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Brennereitechnologie

Carrying out precoat filtration with the CALIDUS cartridge filter

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1. Disassembly of the strainer on the intake lance?
The suction strainer reliably protects the hose quick couplings and the pump bypass from clogging. However, it would itself become clogged during precoat filtration with coarse cellulose. It must therefore be removed before filtration begins. Clogging of the filtration device must then be avoided by first sieving the unfiltered material or by stirring in the cellulose particularly carefully without lumps.

2. Installation of the precoat filter cartridge
The stainless steel filter cartridge is inserted into the cartridge container at the top and bottom, each with a white sealing washer.
The **plastic filter cartridge** is extended at the closed end with the black spacer, then inserted into the cartridge container with the opening facing downwards and fitted with a white sealing washer. If the plastic cartridge does not fit tightly in the closed container, an additional sealing washer must be placed on the black spacer.

3. Checking the pressure relief valve
Before starting filtration, check that the pressure relief valve is working properly. Particularly after the filtration of liqueurs and as a result of inadequate cleaning, the pressure relief valve may be clogged. This must be remedied as follows:

- Pump water in a circle;
- Carefully throttle the filtrate outlet tap on the cartridge container to an overpressure of approx. 4 bar while observing the pressure gauge;
- Carefully pull the ring of the pressure relief valve upwards until water emerges.

4. Setting the pump bypass
The upper edge of the bypass adjustment screw on the pump body is factory-set flush with the edge of the brass cone in which it sits. In this setting, the pump builds up an overpressure of around 4 - 5 bar against the **fully closed filtrate outlet tap** on the cartridge container.

If it causes a higher pressure, this indicates contamination of the pump bypass, which must be removed as follows:

- With the appliance switched off, completely unscrew the brass screw on the pump body;
- Remove the spring behind it and two plastic parts with tweezers, clean them and reinstall them in the correct order and direction;
- **Alternative:** It is often sufficient to pump water in a circle without throttling and to turn the brass screw about 1 mm out and then back in again.

5. Alluviation of the supporting layer
The actual filtration begins with the precoating of a "support layer" of coarse cellulose **CS-Cell 90 (very coarse)** or **60 (coarse) for liqueurs**, possibly also with fine cellulose **CS-Cell 20 (fine)** or even **10 (very fine) for low-sugar or sugar-free alcoholic extracts:**

- Fully open the filtrate outlet tap on the cartridge container;
- Stir 4-6 heaped tablespoons of the cellulose into at least 20 liters of the beverage to be filtered (unfiltered beverage) until lump-free;
- If only a small amount of beverage is to be filtered, the cellulose should not be stirred in all at once, but gradually, in order to avoid clogging the filtration device;
- Filter this mixture in a circle until the screen mesh of the precoat filter cartridge is visibly and **homogeneously coated with cellulose up to the top;**
- If the candle is not completely coated within a few minutes, more cellulose must be added without interrupting the filtration;
- If this does not help either, the precoating must be repeated with a finer cellulose.

Important note: A sufficient distance between the suction lance and the outlet of the filtrate hose in the same container must prevent air bubbles from being sucked in in a circle during this filtration and disturbing the even build-up of the supporting layer on the precoat filter cartridge.

6. Filtration with continuous cellulose dosing

When filtering small quantities, it may be possible to dispense with continuous dosing altogether.

Otherwise, the following filtration process must be used to ...

- **which constant dosage** of
- **Cellulose of what fineness**

as much volume of bright filtrate as possible can be obtained without having to stop filtration while the cartridge container is not yet completely filled with filter cake.

- shortly after the visibly complete precoating of the supporting layer, assess the clarity of the resulting filtrate (hold the filtrate in a clean white glass bottle in direct comparison with the unfiltered filtrate against bright light in order to be able to distinguish the finest air bubbles from any remaining trub or cellulose);

- If the **filtrate is already completely clear**, it must be collected from now on in a clean filtrate container; if the filtration performance is greatly reduced in the further course of filtration, some of the cellulose used for the support layer must be continuously added by stirring it into the cloudy beverage without interrupting the filtration. These cellulose fibers loosen the filter cake and thus improve its permeability without reducing its trub retention capacity;
- If the **filtrate does not yet run clear**, the trub retention capacity of the support layer must be improved by adding more cellulose or a finer cellulose. It is stirred into the unfiltrate without lumps while the device is running. Filtration is continued in a circle until the filtrate runs off completely clean and can be collected. As soon as this is the case, it is also important to keep the filter cake sufficiently permeable by adding more cellulose to the cloudy beverage.

7. End of filtration

Filtration is stopped by switching off the pump as soon as ...

- no more unfiltrate is available or
- the filter cake is so thick and dense that the filtration performance is too low despite an overpressure of over 5 bar in the cartridge container (the safety valve opens at around 6 bar overpressure) or
- the filter cake has become so thick that it is already beginning to cling to the wall of the cartridge container.

8. Cleaning the cartridge container

After end of filtration

- Drain any liquid residue in the system by briefly running dry or opening the **drain tap upstream of the cartridge container**;
- Unscrew the cartridge container;
- Remove the precoat filter cartridge and rinse the filter cake under running water;
- Rinse out the lower part of the cartridge container;
- Screw the cartridge container shut again;
- Pump through the entire filtration device with clean water and empty it again.

Further information and sources of error:

- The unfiltrate should be stirred regularly to keep the cellulose in suspension, but without introducing air unnecessarily.
- If possible, the ongoing filtration should not be interrupted (e.g. by changing the unfiltrate container or taking a break). Pressure fluctuations caused by air bubbles being sucked in should also be avoided. In such cases, the filter cake can slip or crack, causing the filtrate to run cloudy again immediately. If cracks cannot be closed by further filtration in a circle with cellulose, the filtration must be interrupted, the filter cake cleaned and re-suspended.
- Beverages with turbidity consisting of particles with a varied structure or a wide particle size distribution should first be coarsely filtered and then finely filtered in a second or even third filtration pass.
- In the case of beverages with gel-like, slimy lees (e.g. pectin in fruit liqueur, egg white in honey liqueur), which experience has shown to be **extremely difficult to filter**, no miracles can be expected from precoat filtration! Such clouding can often be prevented by minor adjustments in the preceding production steps. We will be happy to advise you.
- For precoat filtration of larger quantities, filtration should be interrupted before the filter cake completely fills the cartridge container. Experience has shown that this is the case after about 15 heaped tablespoons of filtration cellulose have been deposited on the precoat filter cartridge. This makes it much easier to remove and clean the cartridge, which would otherwise only be able to be removed from the housing with a lot of rinsing water.