

# FIBRAFIX® MODULES

## DEPTH FILTER LENTICULAR MODULES FOR DEPTH FILTRATION

For coarse, fine and sterile filtration



### Characteristics

Depth filter modules allow the user to handle large filter areas easily in a disposable assembly. Filtration is performed in a closed system. Depth filter sheets inside have a high dirt holding capacity of up to 4 kg per m<sup>2</sup>. In the filtration process, dirt particles are slowed down and eventually retained by the tortuous path inside the filter sheet and by electrokinetical interactions («zeta potential»). Through this unique mechanism, a high capacity (long lifetime of filter until plugging) can be achieved. All materials are FDA approved.

### Dimensions

Modules are available in the following versions:

	12"	16"
Diameter	300 mm	400 mm
Filter Area/Module (m <sup>2</sup> )	1.8 m <sup>2</sup> (19 sqft)	3.6 m <sup>2</sup> (38 sqft)
Height (bayonet adapter)	330 mm	330 mm
Height (flat adapter)	272 mm	272 mm

Filter area for modules with 16 cells. Modules with reduced number of cells are available upon request.

### Adapter types

The FILTROX depth filter modules are available in all common adapter types:

- flat adapter (= DOE)
- bayonet adapter (= DOR = F)

Historically, the flat adapter is quite common.

The bayonet adapter is a safer alternative and for sterile filtration the adapter of choice due to its double-o-ring sealing gaskets.

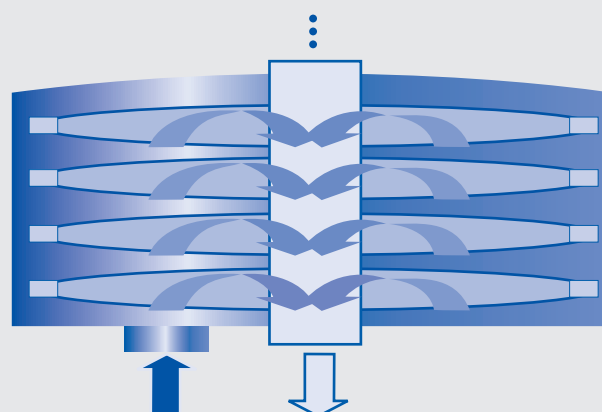
The handling of that adapter type is, in addition, much easier.

### Rigid construction

The module consists of a polypropylene backbone (rigid core) and depth filter sheets on drainage bodies.

### Function principle

The module is placed in a special housing. Turbid liquid fills the space between the housing and the outside part of the module. The liquid flows through the sheets where dirt particles are retained. The clear liquid is drained through the inside of the drainage body and the rigid core to the outlet of the filter housing.



### Applications

The filtration work is done by the depth filter sheets, which are available in a variety of porosities, from coarse over fine to germ reducing and -removing filtration («sterile filtration»).

Examples of industries:

- Beverage (Wine, spirits, juice...)
- Cosmetics
- Solvents
- Fine chemicals
- Process water
- Pharmaceutical intermediates

### Retention rates of coarse and fine filter sheets

Pore size in depth filter sheets is measured indirectly by the flow rate. The correlation between pore size and flow rate is empirical. The following nominal porosities (retention rates) are available:

Type module	Retention rate [µm]	Flow rate* [l/m <sup>2</sup> min]	Flow rate* [GPM/Ft <sup>2</sup> ]
AF 03	20	2800 – 3600	69 – 88
AF 9	10	1500 – 2100	37 – 52
AF 23	6.0	560 – 700	14 – 17
AF 33	5.0	280 – 360	7 – 9
AF 43	4.0	240 – 300	6 – 7
AF 73	1.5	170 – 210	4 – 5

## Retention rates of sterile filtering filter sheets

Type module	Retention rate[μm]	Flow rate* [l/m <sup>2</sup> min]	Flow rate* [GPM/Ft <sup>2</sup> ]
AF 103	0.6	100 – 120	2.5 – 3
AF 113	0.5	68 – 80	1.7 – 2
AF 133	0.4	45 – 56	1.1 – 1.4
AF 143	0.2	26 – 34	0.6 – 0.8
AF 153	0.04	10 – 16	0.2 – 0.4

\* At 1 bar differential pressure.

