

Cellometer[®] K2

Fluorescent Viability Cell Counter



CHAYON
LABORATORIES, INC

Cellometer[®] K2

Image Cytometer for Cell Counting and Analysis



- ✓ 5 imaging modes to provide viability assays by trypan blue and fluorescent stains
- ✓ Dual fluorescence for primary cell samples
- ✓ Available GMP/GLP software module to satisfy GMP/GLP requirements
- ✓ Perform basic cell-based assays such as cell cycle, apoptosis, and GFP population analysis
- ✓ Export data to FCS Express[™]* (for flow-like data analysis)

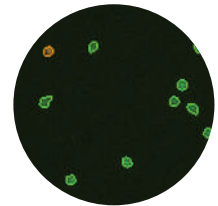
* FCS Express[™] Flow Cytometry software is a product of De Novo Software[™]



1. Pipette 20 µl



2. Insert slide & count



3. Get images & data

Cellometer K2! The Best Option for Primary Cell Counting, Hepatocytes and Cell-Based Assays.

Proven Performance in Many Research Areas

- **Clinical Immunology:** PBMCs
- **DMPK:** Primary Hepatocytes
- **Regenerative Medicine:** Stem Cells
- **Transplantation:** Nucleated Cells
- **Vaccine Development:** Splenocytes
- **Oncology:** Cell Lines, Cell Cycle, Apoptosis
- **Basic Research:** Primary Cells / Cell Lines / GFP

GMP/GLP Support Module

Available for Access and Audit Control

- Four different access level controls for user logging
- Audit trail by user
- Autolocking of system (inactivity timeout)
- Password aging reset requirement
- Auto printing option

“The Cellometer K2 has drastically changed our work flow in the lab. We are able to gather cell counts in minutes rather than waiting overnight for colonies to grow on plates. It also cuts down time in the prep of plating and error in plating/counting. The amount of time that the machine has saved us is incalculable - it has allowed us to move projects along much more quickly and with confidence. - Synlogic

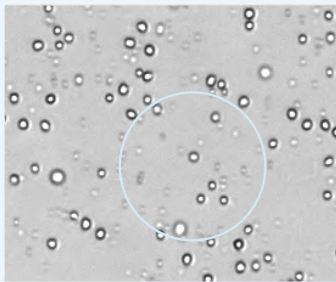
Live/Dead Nucleated Cell Counts using Dual-fluorescence

Why Dual-fluorescence?

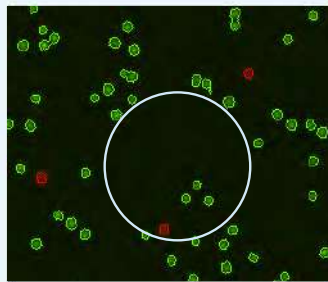
Because brightfield cell counting does not differentiate nucleated from non-nucleated cells and trypan blue staining is not as consistent as fluorescent staining, dual-color fluorescence is strongly recommended for accurate viability analysis for primary cells. The K2 is equipped with standard assays for dual-fluorescence analysis of a variety of cells stained with Acridine Orange and Propidium Iodide (AO/PI).

The AO/PI Method

Acridine Orange (AO) is a nuclear staining (nucleic acid binding) dye permeable to both live and dead cells. It stains all nucleated cells to generate green fluorescence. Propidium Iodide (PI) can only enter dead cells with compromised membranes. It stains all dead nucleated cells to generate red fluorescence. Cells stained with both AO and PI fluoresce red due to quenching, so all live nucleated cells fluoresce green and all dead nucleated cells fluoresce red. Staining with AO/PI also doesn't require incubation, saving time compared to trypan blue.



Brightfield



AO/PI

The brightfield image on the left shows the combination of nucleated cells, red blood cells, and platelets present in the sample. The red blood cells are not visible in the fluorescent image on the right, only the live (green) and dead (red) nucleated cells are counted.

No Interference from Red Blood Cells, Platelets, or Debris

The dual-fluorescence AO/PI method utilizes nuclear staining dyes that bind to nucleic acids in the cell nucleus. Because most mature mammalian red blood cells do not contain nuclei, only live and dead mononuclear cells produce a fluorescent signal. There is no need to lyse red blood cells, saving time and eliminating an extra sample preparation step. Red blood cells, platelets, and debris are not counted in the fluorescent channels.

