СЧЕТЧИК КЛЕТОК SCEPTER 3.0

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Россия +7(495)268-04-70
Казахстан +7(7172)727-132
Киргизия +996(312)96-26-47

https://millipore.nt-rt.ru || mailto:mer@nt-rt.ru

Scepter™ 3.0 Cell Counter

Smarter, handheld cell counting

The Scepter™ 3.0 cell counter is your portable device option for fast, accurate cell counting. While other automated counters consume bench space and rely on object recognition software, manual focusing, and clumsy loading chambers, the Scepter™ cell counter provides true automation without the error that accompanies vision-based systems. With its microfabricated, precision-engineered sensor, the Scepter™ cell counter does all the work and delivers accurate and reliable cell counts in seconds.

The Scepter™ 3.0 cell counter demonstrates the latest enhancements in handheld cell counting technology, highlighted by:

Compatibility with More Cell Types

The Scepter™ cell counter is the only one on the market to accurately count particles as small as 4 µm in diameter.

Smart, Automated Data Transfer

Transfer results wirelessly, or via USB for reliable recording and archiving.

Powerful Instrument Software

- Gate and capture up to 999 cell size or volume histograms
- Create and save gating settings
- Easily export data for in-depth analysis

The power of precision

Trust Scepter™ devices with your most valuable samples to get reproducible and reliable counts. The reliability of Scepter™ cell counters is particularly apparent with smaller cell types. Because the Scepter™ cell counter measures volume using the Coulter principle, it can quantify cells based on size and will discriminate larger cells from smaller debris—unlike vision-based techniques, which rely on object recognition software and cannot reliably detect small cells.

Scepter™ sensor technology

Compatible with 60 µm and 40 µm sensors, the Scepter™ 3.0 cell counter can meet even more of your cell- and particle-counting needs. Use the 60 µm sensor for particles between 6 and 36 µm in diameter. Use the 40 µm sensor for particles between 4 and 18 µm.

- Precise volumes are drawn into the Scepter™ sensor.
- As cells flow through the aperture in the sensor, resistance increases. This increase in resistance causes a subsequent increase in voltage.
- Voltage changes are recorded as spikes with each passing cell.
- Spikes of the same size are bucketed into a histogram and counted. This histogram gives you quantitative data on cell size or volume that can be used to evaluate the quality and health of your cell culture.

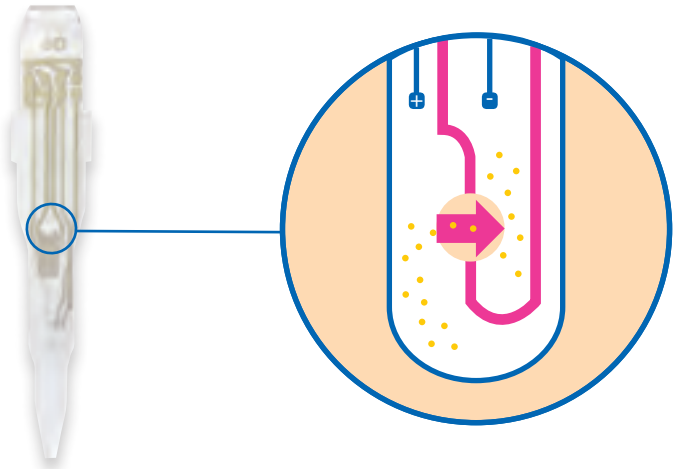
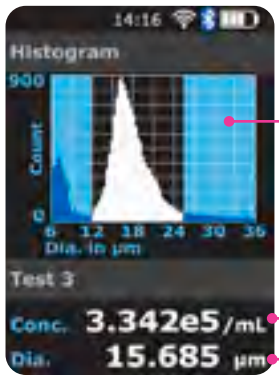


Figure 1.

As cells flow through the aperture in the Scepter™ sensor, resistance increases. By Ohm's Law (V=IR, where V=voltage, I=current, and R=resistance), voltage also increases, and is recorded by the instrument.

