 16, Form C	Flange DN 100 PN 16, Form C	Flange DN 150 PN 16, Form C	Flange DN 200 PN 16, Form C	Flange DN 250 PN 16, Form C	Flange DN 300 PN 16, Form C	Flange DN 350 PN 16, Form C
Slurry outlet	[S 3]	Flange DN 40 PN 16, Form C	Flange DN 50 PN 16, Form C	Flange DN 80 PN 16, Form C	Flange DN 100 PN 16, Form C	Flange DN 125 PN 16, Form C	Flange DN 150 PN 16, Form C	Flange DN 200 PN 16, Form C
External flushing medium	[S 4]	Flange DN 40 PN 16, Form C	Flange DN 50 PN 16, Form C	Flange DN 80 PN 16, Form C	Flange DN 100 PN 16, Form C	Flange DN 125 PN 16, Form C	Flange DN 150 PN 16, Form C	Flange DN 200 PN 16, Form C
Residual discharge	[S 5]	R 1"	R 1"	R 1"	R 1"	R 2"	R2"	R2"
Venting	[S6]	R 3/8" ball valve	R 3/8" ball valve	R 3/8" ball valve	R 3/8" ball valve	R 3/8" ball valve	R 3/8" ball valve	R 3/8" ball valve
Pressure indicator	[S 7]	R 1/2"	R 1/2"	R 1/2"	R 1/2"	R 1/2"	R 1/2"	R 1/2"
A	[mm]	Ø 355,6	Ø 380	Ø 490	Ø 540	Ø 610	Ø 700	Ø 830
B	[mm]	1.491	1.526	1.554	1.570	1.909	2.149	2.328
C	[mm]	405	376	334	288	349	309	335
D	[mm]	608	680	720	760	900	940	1.080
E	[mm]	723	750	890	960	1.055	1.180	1.345
F	[mm]	approx. 500	approx. 500	approx. 500	approx. 500	approx. 500	approx. 500	approx. 500
Weight	[kg]	approx. 370	approx. 400	approx. 480	approx. 570	approx. 680	approx. 820	approx. 960

* based on 100 µm and clean water

Fine Filter

Fine Filter, type ES-KH

For every type of Oil, Fuel Oil and Hydraulic Oil

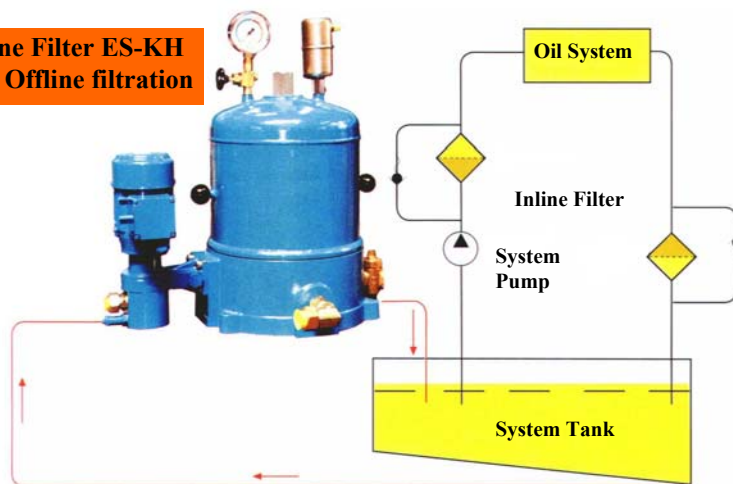
- Filter fineness 1 μm
- High impurity accommodation capacity
- Simple first installation / easy to retrofit
- Main system unaffected by filter element replacement
- Low energy consumption
- No pulsating pressure
- Oil system and tank are cleaned from inside
- Low operational costs due to high dirt holding capacity of the Depth Filter Cartridge
- The water absorbent Depth Filter Cartridge improves oil filterability
- Reduced risks of inline filter blockages
- Oil savings due to prolonged oil change intervals
- Reduced waste oil volume
- Reduced waste oil discharge costs
- Cost savings due to reduced spares consumption, repairs, less down time and longer maintenance intervals



Applications:

- Fuel Oil System
- Hydraulic System
- Lubricant System
- Driving Motor
- Gearing
- Helm
- Stern Tube
- Bow Thruster
- Stabilizer
- Decks Crane
- Hatch Cover
- Decks Winch

**Fine Filter ES-KH
for Offline filtration**



Why using Finefilter ?

