



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/m². Furthermore, any available filter sheet grade is available as lenticular module (FILTRDISC™, see brochures for DISCSTAR™ and FILTRDISC™ 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/m² 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. |
| FILTRDUR® | 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] Δp = 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

** Δp = 1 bar

FIBRAFIX® AF

| Sheet type | | Retention rate [µm] | Water equivalent* [l/m ² min] Δp = 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 145Z** | | 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

** Z = highly charged filter sheet

Bacterial log reduction value (LRV)

| Type | Test pathogen | Load | LRV |
|------------------|---|--|-----|
| AF 100 / AF 101H | Reduction of pathogen quantity in filtrate | | |
| AF ST 110 | <i>Serratia marcescens</i> | 1.0 x 10 ⁷ /cm ² | >5 |
| AF ST 130 | <i>Serratia marcescens</i> | 1.0 x 10 ⁸ /cm ² | >7 |
| AF ST 140 | <i>Serratia marcescens</i> | 1.0 x 10 ⁹ /cm ² | >8 |
| AF ST 145Z | <i>Serratia marcescens</i> | 1.0 x 10 ⁹ /cm ² | >8 |
| AF ST 150 | <i>Brevundimonas diminuta</i> | 1.0 x 10 ⁹ /cm ² | >8 |
| Test germs | <i>Serratia marcescens</i> : ATCC 14756 <i>Brevundimonas diminuta</i> : 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 ₂ SO 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.