

BOKELA BACKFLUSH FILTER

The BOKELA BACKFLUSH FILTER bears advantages of high degree such as automatic control, long-lasting filter bags and desired quality of filtrate combined with a feasible price. This makes it to be the most interesting and advanced equipment for filtration of pregnant liquor for the worldwide Alumina industry.

1. DESCRIPTION

The BACKFLUSH FILTER mainly exists of a vessel, filter elements, a top reservoir, five pneumatic valves and an automatic control system.

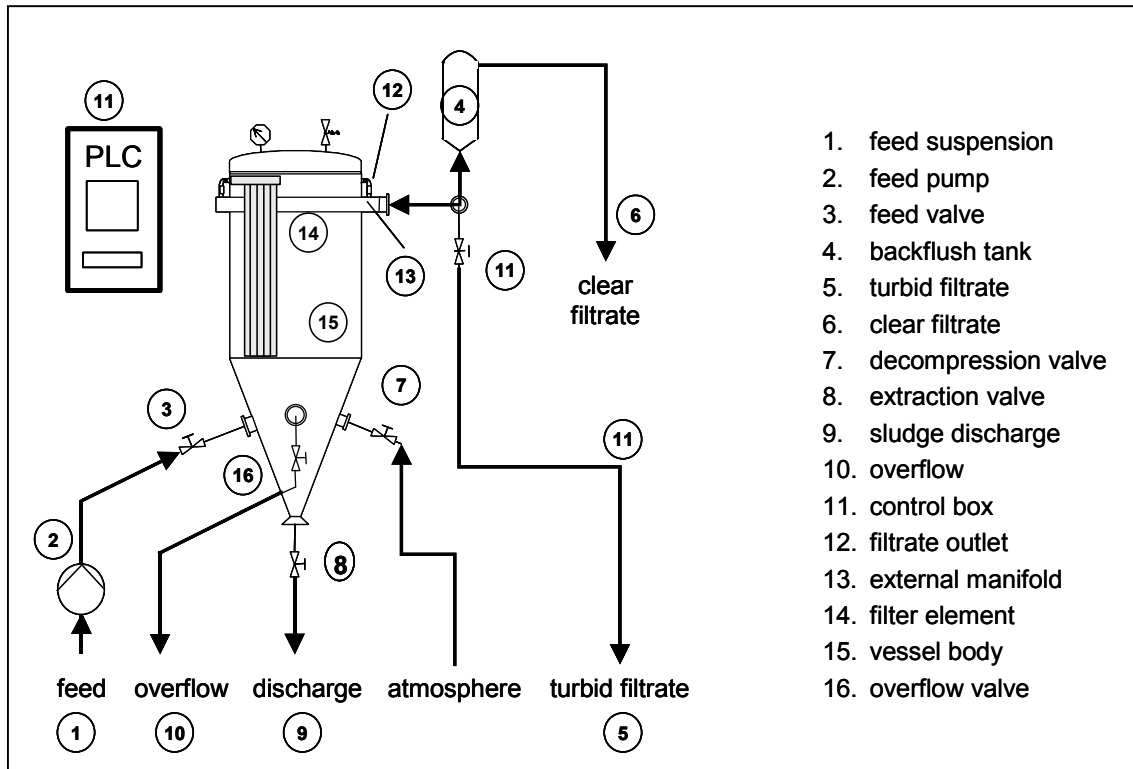
Vertical filter elements inside the vessel are connected to an external manifold via siphons, each equipped with an isolating valve and two sight glasses. The checking of the filtrate turbidity enables the operator to close the relevant isolating valve if there is a damaged filter cloth on one filter element. This way a high quality of the filtrate can be guaranteed for the operating filter.

The BOKELA BACKFLUSH FILTER is operated fully automatic. Each cycle includes:

- 1) Cake formation: start feed pump, open feed and backflow valves, liquid to be filtered is filled into the vessel to form cake adhered to filter cloth, cloudy filtrate would flow back to feed vessel. Close backflow valve when filtrate is clear.
- 2) Clear Filtration: particles are held back by the build up filter cake and clear filtrate flows into the top reservoir above the filter through external filtrate manifold and finally to the filtrate vessel.
- 3) Decompression and Cake discharge: feed valve closes and decompression and overflow valves open, pressure inside vessel falls to atmospheric value. Extraction valve opens to discharge the sludge in the conical bottom of the vessel while fresh filter cake is separated from the cloth by filtrate which is flushed back from top reservoir.
- 4) Levelling: Extraction valve closes and feed valve opens to adjust liquid level and re-establishes a cushion of air in the top of the filter vessel. Decompression and overflow valves close and feed valve opens to start a new filtration (see item 1 above).