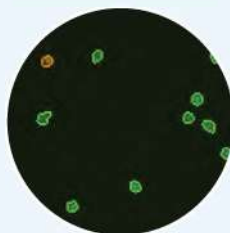
Simple and Fast Cell Counting Workflow with Results in Seconds



1. Pipette 20 µl



2. Insert slide and count



3. Get images and data

"The Cellometer K2, coupled with ViaStain AOPI stain, allows users to easily stain nucleated cells in samples containing red blood cells. No lysis buffer is required, which makes getting results very quick."

- Susan Hamilla, Sorrento Therapeutics

Advanced Fluorescence Cell Counter

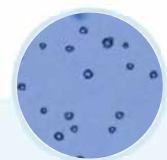
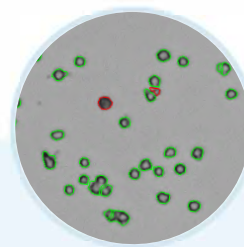
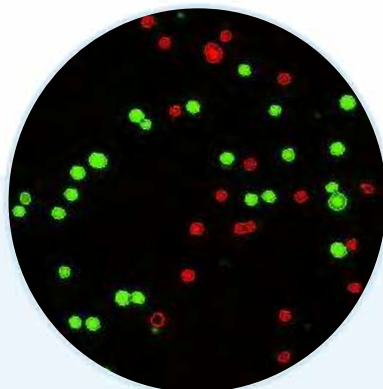
The Cellometer K2, powered by Matrix software, utilizes brightfield imaging and dual-fluorescence imaging to quickly and accurately identify and count individual cells. Cell count, concentration, diameter, and % viability are automatically calculated and reported.

The Cellometer K2 has the following advantages:

- **Dual-fluorescence and brightfield imaging** - stain only nucleated cells for the most accurate count and viability information
- **Fast results** - count, size, concentration, and viability calculations in <60 seconds
- **Analyze complex samples** - designed for analysis of complex and messy samples including whole blood, peripheral blood, cord blood, and bone marrow
- **Multiple fields of view** - increased accuracy with the ability to capture one, four, or eight images per sample
- **Built-in predefined assays** - quickly analyze viability, apoptosis, and transfection efficiency
- **Built-in cell types** - includes saved parameters for over 400 cell types
- **Small sample volume** - only 10 μ l of cell sample required
- **Customizable reports** - includes predefined reports with the ability to create new ones with graphs, images, charts, and tables
- **Multi-language support** - over 7,000 languages available
- **21 CFR Part 11 ready** - optional add-on that includes an audit trail, user access control, and digital signature

"We love our Cellometer K2 and every lab should have one! Gone are the days of manual cell counting and we can now reliably and quickly count thousands of cells in a few seconds."

- Nav Masani, AstraZeneca



Results Display

- Example Assays**
- Accurate PBMC counts in the presence of red blood cells
 - Viability of WBC in whole blood
 - Total nucleated cell count and viability
 - Analysis of primary hepatocytes
 - Apoptosis analysis
 - GFP/RFP detection

Indicates the number of images captured

Select which channels to view

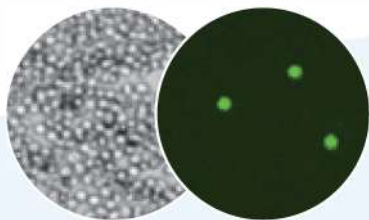
Count	Concentration (cells/mL) at Dilution Factor: 2	Mean Size (µm)	Viability (%)
live: 1078	5.370×10^6	16.7	81.5
Dead: 668	2.310×10^6	14.0	
Total: 1696	5.880×10^6	16.0	

Auto export results for additional analysis

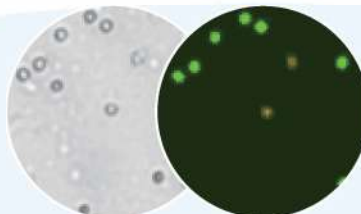
Quickly view results on screen

Accuracy from Cell Lines to Primary Samples

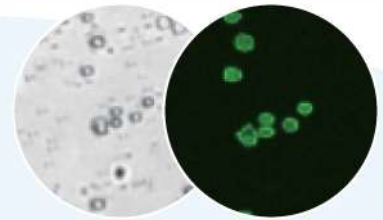
The Cellometer K2 can be customized to handle a variety of cell types, including primary cells, tumor digest, insect cells, cell lines, fragile cells, and more at low or high concentrations.