- Using a Finefilter prevents solid impurities from causing breakdowns incidentally, often accepted as "normal wear"
- Up to 80% of repair and maintenance costs derives from contaminated fluids
- The $<5\mu\text{m}$ particles have been identified as harmful and their removal is often not efficient enough when attempted by means of inline filters only
- The contamination of ultra-fine particles ($<5\mu\text{m}$) increases more than proportionally, which leads to a chain reaction of tear and wear
- Ultra fine particles leads to abrasion, erosion and corrosion of the oil system
- Further the oxidation of oil is accelerated by the presence of ultra fine impurities

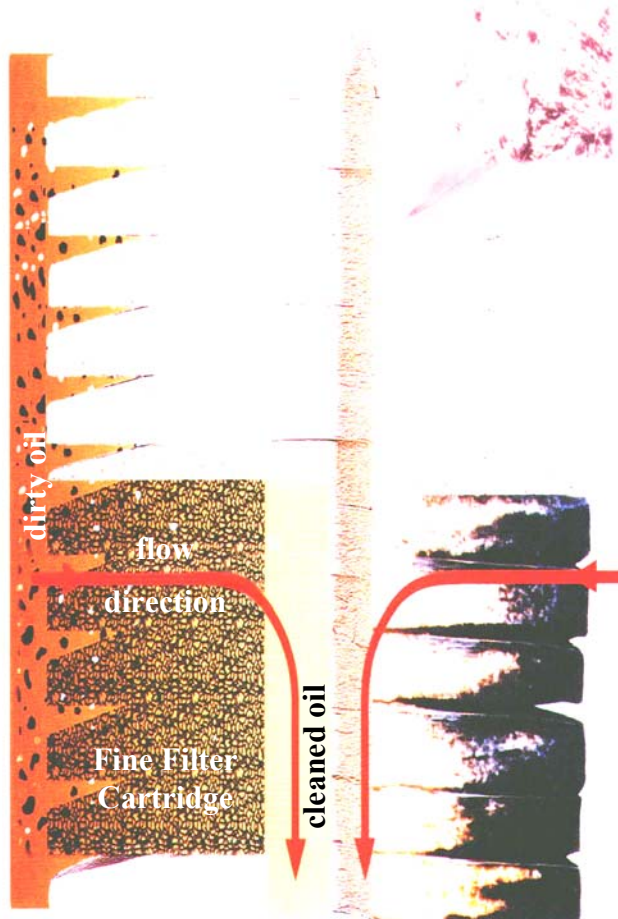
Fine Filter Cartridge -closer inspection-

The Depth Fine Filter:

The efficiency of the filter depends basically on the contact time of the fluid with the filter material. Therefore the main characteristic of the ES-KH-Finefilter is a filter material with a long contact depth and large volume.

The Purity:

The oil flows through the filter radially from the outside to the inner part of the filter. By passing the filter the ultra-fine particles settle down in the depth of the filter material. The filter fineness will be down to $< 1\mu\text{m}$.



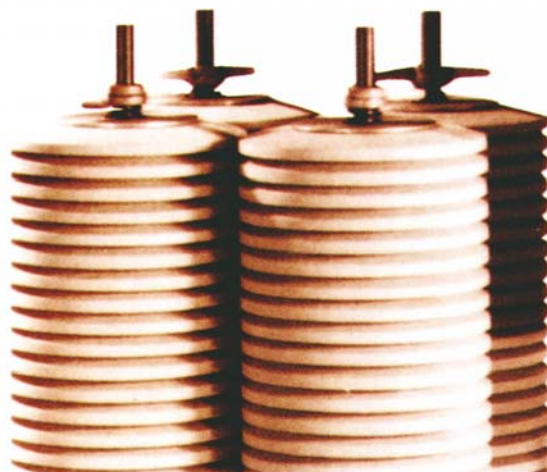
The Filter Material:

The filter material has the structure of a very ultra-fine meshed space lattice with a numerous branched-off channels. The cellulose based cavities account for 75% of the total volume of the filter insert. This results in the very large dirt absorption capacity. The material will not react chemically with additives and therewith no additives will be filtered out.

The Water:

The absorbing of water takes place by cellulose fine filter. Because of extreme absorbency of the cellulose the filter material dehydrate the oil by simultaneously removing of solids out of the oil.

The dirt and water removal capacity of the ES-KH-Fine Filter Cartridges is unique!

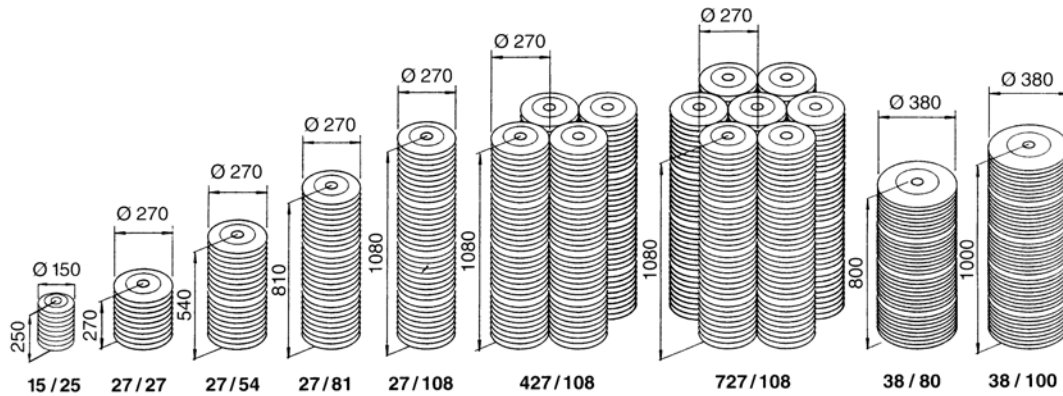


before filtration



after filtration

Standard Filter Cartridges



Depth Filter Cartridge, type J

- Mineral oil up to ISO VG 68/40°C
- Synthetic pressure fluids and lubricants up to ISO VG 68/40°C
- Cold cleaning fluids (mineral oil based)



