СЧЕТЧИК КЛЕТОК
SCEPTER 2.0

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Scepter™ 2.0 –
Precise, handheld cell counting

Scepter™ 2.0 is your portable cell counter. 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 less than 30 seconds.

Scepter™ 2.0 marks the next generation in Scepter™ 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 3 µm in diameter

Increased Cell Concentration Range
The new 40 µm sensor can count samples with concentrations as high as 1,500,000 cells/mL

Powerful Software for Complex, Effortless Cell Analysis

- Compare sample sets side by side using histogram overlay and multiparametric data table
- Create and save gating templates
- Generate reports, graphs and tables

The power of precision

Trust Scepter™ counting with your most valuable samples to get reproducible and reliable counts. The reliability of Scepter™ counting 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™ 2.0 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. Use the 40 µm sensor for particles between 3 and 17 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 morphology that can be used to examine the quality and health of your cell culture.
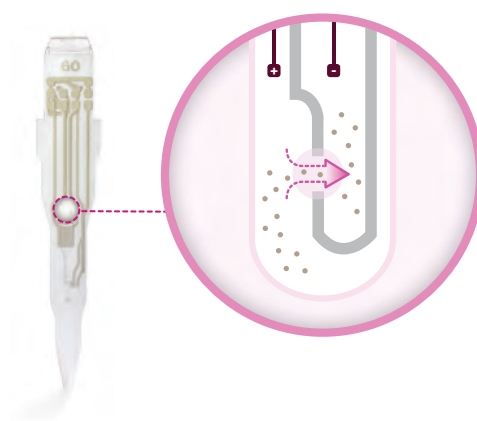

Figure 1.
Particles are detected by Ohm's Law V=IR (V=voltage, I=current, and R=resistance)

Cell Type	Measured size (µm)	40 µm sensor	60 µm sensor
2102 Ep	15-19		EMD
454 beads			Cust
A172	15		EMD
A253	14-18		EMD
A375	16		EMD
A431	15-17		EMD
A549			EMD
Algae (various)	7-9	EMD	EMD
B35	13-16	EMD	EMD
B Cells	6-11	EMD	
C2C12	12	EMD	
C305	12-14	EMD	
C6	12-13		EMD
CA46	10-12	EMD	
Caco-2	17		EMD
CHO	14-17		EMD
COS-1	12	EMD	EMD
Cos-7	15		EMD
D283	12	EMD	
Daudi	10-12	EMD	EMD
DU-145	15-17		EMD
Epithelia	14-15		EMD
HCT-116	10	EMD	EMD
HEK293	11-15		EMD
HeLa	12-14		EMD
HepG2	12		EMD
HFF	18-20		EMD
Hs27	14	EMD	EMD
HT-1080	14-16		EMD
HT-29	11		EMD
HUH7-Hepatoma line			Cust
Human ES Cells	9-12	EMD	
HUVEC	14-15		EMD
IMR-32	12-14	EMD	EMD
IMR-90	15	EMD	EMD
Jurkat	13		EMD
K562	22		EMD
KB	14		EMD
KG-1	10-13	EMD	
L6	14-16		EMD
LNCaP	15-16		EMD
Luminex® beads	5-6	EMD	
MCF7	15-17		EMD
MDCK	13-15		Cust

Cell Type	Measured size (µm)	40 µm sensor	60 µm sensor
Meg-01	16-17		EMD
MG-63	15-17		EMD
Mouse ES Cell	5-13	EMD	EMD
Mesenchymal Stem Cell	15-16		EMD
MRC-5			EMD
NCI-H146	10-13	EMD	EMD
NIH 3T3	15	EMD	EMD
NTERA2, clone D1	13	EMD	EMD
OK	17-18		EMD
PBMCs	7-12	EMD	
PC12	9-13		EMD
Primary Astrocytes	7	Rec	
Primary Neuronal Cell		Rec	
Raji	12-15	EMD	EMD
Ramos	11-12	EMD	EMD
Rat Dorsal Root Ganglion Cells	7	EMD	
Rat Whole Blood	4.6	EMD	
Red Blood Cells	5-7	EMD	
Rat Neural Stem Cell	11-13		EMD
RAW 264.7	12-15		EMD
RBL	11-13	EMD	EMD
RIN-mF5	13-14		EMD
SF9	13		EMD
SH-SY5Y	12		EMD
Sk-Br-3	15-20		EMD
SK-MEL-28	17-19		EMD
SK-N-MC	14-15		EMD
SK-N-SH	14-15		EMD
Splenocytes	7-9	Cust	
SW-480	15		EMD
SW-620	13-14	EMD	EMD
T84	14-18		EMD
T98G	17		EMD
TF-1	13-14	EMD	EMD
U251	16-20		EMD
U2OS	16-19		EMD
U266	12		EMD
U87-Human Glioblastoma cell line	12-14		Cust
U937	11-13	EMD	EMD
WI-38	12-15		EMD
Y79	13-14		EMD
Yeast- *Pichia Pastoris*	5	EMD	
Yeast- *S.cerevisiae*	6	EMD	

Table 1.
Cell types validated with the Scepter™ cell counter and the recommended Scepter™ sensor.