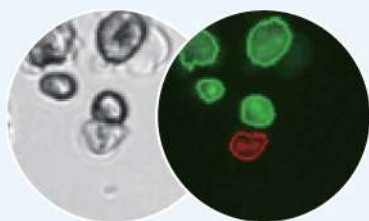
CORD BLOOD



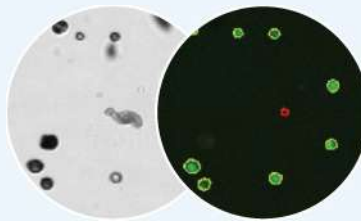
MOUSE SPLENOCYTES



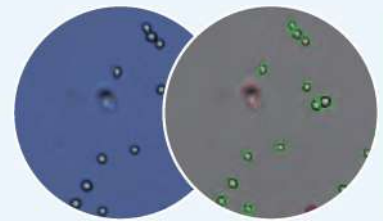
PBMCs



HEPATOCYTES



MELANOCYTES



SF9 CELLS

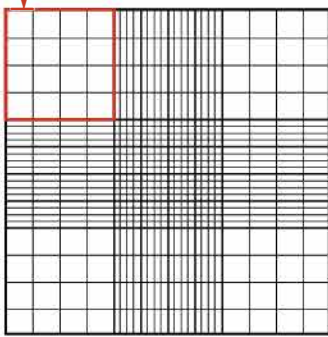
Predefined Assays and Cell Types

Take the guesswork out of setting up your cell quantification experiments. The Cellometer K2 comes with frequently used assays and cell types with predefined settings to ensure consistent results from sample to sample. Easily build custom assays and cell types to fit your experimental needs.

Not sure what settings to use? Our customer success team and field application specialists are here to help you develop fit-for-purpose assays and protocols for your specific research and development requirements.



One quadrant



Capture Multiple Fields of View

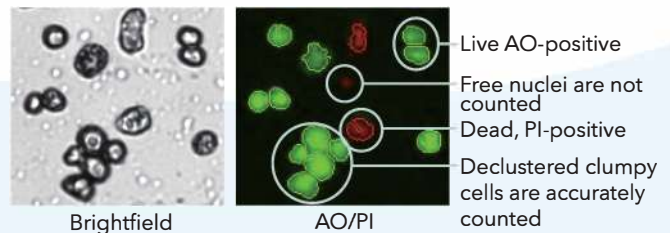
Capture one, four, or eight images per sample. The instrument default is set to four images, which is the equivalent of six quadrants on a hemocytometer. Eight images are equivalent to twelve quadrants on a hemocytometer. The ability to capture multiple images improves the cell counting dynamic range and accuracy of results.

"This unit works fast to get accurate and precise numbers. It takes a fraction of the time trypan blue or other manual methods for cell counting. It allows for greater throughput of samples and simplifies our workload. It is simple to use and miles ahead of any of the competitors."

- Matthew Wilgo, New England Cord Blood Bank

Dual-fluorescent Staining for Clumpy Cells

The fluorescent image (far right) shows bright green AO-positive hepatocytes declustered by the Cellometer K2 algorithm. Red circled hepatocytes are PI-positive (dead) while free nuclei are not counted.



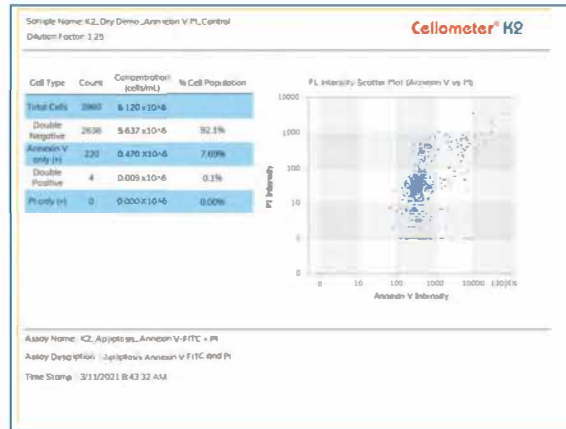
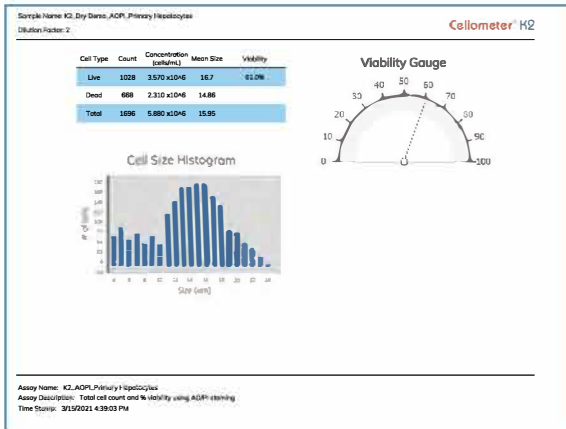
Brightfield

