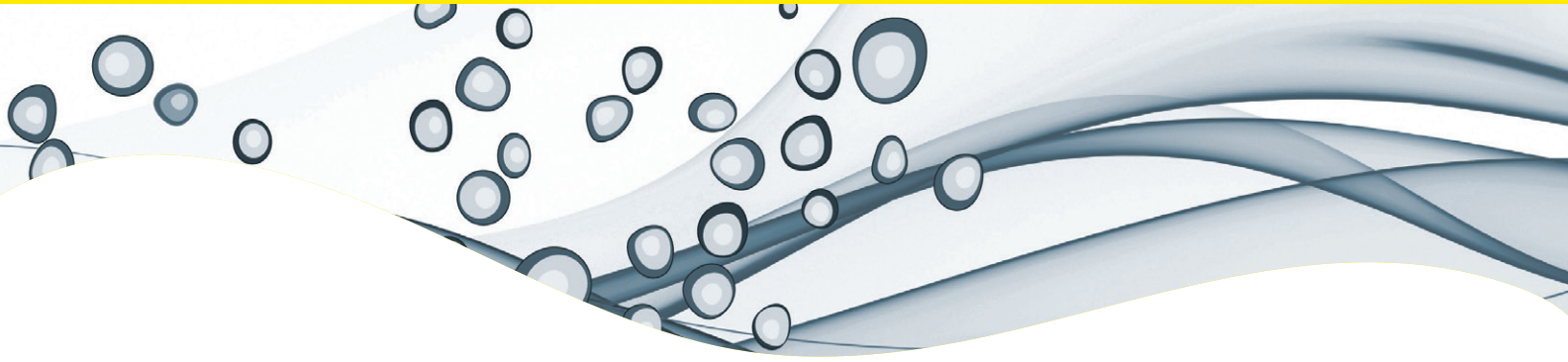
Optimized analysis for yeast and other small cells



Cellometer X2 Fluorescent cell viability counter

Across small cell applications - including brewing yeast, wine yeast and platelets - cell count, concentration, diameter, and % viability are automatically calculated and reported.

Features of the Cellometer® X2 counter

Dual fluorescence and brightfield 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 x 10^5 to 5 x 10^7 cells/mL using Revvity'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

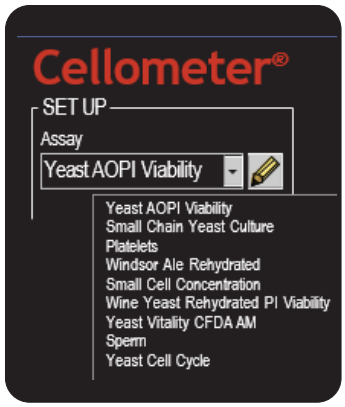
- Brewing yeast
- Wine yeast
- Platelets
- Other small cells

For research use only. Not approved for diagnostic or therapeutic use.

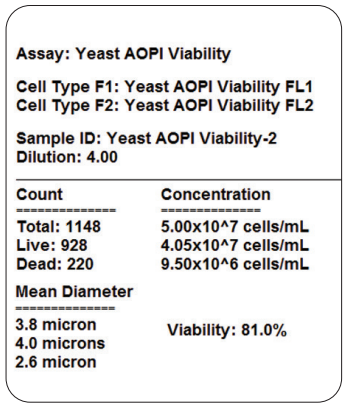
How it works

Step 1: Pipette 20 µl of cell sample

Step 2: Insert counting chamber



Step 3: Select assay & click count



Step 4: Get results

Advantages of the Cellometer fluorescent cell counter

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

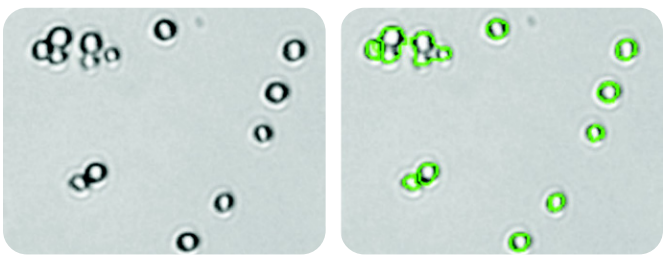
Maintenance-free system

- Disposable counting chambers – no wash steps
- No required instrument maintenance

