



Food and Beverage

NIRO Kieselguhr, Sheet and Combi Filter



Filtration. Separation. Solution.SM

CLEAR SOLUTIONS - SHEET AND COMBI FILTER PRESSES



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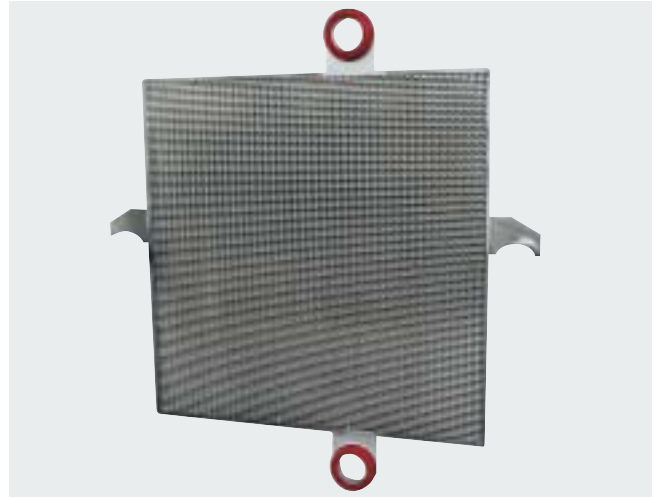
Exceptional design for performance and cost effectiveness

Pall is the global leader in depth filter sheet technology and offers the most extensive range of high quality filter press designs in the market today. Four NIRO filter press models are available: NIRO 400, 600, 1000 and 1200 for the insertion of 400 x 400, 600 x 600, 1000 x 1000 and 1200 x 1200 mm (40x40, 60x60, 100x100 and 120x120 cm) depth filter sheets. NIRO filter presses are available with a full range of chassis options to provide as little as 0.3 m² (3.2 ft²) or as much as 524 m² (5640 ft²) of effective filter area per press. Closing options include automatic or manual choices.

Ports options include DN, TC and sanitary flange. Depending on the filter model filter plates and frames are available in 304 stainless steel, 316 stainless steel, polypropylene and Noryl® plastic. In addition to the innovative HFK plate, Pall offers separating/conversion plates, separating plates, T-frames (9 mm/0.9cm), sludge frames (40 mm/4cm) and specialized, circulated chamber sludge frames for chilled or hot fluid processing (for NIRO 400 and 600 only).

Based on years of practical experience, innovations have been made resulting in increased performance of the NIRO filter press.

Filtration performance mainly depends on the flow geometry of a plate, using depth filter sheets as the filter media. Support is considerably increased by implementing the newly-developed HFK high performance plate.



High performance filter plate HFK



Polypropylene filter plate (for NIRO 400 only)

