

Cellometer[®] X2

Image Cytometer
for Cell Counting & Analysis



Brewing Yeast
Wine Yeast
Platelets
and Other Small Cells

Cellometer X2 Image Cytometer

Optimized Analysis for Yeast and other Small Cells



Features of the Cellometer X2

Dual Fluorescence and Bright Field Imaging: staining of both live and dead cells in yeast samples

User-Friendly Software and Assay Selection: Enhanced inter-operator reproducibility, minimal training, auto-save option

Fast Results: Obtain cell images, counts, size measurements, and viability calculations in 60 seconds

Small Sample Size: Only 20 μ l of sample

Broad Dynamic Range: Measurable concentration range of 2.5×10^5 to 5×10^7 cells/mL using Nexcelom's proprietary de-clustering function

Many Compatible Dyes: Trypan blue, AO, PI, EB, 7AAD, AO/PI, AO/EB, Calcein AM, CFDA-AM, Calcein AM/PI, CFDA/PI



Advantages of Cellometer Image Cytometer

- **Cell Imaging**
 - Verify cell morphology and counted live/dead cells
 - Export cell images for presentations and publications
- **Pattern Recognition Software**
 - Accurately count cells in clumps
 - Count irregular-shaped cells
 - Eliminate debris from cell counts
 - Differentiate cells based on size
- **Automated Data Management**
 - Pre-set assays and automated reports
 - Archive sample images and auto-save results
- **Maintenance-free System**
 - Disposable counting chambers – no wash steps
 - No required instrument maintenance

Learn why thousands of users, including the top ten pharmaceutical companies, trust Cellometer.

On-Line Demonstrations are completed in just 20 to 30 minutes and provide an overview of how Cellometer works using existing images of cells that interest you.

On-Site Demonstrations are a convenient way to test a Cellometer system for a specific application. An experienced Applications Specialist will arrive at your lab for a hands-on session to test your cells and show how Cellometer can enhance your workflow.

Technical Seminars are an excellent way to introduce Cellometer systems to a lab group or collaborators in different laboratories within an organization. A trained biologist will discuss and demonstrate the capabilities and advantages of Cellometer image cytometry.

Call 978-327-5340 or E-mail info@nexcelom.com today to schedule a free demonstration or technical seminar.

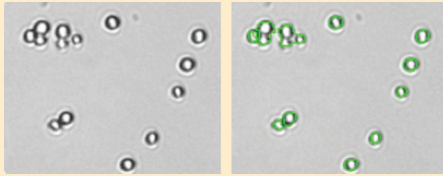
“The Cellometer X1 is easy to use, accurate and fast. And to perform viability and total cell count in 1 step is fantastic.”
-Captain Lawrence Brewing



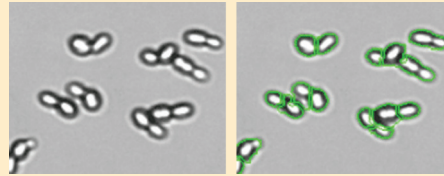
Yeast Used in Brewing Industry

In general, yeast strains used in the brewing industry are very clean. They are counted using Cellometer X1 and X2 Image Cytometers. Concentration and viability are measured using Cellometer bright field and fluorescent images.

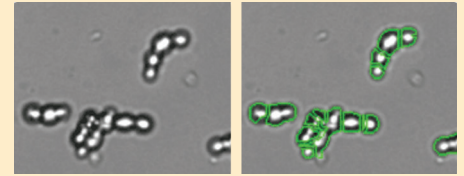
Yeast Concentration Measurement by Bright Field Analysis



Single Cell Count

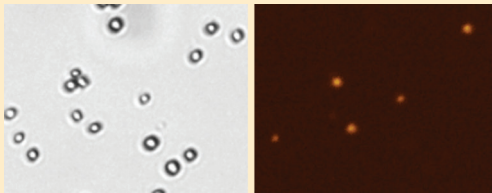


De-clustering of Yeast Cells

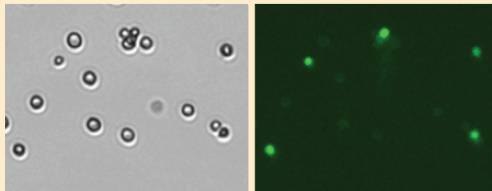


Chain-Forming Cell Count

Yeast Concentration & Viability Measurement by Bright Field & Fluorescence

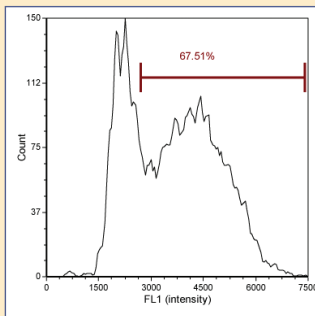


Viability Measurement Using Propidium Iodide (PI)
Bright field images are used to obtain total cell count, while fluorescent images are used to count dead cells.



