



CLOTH FILTRATION

Filtration systems with
pile cloth filter media



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CLOTH FILTRATION

The most used tertiary filtration techniques for municipal and industrial wastewater treatment plants are:

- a) **cloth filtration**
- b) **sand filtration**

The MITA Water Technologies cloth filtration system (both drum and disc types) is an excellent alternative to sand filtration.

Thanks to the employment of special kinds of cloth it combines characteristics and advantages of both surface and deep filtration to achieve high solids removal rates.



OPERATING PRINCIPLE

The Polstoff cloth filtration occurs by flow under gravity with the unit completely at rest. No reserve unit nor service water are required during the backwash of the cloth. Two versions are available:

- a) **drum type**
- b) **disc type**

In the first case the filtration cloth is fitted on a drum made of perforated steel sheet, operating in a horizontal position.

In the second version on the other hand a central hollow shaft supports up to a maximum of 32 discs, each comprising 6 sectors made of plastic, covered with filter cloth. The water to be treated is channelled to the containment tank of the filter, which operates totally submerged, and passes through the filter cloth whilst the solids are retained by its fibres.

The clean water is sent to the discharge from inside the drum

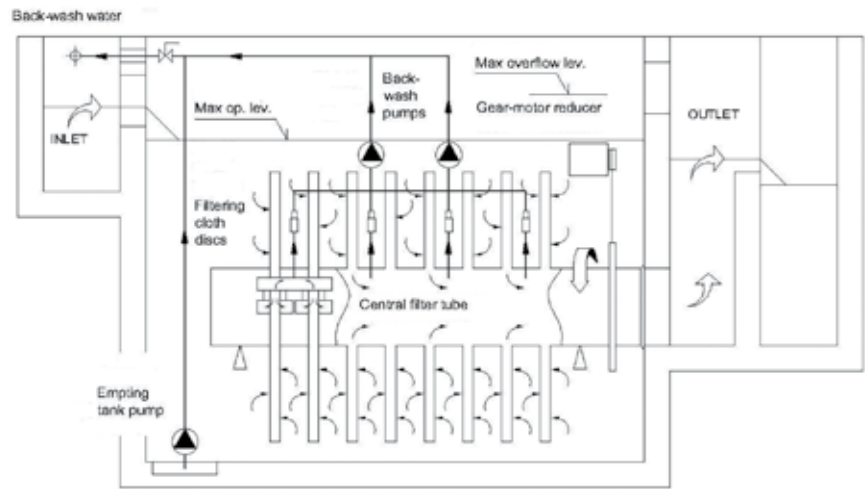
through the riser pipe or, in the case of the disc version, from the central shaft via the discharge weir. As solids are deposited on the cloth the pressure drops increase; the water level in the filter basin increases compared to the height of the exit weir.

When a difference in level of approx. 25 cm is reached, the cloth backwash device is activated: a pumping system, connected to a series of suction nozzles, removes the solids retained by the cloths, restoring the filtration capacity of the unit. The suction water and the sludge removed are returned upstream. Any solids settled out on the bottom of the filter tank are removed by a pump controlled by a timer.



KEY CHARACTERISTICS

- Gravity filtration with limited pressure drop
- Continuous filtration, which does not necessitate any reserve units for the backwashing phase (the washing involves the disc-type sets which are washed one after another; this ensures continuity of the filtration process)
- “Polstoff” free-fibres filter cloth whose key property is high mechanical strength
- High filtration efficiency (TSS < 5 mg/l at discharge)
- Countercurrent washing of the cloth, with low energy consumption, using a suction pumping set which does not cause any aerosol formation or acoustic nuisance
- Flexibility in case of overloading and selfregulation of the filter in function of the values of the inlet parameters
- Minimum layout requirement
- Extremely limited electrical consumption
- Low backwash water volumes
- Extremely reduced electricity consumption (maximum 2.2 kW per system or 4.12 kW per HD system)
- Simplicity of installation with the possibility of installation in concrete or metal tanks
- Flexible execution, adaptable to existing plants
- Limited maintenance (requirements) and direct access to all parts used in the filter
- Very limited environmental impact



Typical flow diagram of MITA disc filter





CLOTH FILTRATION WITH POLSTOFF MATERIAL



The material coating the filter drums and discs is of the “pile” or “free-fibre” type.