AO/PI

- Live AO-positive
- Free nuclei are not counted
- Dead, PI-positive
- Declustered clumpy cells are accurately counted

Predefined and Customizable Reports

Use default or customized reports based on the data and images you want to be included for your specific experimental needs. Automatically export images and data reports including CSV, Excel, Word, or PDF files. Perform statistical analysis for a wide range of parameters such as average, variance, min/max, and standard deviation of cell size.



21 CFR Part 11 Ready

An optional module can be purchased to meet requirements for 21 CFR Part 11 ready software. The additional module comes with the following features:

- User login with passwords
- User assigned permissions
- Audit trail
- Error log files
- Electronic signatures



Consumables that Work for You

We offer two different disposable counting slides, one with protective coverings on both sides and a ready-to-use option packed in microscope slide boxes. Several key advantages include:



- No clogging
- Time savings – no washing
- No risk of cross-contamination
- Reduce biohazard risk to users

Performance of the Cellometer K2

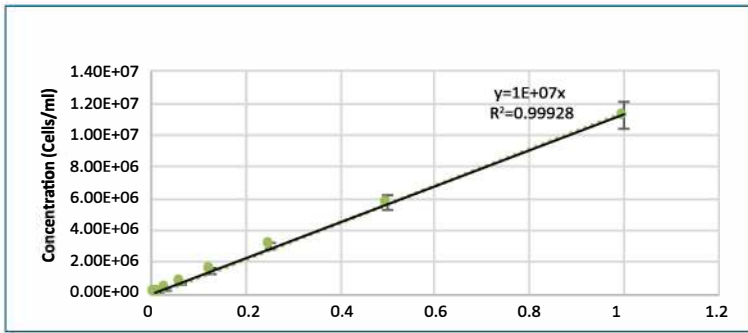
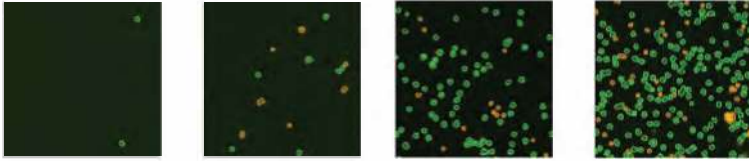


Table of results for cell concentration dynamic range

Concentration Dynamic Range

The dynamic range for cell concentration measurements on Cellometer K2. This data set was taken on a concentration series of a cultured Jurkat cell line.

Samples from 1×10^5 - 1×10^7 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 K2 using dual-fluorescence AO/PI stain.

Sample	N Value	Average Live Cell Concentration	% Viability	CV of Concentration	CV of Viability
Jurkat	24	3.61E+06	92.2%	8.9%	1.0%
Human PBMC	10	5.94E+06	96.0%	4.7%	0.5%
Mouse Splenocyte	10	1.86E+07	88.6%	5.6%	0.7%

Table of results for cell concentration and viability using AO/PI

The results indicate the accuracy of the Cellometer K2 instrument in assessing the viability of Jurkat cells using AO/PI for cell viability. Jurkat, human PBMC, and mouse splenocytes were tested at 24, 10, and 10 sample replications, respectively. The viability average was calculated and plotted. The results show the reliability and accuracy of the Cellometer K2 in measuring cell concentration and viability of mammalian cells.

Low Sample Volume, Complete Counts

10 μ l

Cell samples can be precious. K2 requires only 10 μ l for accurate counts.

