

FACT FILE

Xplorer Bioreactors:

The benchmark for R&D bioreactors:

- Small working volume
- Aerobic, anaerobic plus microbial and cell cultures
- Comprehensive range of monitoring options
- Scalable, reusable reactors
- Steam-In-Place with control option
- Use as a single reactor or within a parallel system

Blocks

4 or 8 miniature bioreactors operating in parallel

Temp Control

0°C to +200°C

With active cooling option for high cell density work

Stirring Speeds

From 30rpm to 1500rpm

Data handling

Real time monitoring, featuring graphical and numerical displays

Stirring Design

Proprietary mechanical stirring design with adaptation for mammalian and microbial applications gives superior agitation in mini reactors



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BUSINESS IN BRIEF: Small Scale Parallel Bioreactors for Microbial Strain Development



The use of biotechnology for development of therapeutics in the pharmaceutical market continues to increase rapidly with biologics research forming over 50% of the pharma pipeline.

In addition to the pressures of reducing manufacturing cost and the complexity of clinical trials, there remains the need to reduce upstream development costs and ultimately reduce the time to market. Key areas where researchers are attempting to address development bottlenecks are microbial strain evaluation and process development. Through improved strain

development faster growing microbial expression systems can provide an efficient way of reducing development costs and drastically decrease production costs compared to mammalian cell lines.

Due to the fact that the therapeutic efficiency of many antibodies is affected by post translational modifications, most importantly glycosylation, it is of utmost importance that attempts to optimise titer in microbial systems do not compromise quality. It is now well known that the maintenance and reproducibility of product quality is based on multiple factors including strain selection, media composition, process conditions and downstream purification methods.

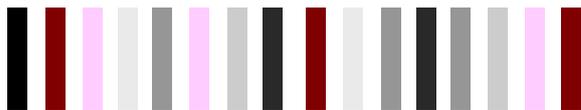
Such multi factorial development processes undoubtedly benefit from high throughput screening and development technology.

HEL has developed tools to address the demands of stirred tank strain selection and evaluation at small scale – typically 25ml to 150ml volume range. This provides the development bridge between the initial strain screening campaigns, typically done in microplates, and the much larger volume scale up trials.

Additional features of the HEL Xplore Bioreactors include:

- Thermal activity monitoring
- Off gas analysis
- Spectroscopic tracking of growth
- Up to 4 gases can be blended including pH control with CO₂





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HEL Xplorer HT

The Automated Parallel Small Scale Bioreactor Platform



At HEL we have used stringent design criteria to develop Xplorer HT, an automated parallel small scale bioreactor platform that can be used for microbial expression systems. Central to the design for this application are the following factors:

Fully automated, independent reactor system.

The ability to independently control and monitor every variable to changes between reactors and the possibility to alter conditions; in real time, is key to reducing development time.

Small scale reactors that closely mimic pilot scale reactors.

Work done with University College London demonstrates that small highly instrumented HEL bioreactors are capable of providing results comparable to those seen in large scale in batch and fed batch modes.

Compact footprint for bench use and integration.

The Xplorer HT unit is the most compact unit available, reducing the impact on the laboratory bench space. Furthermore, deck based liquid handling robots are routinely used in high throughput screening campaigns and their versatility and sample collection abilities are ideal for strain selection and development processes. The HEL Xplorer HT unit can be integrated with any robot deck thereby combining proven screening technologies into one powerful development platform.

Modular system with an extensive portfolio of process development tools.

By combining blocks of 8 mini- reactors a high throughput parallel platform can be quickly established. The reactors themselves can be populated with a range of tools. Further to the traditional temperature, DO and pH probes we also offer optical density, FTIR and bio-calorimetry probes. Options are also available for multi-way feed pumps for substrate addition and pH control as well as DO feedback control and gas blending to maximise cell densities.

All reactors are fully customisable

This is to ensure that the reactor designs evolve to reflect different bioprocessing conditions and demands. By employing a system of 24+ fully independent reactors the time to implement strain development and DOE studies can be drastically reduced. To find out more please contact us....

On-line determination of cell growth in miniature bioreactors : An alternative to repeated sampling and spectroscopic analysis

Monitoring the progress of cell growth is commonly performed by sampling and spectroscopic determination. This approach can introduce the possibility of contamination as well as being laborious for the user especially when multiple reactors need to be monitored. By using the HEL CrystallEYES probe researchers can track cell growth on line. The CrystallEYES unit is portable, can be multiplexed for several reactors and comes with a touch screen interface. The unit can be used with HEL Xplorer bioreactors and with existing third party reactors.



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