Depth Filter Cartridge, type B with large surface

- Mineral oil up to ISO VG 460/40°C
- Synthetic pressure fluids and lubricants up to ISO VG 460/40°C
- Cold cleaning fluids (mineral oil based)



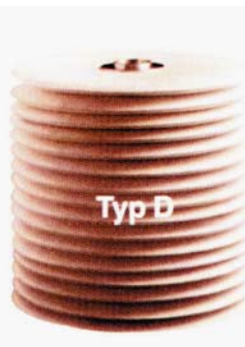
Depth Filter Cartridge, type BLA with large surface

- Water contaminated mineral oil
- Water contaminated synthetic pressure fluids and lubricants up to ISO VG 460/40°C
- HFA fluids (water / oil emulsions)
- HFC fluids (water-glycols)
- Cold cleaning fluids (water)



Depth Filter Cartridge, type FU

- Water contaminated fuel oil
- HFA fluids (water / oil emulsions)



Depth Filter Cartridge, type D with large surface

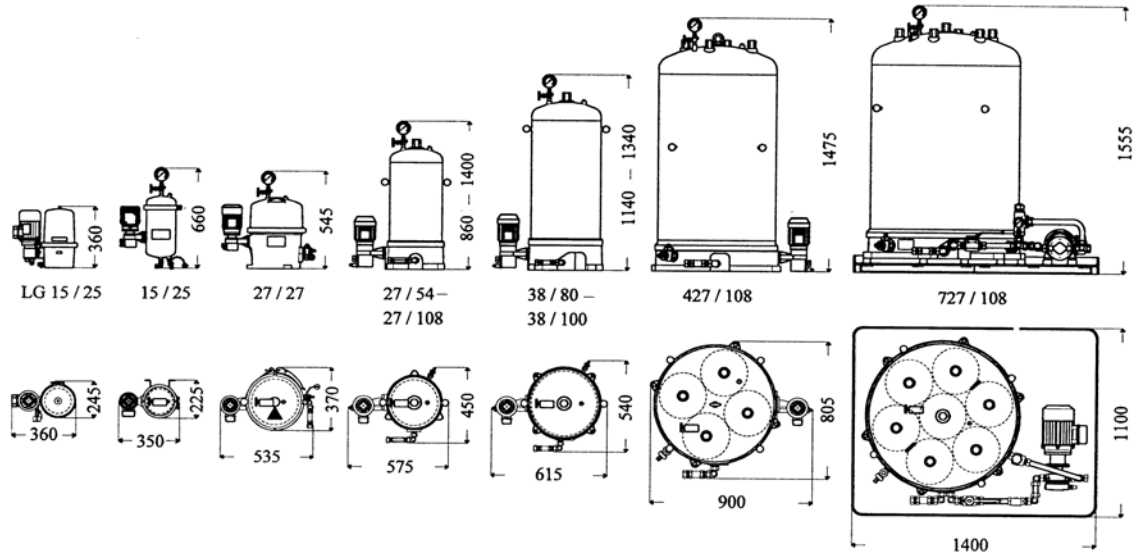
- Mineral oil
- HFA fluids (water / oil emulsions)
- HFC fluids (water-glycols)



Aluminium Oxide or Clay Filter Cartridge

- HFD fluids (phosphate-esters)

Technical Data



Typical standard design of Filter Cartridges for mineral oil and synthetic oil based pressure fluids and lubricants up to ISO VG 68/40°C. Different parameter like viscosity, operation temperature, extreme contamination and high drag-in of dirt results in other designs.

Depth Filter Cartridge, type J								
max. amount of oil in system	ES-KH Fine Filter	Cartridge		Filtration Capacity		Volume	pump capacity	motor power
		Volume	Surface	Particles	Water			
[l]	[model]	[l]	[m ²]	[kg]	[l]	[l]	[l/min]	[kW]
300	15/ 25	4	0,38	0,3	0,4	6	0,35 - 0,7	0,08
700	27/ 27	12	1,13	2,0	1,2	18	0,75 - 1,5	0,09 - 0,12
1.500	27/ 54	24	2,26	4,0	2,4	35	0,75 - 3,0	0,09 - 0,18
2.200	27/ 81	36	3,39	6,0	3,6	60	1,5 - 4,5	0,12 - 0,18
3.000	27/108	48	4,52	8,0	4,8	80	1,5 - 6,0	0,12 - 0,18
4.500	38/ 80	68	6,40	12,0	6,8	103	1,5 - 9,0	0,12 - 0,25
5.500	38/100	85	8,00	15,0	8,5	125	1,5 - 11,0	0,12 - 0,25
10.000	427/108	192	18,08	32,0	19,2	385	6,0 - 21,0	0,18 - 0,55
22.000	727/108	336	31,64	56,0	33,6	621	21,0 - 45,0	0,55 - 1,10

