APPLICATION NOTE

YEAST
CELL VIABILITY

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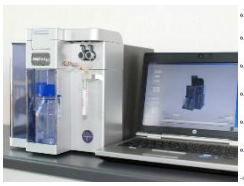
Yeasts are single-celled fungus microorganisms that are widely used in biopharmaceutical production, food and beverage industry and as model organism in basic research. In order to control and improve biotechnological processes, monitoring of yeast viability and cell density are crucial. in order to achieve that, Amphasys developed a rapid and accurate method for yeast viability testing and viable and dead cell density determination using impedance flow cytometry (IFC).

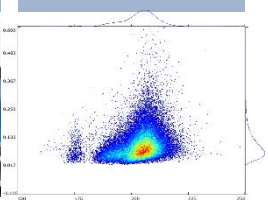
Straightforward 3-Step Workflow

1 Dilution and Filtration

2 Measurement

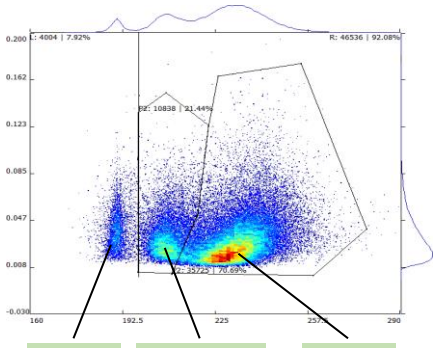


3 Analysis

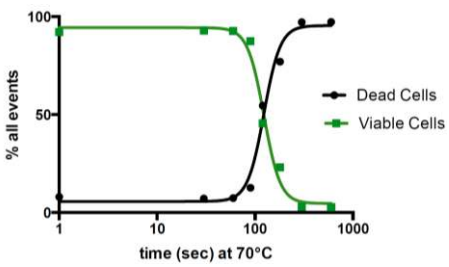


YEAST VIABILITY

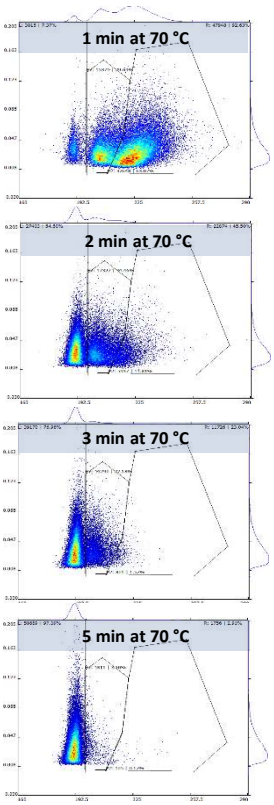
Characterization of > 1000 cells / sec
by impedance flow cytometry



Yeast heat inactivation process

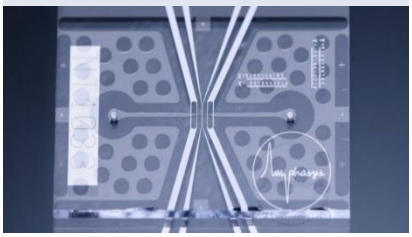


Heat Inactivation



Ampha X30
Impedance Flow Cytometer

- Rapid
- Accurate
- Reproducible
- Label-free
- Portable for on-site analysis



Sample Preparation

- Dilution of yeast cells from solid agar plate or liquid culture in AF6 buffer
  (direct sampling from a bioreactor has also been successfully demonstrated)
- Filtration using a 10 um filter

Instrument Setup

Frequencies	2 / 12 MHz
Triggering	x positive
Level	~ 0.01
Modulation	5
Amplification	6
Demodulation	0
Chip	30 um

Analysis

- Signals at 12 MHz allow a discrimination between viable, apoptotic and dead yeast cells
- Identification of non-viable population using a heat-inactivated sample
- Application of gates to all samples
- Percentages of viable, apoptotic and dead cells are calculated automatically
- Possibility to create a measurement report (includes cell concentrations)