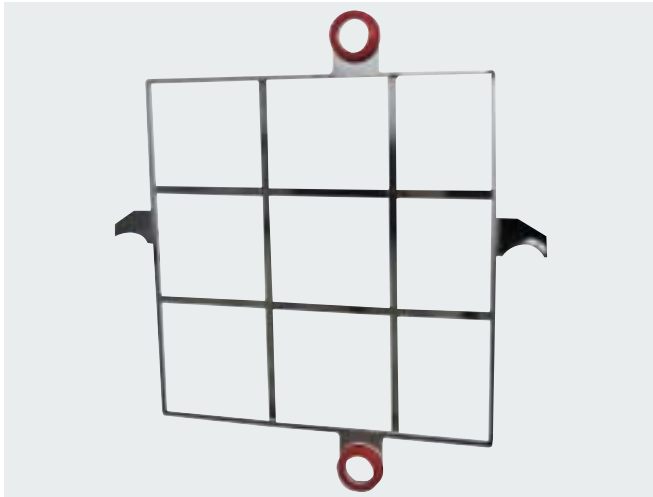


Filter sheets



Sludge frame

The performance advantages

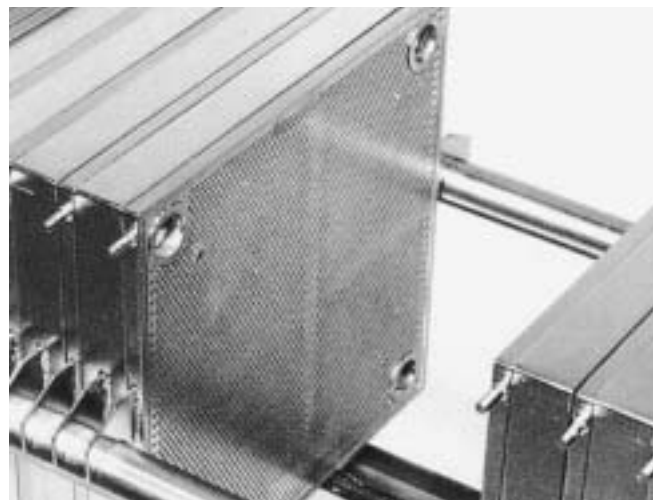


T-frame

More open filtration area

HFK is an innovative, high performance plate with an open filtration area that is 2.5 times larger than perforated plates. The unique pore geometry of HFK plates optimizes the flow path and enables full use of the available filtration area.

Increased filter area translates into better flow distribution - up to twice the product throughput. Optimized filter sheet performance, including greater separation and particle holding capacity, results in longer service life. These advantages result in a smaller size NIRO press recommendation than competitive presses for identical applications.



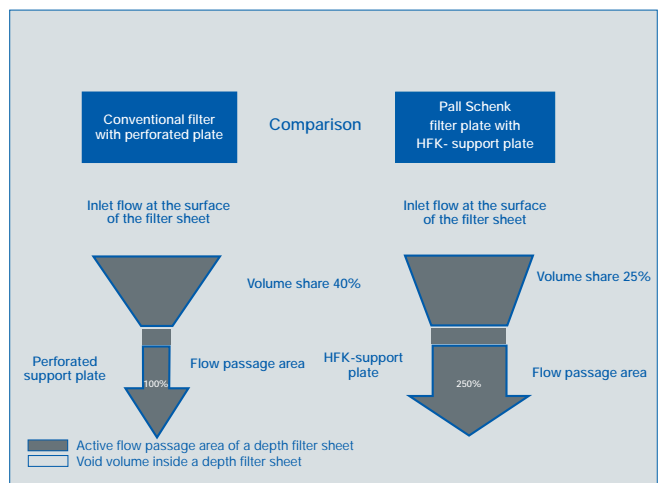
Open filter stack with HFK plates
(o.D. version, for NIRO 400 and 600 only)

Single piece construction without screws

Perforated plates use screws to secure each screen to the filter plate. Contaminants may become trapped behind the screws, making it difficult to dislodge them. Screws can also protrude from the plate and damage filter sheets. HFK plates consist of stainless steel, implementing welded parts, so that no screws are used that can damage the filter sheets. These plates do not require dismantling for cleaning and use smaller volumes of cleaning solution to achieve the same level of effectiveness.



Conversion plate





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Optimal eyelet design

Eyelets for HFK plates are constructed from a single piece that is securely welded into the frame. This is a significant improvement over competitive designs. The HFK weld has no hidden gaps through which contaminant or air could pass into the press. HFK plates have separate product inlet and outlet eyelets at both the top and bottom of each plate. This design maximizes flow distribution throughout the available filter area. It also provides good deaeration of the filter stack as well as highly effective rinse, regeneration, sterilization and cleaning cycles.

Less void volume

Due to the use of HFK, the filter plate thickness is reduced to 9 mm (0.9cm). For that reason, HFK plates have up to 38 % lower void volumes than perforated plates (13 mm/1.3cm of thickness). By flushing the product with water, the mixed volume is reduced.

Lighter weight

HFK plates have less than half the weight of a conventional plate due to their reduced thickness. Advantages of this design include: easier handling, lower foundation load, lower shipping costs, less material to clean, rinse and sterilize as well as shorter sterilization cycles.