Depth Filter Cartridge, type B								
max. amount of oil in system	ES-KH Fine Filter	Cartridge		Filtration Capacity		Volume	pump capacity	motor power
		Volume	Surface	Particles	Water			
[l]	[model]	[l]	[m ²]	[kg]	[l]	[l]	[l/min]	[kW]
1.500	15/ 25	3,0	0,50	0,4	0,3	6	0,35 - 6,0	0,08 - 0,18
3.000	27/ 27	9,6	2,05	2,0	0,9	18	0,75 - 9,0	0,09 - 0,25
5.000	27/ 54	19,2	4,10	4,0	1,8	35	3,0 - 16,0	0,25 - 0,55
7.000	27/ 81	28,8	6,15	6,0	2,7	60	4,5 - 21,0	0,18 - 0,55
10.000	27/108	38,4	8,20	8,0	3,6	80	6,0 - 32,0	0,18 - 0,55
35.000	427/108	153,6	32,80	32,0	14,4	385	32,0 - 100,0	0,55 - 2,20
70.000	727/108	268,8	57,40	56,0	25,2	621	45,0 - 200,0	1,10 - 5,00

Depth Filter Cartridge, type BLA								
max. amount of oil in system	ES-KH Fine Filter	Cartridge		Filtration Capacity		Volume	pump capacity	motor power
		Volume	Surface	Particles				
[l]	[model]	[l]	[m ²]	[kg]		[l]	[l/min]	[kW]
800	15/ 25	3,0	0,5	0,4		6	3	0,18
2.200	27/ 54	19,2	4,1	4,0		35	11	0,25
3.900	27/ 81	28,8	6,1	6,0		60	16	0,55
6.500	27/108	38,4	8,2	8,0		80	21	0,55

*Test particles with a diameter of 0,5µm.

Fine Filter with automatic water discharge

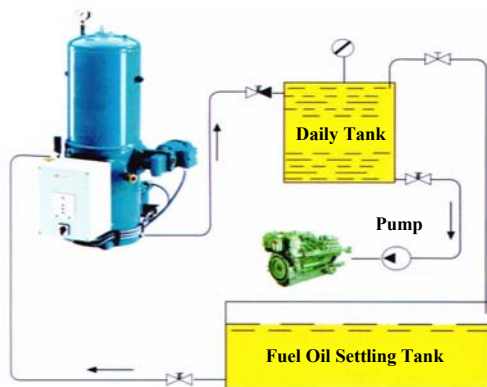
Fine Filter with automatic water discharge, type ES-KH-CO

For every type of Oil, Fuel Oil and Hydraulic Oil

- Fine Filter with additional Coalescer Unit for removal of water
- 2-Step working principle:
 - 1st step: removal of particles out of the oil by the Fine Filter
 - 2nd step: removal of water out of the oil by the Coalescer Unit
- Online filtration for fuel oil filtration
- Offline filtration for lubricants and hydraulic oils
- Simple first installation / easy to retrofit
- Filter fineness down to 3µm
- High impurity accommodation capacity
- Low operational costs due to high dirt holding capacity
- Oil savings due to prolonged oil changing intervals
- Less particles in fuel oil

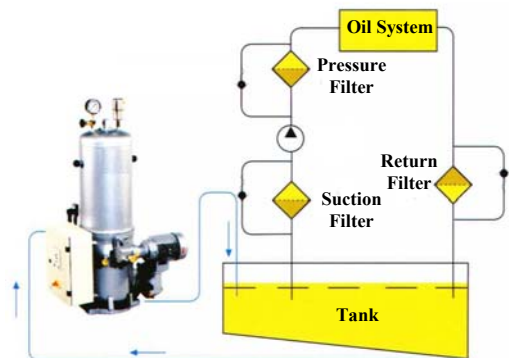


Fuel Oil Filtration



- Online Filtration
- Integration between Fuel Oil Settling Tank and Fuel Oil Daily Tank
- Filter fineness 3µm
- Ensures long lifetime of fuel oil injection pump and nozzles
- Easy operation and long lifetime
- Very effective water separation with the result of minimizing of tank corrosion

Oil Filtration



- Offline Filtration, independent of system operation
- Filter with integrated Coalescer Unit is working with its own pump
- Cleaning of oil also possible if main system is not in operation
- Oil savings due to prolonged oil change intervals
- Main system unaffected by filter element replacement

Why filtration of impurities and water out of the oil?

Impurities

Impurities like particles in the oil are arising during operation by abrasion, suction of dust laden air, corrosion and aging. In pumps, valves cylinders, pipes and screwed connections are impurities from installation works and treatment process. Also the quality of new oils is often not conform with the need of the sensible hydro-components.

On top the normal re-filling process leads to a drag-in of impurities.

Water

Due to leakages in cooling units, sealings, ventilation units or by condensation of humidity, water can be come in contact with the oil. This can cause very expensive interruptions of operation time and maintenance time. If water will be permanently in the oil, there will be a high risk of corrosion.

