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JVK Membrane Plates in the Manufacturing of Beet Sugar

The filtration of carbonated lime slurry of the first carbonisation step is manufactured more and more with filter presses. The essential reason for this fact is the high development standard of filter presses with a fully automatic run of the filtration cycle including the cake release. The operation- and maintenance costs can be reduced to a minimum. Even for the washing and cleaning of the filter cloths there are automatically equipment working, which maintain the capacity and certainty in the running process of filter presses. The filter presses are reaching a new standard of quality by using membrane plates and squeezing the filter cake after a shortened filtration phase.

Advantages of a Membrane Plate compared with a Recessed Chamber Plate

Compared to the conventional recessed chamber filter plate there are the following advantages when using membrane filter plates for filtration of thick juice mud:

- a higher throughput capacity (up to 400 %).
- the moisture of the cake is less and adjustable in wide junction lines depending on the squeezing pressure and the time of drying by blowing (adjustable from 25 - 32 %).
- very good washing results with reproducible sugar content in the filter cake. It is adjustable depending on the temperature while dewatering the slurry and the water quantity less than 0,1%.

Advantages of JVK-Membrane Plates with Detachable Membranes

To make this result sure the **JVK** membrane filter plates are constructed for extremely high cycle times with high filtration- and the slurry-dewatering-temperatures because of especially developed elastomer material. This resilient membrane allows the combination of JVK-membrane plates with recessed chamber plates and out of this fact results the exceptional price/cost ratio. In contrary to a pure membrane plate package the filter cakes in such a mixed package will be homogenously squeezed and fixed with the elastic membrane. That is the reason for avoiding cracks during the washing and drying by blowing off. The results of slurry-dewatering and blowing can be improved considerably.

When using a pure membrane package or membranes with lower elasticity cracks or an uneven cake compressing cannot be excluded. To guarantee a high working life, low spare part costs and high standard of operating safety **JVK** membrane plates are distinguished by the following characteristics:

1. The plates which are formed in one piece without inserted parts and joints possess a high strength against differential pressures in the chambers.
2. The membranes are detachable without any problem
3. It is also possible to deflect the membrane which is flexible up to 500% in an empty or not sufficiently filled chamber without destroying it
4. The squeezing is at once possible with full pressure that leads to the already mentioned short cycle times.
5. High filtrate through put is granted by big filtrate outlet ports.
6. An additional fact or to increase the membranes working life is the fact that the membrane will not be loaded with the closing force of the press at the area of the sealing and support bosses.
7. Safety in case of wrong controlled squeezing medium is guaranteed by the way the membrane is fixed at the core plate. In case of a failure a pressure relief in the sealing area will be released.

According to these facts there are a number of decisive advantages when using **JVK** membrane plates for the carbonated lime slurry filtration.

- Insufficient filling of the press while starting and towards the end of a campaign will not lead to a breakdown of membrane plates.
- There is a noticeable reduction of the filtrate flow caused by crystallising of the sugar in the filtrate outlet holes because of the big cross area only after a longer working time without washing the cloths.
- The admissible temperature range to up to 120°C of the special rubber membrane allows without any problem a very effective and economic washing of the sugar content with water to 100°C.
- Even after a number of campaigns with a temperature of 100°C there is no deflection and also no wrinkling.
- The high-flexible membrane guarantees even when the cake is uneven a constant squeezing and thereby equally distributed TS- and sugar content values in the cake.
- Generally the working without under cloths is possible. Depending on the cloth quality it is possible to work without a coated margin of cloth.
- In the case that there are some solids or liquids behind the membrane via the press air collecting channel it is possible to clean **JVK**-membranes by removing.
- Additionally it is possible to improve the sugar content of the filter cake with the help of the feed port that leads to remarkably higher valances of sugar contents in the feed port area.
- The thereby created empty space around the feed port requires a high elasticity of the membrane. With the high elastic rubber membrane it is possible to incorporate this procedure step.

typical technical facts of a **JVK**-plate package:

size	1200 x 1200	mm
number of chambers	38	
cake thickness	50	mm
squeezing volume	ca. 1970	ltr
filter area	ca. 84	m ²
mud quantity per charge	11-12	m ³
quantity of sugar content in water	ca.1	m ³
TS content in the cake	68-72	%
sugar content	0,2-0,3	%

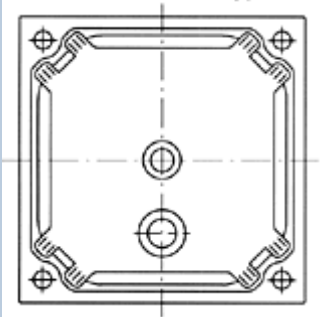
Typical operation conditions for **JVK**-Plates are:

	T[°C]	p[Mpa]	t[sec]
1. filling and filtration The time may change depending on the foul intensity of the cloth resp. the condition of the sugar beet, e.g. frost effect..	80-95	0,4-0,8	220-300
2. cleaning of the feed port	90-95	0,4-0,7	3
3. cake washing through the feed port (gap washing)	80-95	0,4-0,7	60-120
4. pre-squeezing		0,2-0,5	20-30
5. cake washing through the corner channels and pre-squeezing cake washing pressure pre-squeezing pressure The washing pressure depends on the flow resistance of the cake. The time depends on item 3.	90-95	0,3-0,5 0,3-0,5	60-90
6. squeezing		0,6-0,8	30-60
7. air blowing		0,4-0,8	20-60
8. blowing via feed port		0,4-0,8	10-30

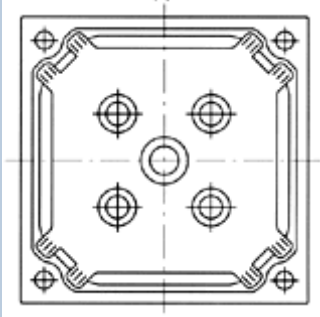
Design Variety of JVK Membrane Plates for carbonated Lime Slurry Filtration

JVK-membrane Filterplates are suitable and can be delivered for all designs of filter presses. Some examples are described below:

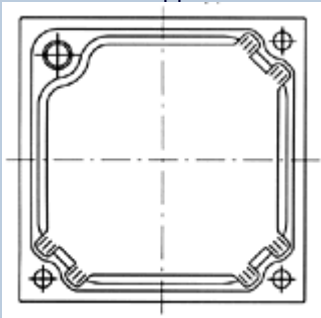
bottom feed center
one support boss



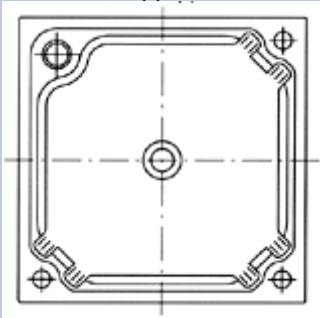
center feed
4 support bosses



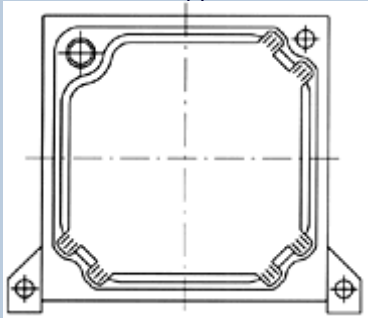
corner feed
without support boss



corner feed
one support boss



corner feed
without support boss



corner feed
one support boss

