ILF Filter in a petrochemical plant

Norcarb Engineered Carbons AB is a Swedish company, parent company is Orion Engineered Carbons International GMBH, manufacturing carbon blacks. Norcarb is located at the oil harbour in Malmoe, Sweden.

In the process Norcarb uses sea water from the Sound for cooling purpose. The sea water intake is located in the harbour area and the water is relatively shallow and sandy, which means the filtration system has to remove seaweed, sand, shells, algae as well as marine life.

The original seawater filter type ALF at Norcarb were susceptible to clogging and the service life of the original filter was coming to the end. Recognizing the need for increased availability and reliability, as well as reduced maintenance, the plant staff investigated replacing the conventional single basket filter type ALF with alternative filter type.

Following thorough investigation into the sea water filters available, Norcarb purchased ILFCO filter type ILF

Jonas Odefjord of Norcarb: “Basically, we had experienced a lot of problems with the original filter type ALF. So when we looked at replacements, we were mainly interested in reliability.

Norcarb listed many benefits with ILF filters:

- 100% of the baskets are back flushed
- Low operation pressure drop due to efficient cleaning system
- The pressure drop is always reset to the initial value after each cleaning cycle
- Easy serves due to the service friendly design
- No unplanned shut down
- Compact design and easy to install

Mr. Jonas Odefjord pulled out the 3 filter baskets for inspection in an ILF20. He was very impressed how easy and fast it was done compared to the old filter. The filter baskets are free from through parts and are easy to handle due to the small dimensions and low weight.

Mr. Odefjord performs an examination of an ILF20 filter in operation. See picture to the right

The filter has been in operation since beginning of May, 2017. Mr. Odefjord tells us that Norcarb is very satisfied with the performance of the filter. The pressure drop of the filter is constant as specified. The pressure differential (inside and outside the baskets) is measured regularly and is constantly low i.e. the baskets are kept clean.

The corrosion resistant ILF automatic pressure flush filters have stainless steel internal parts in a glass fibre reinforced polyester lined, mild steel housing. ILF20 is also available in stainless steel housing.
The 3 baskets are automatically flushed by means of motor-operated valves and a control system. Pneumatic or electrical operation.
Flow capacities from 115 to 14150 m3/h

Connections: DN200/8" to DN1000/40"

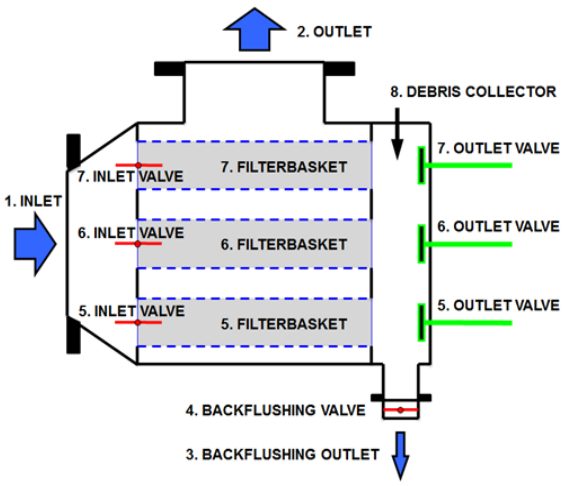
Design code: ASMEVIII div.1 and EN13445

The filter is located in the pump house 9, mounted horizontally in the sea water inlet piping just before the plate heat exchangers. The filter minimize the amount of debris that enters the heat exchangers.

The ILF filter has improved both reliability and efficiency. The automatic flushing based on time or pressure differential, ensures the filter kept clean.

Jonas Odefjord: "There is no doubt that we have seen a great improvement in efficiency since installing the ILF sea water filter"

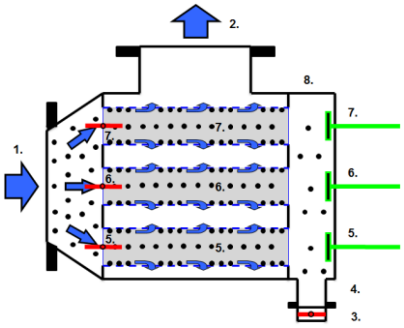
Main parts



1. Main inlet
2. Main outlet
3. Back flushing outlet
4. Back flushing valve

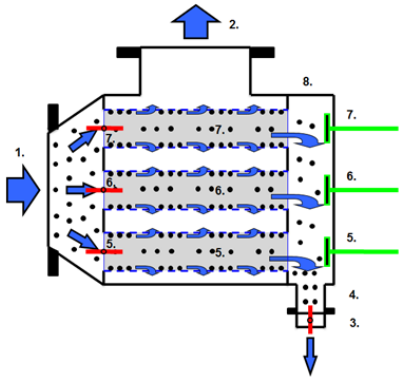
5 – 7. Filter basket inlet and outlet valves.

8. Debris collector



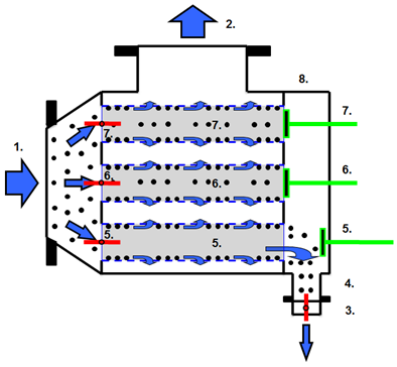
Function - Operation

The raw liquid enters the filter baskets (5, 6, 7) through the main inlet (1). The inlet and outlet valves (5, 6, 7) are all in open positions. The flushing valve (4) is closed. The liquid is being filtrated when it passes through the filter baskets prior to being discharged at the main outlet (2). The debris is collected inside the baskets and in the debris



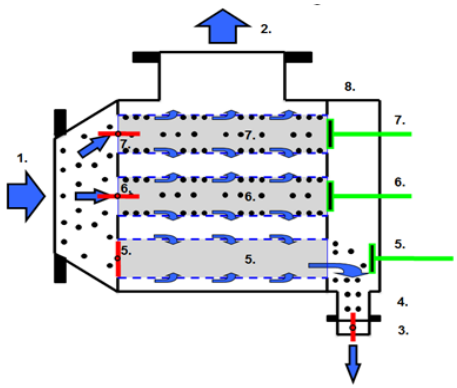
Pre-flushing

The flushing valve opens, thereby reducing the pressure drop and increasing the flow velocity and total flow through the filter. The filter basket's inlet and outlet valves are in open positions. Any collected debris in the baskets and in the debris collector is flushed out through the flushing outlet due to the pressure and flow conditions inside the filter. Pre-flushing is recommended only if bad conditions.



Flushing

The flushing valve are in closed position. The outlet valve (5) at the filter basket (5) is still in open position. The flow is now diverted and forced to pass through the filter basket (5). The velocity inside the filter basket (5) is now increasing also due to the differential pressure, and the basket (5) is being well flushed clean of all remaining debris collected inside the filter basket.



Back flushing

The back flushing valve remains open and the inlet valve (5) of the filter basket (5) is in closed position. The outlet valves of the filter baskets (6, 7) are kept in closed position. A certain portion of the filtrated liquid back flushes 100% of the filter basket (5). Dislodged remnants are washed out through the flushing valve (4). The entire cleaning operation takes place without interrupting the outlet flow.