Reliability and lifetime of the hydro-components depends decisive on the purity of the oil

Design of the ES-KH-CO Fine Filter with Coalescer Unit

Oilfiltration:

The oil, contaminated with particles and water, will be sucked by the own pump and flows through the filter radial from the outside to the inner part of the filter cartridge.

For an effective removal of particles, the filter material consists of a very ultra-fine structure on which also ver fine very fine particles will be filtered.

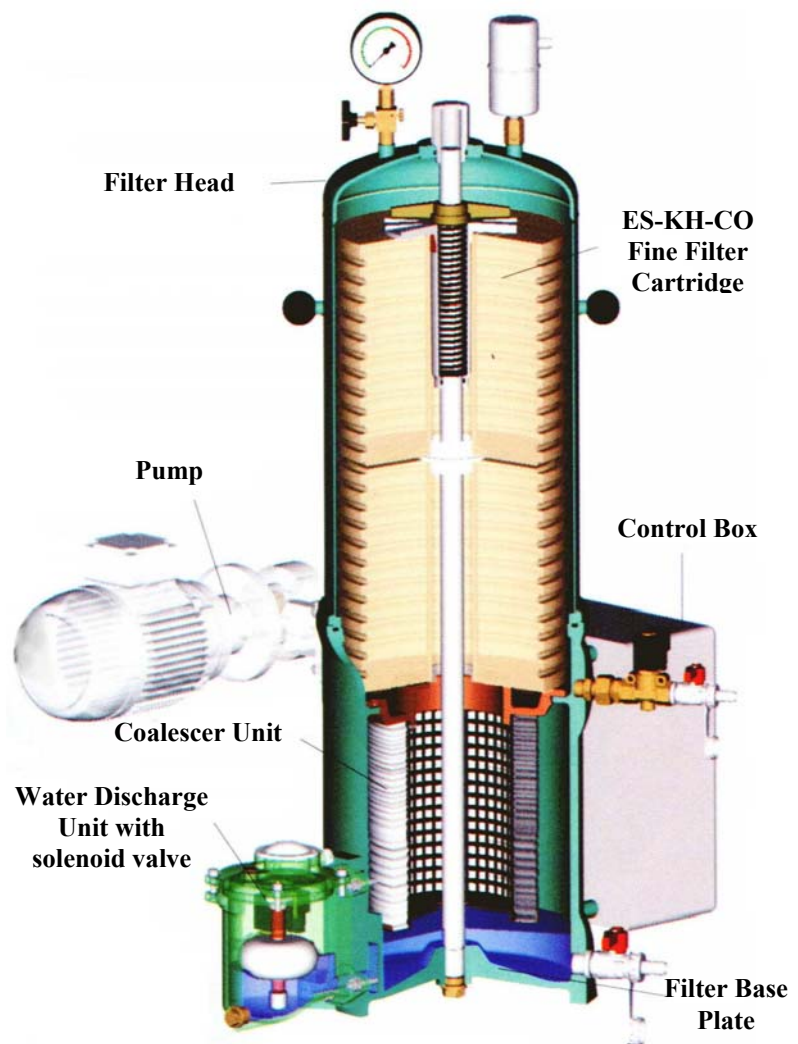
Dehydration:

After passing the Fine-Filter-Element the filtered oil flows axial to the Coalescer Unit. In the Coalescer Unit the filtered oil flows from the inner part to the outside.

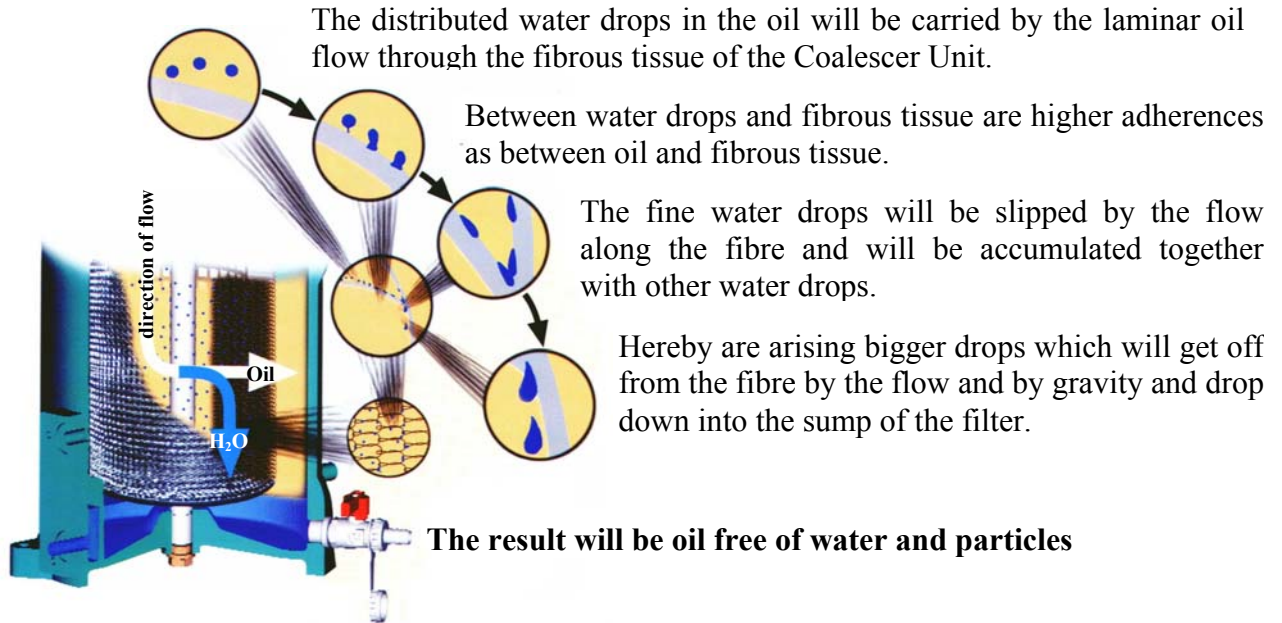
Already in the Fine Filter small drops of water will be combined with each other to form bigger drops of water. In the Coalescer Unit these water drops will be efficiently separated from the oil and flows to the filter sump.