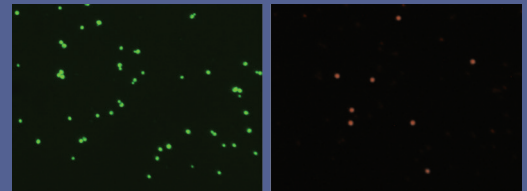
Viability Measurement by Oxonol
Bright field images are used to obtain total cell count, while fluorescent images are used to count dead cells.

Yeast Cell Cycle Analysis

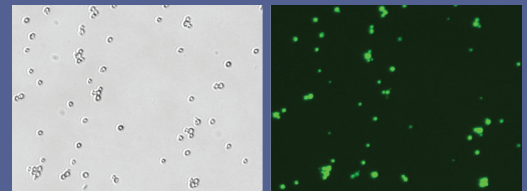


Cell Cycle Analysis Using Propidium Iodide (PI)
Standard baker's yeast stained with the Cell Cycle Staining Kit from Nexcelom Bioscience are incubated for 60 minutes before using Cellometer X2 to analyze the cell cycle. The plot shows the yeast population that is actively dividing. Their higher DNA content is measured using PI.

Yeast Viability and Vitality



Viability by Dual-Fluorescence
Yeast samples are stained 1-to-1 with a mixture of acridine orange (AO) and propidium iodide (PI) dual-fluorescence stain. Yeast concentration and viability are obtained immediately after staining using Cellometer X2. Live yeast cells fluoresce green and dead cells fluoresce red.



Vitality by Fluorescent Enzymatic Stain

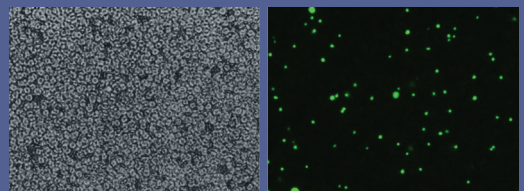
Yeast samples are stained 1-to-1 with Carboxyfluorescein-AM fluorescent enzymatic stain for 45 minutes and then analyzed for vitality using Cellometer X2. Bright field images are used for total cell count and fluorescent images are used to measure the active yeast cells.

Cellometer Yeast Analysis



	X1	X2
Bright field imaging mode	X	X
Single fluorescence imaging mode	X	X
Dual fluorescence imaging mode		X
Viability using PI	X	X
Concentration & viability using AOPI		X
Vitality using CFDA-AM		X
Yeast cell cycle	X	X
Cellometer software for analysis of clumpy and irregular-shaped cells	X	X
Mean diameter and cell size distribution	X	X
Cell type wizard for creating new cell type parameters	X	X

Automated Platelet Counting in Whole Blood



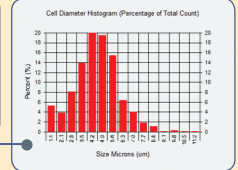
Fluorescence-Based Platelet Concentration Measurement

A blood sample stained using the Calcein AM Vitality / Viability Kit from Nexcelom Bioscience is incubated for 20 minutes. Both platelets and white blood cells produce green fluorescence. Cell size gating is applied to exclusively count platelets.

Cellometer X2 Image Cytometer for Yeast & Other Small Cells from Nexcelom Bioscience

FEATURES

- ➔ Dual FL/BR Channels
- ➔ Easily Edit and Import Assays
- ➔ Images for Data Verification
- ➔ Cell Size Histograms



- ➔ Yeast Viability Analysis by Dual Fluorescence
- ➔ Small Chain Yeast Culture Analysis
- ➔ Platelet Analysis
- ➔ Small Cell Concentration and Viability Analysis
- ➔ Yeast Vitality Analysis
- ➔ Sperm Analysis
- ➔ Yeast Cell Cycle Analysis

