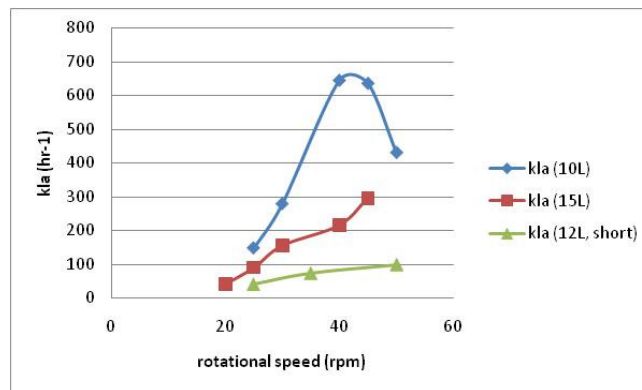


The new age in bioprocessing: single-use bioreactors

Nowadays single-use bioreactors are commonly applied in mainly the biopharmaceutical industry. Based on its advantages of being more flexible, having a quick turnaround, less infrastructure required, higher safety, the application is widely accepted in this industry. Also the contribution to cost reduction of production to apply a single-use system. The same applies for the investments into the infrastructure.

The recently introduced CELL-tainer® is a multi-purpose bioreactor being suitable for also microbial processes. The CELL-tainer® technology is applying a 2-D movement of a pillow-shaped bag and this overcomes the restrictions of both the “Wave” type and the stirred single-use bioreactors in relation to the mass-transfer, mixing and temperature control. The CELL-tainer® offers k_a -values of 300 h^{-1} and higher. This makes the bioreactor suitable for higher demanding processes like high cell density mammalian cell cultures but even for microbial and mycelia cultures.



The question: how representative is a 2-D rocking type motion compared to a stirred tank vessel in relation to the possibilities of scaling-up and scaling-down.

The micro-environment of the cell determines its physiological behavior. When scaling-down a stirred vessel process, conditions that determine whether the small scale process is representative for process development are described. These are conditions like local concentrations of oxygen, carbon dioxide, nutrients, but also the energy dissipation scale.

Based on regime analysis of bioreactors one can judge the suitability of a single-use bioreactor for process development purposes. The CELL-tainer® bioreactor is able to offer those conditions in terms of mass transfer and mixing that a system also can be applied for representative process development work and thus shortening process development times and reducing costs for process development.

Data of both a mammalian process as a bacterial process show the suitability of this single-use system for process development, inoculation steps and small scale productions.