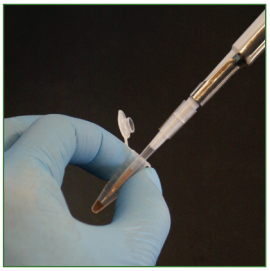
Production Monitoring for Bio-Fuels

Fast, Accurate Yeast Viability for Fermentation Monitoring

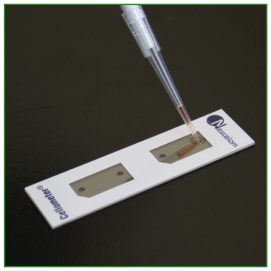
1 Yeast Concentration & Viability in <30 Seconds

Measure yeast viability in complex samples containing corn mash, corn stover, sugar cane, cellulose, and other biomass

Step 1: Stain with AO/PI

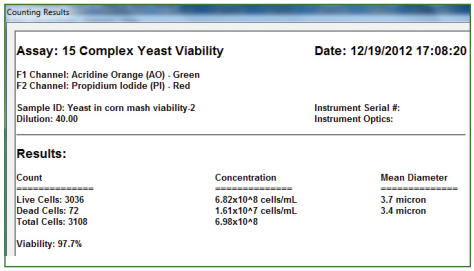


Step 2: Load Chamber



Step 3: Insert Chamber

Step 4: Click Count & Get Results



Counting Results

Assay: 15 Complex Yeast Viability **Date: 12/19/2012 17:08:20**

F1 Channel: Acridine Orange (AO) - Green
F2 Channel: Propidium Iodide (PI) - Red

Sample ID: Yeast in corn mash viability-2
Dilution: 40.00

Instrument Serial #:
Instrument Optics:

Results:

Count	Concentration	Mean Diameter
Live Cells: 3036	6.82x10^8 cells/mL	3.7 micron
Dead Cells: 72	1.61x10^7 cells/mL	3.4 micron
Total Cells: 3108	6.98x10^8	

Viability: 97.7%

2 Test Viability at All Stages of the Fermentation Process

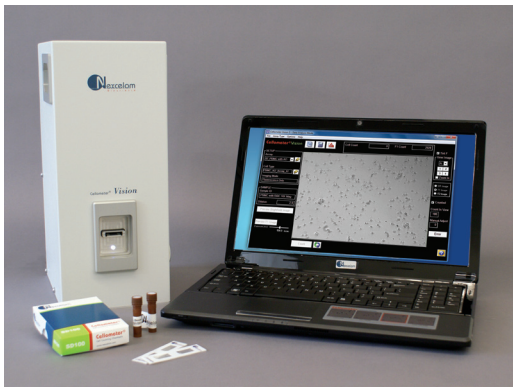
Different stages of the fermentation process are associated with varying degrees of sample complexity. Nexcelom offers a series of yeast viability reagents that enable accurate viability testing throughout the process.

Cellometer AO/PI Yeast Viability Sampler Kit

- Find the right viability reagent for each stage of your fermentation process.
- Select from four different AO/PI yeast viability formulations
- Achieve optimal analysis of both clean and messy yeast samples.

3 Optimize Fermentation Procedures

Test yeast viability under various fermentation conditions to optimize yield and quality.



The Cellometer Vision (10x) Cell Analyzer measures concentration and viability of small cells in complex samples. An optional GMP / GLP software module is available.

4 Implement Automated Quality Control Testing

Optimized assay with pre-set analysis and reporting parameters standardizes test results and significantly reduces inter-operator variability. Auto-save results to a secure network. Auto-print customized reports directly from the Cellometer software. Easily train new operators.

5 Reduce Inter-Operator Variability

Import optimized assay parameters, report templates, and print templates to ensure uniform testing and reporting at multiple locations. Export images and data tables for remote troubleshooting, presentation, and publication

www.nexcelom.com | 978.327.5340 | info@nexcelom.com

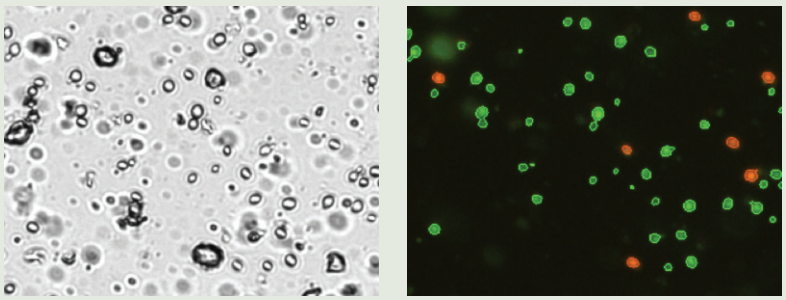
Nexcelom Bioscience

Why Cellometer?

- Proven performance for yeast samples containing corn mash, corn stover, cellulose, and sugar cane
- Optimized viability reagents for both clean and messy yeast samples
- Proprietary Cellometer software for the most accurate counting of irregular-shaped cells and individual cells within clusters, including fermenting yeast and chain-forming yeast
- Collaborations with leading bio-fuel manufacturers
- Proven record with the top U.S. breweries measuring yeast viability for standard quality control and product development
- Free on-line and on-site training

Principle of Yeast Viability Determination for Bio-Fuel Production

The Cellometer Vision utilizes dual-fluorescence to determine accurate concentration and viability of yeast during all phases of fermentation, from pure yeast samples to "messy" samples containing corn mash, corn stover, cellulose, sugar cane, and other biomass.



Images. Bright field and dual-fluorescence images of yeast in sample containing corn mash. Live (green) and dead (red) cells are easily identified and counted in the dual-fluorescence image. Debris visible in the bright field image does not interfere with fluorescent counting.

Acridine orange (AO) stains DNA in all nucleated cells, generating green fluorescence. Propidium iodide (PI), a membrane exclusion dye, stains DNA in nucleated cells with compromised membranes, generating red fluorescence in all non-viable yeast in the sample. Cells stained with both AO and PI fluoresce red due to fluorescence resonance energy transfer (FRET), so only live yeast fluoresce green. The Cellometer Vision reports count, concentration, and diameter for total, live, and dead (non-viable) yeast along with the percent yeast viability for each sample in less than 30 seconds.

Nexcelom has introduced four different reagent formulations for use in different stages of fermentation involving various types of biomass. Researchers developing proprietary procedures for bioethanol, biomethanol, and biobutanol production can utilize the convenient Cellometer AO/PO Yeast Viability Sampler Kit to determine the reagent(s) that best fit their fermentation procedure. Nexcelom applications specialists can assist with optimization of imaging and counting parameters without disclosure of confidential information regarding your fermentation process.

Contact Nexcelom Today at

1-978-327-5340 or info@nexcelom.com
to schedule a free on-site demonstration.

Visit www.nexcelom.com to learn more.

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