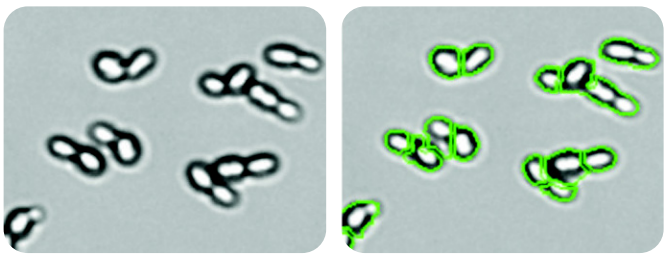
Yeast used in brewing industry

In general, yeast strains used in the brewing industry are very clean. Concentration and viability are measured using Cellometer brightfield and fluorescent images.

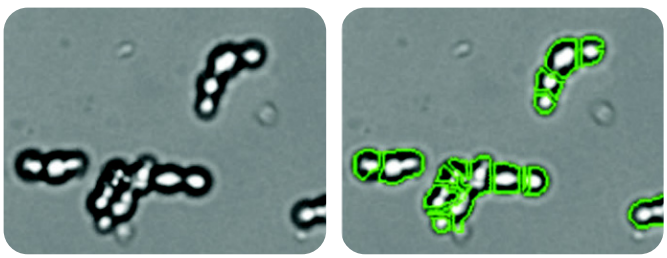
Yeast concentration measurement by brightfield analysis



Single cell count

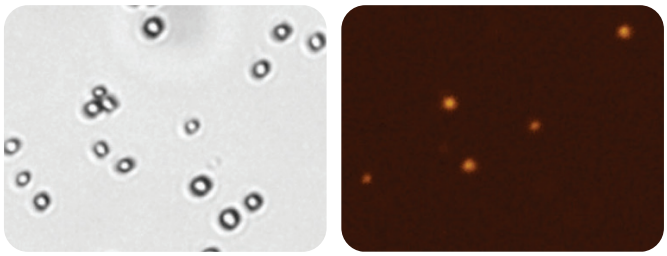


De-clustering of yeast cells

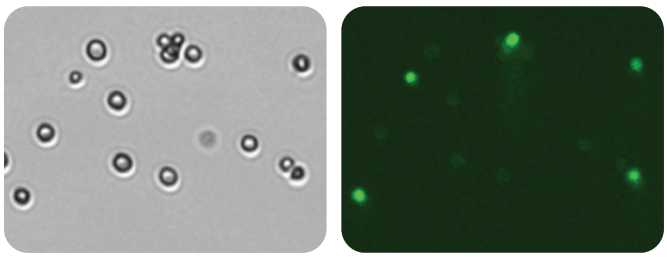


Chain-forming cell count

Yeast concentration, viability and vitality measurement by brightfield & fluorescence

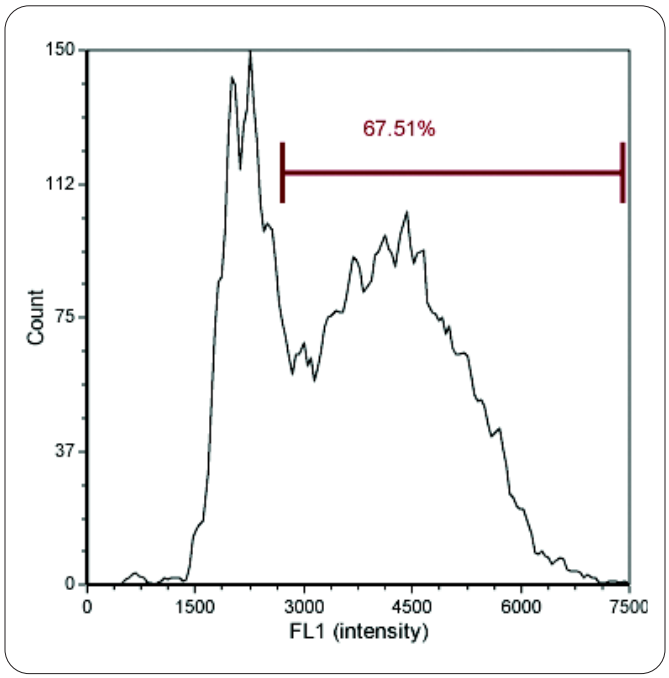


Viability measurement using propidium iodide (PI) brightfield images are used to obtain total cell count, while fluorescent images are used to count dead cells.