Scepter™ cell counters deliver precision

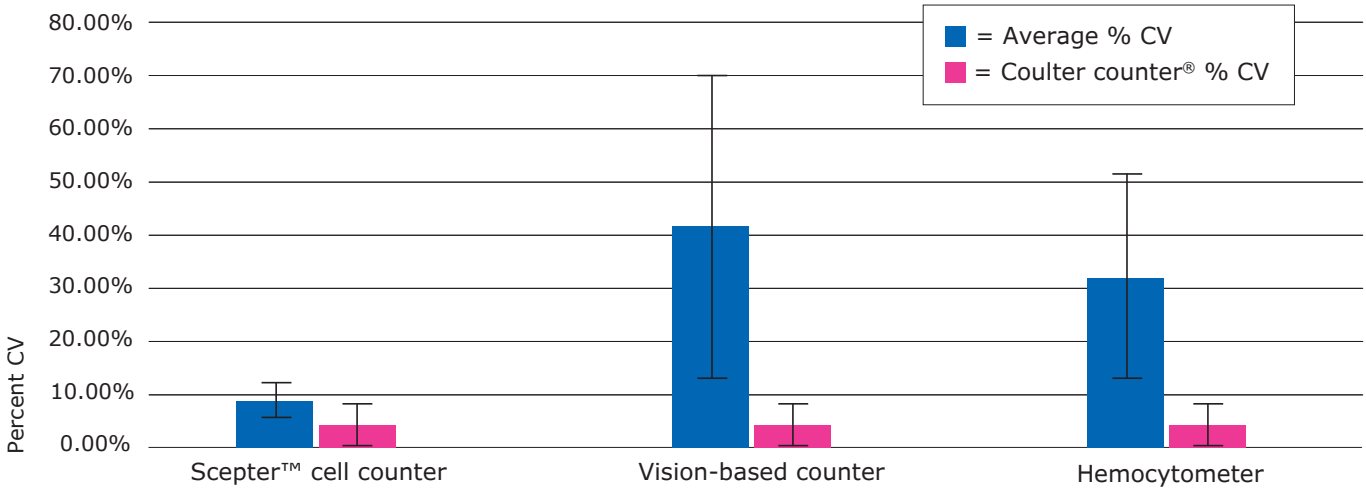
There is no need to rely on subjectively-determined cell counts, as required by vision-based counting methods. The Scepter™ cell counter uses the Coulter impedance principle to detect every cell and displays the population as a histogram of cell size or volume distributions. From the histogram, count every cell, or use the gating function to count a chosen subpopulation. By monitoring changes in the histogram, you can gain insight into the health and status of your cell culture from one experiment to the next.



Histogram displayed as function of cell diameter or cell volume

Cell concentration (cells/mL)

Average cell diameter (µm)



	Format	Counting methods	Sample volume needed	Sample volume counted	Cells counted in a 100,000 cell/mL sample	Average % CV
Hemocytometer	Slide and microscope	Manual, vision-based	10 µL	0.1 µL /square	10/square	41.8
Brand L	Benchtop	Automated vision-based system	10 µL	0.4 µL	40	32.1
Scepter™ Cell Counter	Handheld	Impedance-based cell detection	100 µL	50 µL	5000	9.1

Figure 2.

The average percent coefficient of variation (CV) for each counting method shown was calculated from cell concentration measurements at 50,000 cells/mL samples of 19 different cell lines. The Scepter™ cell counter is more precise than vision-based counting and hemocytometry, and approaches the precision of the Coulter Counter® standard (magenta bars). Error bars represent standard deviation.

Precise counts, faster and easier.

Prepare the sample:

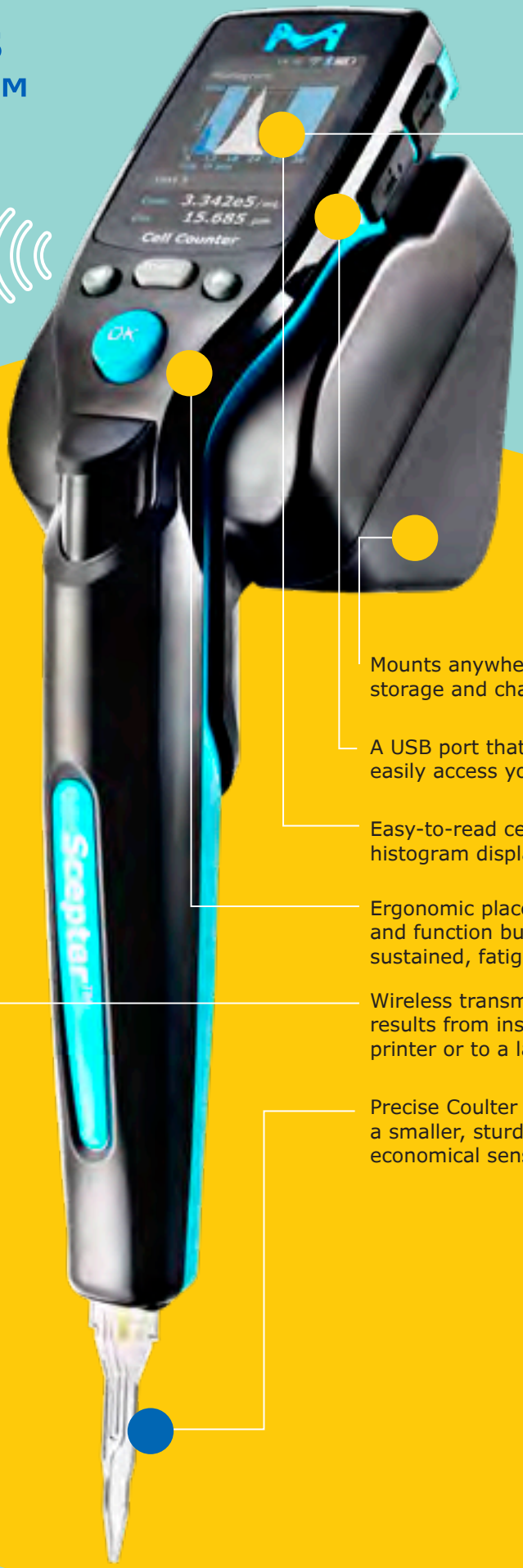
Start with a single-cell suspension, diluted to a total volume of 100 µL (the minimum volume required for an accurate count) in phosphate buffered saline (such as EmbryoMax® 1x DPBS) to 10,000-500,000 cells/mL (operating range for 60 µm sensor) in a 1.5 mL microcentrifuge tube.