■ Recommended based on size   ■ EMD Millipore Validated   ■ Customer Validated

Scepter™ counting delivers precision

There is no need to subjectively determine cell counts, as required by vision-based counting methods. The Scepter™ cell counter detects every cell and displays the population as a histogram of cell size distributions. From the histogram, count all the cells or use the gating function to count a chosen subpopulation. By monitoring changes in your histogram, you can gain insight into the health and quality of your cell culture from one experiment to the next.
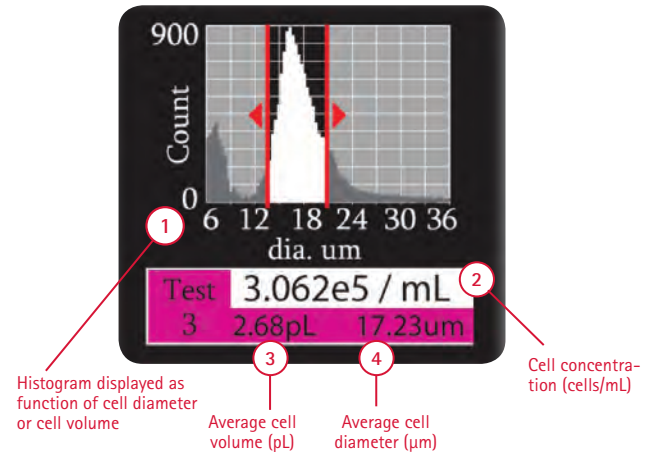

① Histogram displayed as function of cell diameter or cell volume

② Cell concentration (cells/mL)

③ Average cell volume (pL)

④ Average cell diameter (µm)

Figure 2. The average percent coefficient of variation (CV) for each counting method shown was calculated using 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 (maroon bars). Error bars represent standard deviation.

■ = Average % CV   ■ = Coulter counter® % CV
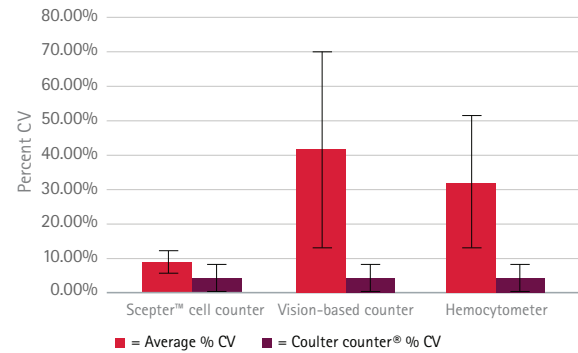
	Format	Counting methods	Sample volume needed	Sample volume counted	Cells counted in a 100,000 cell/mL sample	Average % CV
Hemocytometer	Slide and microscope	Manual, vision-based	10 µL	.1 µL / square	10/square	41.8
Brand L	Benchtop	Automated vision-based system	10 µL	.4 µL	40	32.1
Scepter™ Cell Counter	Handheld	Impedance-based cell detection	100 µL	50 µL	5000	9.1

As easy as pipetting

Prepare the sample:

Start with a single-cell suspension, diluted to a total volume of 100 µL (recommended) 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™ cytometer by pressing the toggle on the back 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.

• Pipette once to draw sample into the sensor. 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 into the sensor and thus cell concentration is 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.

Intuitive analysis software

From simple counts to complex volume measurements used to assess cell health parameters, Scepter™ Software Pro provides an intuitive, intelligent platform to perform high-level cell analysis based on the size measurements captured with the Scepter™ cell counter.

