

# Recommendations for the implementation of Perfit during filtration in a vorticular vacuum filter



## Procedure for making suspensions.

The suspension is made in a dedicated cruse with a blender, in the presence of water or material which needs filtration. In this process it is important that the front suspension for application of filtration layer be as homogeneous as possible. In addition, the suspension must not be too thick. Depending on the capacity of the cruse for mixing suspensions, it determines the amount of the starting materials for making the prime layer of the filtration cake. If the suspension is too dense, there is real danger of creating a blob on the "cake", so you can easily rupture filtration layer in this area, due to the uneven flow of filtrate in the cross section where the lumps are.

In the case that the power is too diluted, the process of applying the layer of the filtration is prolonged and therefore reduces the efficiency of device.

## Procedure for creating a filtration layer.

When putting the suspension in the tank, it is important that the suspension is distributed evenly throughout the volume, before releasing the vacuum pump in operation. Immersion height of the rotating drum, and the level of the suspension should be  $\frac{1}{3}$  of the radius of the drum which is about 20 cm higher than the suspension exiting from the dosing nozzle. When the above conditions are met, vacuum pump is ready to work. The drum rotation speed in this case is quicker than that of the filtration process, and it is recommended that rotation be 3-4 revolutions per minute. When depositing it should be visually monitored, especially the process of creating "cakes" and react in the following situations:

### The appearance of lumps on the "cake":

- The reason: a dense suspension and insufficient mixing time in the preliminary court for amount of filtration materials.
- Reactions: manually or with additional tools remove lumps and material return to the pan; possibly reduce the low pressure of vacuum pumps or shut down completely to, initially made a filtering "cake" slipp back into manger and conflate aproposof recirculation pump again conflate in the preliminary court.

### Creating a foam layer:

- Reason: insufficient immersion of the drum in a suspension, aproposof the level of the suspension is low, so that a foamy layer is applied, which floats on the surface of the suspension in the channel.
- Reactions: urgently increase the level of suspension in the riverbed to the above mentioned levels.

### Uneven layer of thickness along the length of the drum:

- The reason insufficient capacity of nets on drum in places of less thickness; unequal distribution of vacuum lengthwise; dispensing nozzles are directed tangentially to the radius of the drum(jet suspension is aimed directly at the drum and washes already formed layer of filter and make real furrows i.e. wavy surface )
- Reactions: operator has the option to turn on, at large deformation, blade for straightening and fallen off filtering material put back into the trough or the bowl for mixing, and this how we increase the effective filtrating surface at the beginning of the

filtration process. After completing filtrating process, if possible, banish any defects that are technical nature. In the event of suspension which can be made out of two or more phases, it is necessary to monitor the purity of the recirculation of liquid from the drum to the preliminary cruse. It is not necessary that the liquid is cleawhen is the of rest filtration material gradually added in the preliminary cruse for suspension until your anticipated quantity. In this case there is a risk of insufficient mixing and creating a blob, but it is not as dangerous as in the initial layer. Applying the "cake" is finished when it reaches the desired thickness and the suspension in the trough classes of a visible clumps or liquid recirculation clarifies, which is a subjective assessment of the operator.

#### Procedure for the filtration process

After completion of the sediment, access to the filtration process. In the case that suspension has been mixed with water, it is necessary to minimize the level of the suspension in the trough so as not to dilute filtration material. With the introduction of filtration material should pay attention to the point of entry into the trough. In the case that the material is introduced at one input terminal, it is necessary to gradually open the valve to prevent the hydraulic shock of the flat "cake". In a multi-faceted input is not necessary. The level of filtration of liquid should be at least around one half the radius of the rotary drum, that is, depending on the type and viscosity of liquid which need to be filtered. More viscous liquids having a longer time of filtration, so that the quantity in the trough should not be at the maximum level. The operator should find himself the optimum level of fluid in the channel and the speed of rotation of the drum for each material which needs filtration. Approximate the optimal mode is determined visually (experiential) by checking the dryness of the "cake" to touch in the cut-off zone in front of the blade. It is recommended to pay attention to the drum part that comes out of the trough, to be looked up to which drum part has a humid area has came (a reflection). "Ideal" height sprinkled surface is up to 1/3 of the drum, which is immersed in liquid filtration. When part of the "cake" is excessively humid in the area of knife, then reduce the drum speed to increase the filtration through the "cake" or reduce the liquid level in the trough. In wet "cake" knife for removing the filtration layer more squeezing a "cake" so that reduces the effect of filtration. However, achieving the optimal mode depends on the operator and his degree of subjective judgment and reactions to the situation. There is a possibility that each filtration process differ from the previous, and therefore it is advisable to keep a diary of filtration that after a certain time compared filtration parameters (type, viscosity and quantity of materials for filtration, speed drum, blade pitch, the amount of filtration material, the amount of filtrate obtained in the process, during the process, etc ) the same or similar process, and from processing of these data to find the best result and to define the parameters for each particular material for filtration.

In the table are the recommended values for blade pitch depending on the speed of rotation of the drum, for elapsed time of the filtration for cake thickness of 1 cm.

		Vreme filtracije (sati) za debljinu od 1 cm upotrebljene filter pogače										
		2	3	4	5	6	8	10	12	15		
Brzina rotacije doboša (minuta po obrtaju)	0,5	Brzina rotacije doboša (obrtaja u minutu)	2	0,042	0,027	0,021	0,017	0,014	0,01	0,008	0,007	0,006
	0,75		1,333	0,063	0,042	0,031	0,025	0,021	0,016	0,013	0,01	0,008
	1		1	0,083	0,056	0,042	0,033	0,028	0,021	0,017	0,014	0,011
	1,5		0,667	0,125	0,083	0,063	0,05	0,042	0,031	0,025	0,021	0,017
	2		0,5	0,167	0,111	0,083	0,067	0,056	0,042	0,033	0,028	0,022
	2,5		0,4	0,208	0,139	0,104	0,083	0,069	0,052	0,042	0,035	0,028
	3		0,333	0,25	0,167	0,125	0,1	0,083	0,063	0,04	0,042	0,033
	3,5		0,286	0,292	0,194	0,146	0,117	0,097	0,073	0,058	0,049	0,039
	4		0,25	0,333	0,222	0,167	0,133	0,111	0,083	0,067	0,056	0,044
Korak noža za sečenje (mm po obrtaju doboša)												

For increased efficiency of the filtration process is necessary that the entire amount of the cake it is used for a predetermined amount of filtration material. Adjustment of the automatic turning off of the blade pitch is performed while there is no filter cake on the drum. In this case you should bring a knife for cutting "cake" nearest 2 mm from the edge of the drum and adjust the position of the automatic exclusion of blade pitch.