# 4 Definitions

## 4.1 Microbiological Requirements

The number of yeast cells found in the filtrate – measured directly downstream from the kieselguhr filter – is the preferred method for gauging the degree of clarification accomplished by a filtration line (also see section 5).
Similarly, samples of the last rinse water can be collected and analyzed if the supplier is responsible for hygiene and cleaning equipment. In such cases, the water used to clean the equipment must also be tested for contaminants.
Tests for the presence of beer spoilers should also be carried out to ensure that all pipes and valve connections are cleaned properly.
Furthermore, prior to starting the filtration process, one must first take stock of existing conditions. Microbiological analysis of the contents of all tanks awaiting filtration, including that of the PRC tank, should be performed.
A sample collection point that was previously cleaned with the system, as well as that of the surrounding area, should serve as the basis for proper sample collection. Observation of the rules of general hygiene and avoidance of air currents or condensate droplets are critical aspects of collecting samples for microbiological analysis.

## 4.2 CTA Requirements

Of course, the comprehensive list of measurements and analyses (see section 5) represent the maximum possible for an evaluation. They describe not only the beer quality achieved after filtration but also assist in the assessment of the quality of the unfiltrate prior to filtration.

## 4.3 Proof of Performance

Filter performance is expressed in terms of flow rate [hL/h] and the filtration volume [hL] that is theoretically possible.

The flow rate indicated in the specification provided by the equipment manufacturer must be maintained throughout the entire filtration line until the maximum working pressure in the kieselguhr filter is reached. The maximum operating pressures on the unfiltrate side of the filter range from 6.5 to 8.5 bar.

The batch volume which is theoretically possible can be determined mathematically. In this calculation, the volume required for the pre-coat is subtracted from the sludge volume (depends on the length of the filter candles and space between them). The remaining volume represents the volume filled by the ongoing dosage of filter media (body feed). Any additional quantities of stabilizers or PVPP must be taken into account.

The batch volume, which is theoretically possible, can be figured using the dosing rate [g/hL] set by the brewery.
The prerequisite for this determination is a moderate and uniform increase in pressure over the course of filtration, generally between 0.3 and 0.4 bar per hour.
If the beer requires a higher dosing rate and/or the pressure increases too rapidly, the performance expected on the basis of the calculation will not be achieved.
Alternatively, the calculated batch volume can be higher if less kieselguhr is required or if the pressure increase occurs more slowly.

On average, a filtrate output of 75 to 90 hL/m² (at a dosing rate of 100 g/hL) can be assumed.
In theory, only an output of 62 to 75 hL/m² of metallic filter area is possible at a dosing rate of 120 g/hL.