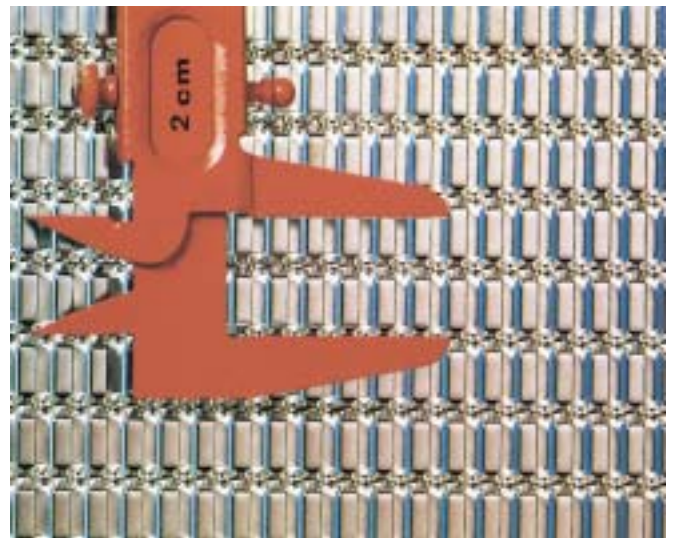
Less footprint required

A NIRO press with HFK plates can achieve better performance with less filter area than competitive designs. A NIRO press three times smaller than a larger competitive press with perforated plates can

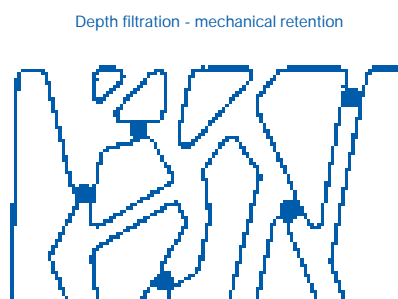
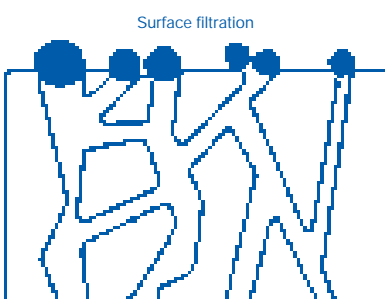
meet the same filtration requirements. A smaller press size results in lower capital investment, smaller production space requirements and lower labor and operating costs.

Overall savings

- No screws damaging the filter sheets
- Up to 38 % lower void volume
- Uses up to 40% less energy for sanitizing (lower heat loss from smaller filter stack)
- Smaller pre and post run volumes
- Shorter, more effective rinsing, cleaning and sterilization cycles
- Reduced filtration times for clarifying filtration
- Lower labor and materials costs



HFK filter plate detail





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NIRO 400 sheet filter with manual hydraulic compression



