

Application Report

Yeast propagation

Today, the propagation of yeast cells is one of the most important processes within the brewery, since the quality of the beer strongly depends on good yeast management. The term yeast management combines all processes and activities concerning the handling of the brewery's yeast.

In addition to our solutions regarding yeast harvest (PhaseGuard HT) and yeast dosing (TurbiGuard, output in mioYeast cells/ml), we can now measure yeast growth during yeast propagation.

Benefits

The objective is to automatically control yeast propagation using the inline turbiditymeter TurbiGuard. So far, samples have been taken manually and examined in the laboratory to determine the yeast count. This should be simplified and accelerated with the inline turbidity monitor. As a result, the processes become much more transparent and offer starting points for optimisation and cost reductions.



Figure 1: Yeast propagation plant

Typical application

In the course of the multiplication of the yeast cells, the turbidity of the wort-yeast-suspension increases. Thus, the best time for using the starting yeast can be determined on the one hand and on the other hand, the plant can be automatically switched to pause mode in case of brewing pauses. The use of the inline turbidity monitor TurbiGuard thus reduces laboratory analyses and tests and saves time and costs. As a result of increased transparency, process and product safety can be improved. The data is continually available and in real time without delay.



Figure 2: Transfer pipes with TurbiGuards installed inline

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Practical measurement (examples)

Several series of measurements were carried out in which the yeast cell count (measuring instrument model 871 of AL Systems as reference in the laboratory) and the turbidity values were determined. It was ascertained that turbidity increases with the cell count and that the turbidity value correlates well with the yeast cell count. It can therefore be concluded that yeast propagation can be controlled by means of inline turbidity monitoring.

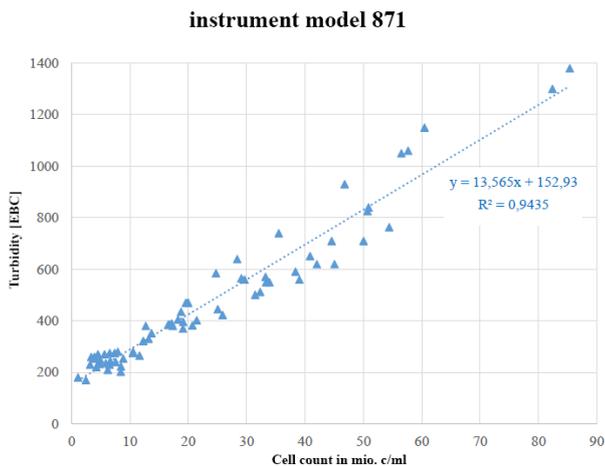


Figure 3: Turbidity over cell count

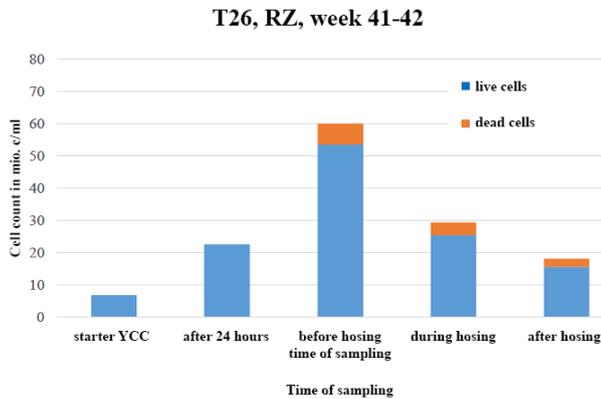


Figure 4: Yeast cell count over process

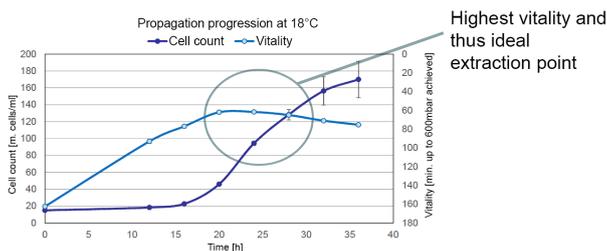


Figure 5: Vitality as a function of the cell count

Advantages of the SIGRIST TurbiGuard

Customer benefits

- Using inline turbidity monitoring, the user has an overview over the current yeast cell count (YCC) – in real time without laboratory tests, without loss of time and without personnel expenditure
- The optimal time for yeast dosing can be defined
- Highest vitality correlates with the cell count, dead cells hardly exist in yeast propagation
- This allows an optimal fermentation process – the basis for an excellent quality of beer
- A better fermentation process results in shorter fermentation times with considerable cost savings
- During brewing pauses, yeast propagation can be suspended at the right time

Summary

Yeast propagation is a multiple black box. Regular determination of the yeast cell count is elaborate and consequently the plant is not necessarily run in the optimal standard mode. It would be perfect to know in real time how many yeast cells are present in order to transfer the wort with the optimal yeast cell number at the stage of highest vitality. Using an inline SIGRIST turbiditymeter, this is now possible in real time and fully automatically.