1 Description

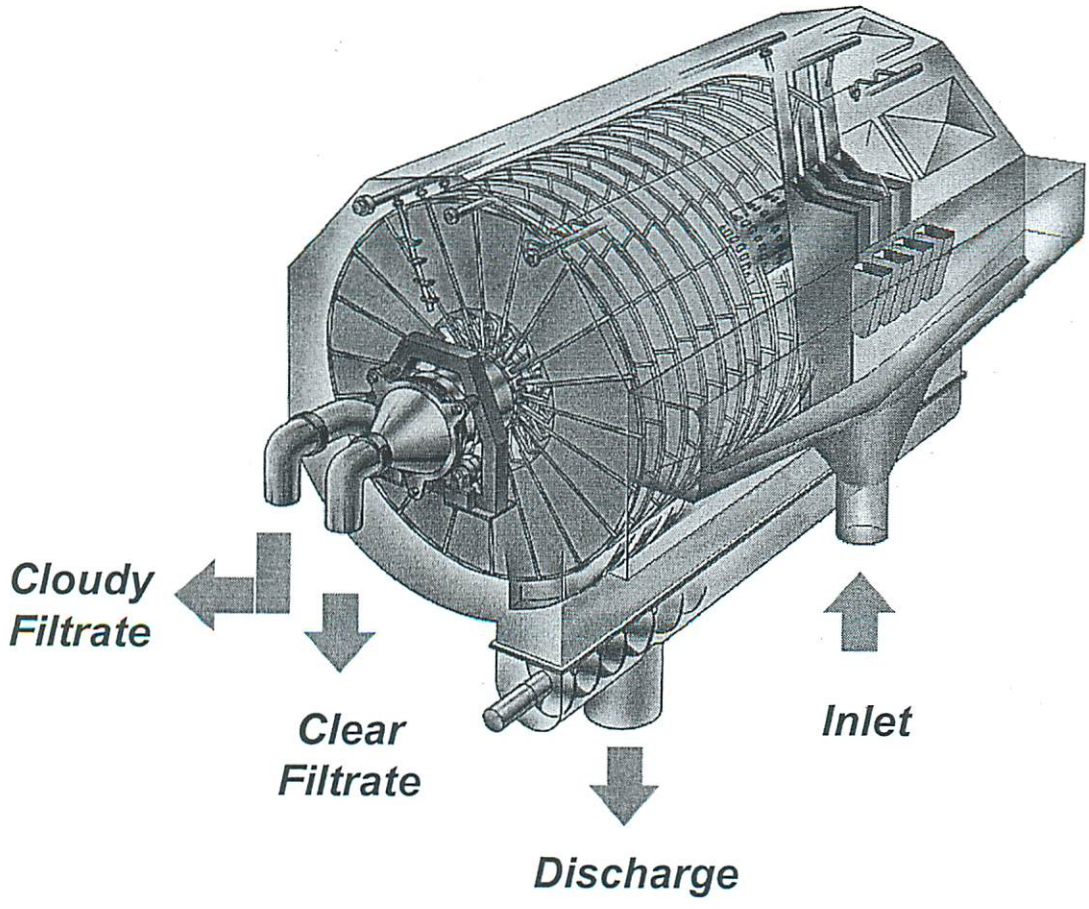

Figure 1 - Kværner Disc Filter

1.1 General

The filter is built for white water cleaning and dewatering of pulp suspensions in concentrations up to 15 %.

It is designed according to basic modern filtration principles and consists of discs mounted on a horizontal center shaft with conical flow channels. Mounted at the outlet end of the center shaft is a filtrate valve with built-in wearing disc and bridges for separation of the various filtration zones. The outlet end of the filtrate valve is connected to a barometric leg which generates the required vacuum. The pulp is removed from the disc by water jets and the screen of the discs is continuously washed by an oscillating shower. The center shaft with discs is built into a vat with

the inlet box as an integrated part of the vat. Between the discs there are vertical pulp chutes in which the pulp can fall freely down to the conveying repulper for transport away from the filter.

1.2 Basic Operation

The disc filter rotates and a series of segments is lowered into the suspension. The pulp mat formation starts under gravity and the pre-filtrate is extracted. This procedure gives a good basis for further filtration. The main filtration takes place afterwards under vacuum which gives a high capacity and pure filtrate.