NIRO 600 sheet filter with electric/hydraulic closing device



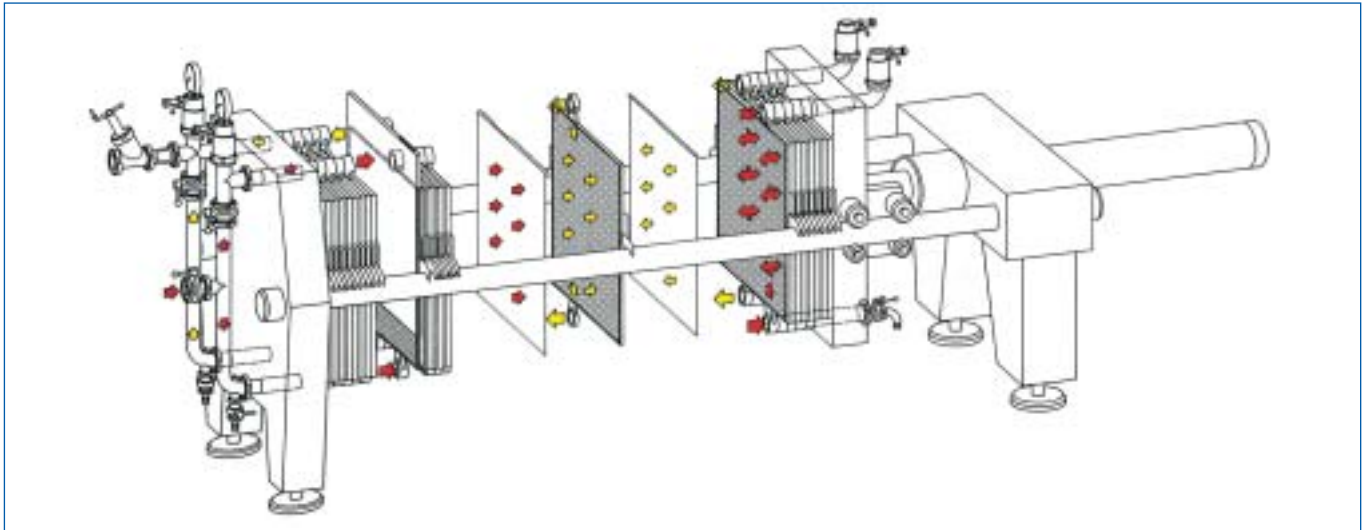
NIRO 1000 combi filter



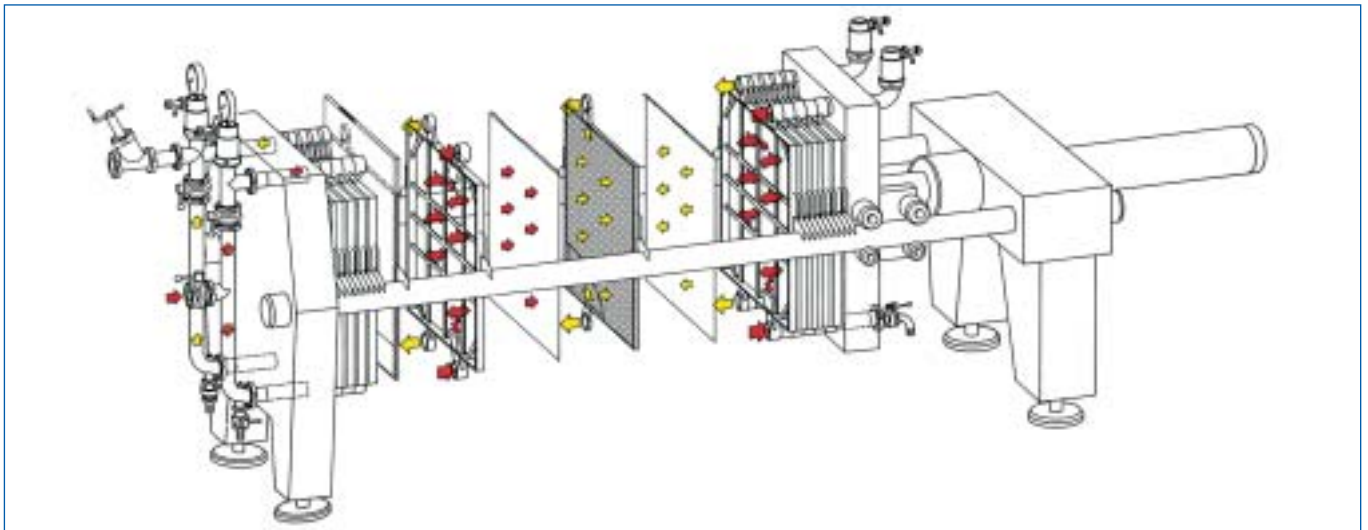
NIRO 1200 sheet filter



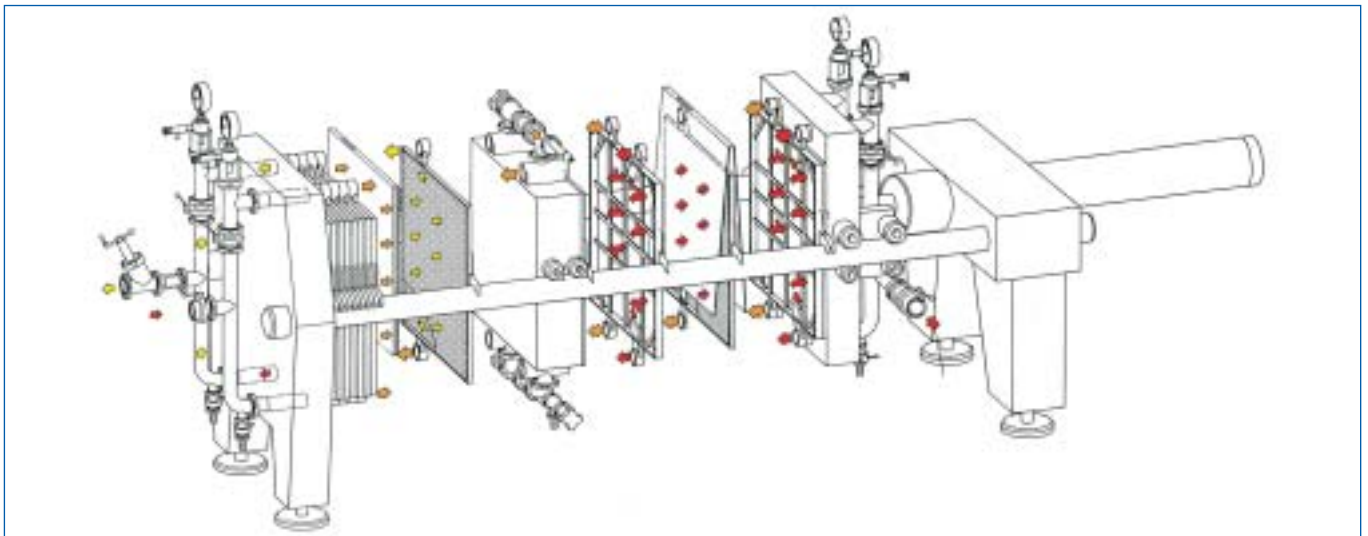
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Sheet filter with filter plates