After reaching high level in the filter sump an automatic operated valve will be opened for discharge of the separated water.

The particle and water-free oil coming out of the Coalescer Unit will now flow back to the system.



The Coalescer Unit for an effective removal of water

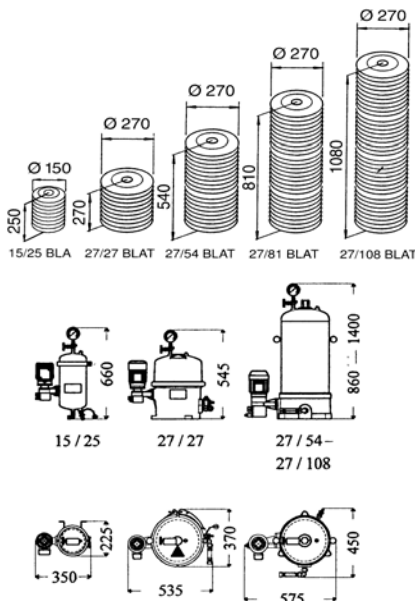


The Fine Filter for highest purity of oil

The filter material has the structure of a very ultra-fine meshed space lattice with a numerous branched-off channels. The cellulose based cavities account for 75% of the total volume of the filter insert. This results in the very large dirt absorption capacity. The material will not react chemically with additives and therewith no additives will be filtered out.



Technical Data



Type of Filter	Filter Cartridge type BLAT		Filtration Capacity approx.	Volume [l]	Pump Capacity [l/min]**	Power of Motor [kW]
	Volume [l]	Surface [m ²]				
15/ 25	3,0	0,5	0,4	7	0,35 - 1,00	0,12 - 0,18
27/ 27	9,6	2,0	2,0	30	3,00 - 4,50	0,18 - 0,25
27/ 54	19,2	4,1	4,0	50	6,00 - 8,00	0,25 - 0,55
27/ 81	28,8	6,1	6,0	75	8,00 - 11,00	0,55
27/108	38,4	8,2	8,0	95	11,00 - 16,00	0,55

* Test particles with a diameter of 0,5µm

** up to ISO VG 46/40°C, other viscosities on request

Crossflow Filter with integrated pressing and briquetting unit

Crossflow Filter, type ES-Z-CF

Filtration / compression of solids / briquetting within one step

- Filtration capacity between 20 – 6.000 l/min
- Automatic backwash system
- Automatic sludge discharge
- Optional separated solids / sludge can be pressed into briquettes
- Filter fineness 3 – 100 µm
- No need of filter aids
- Robust design
- Automatic operation
- Easy operation / handling
- Material steel or stainless steel
- Concentration of solids in the oil up to 20 %
- For new / changed applications, the Filter can be easily changed within 5 minutes

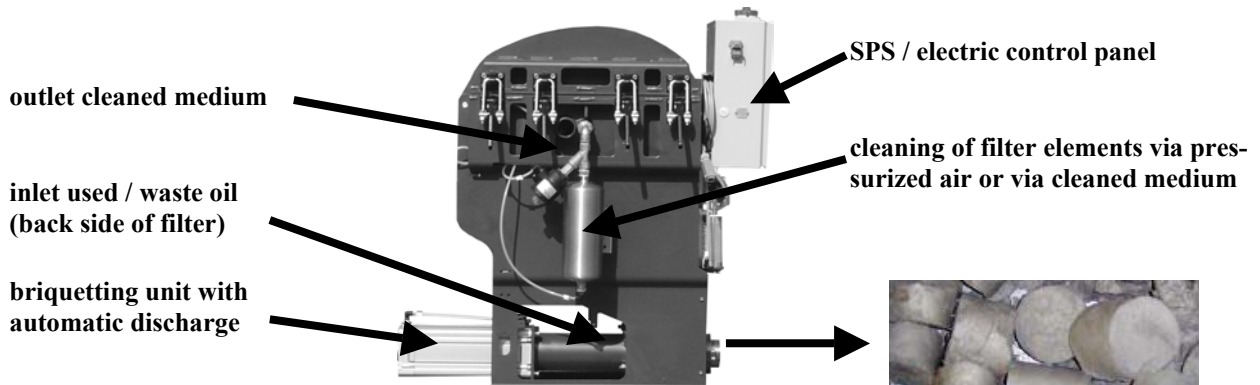


Applications:

