

# Online monitoring of cell growth for vaccine production

## Save time and make your process safer with OUSBT66



### Benefits at a glance

- Increased process reliability
  - Lower risk of batch contamination
- More accurate cell counting
- Online measurement provides real-time information about cell growth and helps to ensure optimal process conditions
- Reduced requirement for grab sampling and laboratory testing

For the production of vaccines, viruses are often obtained from tissue cultures. These nutrient media contain mammal cells. In our customer's bioreactors, the cells grow and multiply the viruses with which they were previously infected. Until now, the cells have been counted in the lab. The result was very dependent on the person who was counting and the error rate was quite high. With OUSBT66, cell growth can be monitored directly in the process, avoiding the risk of batch contamination and making the results more precise.

**Customer challenge** For our customer, a pharmaceutical company producing animal vaccines, the main objective was to reduce the batch sampling and to avoid contamination of the process which would lead to a production loss. The sampling is primarily done to check

the cell growth, which is related to the process yield. So far, a manual sample was taken and the cells were counted by eye in the lab.

**Our solution** After presenting our liquid analysis portfolio and showing our experience with Novozymes Argentina, the customer became interested in optical density measurement. However, they were still undecided because the behavior of mammalian cells is different from that of bacteria. Nevertheless they saw there were good reasons for an online measurement and agreed to test our sensor. We gave the customer a complete measuring point for lab and pilot scale trials, taking the opportunity of the development of a new production process. In this application, the challenge for us was to achieve the best correlation between optical density measurement (OD) and cell count.

### Process details

Temperature: 37°C  
Pressure: very low overpressure compared to atmospheric  
Dissolved oxygen: No data (soft aeration, constant)  
Stirring: 140 – 160 rpm  
Typical cell culture operating conditions.

### Products

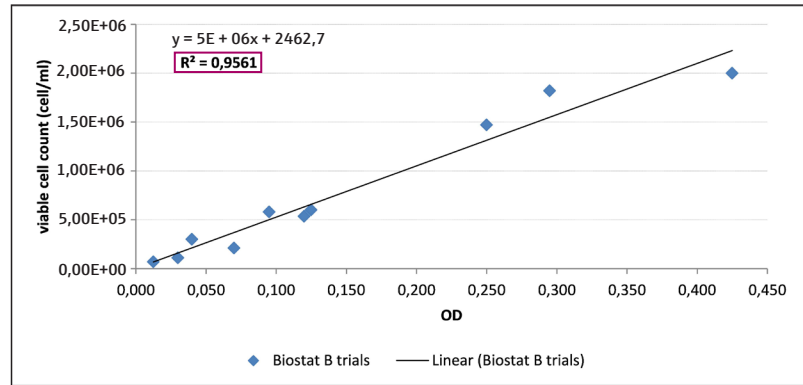
The trial started with a CVM40 and ended up with the Liquiline CM44P.  
Order code sensor: OUSBT66-AA10A1A  
Order code transmitter: CVM40-AA1A1A1A

When the multiparameter transmitter Liquiline CM44P was launched, the customer also tested this one to prove its performance. He liked especially the multiparameter capabilities and used it together with a Memosens CPS71D pH sensor.

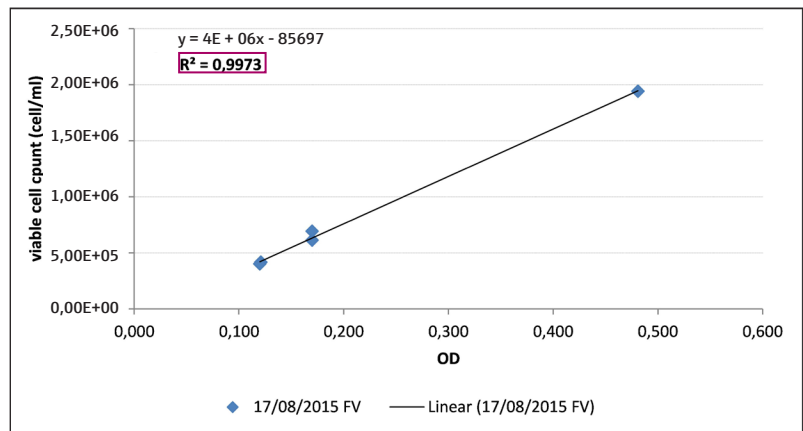
### The results

The correlation along the different batches was very good. The customer was able to find a factor to correlate the OD value with the number of viable cells in the process. This factor was constant batch after batch.

In the end, the sensor proved that it is absolutely suitable for this application. All in all, it made the process both safer and more efficient, and also reduced the time dedicated to the lab tests.



Example of the correlation for the 5 litre bioreactor in the lab (several batches).



For a 25 litre bioreactor (pilot scale), the results were still very good.

### Instruments International

Endress+Hauser Instruments  
International AG  
Kägenstrasse 2  
4153 Reinach/BL  
Switzerland

Tel +41 61 715 8100  
Fax +41 61 715 2888  
info@ii.endress.com  
www.endress.com