Consumable & Reagent for Cellometer

Cellometer Counting Chamber				
Catalog #	Description	Size	Unit	
CHT4-PD100-002	Standard chamber thickness. Packed in microscope slide boxes. Ready to use.	Box of 100 slides for 200 counts	1 Box	
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-PD300-002	3x chamber thickness. Packed in microscope slide boxes. Ready to use.	Box of 100 slides for 200 counts	1 Box	
CHT4-PD300-003	3x chamber thickness. Packed in microscope slide boxes. Ready to use.	Case of 500 slides for 1,000 counts (10 individual boxes)	1 Case	
CHT4-SD100-002	Standard chamber thickness. Packed with protective film on both sides. Remove protective film before use.	Box of 75 slides for 150 counts	1 Box	
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-SD025-002	For cells < 20 microns in diameter. Packed with protective film on both sides. Remove protective film before use.	Box of 75 slides for 150 counts	1 Box	

Cellometer Reagents				
Catalog #	Description	Instrument Compatibility	Size	Unit
CS1-0108-5mL	AO (acridine orange) staining solution for staining of nucleated cells.	Auto2000, K2, X2, Spectrum	5 mL	each
CS1-0109-5mL	PI (propidium iodide) staining solution for staining of dead nucleated cells.	Auto2000, K2, X2, Spectrum	5 mL	each
CS2-0106-5mL	AO/PI (acridine orange / propidium iodide) staining solution for live/dead Mammalian nucleated cells.	Auto2000, K2, X2, Spectrum	5 mL	each
CS1-0119	Cell permeable viability dye. In live cells, non-fluorescent Calcein AM is converted by cellular esterases into green fluorescing cells.	Auto2000, K2, X2, Spectrum	200 uL	each
CSK-0118	The Calcein-AM/PI Cell Vitality and Viability kit enables measurement of the number and concentration of both metabolically active calcein positive and dead PI positive cells	Auto2000, K2, X2, Spectrum		each
CS1-0114-1	Annexin V staining solution for the detection of apoptotic cells	K2, X2, Spectrum	500 uL	each
CS0-0115-100ML	Binding Buffer necessary for the Annexin V staining	K2, X2, Spectrum	100 mL	each
CS1-0116-1	Propidium iodide for the detection of dead and/or necrotic cells	K2, X2, Spectrum	500 uL	each
CSK-0112	ViaStain™ PI Cell Cycle Kit for cell cycle analysis	K2, X2, Spectrum	15 mL	each
CSK-0102-2mL CSK-0102-10mL	AO/PI Yeast Viability Kit containing dilution buffer and fluorescent dye mixture for staining of live and dead Yeast cells.	X2, Spectrum		each
CSK-0125	Yeast Vitality Stain enables breweries to detect metabolically active Lager and Ale yeast at different fermentation stages. PBS included.	X2, Spectrum		each
CSK-V0023-1	ViaStain™ Cell Fitness Panel for Cellometer Spectrum	Spectrum		each
CSK-V0022-1	ViaStain™ Total ROS Green for Cellometer Spectrum	Spectrum		each

See www.nexcelom.com/products for more updated product selections.

Applications for Cellometer K2 Fluorescent Cell Counter



Peripheral Blood Mononuclear Cells (PBMC)

Measure live cell concentration and viability without lysing red blood cells for consistent results from patient samples.



Measure GFP Transfection

Rapidly identify fluorescence-positive cells from a sample, calculate cell concentration, size, and determine the GFP transfection percentage automatically.



WBCs in Whole Blood

Measure nucleated cell concentration without lysing red blood cells using nuclear staining dyes (AO), for human and mouse blood.



Immunology Research

Quantify cell viability and concentration for a variety of immunologically relevant samples such as: bone marrow, cord blood, splenocytes, lymphocytes, isolated mononuclear cells, tumor digests, murine samples, and others.



Insect Cells

Measure live cell concentration and viability for baculovirus infected insect cells.



NCI-60 Cancer Cell Lines

Measure live cell concentration and viability of cancer cell lines used in oncology research and biology research.



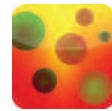
Single Cell Sequencing

Scientists in single cell genomics choose the Cellometer K2 because accurate cell counts are critical in sample preparation. Viability and clumps also need to be assessed to minimize double rate.



Adoptive Cell Transfer Therapy

Perform cell based assays and measure cell size, viability, and concentration of cell lines and primary samples used in adoptive cell therapy research.



Apoptosis and Necrosis

Detect and analyze apoptotic and necrotic cells with Annexin V and PI.



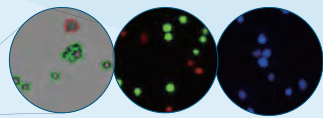
Primary Hepatocytes

Measure live hepatocyte concentration and viability from fresh and cryo preserved samples using dual-fluorescent nuclear stains for human, rat, mouse, and horse.