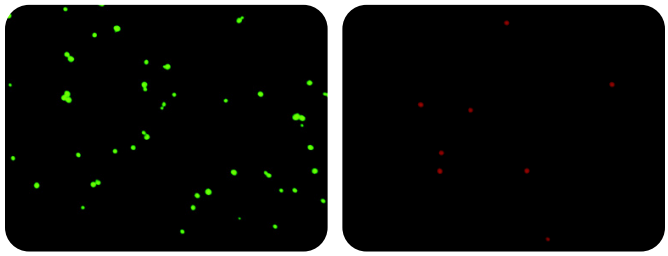


Viability measurement by oxonol brightfield images are used to obtain total cell count, while fluorescent images are used to count dead cells.

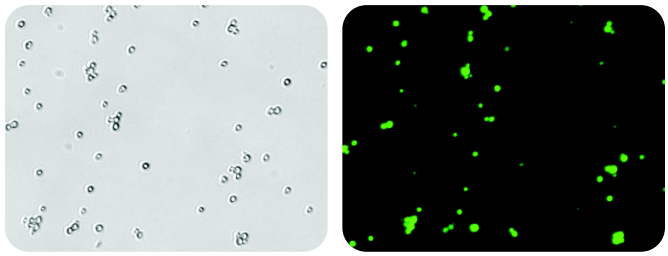
Yeast cell cycle analysis



Cell cycle analysis using propidium iodide (PI) standard baker's yeast stained with the cell cycle staining kit from Revvity 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.

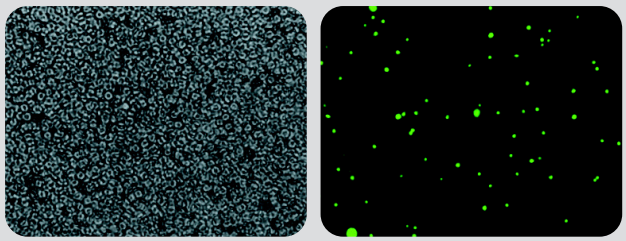


Viability by dual-fluorescence yeast samples are stained 1-to-1 with a mixture of acridine orange (AO) and propidium iodide (PI) dual-fluorescence stain. Yeast concentration and viability are obtained immediately after staining using Cellometer X2. Live yeast cells fluoresce green and dead cells fluoresce 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. Brightfield images are used for total cell count and fluorescent images are used to measure the active yeast cells.

Automated platelet counting in whole blood

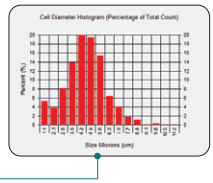


Fluorescence-based platelet concentration measurement a blood sample stained using the Calcein AM Vitality / Viability Kit from Revvity is incubated for 20 minutes. Both platelets and white blood cells produce green fluorescence. Cell size gating is applied to exclusively count platelets.