Perform cell count:

- Turn on the Scepter™ 3.0 cytometer by pressing the menu button on the face of the instrument, and wait for on-screen instructions to appear.
- When prompted, attach a sensor to the end of the Scepter™ unit with the electrode sensing panel facing toward the front of the instrument, and you'll see detailed instructions for each step of the counting process.
- When the display prompts you, press OK to begin drawing up sample. 50 µL of your cell suspension is drawn into the microfabricated, precision-engineered channel embedded in the sensor. The cell sensing zone detects each cell drawn through the sensor, and cell concentration is subsequently calculated.
- The sensing zone also measures cell sizes and cell volumes with sub-micron and sub-picoliter resolution, enabling the Scepter™ cytometer to display a histogram distribution of cell size or cell volume.

What makes the Scepter™ cell counter different?

The unparalleled accuracy of Coulter impedance counting in a handheld device



Thousands of cells per sample are counted in seconds, returning histogram data binned by cell size or volume

Technical support direct from Millipore® scientists, who developed the instrument

Mounts anywhere for storage and charging

A USB port that lets you easily access your data

Easy-to-read cell count histogram display

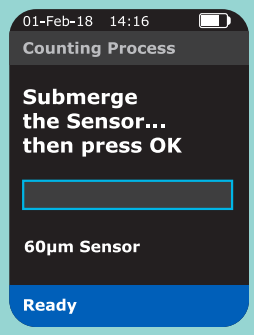
Ergonomic placement of power and function buttons for sustained, fatigue-free use

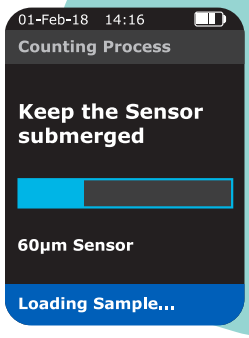
Wireless transmission of results from instrument to printer or to a lab workstation

Precise Coulter technology in a smaller, sturdier, more economical sensor

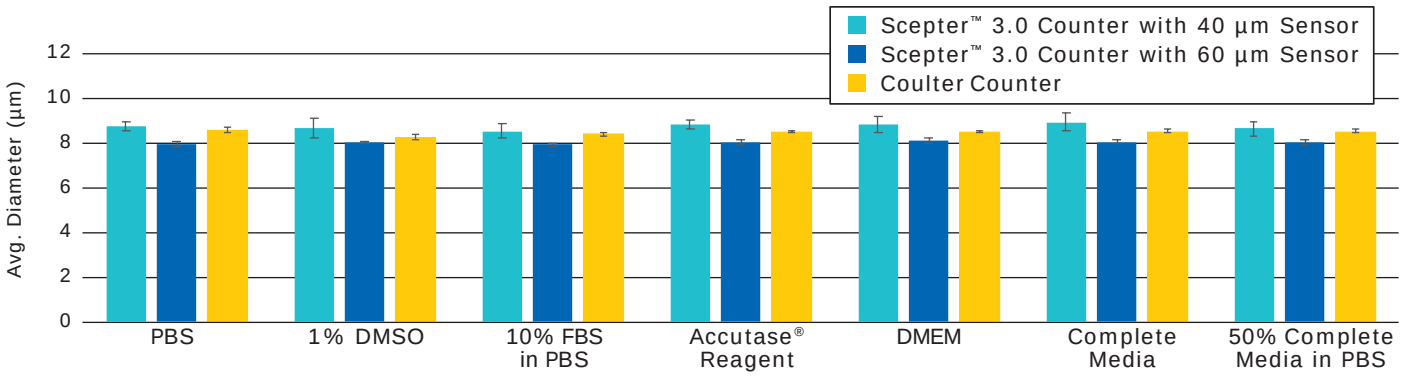
With the Scepter™ 3.0 instrument,

Count on this:



