

YOKOGAWA 



## FlowCam<sup>®</sup> Cyano

FLOW IMAGING MICROSCOPY

Automate detection of cyanobacteria and other algae

## Particle Analysis with Vision®

A high-throughput, semi-automated alternative to manual microscopy, FlowCam Cyano automatically differentiates between fluorescence-emitting Cyanobacteria and other algae while enabling the early detection of harmful algal blooms.

FlowCam Cyano provides an innovative solution for freshwater research and monitoring of drinking water reservoirs and recreational water bodies.

- Identify and enumerate Cyanobacteria in aquatic environments using high-sensitivity fluorescence detection
- Save time and money on drinking water testing and treatment with same-day results
- Eliminate customer taste-and-odor complaints
- Calculate count, concentration, and biovolume for microalgae colonial units
- Classify organisms by creating your own libraries in VisualSpreadsheet software



### **OBTAIN RESULTS QUICKLY**

Obtain statistically significant results in less than a minute. With advanced hardware and processing capabilities, FlowCam is streamlined for rapid data acquisition and analysis.

### **PREDICT HARMFUL ALGAL BLOOMS**

Identify harmful Cyanobacteria or nuisance and filter-clogging algae before a bloom occurs.

### **SORT, FILTER, QUANTIFY**

Acquire data and classify images based on 40+ morphological parameters with the powerful, yet flexible VisualSpreadsheet® software.

### **AUTOMATICALLY CLASSIFY WITH FLUORESCENCE**

Utilize Trigger mode with two fluorescence channels (chlorophyll and phycocyanin) to differentiate Cyanobacteria from other algae.

### **BE FLEXIBLE**

Use FlowCam in both research and routine operations and work with a wide range of sample types and concentrations. ALH for FlowCam™ enables unattended operations for up to 384 samples.

### **ELIMINATE CUSTOMER COMPLAINTS**

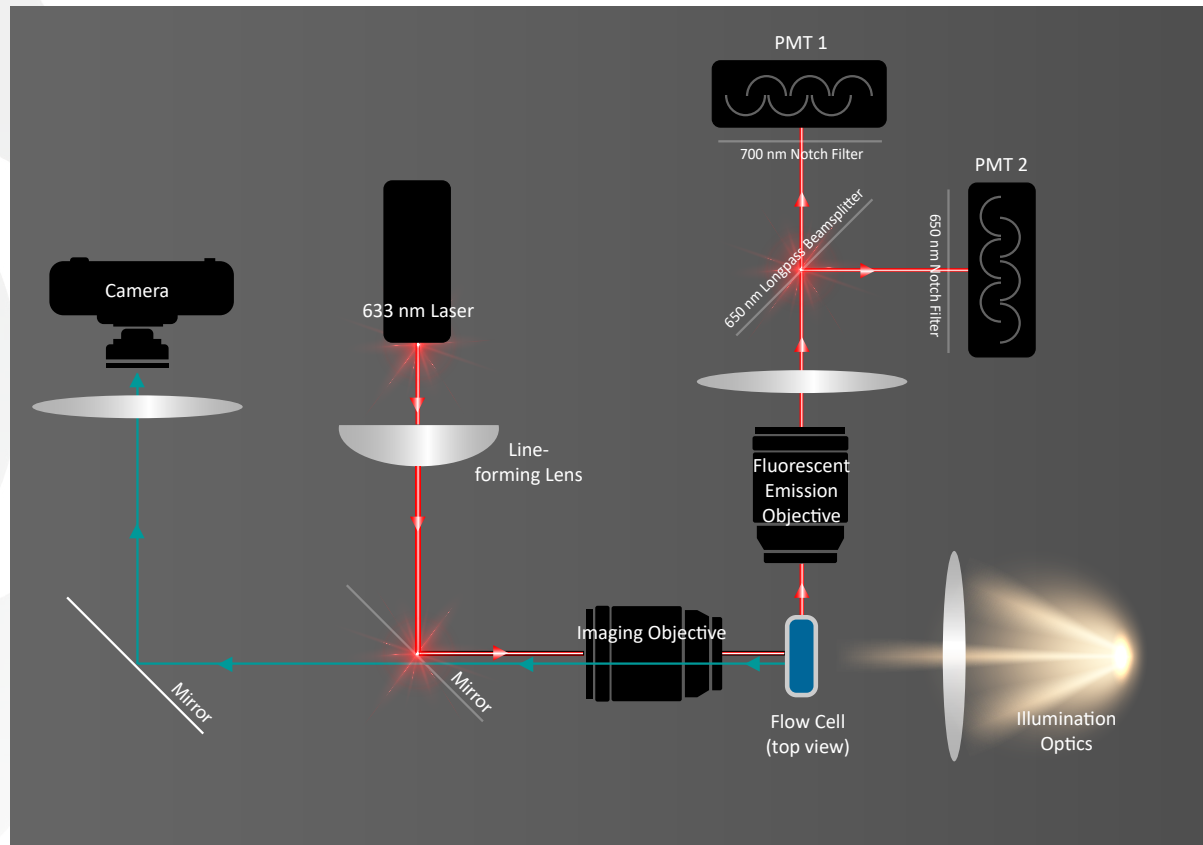
Obtain same-day data to inform treatment decisions and prevent the growth of algae before it causes taste and odor complaints from drinking water customers.