When the segment leaves the suspension, the residual filtrate is quickly drained off from the segment and air is sucked in through the pulp mat, which is thus dried. When drying is over, the vacuum is cut off and the pulp is completely removed from the disc with jets of water. The pulp falls freely down to the conveyor repulper via the vertical chutes between the discs. After the pulp has been discharged, the screen is washed by the oscillating showers.

1.3 Filter Disc

The disc is divided into 20 segments with low volume for high dryness and a clear filtrate. The segments are cassette design for easy dismantling when changing cloth. The cassettes are mounted in a strong support structure bolted to the center shaft. The disc alignment is thus never changed when changing filter bags.

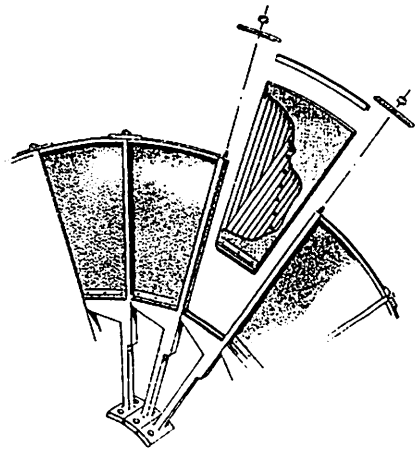

Figure 2 - Filter Disc

1.4 Patented sector

The design of the sector is unique, with its thin corrugated plate construction which gives low volume with little contact to the cloth, while at the same time it has flow-facilitating channels through which the filtrate can pass with very low pressure drop. This means high capacity per installed filter surface and a high pulp discharge consistency.

The open area under the cloth is over 90 %, which improves the potential for keeping the cloth clean with the oscillating washing shower.

The design of the sector with crossed plates means that the filtration surface is divided into three, so that the filtrate has only a short path away from the cloth, as it can pass between the crossed plates without rewetting the pulp. The volume under the cloth is thus minimized. The sector is supplied with either a synthetic or stainless steel cloth.

1.5 Center Shaft

The center shaft is internally divided into the same number of flow channels as the segments of the disc. This gives a stable design. The cross-sectional area of the channels increases towards the outlet end.

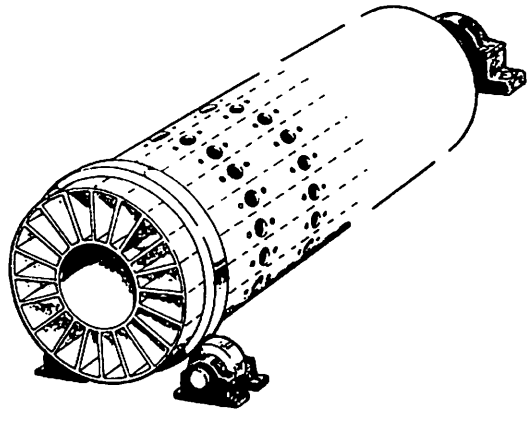

Figure 3 - Center Shaft

1.6 Bearings

The center shaft is supported in roller bearings at both ends for accurate centering against the filtrate valve and is well-sealed with extended long-service packing boxes.

1.7 Seals

The center shaft is sealed from the filter vat by a double stuffing box consisting of fiber layers.

1.8 Patented Filtrate Valve

The filtrate valve is in three-point suspension, centered against the rotating center shaft. Between the filtrate valve and the center shaft there is a wearing disc which has a built-in adjustable bridge separating the pre-filtrate and clear filtrate. The position of the bridge can be adjusted to suit the application. The design prevent airbag formation at the upper part of the valve (big air bubbles) and secure a continuous transport of small air bubbles to the dropleg. This means a more stable and increased vacuum and consequently a higher capacity and outlet consistency.

1.9 The Spray System

The clear filtrate from the filter is used as spray water.

1.10 Discharge Shower

The fiber mat discharge is achieved by jets of water placed on each side of the disc, spraying diagonally against the rotation direction of the disc for high efficiency.

1.11 Screen Washing

The screen is efficiently washed with an oscillating washing spray. The oscillating speed is synchronized with the peripheral speed of the disc.

This gives optimal washing liquid volume over the whole disc surface.

1.12 Patented Spray Nozzle

For both cake discharge and cloth washing, a patented spray nozzle is used, with the advantage that it can be cleaned during operation. No dismantling of the jets is necessary if they become blocked - a single twist of the jet handle and the jet is cleaned.