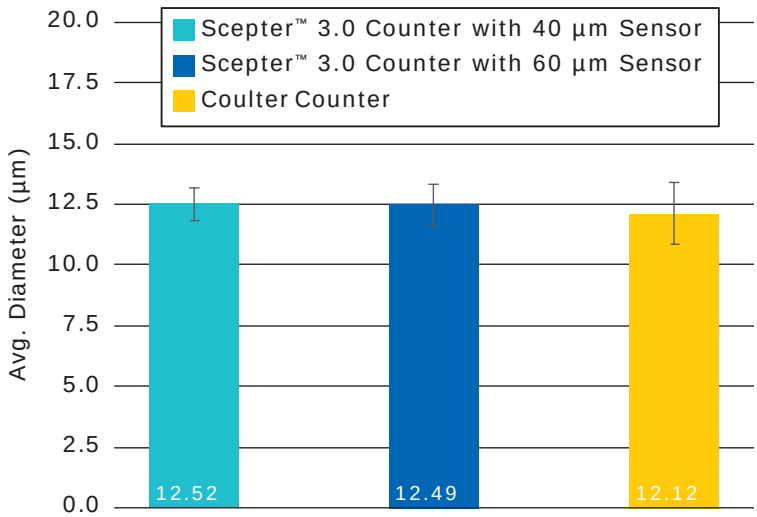


Consistent data from diverse samples

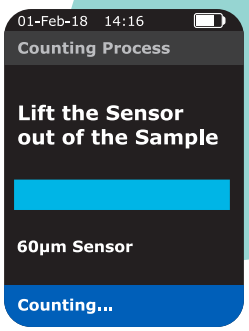


Polystyrene beads of known diameter (8 µm) suspended in various cell culture buffers and reagents were measured using the Scepter™ 3.0 Cell Counter with both 40 µm and 60 µm sensors. Results are compared to the same counts obtained with a Coulter Counter Z2™ Instrument equipped with 100 µm aperture. Data are from three measurements per sample.

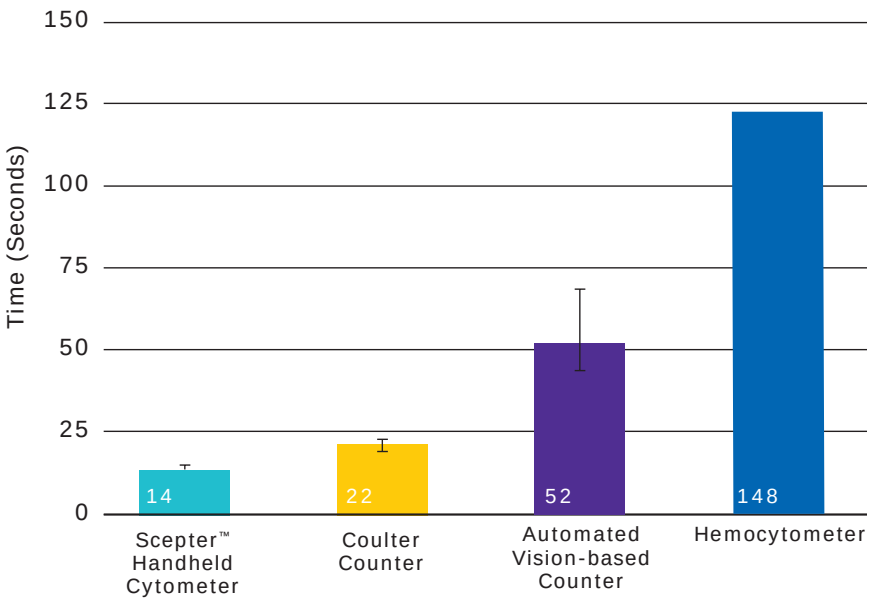
Precision cell measurements



Jurkat cells were measured to test accuracy and reproducibility of cell size measurements using the Scepter™ 3.0 Cell Counter with both 40 µm and 60 µm sensors. Results are compared to the same measurement obtained with a Coulter Counter Z2™ Instrument equipped with 100 µm aperture. Data are from five measurements per sample.

