FIBRAFIX®

DEPTH FILTER SHEETS

For beverage, food and industrial applications

Depth filter sheets are used to remove particles from liquids. This means that liquids can be clear-, fine- or sterilization-filtered. For depth filtration filter media of a thickness of 2.5–4.5 mm are required. The particles are retained using two filtration principles: 1. surface filtration and 2. depth filtration. The liquid flows through a three-dimensional, asymmetrical fiber network in the depth filter. The solid components are retained using mechanical and electrokinetic effects. This significantly increases the absorption capacity. The purpose of a filtration process is to produce either a liquid (filtrate) or solids (retentate). Depth filtration focuses mainly on the production of liquid filtrate.

Formats are available from 6 cm round to 2.425 m x 1.215 m square. Practically every format in between is possible, which means they can be installed in any commercially available sheet filter. Depth filter sheets have a particle absorption capacity of up to 4 kg/m^2. Furthermore, any available filter sheet grade is available as lenticular module (FILTRODISC™, see brochures for DISCSTAR™ and FILTRODISC™ modules).

Material

Filter sheets:
- Cleaned and bleached cellulose
- Natural filter aid (kieselgur, perlite)
- Cationic wet strength agent
- TRIEX® (only FIBRAFIX® TX-R)

Handling

Depth filter sheets are used in sheet filters such as those in the FILTROX NOVOX® range. The sheets (except in NOVOX® OD or NOVOX® CP) must be wetted when fitted into the filter. All filter sheets should be pre-rinsed with 50 l/m^2 of clean water/buffer for all water and solvent based applications. A pressure difference between the inlet and outlet is required to allow flow. The filters are exhausted when the differential pressure exceeds a given value (1–2.5 bar, depending on porosity and application). With certain applications it is possible for the filter sheets to be regenerated. Please refer to the special instructions for the handling of depth filter sheets.

The sheets can be sterilized with hot water (85 °C) or inline steam (125 °C).

Sheet types

Type	Description	Application examples
FIBRAFIX® TS	Technical sheets	Paints, inks, glues, process water, biodiesel, high-viscosity solutions etc.
FIBRAFIX® AF	Standard depth filter sheets	Beverages, fine chemicals, cosmetics, extracts, gelatine, sugar solution etc.
FILTRODUR®	Filter sheet developed as a carrier sheet for pre-coat filtration	Beverages (especially beer)
FIBRAFIX® TX-R	Special sheet	Removing TCA and TBA from wine and other carriers

FIBRAFIX® TS

	Retention rate [µm]	Water value* [l/m^2 min] Δ p = 0.3 bar	Filtration type
TS 2	55–35	2468–4444	Coarse
TS 4	50–30	2400–3600	Coarse
TS 5	40–25	1723–3064	Coarse
TS 7	35–20	677–1203	Coarse
TS 10	30–10	1583–2815	Coarse
TS 12	20–8.0	1119–1989**	Coarse

* does not correspond to the effective flow rate

** Δ p = 1 bar

FIBRAFIX® AF

Sheet type		Retention rate [µm]	Water equivalent* [l/m² min] Δ p = 1 bar	Filtration type
Standard	High performance (increased capacity)			
FILTRODUR®			>2500	Support sheet
AF 6		35–15	2800–3600	Coarse filtration
AF 9		30–10	1500–2100	Coarse filtration
AF 15		20–8.0	960–1240	Coarse filtration
AF 20		15–6.0	560–700	Clear filtration
	AF 21H	15–6.0	690–865	Clear filtration
AF 30		12–5.0	350–400	Clear filtration
	AF 31H	12–5.0	280–360	Clear filtration
AF 40		9.0–4.0	240–280	Clear filtration
	AF 41H	9.0–4.0	240–300	Clear filtration
AF 50		6.0–3.0	200–240	Clear filtration
AF 70		3.0–1.5	160–200	Fine filtration
	AF 71H	3.0–1.5	170–210	Fine filtration
AF 100		1.5–0.6	115–145	Germ reducing filtration
	AF 101H	1.5–0.6	98–121	Germ reducing filtration
AF ST 110		0.8–0.5	68–80	Sterile filtration (germ removing filtration)
AF ST 130		0.6–0.4	42–52	Sterile filtration (germ removing filtration)
AF ST 140		0.4–0.2	26–34	Sterile filtration (germ removing filtration)
AF ST 145		0.3–0.1	19–29	Sterile filtration (germ removing filtration)
AF ST 150		0.2–0.04	10–16	Sterile filtration (germ removing filtration)
TX-R			42–52	TCA / TBA removal

* does not correspond to the effective flow rate

Bacterial log reduction value (LRV)

Type	Test pathogen	Load	LRV
AF 100 / AF 101H	Reduction of pathogen quantity in filtrate		
AF ST 110	*Serratia marcescens*	1.0 x 10^7/cm²	>5
AF ST 130	*Serratia marcescens*	1.0 x 10^8/cm²	>7
AF ST 140	*Serratia marcescens*	1.0 x 10^9/cm²	>8
AF ST 145	*Serratia marcescens*	1.0 x 10^9/cm²	>8
AF ST 150	*Brevundimonas diminuta*	1.0 x 10^9/cm²	>8
Test germs	*Serratia marcescens:* ATCC 14756 *Brevundimonas diminuta:* ATCC 19146		

Chemical resistance

Substance	Concentration [%]	Resistance T = 20 °C	Resistance T = 80 °C
NaOH	1	r	r
	2	r	lr
HCl	5	r	lr
HNO_3	5	r	lr
H_2SO_4	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 = limitation in resistance
Please contact FILTROX directly for other chemicals.

Extractable materials
FILTROX filter sheets fulfill the requirements of the German Food, Consumer Goods and Feedstuffs Code (Lebensmittel-Bedarfsgegenstände und Futtermittelgesetzbuch – LFGB) Recommendation XXXVI/1 of the Federal Institute for Risk Assessment (Bundesinstitut für Risikobewertung – BfR), and the test criteria of the FDA (US Food and Drug Administration) CFR 21 Section 177.2260. The filter sheets are manufactured under controlled conditions, to guarantee the highest expectations in terms of quality and cleanliness (FDA Drug Master file: DMF #16418).

FIBRAFIX® AF and TS, FILTRODUR®
Heavy metals: According to the
recommendations of the XXXVI/1 BFR: ..... < 50 ppm
MCPD and DCP in the wet
strength agent:..... in accordance with legal regulations
GMO: ..... absent
Allergenic substances: ..... absent

Packaging
FILTROX filter sheets of all standard sizes are hygienically shrink-wrapped and packaged in boxes. Special packaging (non-standard sizes or unboxed) is available on request.

Storage period and conditions
The sheets must be stored in their original packaging in an odorless, dry and well vented area. We recommend using the sheets within 60 months of the date of manufacture.

Disposal
Untainted sheets can be disposed of with normal household waste. Used sheets must be disposed of in accordance with the type of contamination.

Quality assurance
Quality checks meet international standards:
- ISO 9001:2008 (quality management)
- ISO 14001:2004 (environmental management)
- ISO 22000 (food safety)
- FDA Drug Master file: DMF #16418
- FDA 21 CFR compliance
- Kosher certificate
- EU safety data sheets can be downloaded from the website.

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