## Logarithmic bacteria retention value (LRV)

LRV of germ reducing or germ removing sheets in modules:

Type	Test germ	Load	LRV
AF 103	Germ reducing (reducing the no. of germs in filtrate)		
AF 113	<i>Serratia marcescens</i>	1.0 X 10 <sup>7</sup> /cm <sup>2</sup>	>6
AF 133	<i>Serratia marcescens</i>	1.0 X 10 <sup>8</sup> /cm <sup>2</sup>	>7
AF 143	<i>Serratia marcescens</i>	1.0 X 10 <sup>9</sup> /cm <sup>2</sup>	>8
AF 153	<i>Brevundimonas diminuta</i>	1.0 x 10 <sup>9</sup> /cm <sup>2</sup>	>8
Test germs:	<i>Serratia marcescens</i> , ATCC 14756 <i>Brevundimonas diminuta</i> , ATCC 19146		

## Operating conditions

Max. operating temperature: ..... 82° C

Max. differential pressure (Module): ..... 2.4 bar

Recommended rinsing volume: .....  
... 50 l/m<sup>2</sup>

Recommended sterilization: ..... hot water or chemical

Note: For chemical sterilization with oxidizing agents do not exceed recommended contact time. Inline steam sterilization requires careful handling to avoid back pressure.

## Extractables

Heavy metals content referring to recommendations XXXVI/1 German BgVV (law on foodstuffs and items of practical use): ..... < 50 ppm

## FILTROX quality assurance

FILTROX assures the best quality control according to international standards:

- ISO 9001 (Quality management)
- ISO 14001 (Environmental management)
- FDA drug master file: # 16418

External tests of lenticular modules and filter sheets were performed and certified according to

- USP plastic class test VI (BSL, Munich)
- other CFR requirements by the NAMSA

FILTROX is using polyamidoamine, as wet strength agent, in its filter

sheets. The ISEGA Institute for food analysis in Aschaffenburg (Germany) performed a test for extractable MCPD and DCP. The FILTROX filter sheets extracts were below the detection limit of the approved standard method. The filter sheets are free of GMO and common allergens. The backbone material of the lenticular modules is polypropylene.

## Gasket material

Available material:

- Silicone (standard)
- EPDM
- Teflon® (encapsuled gaskets)

## Chemical resistance (filter sheets)

Substance	Concentration [%]	Resistance	
		T = 20° C	T = 80° C
NaOH	1	r	r
	2	r	lr
HCl	5	r	lr
HNO <sub>3</sub>	5	r	lr
H <sub>2</sub> SO <sub>4</sub>	10	r	lr
Acetic acid	Conc.	r	r
Citric acid	10	r	r
Peracetic acid	0.1	r	r
Butanol	80	r	r
Ethanol	80	r	r

r = resistant; lr = limited resistant

For the complete list please refer to our special documentation

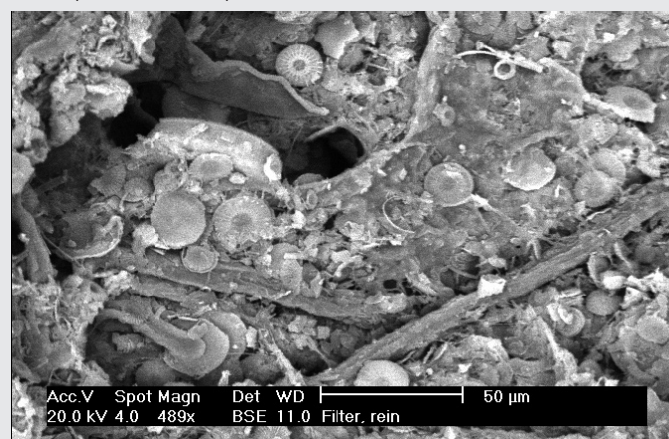
## Material (filter sheets)

Purified and bleached cellulose, natural inorganic filter aid and polyamidoamine (< 3%).

## Diatomaceous earth

Sheets with an ash content > 1 contain diatomaceous earth (DE /«Kieselguhr») or perlite as an inorganic filter aid.

Filtrox uses only natural kieselguhr with a «Cristobalite» content < 1 % (detection limit).



REM picture of a depth filter sheet: round/disc-structures are DE, particles, long structures represent cellulosic fibers.

Your Filtrox dealer:

The information contained in this pamphlet is up-to-date at the time of release. However, each end user is requested to check the suitability of their product(s) with the types of filtration mentioned in this leaflet. Technical modifications are reserved.