Need higher-throughput?

Cellaca[®]MX

High-throughput Automated Cell Counter



Count 24 samples in less than 3 minutes

Learn more: www.nexcelom.com/cellaca

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1001528 Rev A 03/21

CHAYON
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Spectrum Image Cytometer

일회용 슬라이드를 이용하여 빠르고 간편하게 Flow-like data를 얻을 수 있는 이미지 분석 장비

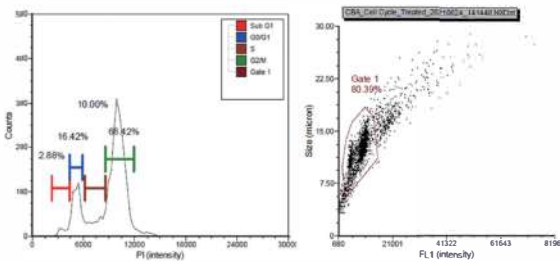


FEATURES

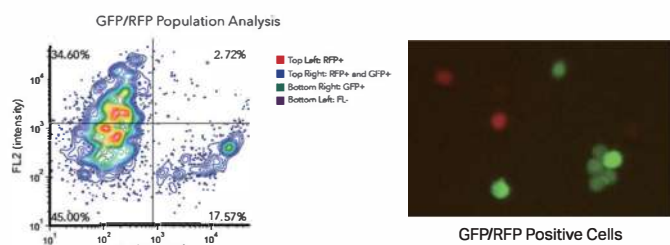
- Cell counting, cell viability, cell-based assay까지 한 번에 가능한 all-in-one 시스템
- 분석 소프트웨어를 통해 dot blot, histogram과 같은 flow cytometry와 유사한 결과 도출
- 원하는 dye에 맞춰 다양한 optics 선택 가능 (최대 6개)
- IQOQ, GMP/GLP 가능

