

# Cellometer<sup>®</sup> 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 µl of sample

**Broad Dynamic Range:** Measurable concentration range of  $2.5 \times 10^5$  to  $5 \times 10^7$  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.

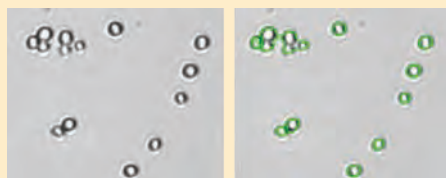
Call 978-327-5340 or E-mail [info@nexcelom.com](mailto:info@nexcelom.com) today to schedule a free demonstration or technical seminar.



## 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

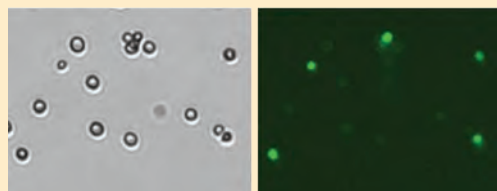


Chain-Forming Cell Count

### Yeast Concentration & Viability Measurement by Bright Field & Fluorescence

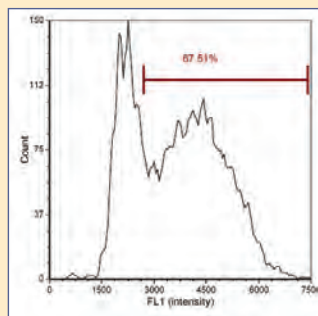


**Viability Measurement Using Propidium Iodide (PI)**  
Bright field images are used to obtain total cell count, while fluorescent images are used to count dead cells.



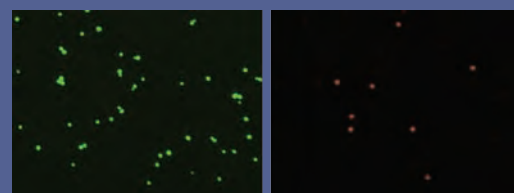
**Viability Measurement by Oxonol**  
Bright field images are used to obtain total cell count, while fluorescent images are used to count dead cells.

### Yeast Cell Cycle Analysis

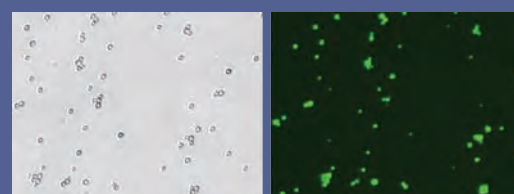


**Cell Cycle Analysis Using Propidium Iodide (PI)**  
Standard baker's yeast stained with the Cell Cycle Staining Kit from Nexcelom Bioscience are incubated for 60 minutes before using Cellometer X2 to analyze the cell cycle. The plot shows the yeast population that is actively dividing. Their higher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



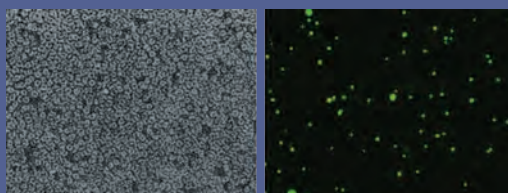
**Vitality by Fluorescent Enzymatic Stain**  
Yeast samples are stained 1-to-1 with Carboxyfluorescein-AM fluorescent enzymatic stain for 45 minutes and then analyzed for vitality using Cellometer X2. Bright field images are used for total cell count and fluorescent images are used to measure the active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

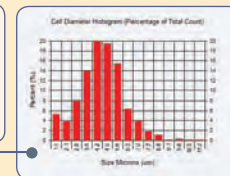


**Fluorescence-Based Platelet Concentration Measurement**  
A blood sample stained using the Calcein AM Vitality / Viability Kit from Nexcelom Bioscience is incubated for 20 minutes. Both platelets and white blood cells produce green fluorescence. Cell size gating is applied to exclusively count platelets.