A VIEW OF SCEPTER™ SOFTWAREPR O

DATA: data files from your Scepter™ cell counter

CURRENT PLOT: working plot and data file

GROUP STATS: customizable statistics from your selected data files
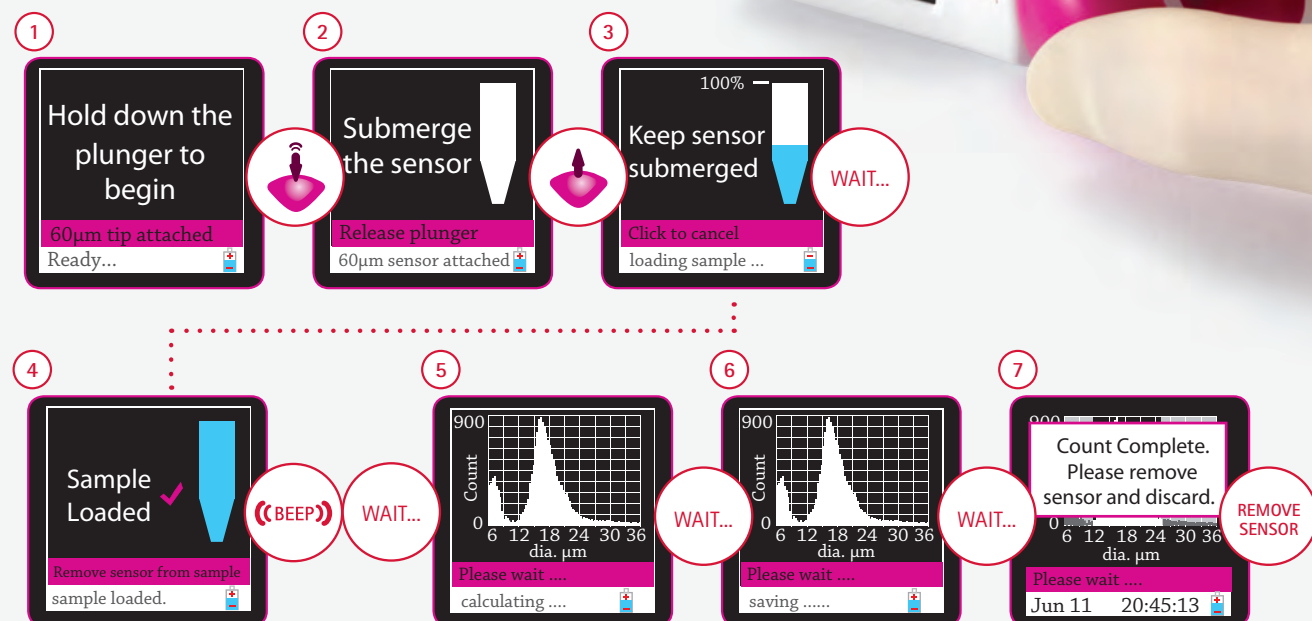
MULTIFUNCTIONAL PLOT: multiple data sets/ histogram overlays

REPORTS: export, print selected graphs/files, cut and paste

ANALYSIS TEMPLATES: saved gating parameters

Using the Scepter™ Software Pro on your computer, you can:

- Compare several samples and data sets side by side using histogram overlay and multipara-metric tables
- Create and save gates to be used from one experiment to the next
- Create attractive graphical presentations and reports with your data

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1 Hold down the plunger to begin
60μm tip attached
Ready...

2 Submerge the sensor
Release plunger
60μm sensor attached

3 Keep sensor submerged
100%
WAIT...
Click to cancel
loading sample ...

4 Sample Loaded ✔
BEEP
WAIT...
Remove sensor from sample
sample loaded.

5 900 Count 0
6 12 18 24 30 36 dia. μm
WAIT...
Please wait ....
calculating ....

6 900 Count 0
6 12 18 24 30 36 dia. μm
WAIT...
Please wait ....
saving ......

7 Count Complete. Please remove sensor and discard.
REMOVE SENSOR
6 12 18 24 30 36 dia. μm
Please wait ....
Jun 11   20:45:13

Ordering Information

Description	Qty	Catalogue No.
Scepter™ 2.0 Handheld Automated Cell Counter		
with 40 µm Scepter™ Sensors (50 Pack)	1	PHCC20040
with 60 µm Scepter™ Sensors (50 Pack)	1	PHCC20060
Includes:		
Scepter™ Cell Counter	1	
Downloadable Scepter™ Software	1	
O-Rings	2	
Scepter™ Test Beads	1	PHCCBEADS
Scepter™ USB Cable	1	PHCCCABLE
Scepter™ Sensors, 60 µm	50	PHCC60050
	500	PHCC60500
Scepter™ Sensors, 40 µm	50	PHCC40050
	500	PHCC40500
Universal Power Adapter	1	PHCCP0WER
Scepter™ O-Ring Kit, includes 2 O-rings and 1 filter cover	1	PHCC0CLIP

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