During the filtration phase the fibres are crushed, distorted and cross-wound to form a panel which is very efficient for the separation and retention of suspended sludge, in a similar manner to the deep filtration typical of sand filters.

During the suction and backwash

process the fibres are raised inside the suction device, in such a manner that the so-lids, previously captured, can be readily removed by the counter-current water flow.

This filtration technique with free-fibres filter cloth provides the possibility of use of very fine fibres and the attainment of optimum separation efficiencies, even in cases of

high hydraulic loading or of load peaks and with minimum back-wash water flowrates.



CONSTRUCTION MATERIALS

- Polyamide free-fibres filter cloth with polyester support structure
- Cloth support is composed of a fibreglass reinforced polypropylene grille
- The suction device in contact with the cloth is made of anti-friction plastic material
- Driver chain, motor-gearbox pin and sprocket wheel on the filter shaft are all made of plastic material
- All metal structures are made of 304 stainless steel (or, on request, 316 L).



SECTORS OF APPLICATION

- Advanced tertiary treatment for solids removal from civil and industrial effluents
- Secondary sludge removal downstream biological treatments with bio-film as an alternative to final clarifiers
- Phosphorus reduction up to values < 0.1 mg/l
- Micro-plastics separation
- Primary filtration downstream screening
- Pre-filtration of surface water for potabilization
- Separation of solids derived from the chemical-physical treatment of industrial water
- Filtration upstream of UV disinfection
- Filtration upstream membrane treatment (RO)
- Removal of micro-pollutants in combination with PAC
- Water treatment of cooling towers
- First flush stormwater treatment
- Road runoff water treatment

TF SERIES DRUM FILTERS

In the TF series the cloth support is provided by a perforated sheet steel drum.

This model is employed for tertiary wastewater treatment plants of low capacity (up to approx. 2.000 equivalent inhabitants).

It is moreover the type of filter generally used for secondary wastewater treatment downstream of fixed growth biological systems.

It is available in versions suitable for installation in concrete tanks or in metal tanks, complete with electric control panels.



PEC - PEC VM SERIES DISC FILTERS

In the PEC - PEC VM series the washing of the (filter) cloth is effected by pumps, each of which serves two or more discs.

These pumps are activated in sequence in order to never interrupt the operation of the system.

The filter solution with PEC - PEC VM is ideal for small-to-medium installations and is an especially flexible and reliable answer to the needs of installations which are poorly supervised with high and very variable loads.

The largest model of this series has a maximum disc count of 24, a filtration surface of 120 m² and can handle, as a tertiary wastewater treatment step, a load corresponding to a community of 40.000 equivalent inhabitants.

The various models available can be installed in parallel thus obtaining installations of varied capacities.



PPC - PPC VM SERIES DISC FILTERS

The PPC - PPC VM series was developed for installations serving medium to large capacity plant.

For this range of filters the cloth washing is performed by only two pumps (of which one is stand-by) which serve all the discs.

The selection of the discs for which the backwashing is to be effected, in sequence, is obtained via pneumatically controlled, double-effect valves. In this way the operation of the unit is not interrupted, even during the backwash phases. The largest model of this series has a maximum disc count of 32, a filtration surface of 160 m² and can handle, as tertiary treatment, a load corresponding to a community of approximately 50.000 equivalent inhabitants.

The system is moreover equipped with 1 pump for regular bottom sludge extraction, also having the

function of tank emptying in case of need. The low energy consumption, characteristic of MITA filters, becomes even more apparent and important in this higher capacity series: this is one of the determining factors in the selection and in the choice of technology to adopt per tertiary filtration.

Again for this series of filters, several units can be employed in parallel to meet the requirements of large sizes of plant.



PECV-VM SERIES

The filter solution model PECV-VM is suitable for small-to-medium installations and is an especially flexible and reliable answer to the needs of plants that are poorly supervised with high and very variable loads.

The largest model of this series has the maximum disc number of 6, a filtration surface of 30 m² and can handle, as a tertiary wastewater treatment step, a load corresponding to a community of 10.000 PE.

The various available models can be installed in parallel in order to obtain installations with several capacities.

In the PECV-VM series the washing of the (filter) cloth is carried out by pumps, each of which serves two or more discs.

These pumps are activated in sequence, in order to never interrupt the operation of the system.