DE filter with filter plates and frames



Combi filter for DE and sheet filtration with filter plates, frames and conversion plate



Different types of Sheet, DE and Combi Filters

SHEET FILTERS - Examples typical for beer filtration

NIRO	Filtration Area (approx.)	No of HFK Plates*	Hourly Rate (approx.) [hL]	Flow rate [hL m ⁻² h ⁻¹]
Type 400 (manual central spindle)	0.27 - 22.42 m ² 2.9 - 241.33 ft ²	1 - 161	0.4 - 34	at 1.5
Type 600 (electro-hydraulic closing device)	12.2 - 95.6 m ² 131.32 - 1029.03 ft ²	35 - 279	18 - 143	at 1.5
Type 1000 (hydraulic compression)	66.5 - 332.5 m ² 715.8 - 3579 ft ²	85 - 379	100 - 499	at 1.5
Type 1200 (hydraulic compression)	170 - 524 m ² 1829.87 - 5640.29 ft ²	85 - 379	255 - 786	at 1.5

* plus 1 front end and 1 rear end plate (HFK)

DE FILTERS - Examples typical for beer filtration

NIRO	Filtration Area (approx.)	No of HFK Plates / Sludge Frames*	Hourly Rate (approx.) [hL]	Flow rate [hL m ⁻² h ⁻¹]
Type 400 (manual central spindle)	0.27 - 9.96 m ² 2.9 - 107.21 ft ²	0 - 35/ 1 - 36	1.0 - 36	at 3.6
Type 600 (electro-hydraulic closing device)	5.5 - 56.4 m ² 59.2 - 607.08 ft ²	7 - 82/ 8 - 83	20 - 203	at 3.6
Type 1000 (hydraulic compression)	28.5 - 195.7 m ² 306.77 - 2106.49 ft ²	16 - 107/ 17 - 108	102 - 704	at 3.6
Type 1200 (hydraulic compression)	84 - 285 m ² 904.17 - 3067.71 ft ²	16 - 107/ 17 - 108	302 - 1026	at 3.6

* plus 1 front end and 1 rear end sludge frame

COMBI FILTER - Examples typical for beer filtration

NIRO	Filtration Area (approx.) Sheet / DE	No of HFK Plates / Sludge Frames*	Hourly Rate (approx.) [hL]	Flow rate [hL m ⁻² h ⁻¹]
Type 600	3.4/6.8 - 27.2/54.7 m ² 36.60/73.19 - 292.78/588.79 ft ²	23-208/4 - 40	12 - 98	at 3.6 + 1.5
Type 1000	28.5/66.5 - 85.5/201.4 m ² 306.77/715.8 - 920.31/2167.85 ft ²	32 - 282/6 - 50	102 - 308	at 3.6 + 1.5
Type 1200	57/137 - 139/333 m ² 613.54/1474.66 - 1496.18/3584.38 ft ²	32 - 282/6 - 50	205 - 500	at 3.6 + 1.5

* plus 1 rear end plate (HFK), 1 front end sludge frame and 1 separation/conversion plate



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