

Industrial Algae Cultivation

through real-time monitoring of bioreactors



Algae have the potential to change the world

Renewable resources have become one of the most important factors to face today's challenges of climate change and increasing scarcity of raw materials. As a source of renewable raw materials, industrialized algae cultivation moves into focus of various industries like food, chemicals, bioenergy or pharmaceuticals. Be it algae as food, as bio fuels or as bio plastics: Increasing the efficiency of industrial algae cultivation is crucial in order to make algae products competitive on the market.

“Roses are pretty and oak trees are impressive, but no other groups of ‘plants’ have done so much, for so long, and, for so many as have the algae!”

Chapman, R. L., Algae: the world's most important ‘plants’ — an introduction.

Real-time bioreactor monitoring for industrial algae cultivation



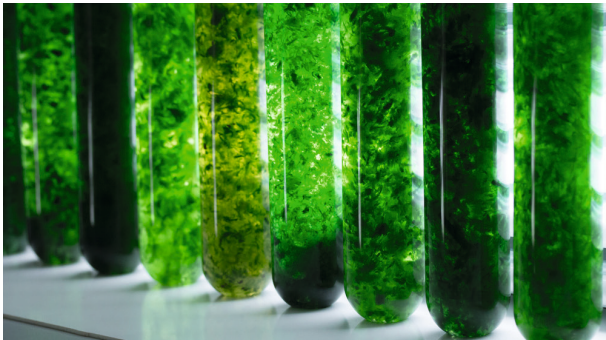
When cultivating algae, population vitality is crucial. However, currently used optical density sensors provide limited information about vital biomass or individual cell characterization.

The Q.ANT Particle Sensor enables the real-time analysis of size, velocity and position of single particles ranging from 2 to 700 microns for real-time monitoring of algae cultivation in bioreactors. By providing an instant evaluation of growth phases and key cellular attributes like size, cell debris, agglomeration factor or contamination, the sensor's analysis provides real-time insights into the algae culture, enhancing the understanding of their state.

Solving challenges in industrial algae cultivation

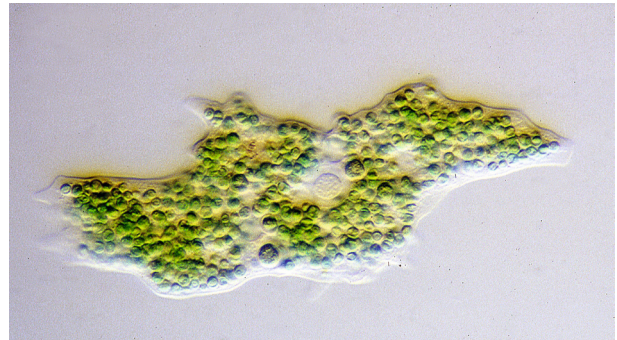


The Q.ANT Particle Sensor solves the current challenges in industrial algae cultivation.



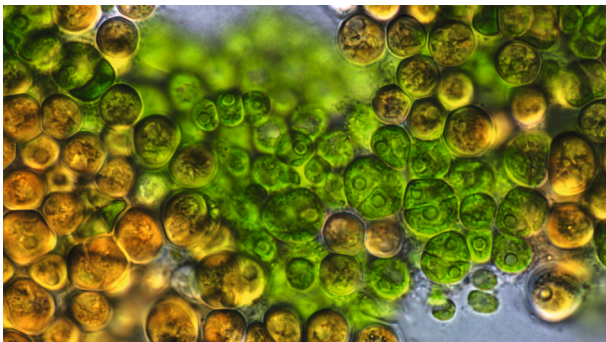
Analysis of the growth phase of the cultivation

By monitoring the relative cell count over time, the growth phase of the algae cultivation in a bioreactor can be determined. This helps to run bioreactors at the optimal operating point, to identify harvest time or optimize fed-batch processes.



Analysis of contaminations in bioreactors

The determination of contamination levels and its temporal development in photobioreactors for example bacterial or ciliates growth can be determined.



Analysis of algae quality in the cultivation

The measurement of the cell count and key cellular attributes like size, cell debris, growth phase, agglomeration factor and contamination provides profound insights into the viability of the algae culture.



Optimization of industrial algae cultivation

Monitoring the algae cultivation in real-time enables increasing process productivity as well as the quality of the cultivated algae. The resulting avoidance of manual lab work and faulty production leads to an optimized industrial algae cultivation.



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