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

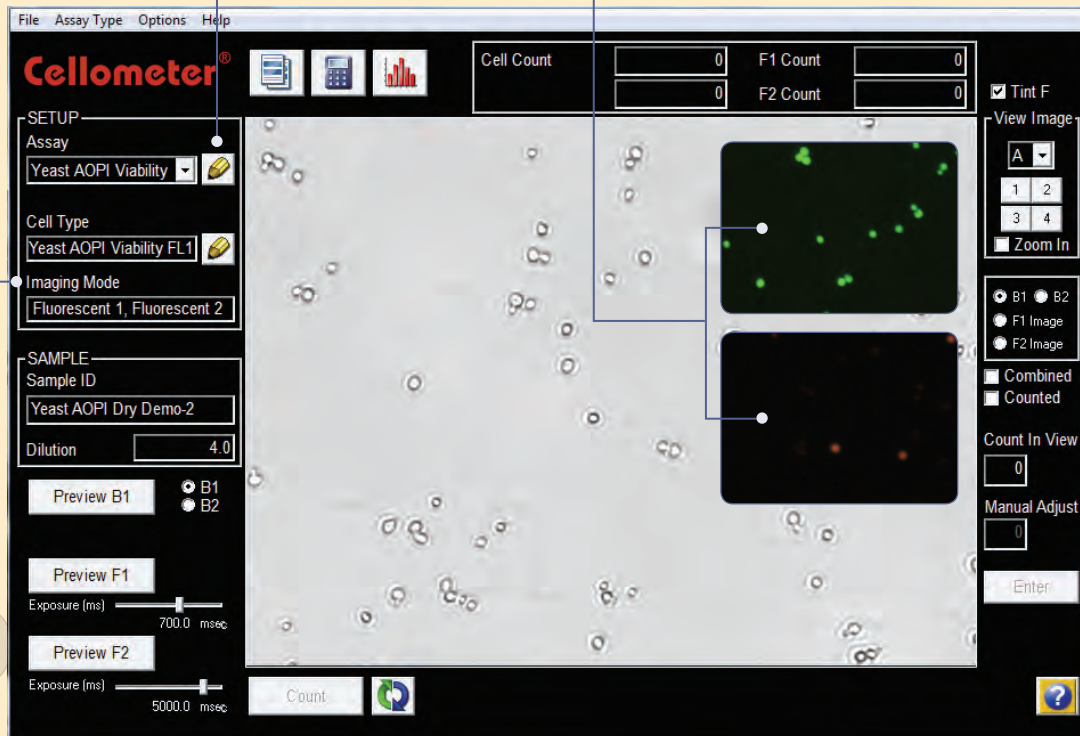
## FEATURES

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

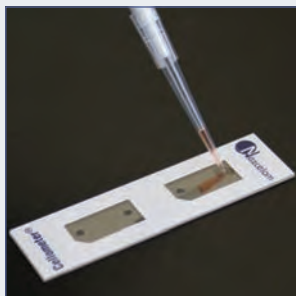


- ➔ Yeast Viability Analysis by Dual Fluorescence
- ➔ Small Chain Yeast Culture Analysis
- ➔ Platelet Analysis
- ➔ Small Cell Concentration and Viability Analysis
- ➔ Yeast Vitality Analysis
- ➔ Sperm Analysis
- ➔ Yeast Cell Cycle Analysis

## ASSAYS



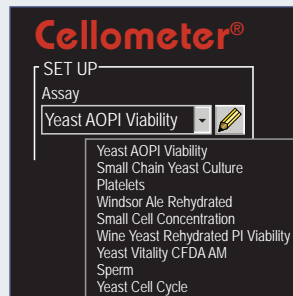
## How It Works



Pipette 20 µl of Cell Sample



Insert Counting Chamber



Select Assay & Click Count

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

Get Results



## Performance of the Cellometer X2 Image Cytometer

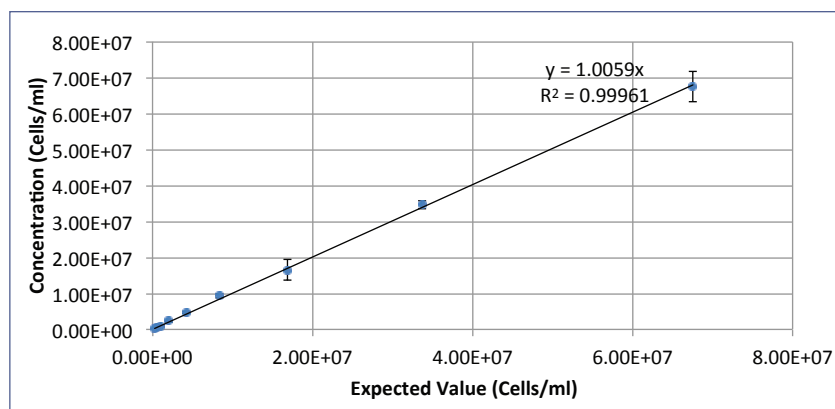


Figure 1. Table of results for cell concentration dynamic range

**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)

**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  $2.5 \times 10^5$  –  $5 \times 10^7$  cells/ml can be counted without further dilution.

The %CV at each concentration was below 10%.

