



FlowCAM®

A Digital Imaging System for Particle or Cell Measurements in Solution

FlowCAM is an integrated system for rapidly analyzing particles in a fluid. Combining the high speed automated capabilities of a particle analyzer with the wealth of information derived from microscopic images, FlowCAM goes beyond simple particle size measurement. By acquiring and storing a digital image of each particle detected, different particle types in a heterogeneous sample can be automatically identified, differentiated and quantified.

A Real-Time Visualization System for Monitoring and Analysis

Originally developed for oceanography to study organisms and solids in seawater, the FlowCAM is now used for industrial applications as well. Chemical, cosmetics, food, beverage, pharmaceutical and petroleum industries are benefitting from the rapid evaluation of particles, cells,

flavorings and other product components. FlowCAM is a new tool which previously required multiple instruments to obtain the desired test measurements.

Features Include

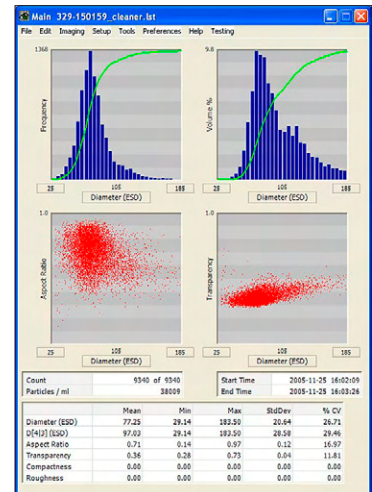
- ◇ High-Speed Digital Imaging (Color or Monochrome)
- ◇ Up to 23 different measurement parameters for each particle
- ◇ Intuitive VisualSpreadsheet® analysis software
- ◇ Wide size range (1µm to 3mm)
- ◇ Automatic pattern recognition and classification
- ◇ Optional fluorescence and scatter triggering/measurement
- ◇ Bench top and portable models available



FlowCAM® Bench Top Model

Integrated VisualSpreadsheet® Analysis Software

FlowCAM acquires high resolution microscopic images at a very rapid rate; typically up to 10,000 images/minute. The intuitive VisualSpreadsheet® analysis software allows the user to sort, filter and classify particle images interactively. What once took hours, days or even weeks with a microscope can now be accomplished in minutes. With orders of magnitude more images being analyzed over traditional methods, the results have a much greater statistical significance. Particle data and summary statistics can be exported to database or spreadsheet applications.



Particle Analysis Made Easy

Particle Characterization

FlowCAM® uses powerful pattern recognition algorithms to identify and quantitate individual particle types in a heterogeneous sample.

Particle Concentration, Size and Shape

As a sample is processed, concentration values are automatically calculated along with the size and shape for each particle.

High-Speed Imaging

All particles or organisms detected by the FlowCAM® are captured and stored in an efficient manner for easy retrieval for analysis and archival purposes.

Speed of Sampling

FlowCAM® can analyze thousands of particles or cells from the captured images in seconds.

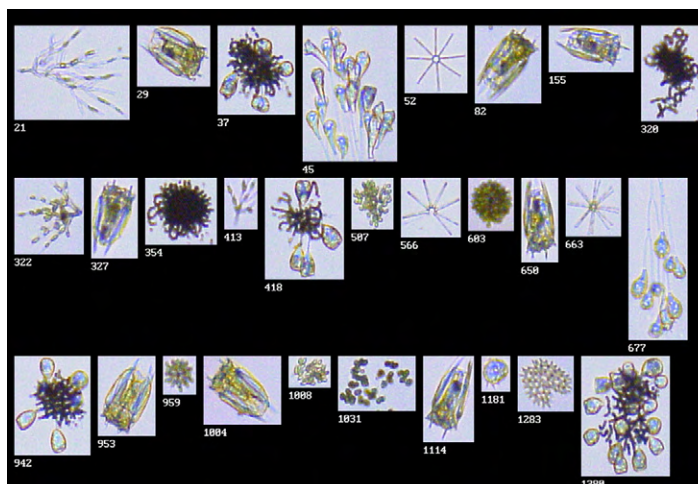
The Combined Benefits of Multiple Instruments

The FlowCAM® is a digital imaging microscope and a flow cytometer. Previously, these functions were only possible utilizing two separate instruments.

Example FlowCAM® Applications



The monochrome particle images above were taken with the FlowCAM BX from a sample of silica gel intended for use as column packing material for chromatography. The sample was being analyzed by Quality Control for particle uniformity. In this application, the particles were expected to be relatively spherical in shape in order to pack the column uniformly. A common particle analysis system showed the particles to have a uniform distribution of Equivalent Spherical Diameter (ESD), but the FlowCAM showed the particles to be non-spherical in shape, indicating that the lot was to be rejected.