ASSAYS

File Assay Type Options Help

Cellometer

Cell Count: 0 F1 Count: 0
0 F2 Count: 0

SETUP

Assay: Yeast AOPI Viability

Cell Type: Yeast AOPI Viability FL1

Imaging Mode: Fluorescent 1, Fluorescent 2

SAMPLE

Sample ID: Yeast AOPI Dry Demo-2

Dilution: 4.0

Preview B1 B2

Preview F1 Exposure (ms): 700.0 msec

Preview F2 Exposure (ms): 5000.0 msec

Count

View Image: A, 1, 2, 3, 4, Zoom In

B1 B2, F1 Image, F2 Image, Combined, Counted

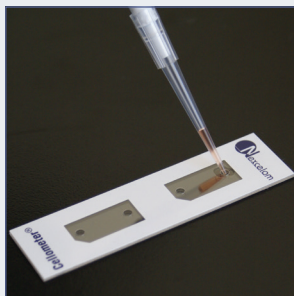
Count In View: 0

Manual Adjust: 0

Enter

“ Our new Cellometer X2 has cut the time we spend on cell counts drastically, freeing up time for much more. The transition was very easy, the software is a piece of cake to learn and the support is excellent! -Westbrook Brewing Company

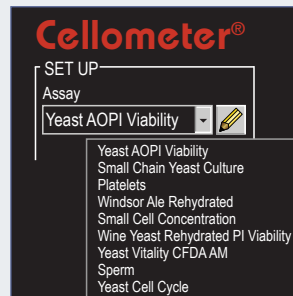
How It Works



Pipette 20 µl of Cell Sample



Insert Counting Chamber



Select Assay & Click Count

Assay: Yeast AOPI Viability	
Cell Type F1: Yeast AOPI Viability FL1	
Cell Type F2: Yeast AOPI Viability FL2	
Sample ID: Yeast AOPI Viability-2	
Dilution: 4.00	
Count	Concentration
Total: 1148	5.00x10 ⁷ cells/mL
Live: 928	4.05x10 ⁷ cells/mL
Dead: 220	9.50x10 ⁶ cells/mL
Mean Diameter	
3.8 micron	Viability: 81.0%
4.0 microns	
2.6 micron	

Get Results

Performance of the Cellometer X2 Image Cytometer

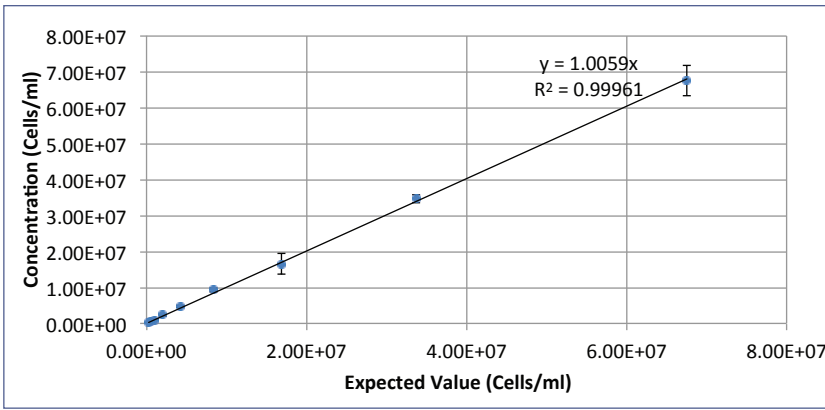


Figure 1. Table of results for cell concentration dynamic range

Concentration Dynamic Range Figure 1 depicts the dynamic range for cell concentration measured by Cellometer X2. This data set was taken on a concentration series of cultured yeasts.

Samples from 2.5×10^5 – 5×10^7 cells/ml can be counted without further dilution.

The %CV at each concentration was below 10%.

Viability Dynamic Range The viability dynamic range is 0 - 100% for Cellometer X2 Image Cytometer using dual fluorescence AO/PI stain.

Cellometer X2	Average Live Cell Concentration Via Fluorescence	Viability
AVE	1.32E+07	78.1%
STDEV	7.69E+05	2.2%
CV(%)	5.84	2.78

Figure 2: Table of results for cell concentration and viability using acridine orange (AO) and propidium iodide (PI)

Consistency and Repeatability The results indicate the accuracy of the Cellometer X2 instrument in assessing the viability of yeasts using AOPI for cell viability. Yeasts were tested at 24 sample replications. The viability average was calculated and plotted. The results show the reliability and accuracy of the Cellometer X2 in measuring cell concentration and viability of yeast cells.