Cellometer X2 user interface

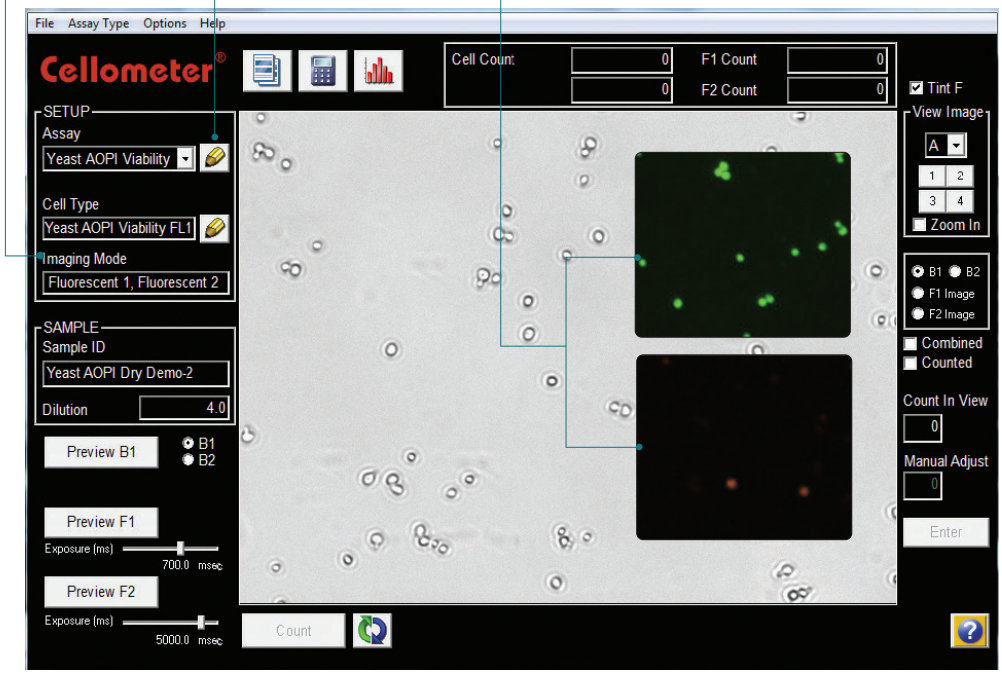
Features

- 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



Yeast analysis

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

"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 reccommend this product to anyone who needs reliable cell counts for mammalian cell lines."

"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."

Performance of the Cellometer X2 fluorescent cell counter

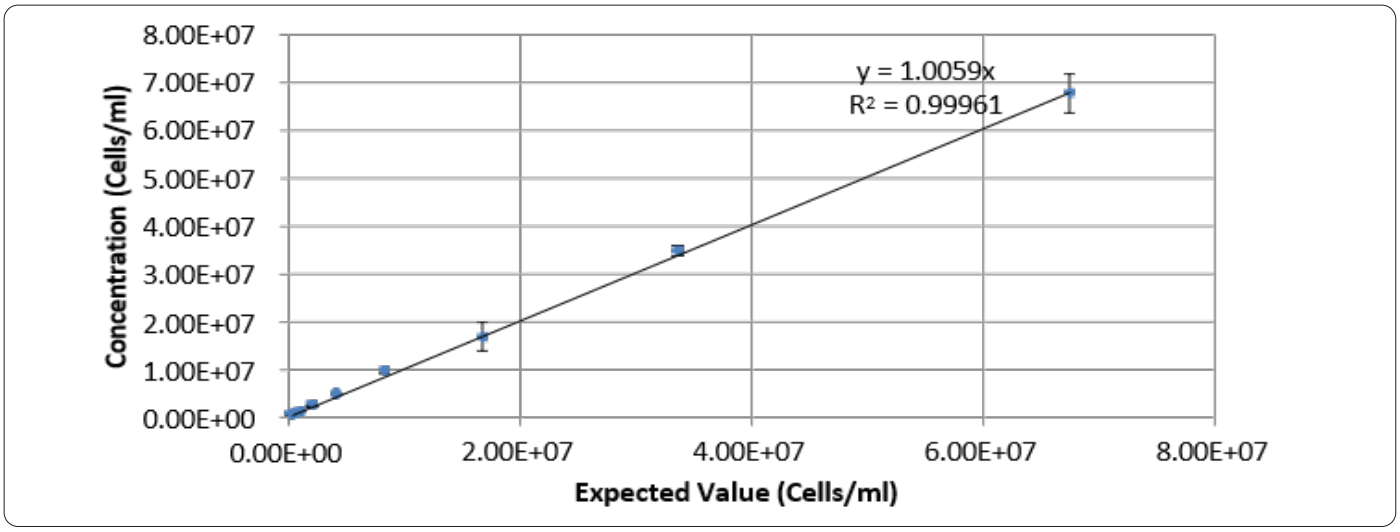


Figure 1. Table of results for cell concentration dynamic range

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 x 10^5 – 5 x 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 cell counter using dual fluorescence AO/PI stain.

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

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

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.

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