- | | |
|------------------|------------------------------|
| ➤ Metal industry | ➤ Automotive industry |
| • cleaning part | ➤ Pharmaceutical industry |
| • wire drawing | ➤ Chemicals industry |
| • grinding | ➤ Paper / Cellulose industry |
| • honing | ➤ Waste Water |

Range of filter-finenesses:

- 0 – 5 micron
- 5 – 15 micron
- 15 – 30 micron
- 30 – 50 micron
- 50 – 100 micron



Technical Data

Crossflow filter with integrated briquette unit

	Type of Filter			
	ES-Z-CF-503-B-50	ES-Z-CF-503-B-60	ES-Z-CF-504-B-75	ES-Z-CF-504-B-110
application	main volume stream by-pass - cleaning	main volume stream by-pass - cleaning	main volume stream by-pass - cleaning	main volume stream by-pass - cleaning
retained particles / filtration capacity	50 – 100 µm / 1.000 l/min	50 – 100 µm / 1.000 l/min	50 – 100 µm / 2.000 l/min	50 – 100 µm / 2.000 l/min
	30 – 50 µm / 500 l/min	30 – 50 µm / 500 l/min	30 – 50 µm / 1.000 l/min	30 – 50 µm / 1.000 l/min
	15 – 30 µm / 300 l/min	15 – 30 µm / 300 l/min	15 – 30 µm / 600 l/min	15 – 30 µm / 600 l/min
	5 – 15 µm / 200 l/min	5 – 15 µm / 200 l/min	5 – 15 µm / 400 l/min	5 – 15 µm / 400 l/min
	0 – 5 µm / 100 l/min	0 – 5 µm / 100 l/min	0 – 5 µm / 200 l/min	0 – 5 µm / 200 l/min
max volume of filter housing	50 l	60 l	75 l	110 l
material	steel	steel stainless steel	steel	steel stainless steel
pH-Value	7 - 10	steel: 7 - 10 stainless steel: 4 - 13	7 - 10	steel: 7 - 10 stainless steel: 4 - 13
temperature	50°C	steel: 50°C stainless steel: 90°C	50°C	steel: 50°C stainless steel: 90°C
discharge of briquettes	automatic	automatic	automatic	automatic
coarse chips max 5 mm	up to 20 % allowed	up to 20 % allowed	up to 20 % allowed	up to 20 % allowed

Crossflow filter with automatic sludge discharge

	Type of Filter			
	ES-Z-CF-502-S-33	ES-Z-CF-503-S-50	ES-Z-CF-504-S-75	ES-Z-CF-804-S-300
application	main volume stream by-pass - cleaning	main volume stream by-pass - cleaning	main volume stream by-pass - cleaning	bypass
retained particles / filtration capacity	50 – 100 µm / 500 l/min	50 – 100 µm / 1.000 l/min	50 – 100 µm / 2.000 l/min	50 – 100 µm / 6.000 l/min
	30 – 50 µm / 250 l/min	30 – 50 µm / 500 l/min	30 – 50 µm / 1.000 l/min	30 – 50 µm / 3.000 l/min
	15 – 30 µm / 150 l/min	15 – 30 µm / 300 l/min	15 – 30 µm / 600 l/min	15 – 30 µm / 2.400 l/min
	5 – 15 µm / 100 l/min	5 – 15 µm / 200 l/min	5 – 15 µm / 400 l/min	5 – 15 µm / 1.600 l/min
	0 – 5 µm / 50 l/min	0 – 5 µm / 100 l/min	0 – 5 µm / 200 l/min	0 – 5 µm / 800 l/min
max volume of filter housing	33 l	50	75 l	300 l
material	steel stainless steel	steel stainless steel	steel stainless steel	steel stainless steel
pH-Value	steel: 7 – 10 stainless steel: 4 - 13	steel: 7 – 10 stainless steel: 4 - 13	steel: 7 – 10 stainless steel: 4 - 13	steel: 7 – 10 stainless steel: 4 - 13
temperature	steel: 50°C stainless steel: 90°C	steel: 50°C stainless steel: 90°C	steel: 50°C stainless steel: 90°C	steel: 50°C stainless steel: 90°C
discharge of briquettes	automatic	automatic	automatic	automatic
coarse chips max 20 mm	up to 20 % allowed	up to 20 % allowed	up to 20 % allowed	up to 20 % allowed

Precoated Filter System

Precoated Filter System, type ES-A

- Dead-End-Filtration with short regeneration times
- Filter fineness can be adjusted via different filter aids to precoat the filter
- Thickness of precoat layer 0,5 – 1,0 mm
- Precoat can be renewed during operation thus no filter blocking
- Filter fineness down to 0,1 µm
- Pressure filtration up to 4 bar
- Fully automatic operation
- Self cleaning
- Material stainless steel



Also high contaminated suspensions with a high amount of slimy, oily, greasy or other difficulty substances for the separation process can be treated by the Precoated Filter System.