Cellometer Performance

Performance of the Cellometer X1 Image Cytometer

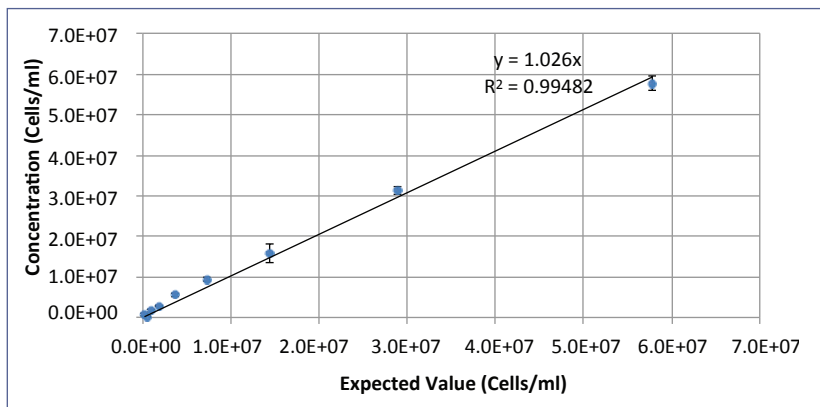


Figure 3. Table of results for cell concentration dynamic range

Concentration Dynamic Range Figure 3 depicts the dynamic range for cell concentration measured by Cellometer X1. This data set was taken on a concentration series of cultured yeasts.

Samples from 4×10^5 – 5×10^7 cells/ml can be counted without further dilution.

The %CV at each concentration was below 10%.

Viability Dynamic Range The viability dynamic range is 0 - 100% for Cellometer X1 Image Cytometer using PI stain.

Cellometer X1	Average Total Cell Concentration via Bright-Field	Viability
AVE	4.07E+07	69.0%
STDEV	2.28E+06	2.5%
CV(%)	5.61	3.64

Figure 4. Table of results for cell concentration and viability using bright-field and Propidium iodide (PI)

Consistency and Repeatability The results indicate the accuracy of the Cellometer X1 instrument in assessing the viability of yeasts using PI for cell viability. Yeasts were tested at 24 sample replications. The viability average was calculated and plotted. The results show the reliability and accuracy of the Cellometer X1 in measuring cell concentration and viability of yeast cells.

“ The Cellometer X2 has provided me with reliable counting that has standardized our cytotoxicity assay and maintains consistency across various users. Previously, I was using a hemacytometer for counting our human cell lines, which would often give me intense headaches from staring into a microscope for long periods of time. This is no longer a problem with the Cellometer X2! I would recommend this product to anyone who needs reliable cell counts for mammalian cell lines.

Cellometer Cell Counters, Cell Analysis Systems & Image Cytometry

Nexcelom offers a wide range of Cellometer systems developed and optimized for specific applications and cell types.



For more information, visit www.nexcelom.com

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www.nexcelom.com/products

Cellometer® Simply Counted  **Celigo®** Image Cytometer

Which Instrument is Right for Me?

Features	Bright Field Cell Counters			Fluorescent Viability Cell Counters				Image Cytometers				
	Mini	Auto T4	Auto 1000	Auto 2000	X1	X2	K2	Vision CBA	Vision CBA (10x)	Celigo BF	Celigo 4 Channel	Celigo 5 Channel
Cell / Sample Type												
Cell Line	X	X	X	X			X	X		X	X	X
Cultured Primary Cells	X	X	X	X			X	X		X	X	X
Algae									X			
Platelets						X			X			
Low Concentration Cell Lines				X			X	X		X	X	X
Yeast (Clean Sample)					X	X			X			
Yeast (Messy Sample)						X			X			
Primary cells (Messy Sample*)				X			X	X			X	X
PBMCs, Splenocytes, Stem Cells				X			X	X			X	X
Hepatocytes							X	X			X	X
Adipocytes***				X			X	X		X	X	X
Cell-Based Assay **					X	X	X	X	X	X	X	X
Apoptosis (Annexin V-FITC/PI)							X	X	X		X	X
Apoptosis (Caspase Activity)							X	X	X		X	X
Autophagy (CytolD-green)								X	X			
Cell Proliferation (CFSE)								X	X		X	X
Cell Cycle (PI)					X	X	X	X	X		X	X
GFP Transfection				X		X	X	X	X		X	X
RFP Transfection								X	X		X	X
Mitochondrial Potential (JC-1)								X	X		X	X
Multi-drug Resistance (ABC Transporter)								X	X		X	X
Surface Marker Analysis								X	X		X	X
Vitality (Calcein-AM/PI)						X	X	X	X		X	X
Vitality (CFDA-AM)						X						
Image Cytometry**								X	X		X	X

* A messy sample is a heterogeneous sample containing unwanted cell types, such as red blood cells, in addition to the cells of interest.
** FCS Express license must be purchased in order to perform Cell Based Assay or Image Cytometry analysis
*** Cellometer CHT4-PD300 slides are required for cells greater than 80µm in diameter