The BOKELA BACKFLUSH FILTER has following characteristics:

- Fully automatic operation, low labour input and easy to operate.
- Completely closed operation, safe and clean.
- PC-PLC control, excellent mechanical-electrical integration, reliable measure and control systems and an friendly operator-filter interface, easy to learn and operate.
- Efficient filtrate back flush cake discharge system, no water consumption, no need of evaporation.
- Special ternary overpressure protection.
- Short period for back flushing of filter cake (only 1 – 2 minutes of idle time) and thus high specific throughput.



Operating principle of the BOKELA BACKFLUSH FILTER

- Excellent strong stainless steel filter elements, stable dimension and mechanical properties.
- Special reliable pneumatic valves with fine dynamic characteristics & long service life.
- Special technology of harmony action between feed pump and feed valve.
- Small foot print per filtration area.

2. PERFORMANCES

The following exemplary performance data refer to Alumina pregnant liquor purification:

- Design capacity: 1.4 - 2.0 m³/m²h
- Suspension in filtrate: ≤ 10 mg/l
- Sludge concentration: 150 g/l
- Service life of filter cloth: 90 days

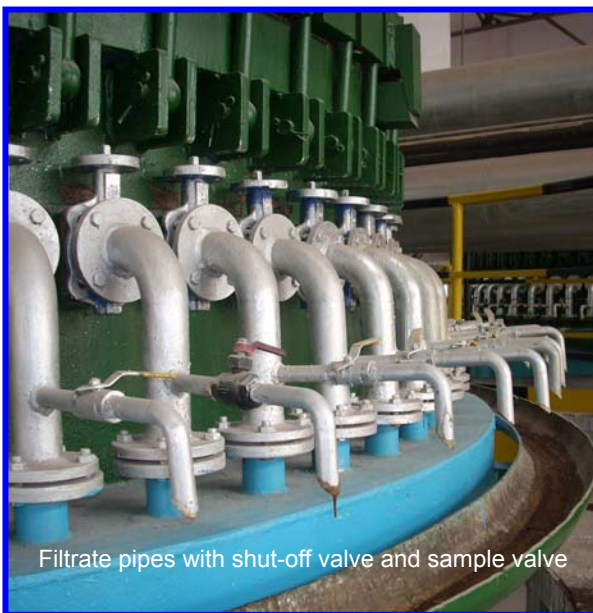
3. APPLICATION

The first BACKFLUSH FILTER, used to clean the Alumina from sodium aluminate, has been performing well for more than three years now with a capacity > 1.4 m³/m²h per unit and a filtrate solids content of no more than 10 mg/l. Based on this successful operation a high number of further filters have been made and commissioned in various Alumina refineries. A list of reference can be submitted on demand.

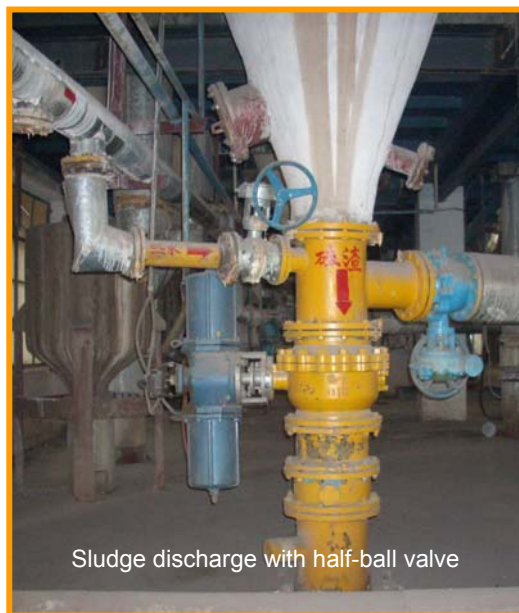


View of a BOKELA BACKFLUSH FILTER Plant
(4-units)

Capacity: 300,000 MT per filter
Solids in filtrate ≤ 10 mg/l
Filter area: 226 m² per filter
Temperature: 90 °C



Filtrate pipes with shut-off valve and sample valve



Sludge discharge with half-ball valve



4. EXCELLENT SERVICE

Based on clients' demands, we offer:

- field supervision services for installation and debugging, start-up and test run,
- field test to particular materials or processes, which can be reliable basis for an upscale to an industrial sized application.

