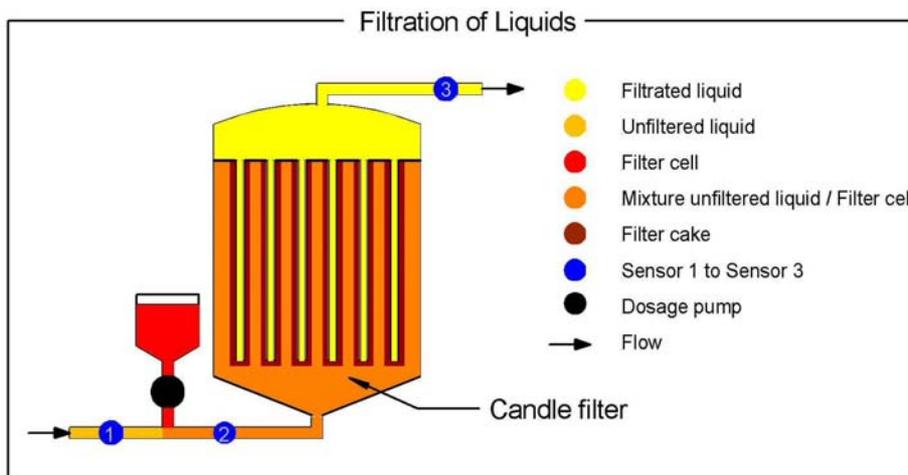


Filtration Control



Sensor 1:
typical range:
0-1000 ppm / 0-100 EBC

Sensor 2:
typical range :
0-3000 ppm / 0-300 EBC

Sensor 3:
typical range :
0-10 ppm / 0-2 EBC

The turbidity is measured at filter in- and outlet during the filtration of liquids. Different filter constructions (sheet filters, sieve filters, candle filters, etc.) are used for the filtration of different liquids. Typically a filter cell like DE, PVPP, activated carbon, etc. streams together with the unfiltered product into the filter chamber. The filter cell covers the filter plates or the filter candles and builds the real filtration layer (filter cake). Other filter construction, e.g. membrane filters, do not require filter cell for the filtration of liquids. Turbidity at in- and outlet is monitored as well at those filters to control the load of the unfiltered product and the clarity of the filtered product.

Filter Inlet:

The filter inlet must be monitored because a high turbidity at the inlet will stress the filter and reduce the life time of the filter cake. Filter cells are expensive in purchasing, recycling and wasting. A precise dosage of filter cell will reduce costs and increase the life time of the filter cake. Down times for cleaning, maintenance, etc. will decrease.

The turbidity sensor 1 measures the concentration in the unfiltered liquid. The turbidity sensor 2 measures the concentration in the mixture of unfiltered liquid and filter cell. The difference of the measuring values (sensor 2 – sensor 1) shows the concentration of filter cell. A control circuit assigns exactly how many g/l filter cell streams into the filter.

Filter outlet:

The turbidity measurement at filter outlet monitors the correct operation of the filter hardware as well as the quality of the filtered liquid. A rupture of the filter cake or other irregularities during the filtration will be recognised at once. Already filtered product charges are protected. An expensive and time intensive re-filtration is not required.

Measurement procedure:

The turbidity at filter inlet is monitored by using the absorption measurement e.g. model LAS/Messenger or the forward scatter measurement model MTF/Messenger. The principle of measurement depends on the product turbidity and has to be selected according to application. A combined 12°forward / 90°side scattered turbidimeter is perfectly suited to monitor the turbidity at filter outlet. The 90°measurement detects especially the small particles in the filtrate. The 12° measurement shows mostly substance related measuring values. The user knows if the turbidity is caused by unfilterable particles or caused by problems with the filter hardware.

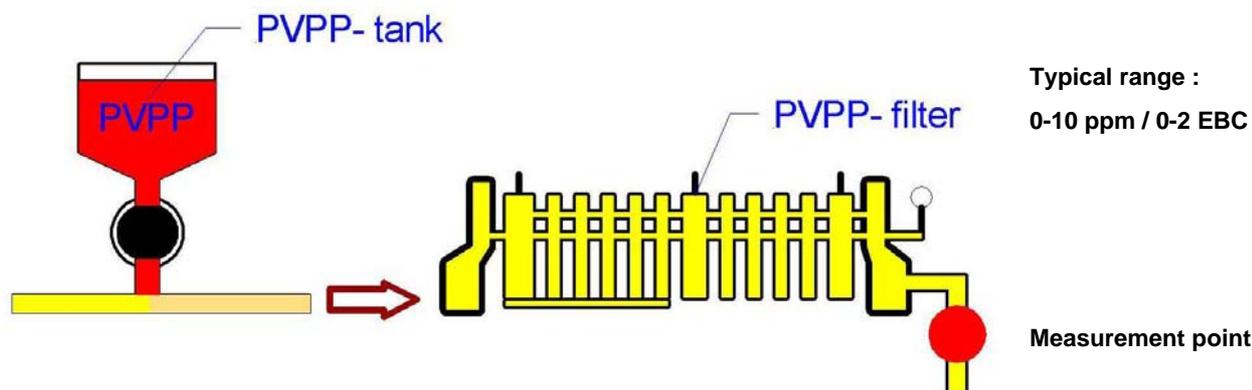
Measurement of opaque and other problematic liquids:

Some products cause very resistant coats on the windows of turbidity measurement systems. Some products are just opaque. In this case, filter In- and outlet can be monitored by using the ultrasonic reflection (model AS3/AT3). The ultrasonic prevents coating and the measurement values are not affected by colour or extreme light absorption.

* shown measurement ranges may vary according to customers application.

Filtration Control

PVPP



Description:

PVPP is an insoluble organic compound, which will swell in water. PVPP allows a selective removal of tannoids and proteins inside the beer. Therefore the PVPP filtration is used to receive a better long time stability and taste of the filtrated beer.

The turbidity is measured at filter outlet during the filtration procedure. Typically PVPP filter cell streams together with the pre filtered beer into the filter chamber. The filter cell covers the filter plates and builds the filtration layer (filter cake).

Filter outlet:

The turbidity measurement at filter outlet monitors the correct operation of the filter hardware as well as the quality of the filtered liquid. A rupture of the filter cake or other irregularities during the filtration will be recognised at once. Already filtered product charges are protected. An expensive and time intensive re-filtration is not required.

Measurement procedure:

A combined 12°forward / 90°side scattered turbidimeter is perfectly suited to monitor the turbidity at filter outlet. The 90° measurement detects especially the small particles in the filtrate. So the side scatter monitors the efficiency of the protein removal. The 12° measurement shows mostly substance related measuring values. So the forward scatter shows problems with the filter hardware e.g. PVPP particles. The user knows if the turbidity is caused by un-filterable particles or caused by problems with the filter hardware.

* shown measurement ranges may vary according to customers application.