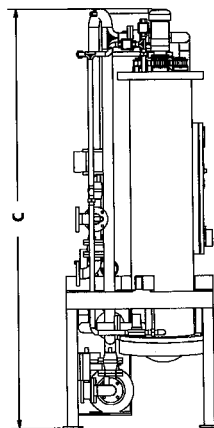
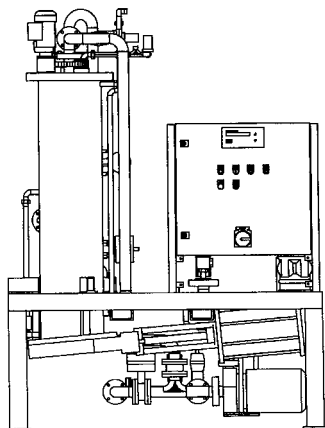
Applications

- Petrochemical industry
- Metal processing industry
- Pharmaceutical industry
- Water treatment
- Oil treatment

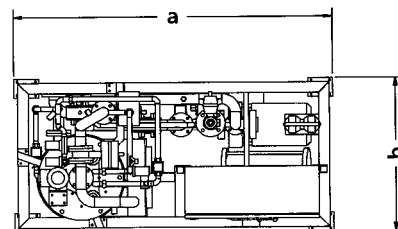
Main components of the Multi Chamber Filtration System

- ✓ stainless steel filtration membrane with housing
- ✓ el. process control
- ✓ pumps
- ✓ valves
- ✓ filter aid dosing station with stirrer and feeding pump

Main dimensions of the Precoat Filter System



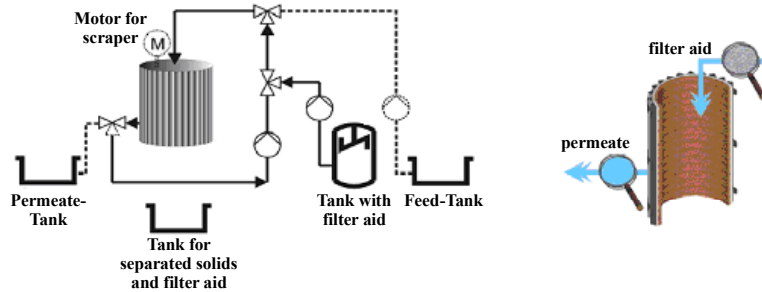
		Filtering surface		
		0,25 m ²	0,75 m ²	1,20 m ²
a	[mm]	1.200	1.550	1.810
b	[mm]	700	775	890
c	[mm]	2.000	2.000	2.500



Principle process of the Precoated Filter System

Step 1: Defined coat application of the filter aid

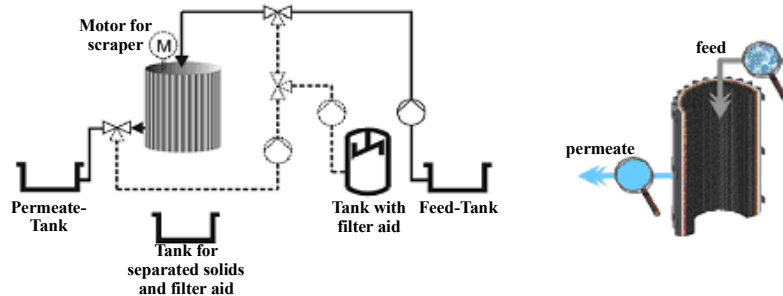
Specific fine precoating of the filter membrane with the filter aid.



1. 0,5 – 1,0 mm thin precoat within 30 sec
2. Different filter aids applicable like cellulose, diatomite, perlite, charcoal etc
3. Filter fineness adjustable
4. Circulation until total build up of precoat

Step 2: Filtration

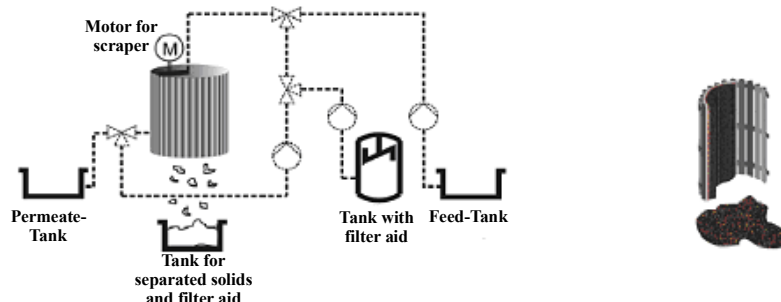
During filtration the feeding pump will press the feed through the precoat into the Permeate-Tank. Via pressurized air the separated solids and the filter aid will be “dewatered”.



1. Separation limit down to 0,1 micron
2. Pressurized filtration via dead-end -treatment
3. Combination of surface- and deep-bed filter
4. Slowly growing of the filter cake

Step 3: Discharge of retentate

peel off and discharge of the separated solids together with the soiled filter aid



1. Dehumidifying of filter cake via pressurized air
2. Automatic discharge of separated lids
3. dry content of discharged solids up to 50 %
4. Compact and hard standing retentate