

## LIVE BIOMASS SENSORS AND THEIR INTEGRATION AND APPLICATION IN SINGLE USE TECHNOLOGY

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The detection of biomass is one of the most requested parameters in industrial cell cultivation. The knowledge of the biomass progress during a fermentation process gives deeper process knowledge and control and helps to define harvest or infection points.

Offline methods like visual cell counting or semi-automated systems still dominate the biomass detection in industrial cell cultivation. But these offline methods based on taking a representative sample cannot monitor the process continuously.

The radio frequency impedance (RFI) method for online in-situ detection of viable biomass has already become well established in biopharmaceutical applications using traditional reusable fermenter equipment. On the other hand, industrial cell cultivation tends more and more to single use (SU) fermentation equipment. This paper shows comprehensive results of a standardized online biomass measurement solution for SU fermenter systems which is fully integrated into the standard fermenter control system and tailored to the SU fermentation bags

Sartorius BioPAT®ViaMass biomass sensors, integrated in a range of single use rocking motion (RM) and stirred tank reactors (STR) from 20L up 2000L were used for the experiments. These systems use RF impedance based method (Aber Instruments Ltd) to determine the biomass in the single use bioreactors. The capacitance signals of the BioPAT® ViaMass sensors were compared with the viable cell density of the offline Cedex HiRes measurement as a reference.

Data will also be presented from a new rocking motion bag (Xapand, Holland) for growing up stem cells. The performance of a disposable biomass probe to measure mesenchymal stem cells grown on microcarriers will also be presented.