**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

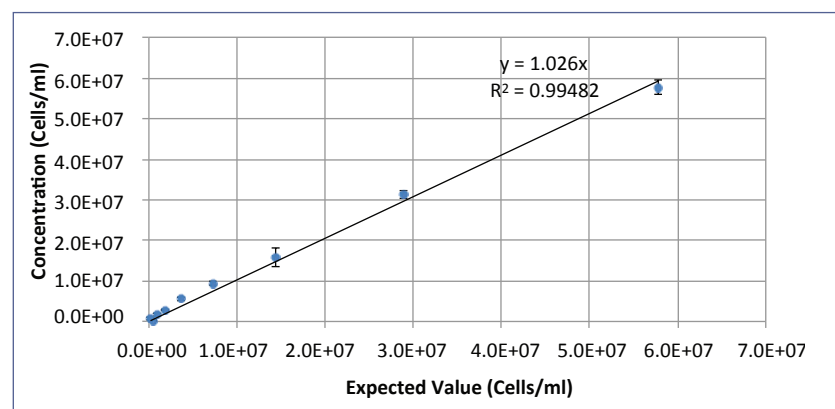


Figure 3. Table of results for cell concentration dynamic range

**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)

**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  $4 \times 10^5$  –  $5 \times 10^7$  cells/ml can be counted without further dilution.

The %CV at each concentration was below 10%.

**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.

## Cellometer Reagents

Catalog #	Description	Instrument Compatibility	Size	Unit
CS1-0108-5ML	AO (acridine orange) Staining Solution for staining of nucleated cells	Auto 2000, K2, X2, X1, X4, Vision CBA	5 mL	each
CS1-0109-5ML	PI (propidium iodide) Staining Solution for staining of dead nucleated cells	Auto 2000, K2, X2, X4, Vision CBA	5 mL	each
CS2-0106-5ML	AO/PI (acridine orange / propidium iodide) Staining Solution for live/dead <b>Mammalian</b> nucleated cells	Auto 2000, K2, X2, Vision CBA	5 mL	each
CS1-0114 CS0-0115-100ML CS1-0116	Cellometer Annexin V-FITC / PI Apoptosis Reagents	X2, K2, Vision CBA		each
K183-100-N K183-25-N	Cellometer Caspase-3 Apoptosis Kit	X2, K2, Vision CBA		each
K188-100-N K188-25-N	Cellometer Caspase-8 Apoptosis Kit	X2, K2, Vision CBA		each
CSK-0112	Cellometer PI Cell Cycle Kit	X1, X2, K2, Vision CBA		each
CSK-0102	Cellometer ViaStain Kit for live/dead <b>Yeast</b> concentration including stainer buffer, fluorescent dye mixture	X2, K2, Vision CBA		

## Cellometer Counting Chamber

Catalog #	Description	Size	Unit
CHT4-PD100-003	Standard chamber thickness. Packed in microscope slide boxes. Ready to use.	Case of 500 slides for 1,000 counts (10 individual boxes)	1 Case
CHT4-SD100-014	Standard chamber thickness. Packed with protective film on both sides. Remove protective film before use.	Case of 900 slides for 1,800 counts	1 Case
CHT4-PD300-003	3x standard chamber thickness. Packed in microscope slide boxes. Ready to use.	Case of 500 slides for 1,000 counts (10 individual boxes)	1 Case

See [www.nexcelom.com/products](http://www.nexcelom.com/products) for updated product selections.

## 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.



**Cellometer®**  
Simply Counted



**Celigo®**  
Image Cytometer

**Nexcelom**  
Bioscience

### Which Cellometer is Right for Me?

Features	Automated Cell Counters					Image Cytometers				
	Mini	Auto T4	Auto 1000	Auto 2000	X4 (10x)	X1	X2	K2	Vision CBA	Vision CBA (10x)
<b>Cell / Sample Type</b>										
<b>Objective Magnification</b>	4X	4X	4X	4X	10X	10X	10X	4X	5X	10X
Cell Line	X	X	X	X				X	X	
Cultured Primary Cells	X	X	X	X				X	X	
Algae					X					X
Platelets					X		X			X
Low Concentration Cell Lines				X				X	X	
Yeast (Clean Sample)					X	X	X			
Primary cells (Messy Sample*)				X				X	X	
PBMCs, Splenocytes, Stem Cells				X				X	X	
Yeast (Messy Sample)							X			X
Hepatocytes								X	X	
Adipocytes***				X				X	X	
<b>Cell-Based Assay **</b>						X	X	X	X	X
Apoptosis (Annexin V-FITC/PI)								X	X	X
Apoptosis (Caspase Activity)								X	X	X
Autophagy (CytolD-green)									X	X
Cell Proliferation (CFSE)									X	X
Cell Cycle (PI)						X	X	X	X	X
GFP Transfection				X			X	X	X	X
YFP Transfection									X	X
RFP Transfection									X	X
Mitochondrial Potential (JC-1)									X	X
Multi-drug Resistance (ABC Transporter)									X	X
Surface Marker Analysis									X	X
Vitality (Calcein-AM/PI)							X	X	X	X
<b>Image Cytometry**</b>									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 4 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

For more information, visit  
[www.nexcelom.com](http://www.nexcelom.com)

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