The color particle images above were taken with the FlowCAM CX from a pond water sample. The fluorescence triggering method was used to trigger the camera only when living algae passed through the flow cell and 2 channels of fluorescence measurement were collected for each particle. Fluorescence or scatter triggering is very useful when analyzing sparse samples where continuous imaging might not yield the desired results.



Data Like You've Never Seen Before.

FLUID IMAGING
TECHNOLOGIES

The Portable FlowCAM®:
Real-time digital imaging and particle analysis on the go



Our original FlowCAM®, the world's first instrument for continuous analysis and digital imaging of microscopic particles in a fluid stream, is also available in a convenient travel size. The Portable FlowCAM® is mounted in a rugged, water-resistant housing for safe transportation, rapid set-up and ease of use. It can operate on either 120/240 volt or 12 volt battery power! From the laboratory to the field, the Portable FlowCAM® is a virtual lab on wheels.

Ideal for water or industrial process monitoring, the FlowCAM® detects, counts, measures, and provides shape analysis of cells or particles in a fluid stream on a real-time basis.



Real-time visualization system brings the power of a big lab to remote locations or temporary installations

Portable Applications

- On-site Data Needs
- Remote Testing
- Production Line Testing
- Extended Cruises
- Emergency Response Feedback
- Offshore Petroleum Platforms



FlowCAM® Features

- Housed in a lightweight, water resistant and highly durable case
- Two channel fluorescence detection, or simultaneous fluorescence and light scatter detection
- VisualSpreadsheet®— interactive and intuitive particle analysis software (see other side for details)
- Identify and analyze organisms and particles using over 20 different image parameters
- Process and analyze large sample volumes up to 10 ml/min



Summary data displayed in a histogram, including fluorescence and size data. Select specific areas of interest using Interactive Scattergram[®].

Summary data also displayed in a scattergram based upon Aspect Ratio or other image parameters. Quickly isolate particle types by shape using Interactive Scattergram[®].

VisualSpreadsheet - 207.102418.lst

View Particles (page 1 of 1)

	Mean	Median	674	74.96	21.10	293.34
ESD Diameter	59.93	40.89	44.92	74.96	21.10	293.34
ESD D[4,3]	170.37	40.89	119.26	70.00	21.10	293.34
ABD Diameter	36.77	28.84	21.09	57.35	19.97	177.53
ABD D[4,3]	87.88	28.84	55.12	62.86	19.97	177.53
Length	74.93	50.06	59.10	78.87	22.70	392.93
Width	35.87	27.76	22.33	62.26	9.74	179.41
Aspect Ratio	0.56	0.56	0.18	31.81	0.10	0.94
Transparency	0.31	0.31	0.15	47.61	0.04	0.73
Intensity	29.11	25.88	11.00	37.79	14.75	86.11

Summary particle statistics displayed for all particles, or only those selected via the Interactive Histogram[®].

Automatic display of all particle images selected via either the Interactive Scattergram[®] or defined using VisualSpreadsheet[®] filtering.

VisualSpreadsheet[®] enables FlowCAM[®] users to *visually* post-process particle data. Traditional particle analysis systems use cumbersome tabular spreadsheets.

VisualSpreadsheet[®] Turns Data into Knowledge

The proprietary processing system of the FlowCAM[®] captures a digital image of each cell or particle and presents the data in an easy-to-read VisualSpreadsheet[®] or through our patented Interactive Scattergram[®] feature.

Harness the Power of the Most Powerful and Intuitive Particle Analyzer Available

Intuitive, familiar interface – VisualSpreadsheet[®] is as simple as using standard office software. Designed as a responsive companion in your research and analysis function, VisualSpreadsheet[®] seamlessly accesses and documents images, and analyzes data on over 20 different parameters.

Rapid investigation of particle properties – FlowCAM[®] automatically counts, images, and analyzes cells or particles from a discrete sample or continuous flow, providing significantly increased data collection, instantly. FlowCAM[®] eliminates slide preparation and provides a complete picture of your fluid sample in a fraction of the time needed for traditional microscopy.

Separate and quantify different particle types – The Interactive Scattergram[®] can help you refine the results within a region of interest (ROI). The VisualSpreadsheet[®] filtering feature will automatically find all particle images using a sophisticated image recognition algorithm.

Compare multiple data sets – Our unique viewing windows allow you to see multiple filtered ROIs, which are helpful for visual comparisons, and also organizes and manages the data sets.

Build Image Libraries – Create libraries of desired images for later use to identify like particles/species in other samples.



Data Like You've Never Seen Before.

FLUID IMAGING
 TECHNOLOGIES