- Made of AISI 304 stainless steel
- Backwash system with submersible pump
- Compact solution, with low hydraulic profile
- Containing tank with flat bottom
- Free fibers filtering media
- High efficiency in TSS removal < 5 mgTSS/l at the outlet
- Easy access to the utilities
- Minimum maintenance.



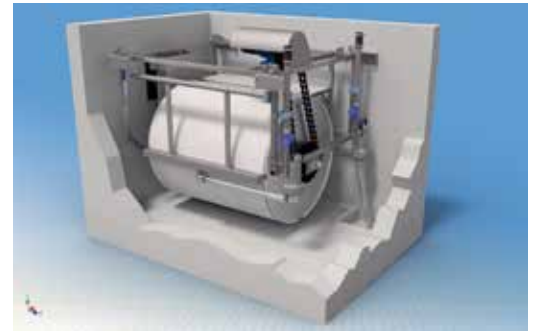
TECHNICAL DATA



MSF PECV-VM Model	2/10	3/15	4/20	5/25	6/30
Surface - m ²	10	15	20	25	30
No. filtering discs	2	3	4	5	6
Motor power - kW	2,75	3,85	3,85	6,05	6,05
Motor power input - kW	1,32	2,20	2,20	2,20	2,20

Technical data not binding

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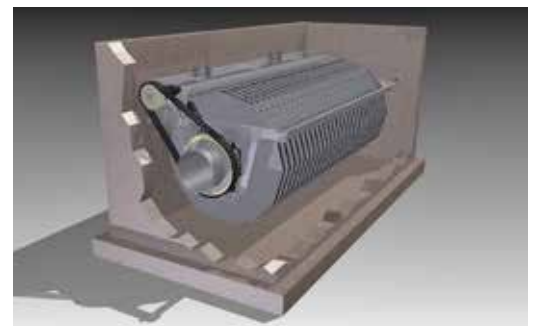


Drum series

Model*	Drum dimensions mm	Filtering surface m ²	Motor power kW	Input kW
TF 2	Ø 740 x 935	2,00	1,98	0,86
TF 4	Ø 1.200 x 1.050	4,00	1,98	0,86
TF 6	Ø 1.320 x 1.510	6,00	1,98	0,86

* Available both for concrete and metallic tank installation

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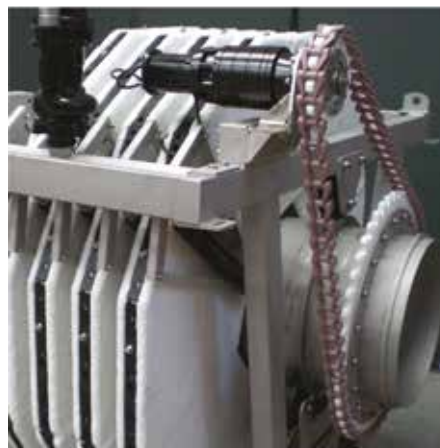
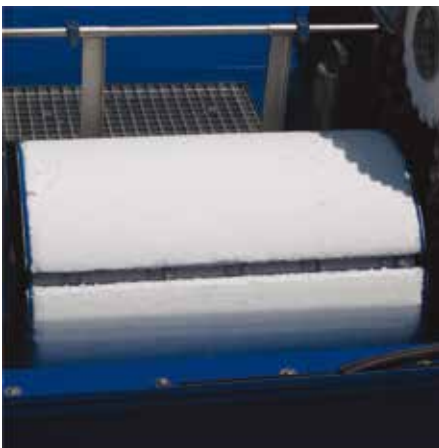


Disc series

Model*	Discs dimensions mm	Filtering surface m ²	Motor power kW	Input kW
MSF 2/10	2.100	10	2,57	1,18
MSF 4/20	2.100	20	4,77	2,06
MSF 6/30	2.100	30	6,97	2,06
MSF 8/40	2.100	40	6,97	2,06
MSF 10/50	2.100	50	9,35	2,20
MSF 12/60	2.100	60	9,35	2,20
MSF 14/70	2.100	70	7,15	2,20
MSF 16/80	2.100	80	7,15	2,20
MSF 18/90	2.100	90	7,15	2,20
MSF 20/100	2.100	100	7,15	2,20
MSF 22/110	2.100	110	7,15	2,20
MSF 24/120	2.100	120	7,15	2,20
MSF 28/140	2.100	140	11,75	4,12
MSF 32/160	2.100	160	11,75	4,12

* Available both for concrete and metallic tank installation

Technical data not binding





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