The transportable pilot leaf filter is equipped with advanced control and measure systems and is designed to support marketing of this filter not only to the Alumina industry, but also to other applications, e.g. in the chemical industry.

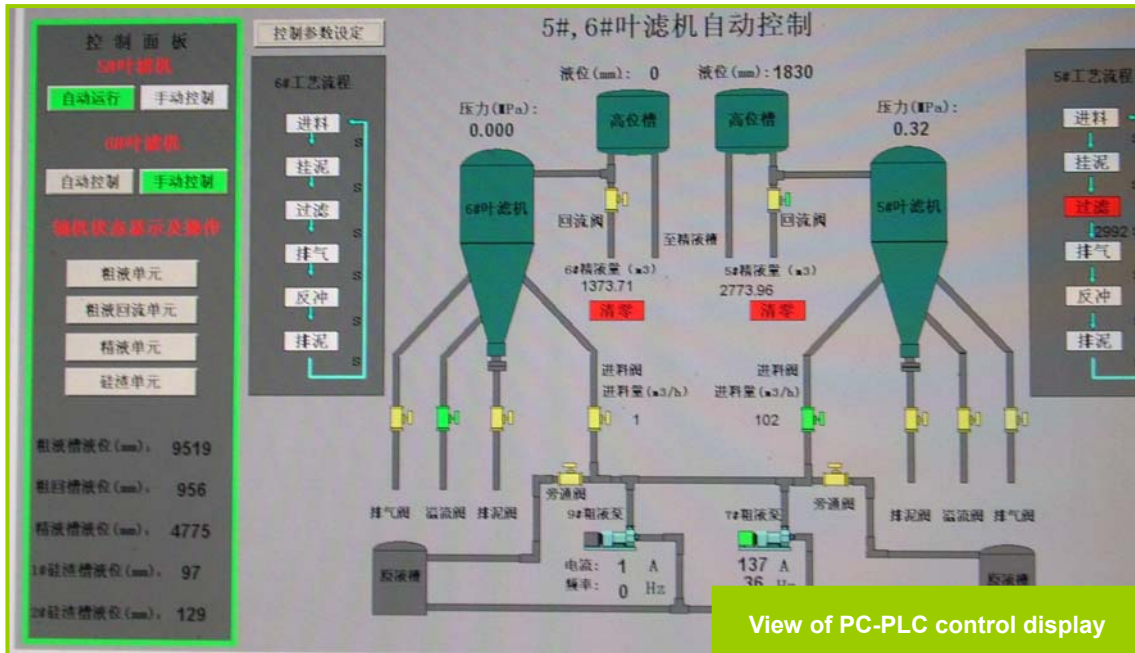


Transportable pilot leaf filter plant (figure left); advanced control and measure systems of the pilot leaf filter (figure above)

5. BENEFITS

Compared with similar filters the BACKFLUSH FILTER is superior in:

- PC-PLC control, excellent mechanical-electrical integration, reliable measure and control systems and an operator-filter interface easy to learn and operate.
- Pressure on the vessel top as reference to adjust other control parameters resulting in a more stable operation.
- Special synchronization of feed pump and feed valve which prevents shock pressure.
- Excellent strong stainless steel filter elements, stable dimensions and mechanical properties.



View of PC-PLC control display

6. FILTER SIZES

The table below shows available sizes and technical data of the BOKELA BACKFLUSH FILTER:

AREA [m ²]	VOLUME [m ³]	DIAMETER [mm]	HEIGHT [mm]	LOAD WEIGHT [tons]	NET WEIGHT [tons]
72	10.0	1500	5300	25	22.0
106	12.8	2100	5695	28	25.0
128	15.7	2300	5975	33	26.0
155	19.0	2500	6255	40	30.0
180	22.7	2700	6455	47	31.4
198	24.6	2800	6595	51	34.9
226	29.0	3000	6835	59	36.0
262	33.8	3200	7115	69	41.1
306	39.0	3400	7325	79	45.3
336	48.0	3600	7610	90	47.1
354	52.0	3700	7751	95	48.2
500	58.0	3900	8430	105	52.0



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