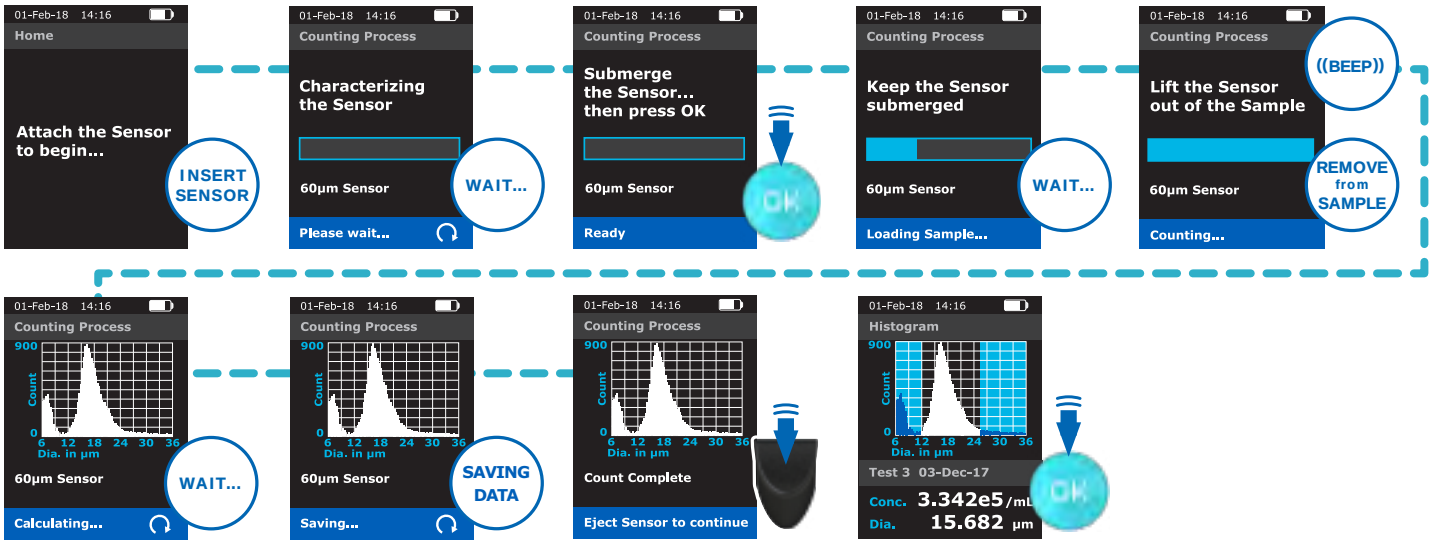


Rapid counts



The time required to perform cell counts using various methods was compared using a sample concentration of 500,000 cells/mL. Scepter™ counting (14 seconds on average, using the 60 µm sensor) is significantly faster than other counting methods. Using the 40 µm sensor, Scepter™ counts are complete within 25 seconds, on average (data not shown).

Sample and Count



Export your Scepter™ count data wirelessly or by USB transfer, and you can:

- Compare several samples and data sets side by side using virtually any spreadsheet program
- Create graphical representations and meaningful reports with your data

With a portable instant printer, you can:

- Create a printout of the count display to be added to lab notebook or other archival record

Ordering Information

Description	Quantity	Cat. No.
Scepter™ 3.0 Handheld Automated Cell Counter		
Kit with 40 µm Scepter™ 3.0 Sensors (50 Pack)	1	**PHCC340KIT**
Kit with 60 µm Scepter™ 3.0 Sensors (50 Pack)	1	**PHCC360KIT**
Each Kit Includes:		
Scepter™ 3.0 Handheld Automated Cell Counter		
Scepter™ 3.0 Cell Counter Sensors (50 Pack)		
Scepter™ 3.0 Charger Station		
Scepter™ 3.0 Test Bead Vial		
Cell Counter Sensors & Accessories		
Scepter™ 3.0 Cell Counter Sensors, 60 µm	50/pk	**PHCC360050**
Scepter™ 3.0 Cell Counter Sensors, 60 µm	250 (5 x 50/pk)	**PHCC360250**
Scepter™ 3.0 Cell Counter Sensors, 40 µm	50/pk	**PHCC340050**
Scepter™ 3.0 Cell Counter Sensors, 40 µm	250 (5 x 50/pk)	**PHCC340250**
Scepter™ 3.0 Charger Station	1 ea	**PHCC3CHARG**
Scepter™ 3.0 Charger Mounting Kit	1 ea	**PHCC3WKIT**
Scepter™ 3.0 Test Bead Vial	1 ea	**PHCC3BEADS**

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