APPLICATIONS

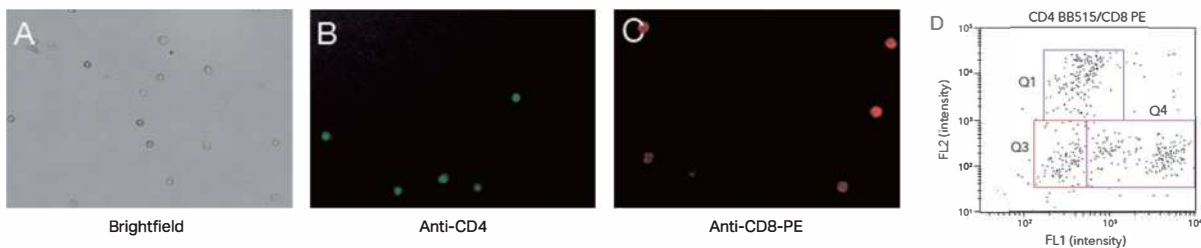
• Cell Cycle



• GFP/RFP Population Analysis



• Surface marker Analysis



Which Instrument is Right for Me?						
Features/Specifications	Single-sample Fluorescent Cell Counters			High-throughput Cell Counter	High-throughput Image Cytometers	
	Auto 2000	K2	Spectrum	Cellaca MX FL2	Celigo 4 Channel	Celigo 5 Channel
Channels	Brightfield, Green, Red	Brightfield, Green, Red	Brightfield + Fluorescence (modular)	Brightfield, Green, Red	Brightfield, Blue, Green, Red	Brightfield, Blue, Green, Red, Far-Red
Number of Channels	3	3	3	3	4	5
Optics	4x objective	4x objective	5x or 10x objective	1.27 um/pixel resolution	1um/pixel resolution	1um/pixel resolution
Fluorescence upgradeable	No	No	No	Yes	Yes	N/A
Excitation LED	470, 540 nm	470, 540 nm	475, 525, 525, 628, 370, 475 nm*	470, 527 nm	377, 483, 531 nm	377, 483, 531, 628 nm
Emission Filters	535, 605 nm	535, 660 nm	534, 605, 655, 692, 452, 594 nm*	534, 655 nm	470, 536, 629 nm	470, 536, 629, 688 nm
IQ/OQ Option	Yes	Yes	Yes	Yes	Yes	Yes
GLP/GMP Audit Control Option	No	Yes	Yes	No	No	No
Auto-export to Excel	No	Yes	Yes	Yes	Yes	Yes
FCS Express Software for flow-like data reporting for cell-based assays	No	Yes	Yes	No	Yes	Yes
Commonly used Compatible Dyes	Trypan Blue, AO/PI, Calcein AM, CMFDA, AO, PI	Trypan Blue, AO/PI, 7AAD, AO, PI, Calcein AM, CMFDA, Calcein AM/PI	Trypan Blue, AO, AO/PI, CMFDA, CFSE, Calcein AM, AO/EB, GFP, FITC, PI, EB, PE (R-phycoerythrin), 7-AAD	Trypan Blue, AO/PI	FITC, Calcein, Calcein AM, Calcein AM Violet, GFP, AlexaFluor 488, R-PE, PI, Texas Red, AlexaFluor 568	Hoechst, DAPI, FITC, Calcein, Calcein AM, Calcein AM Violet, GFP, AlexaFluor 488, R-PE, PI, Texas Red, AlexaFluor 568, DRAQ5, AlexaFluor 647
Counting Speed	30 seconds	< 60 seconds	30 seconds/sample	2.5 minutes for 24 fluorescent samples	< 2 minutes per 384-well plates	< 2 minutes per 384-well plates
Sample Volume (per well)	20 µL sample volume	20 µL sample volume	20 µL sample volume	25 µL - 100 µL	80 µl - 200 µl	80 µl - 200 µl
Total Volume (per well)	N/A	N/A	N/A	50 µL - 200 µL	Depends on plate type	Depends on plate type
Size/Diameter Range	5 - 300* µm	5 - 300* µm	5-300* µm (5x) 0.5-25µm (10x)	5 - 80 µm	6- to 1536-well plates, T-25 and T-75 flasks	6- to 1536-well plates, T-25 and T-75 flasks
Concentration Range	10 ⁵ - 10 ⁷ cells/ml	10 ⁵ - 10 ⁷ cells/ml	5x - 10 ⁵ - 10 ⁷ cells/mL 10x - up to 2x10 ⁷ cells/mL	10 ⁵ - 10 ⁷ cells/mL	Depends on plate type	Depends on plate type
Integrated Touchscreen	Yes	No	No	No	No	No
Focus	Manual	Manual	Manual	Automated or Manual	Automated or Manual	Automated or Manual
Computer included	No	Laptop Optional	Laptop Included	Laptop Included	Desktop Included	Desktop Included
Robotic Compatible	No	No	No	Yes	Yes	Yes
Dimensions	11.1 in x 12.8 in x 13.4 in (28.3cm x 32.4 cm x 34.0 cm)	6 in x 8.5 in x 14 in (15.2 cm x 21.6 cm x 35.6 cm)	6 in x 8.5 in x 14 in (15.2 cm x 21.6 cm x 35.6 cm)	13 in x 13 in x 16 in (33 cm x 33 cm x 41 cm)	20 in x 25 in x 20 in	21 in x 25 in x 20 in
Weight	26 lbs. (11.8 kg)	23 lbs. (10.4 kg)	24 lbs. (10.9 kg)	42 lbs (19 kg)	117 lbs. (53 kg)	117 lbs. (53 kg)
Cell / Sample Type						
Cell Line	X	X	X	X	X	X
Cultured Primary Cells	X	X	X	X	X	X
Low Concentration Cell Lines	X	X	X	X	X	X
Yeast			X			
Primary Cells	X	X	X	X	X	X
PBMCs, Splenocytes, Stem Cells	X	X	X	X	X	X
Hepatocytes		X	X	X	X	X
Adipocytes**	X	X	X		X	X
Apoptosis		X	X	X	X	X
Autophagy (Cytold-green)			X			
Cell Proliferation (CFSE)			X		X	X
Cell Cycle (PI)		X	X		X	X
GFP Transfection	X	X	X	X	X	X
RFP Transfection			X	X	X	X
Mitochondrial Potential (JC-1, JC-10)			X		X	X
Multi-drug Resistance (ABC Transporter)			X		X	X
Surface Marker Analysis			X		X	X
Vitality (Calcein-AM/PI)		X	X	X	X	X

*The Spectrum holds two user-changeable fluorescence optics modules at a time
**Cytometer CHT4-PD300 slides are required for cells greater than 80µm in diameter

Innovation and Expertise in the Science of Cell Counting

Schedule a FREE demonstration or technical seminar with a Nexcelom Applications Specialist today. Learn more nexcelom.com/spectrum



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