# How it Works

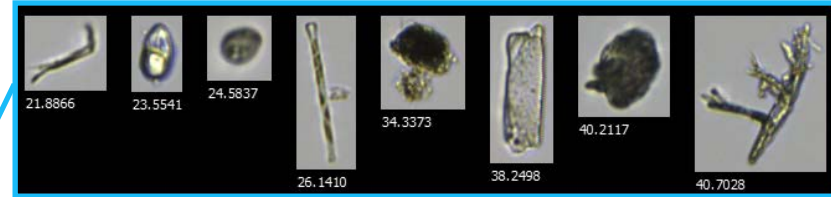
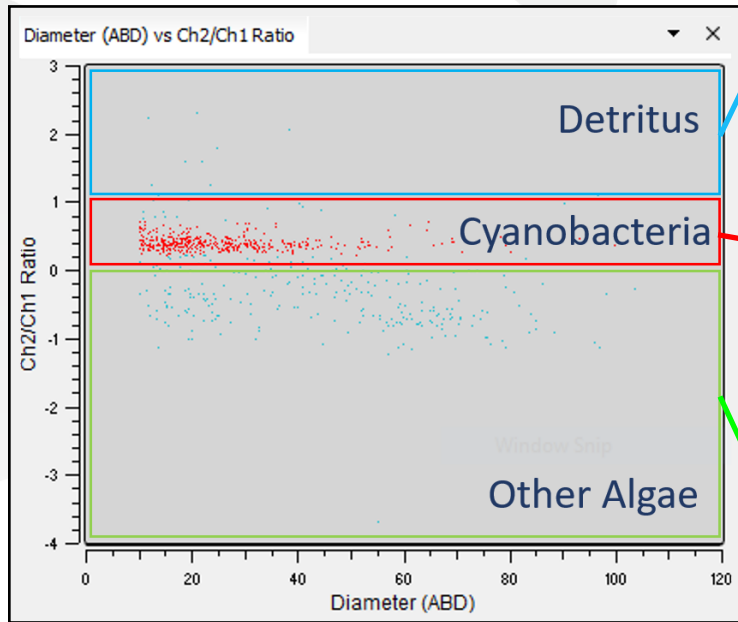
FlowCam fluorescence-based flow imaging microscopy with FlowCam Cyano uses laser excitation to image and identify Cyanobacteria and differentiate them from algae and other particles in aquatic samples. Its optical configuration uses a red laser (633 nm) to detect the unique fluorescence emissions from aquatic organisms.

- 1** A sample is manually loaded into the injection port where a high-precision syringe draws the sample into an optical flow cell and a fluidics sensor initiates data acquisition.
- 2** The red laser excites microalgae fluorescence via Channel 1 (chlorophyll) or Channel 2 (phycocyanin) as a sample passes through the flow cell, triggering the camera to capture an image of the entire flow cell.
- 3** FlowCam's image analysis software, VisualSpreadsheet®, isolates each particle or organism as a separate image, and calculates data for each image, including fluorescence ratios, as well as sample count and concentration.
- 4** Pre-built filters sort images into three categories: Cyanobacteria, Diatoms and Other Algae, and Detritus and Decomposing Particles. Data may be further analyzed, grouped, and filtered by the user.

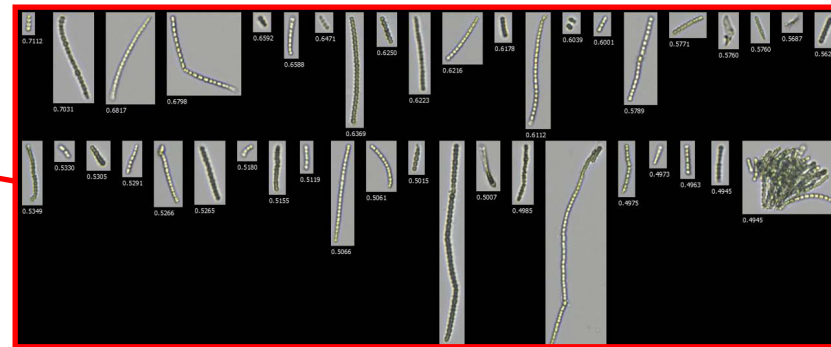


# How it Works

FlowCam Cyano offers three pre-built fluorescent filters to differentiate Cyanobacteria from diatoms and other algae, and detritus and decomposing particles. Create libraries from microalgae specific to your region to further sort and assist in classification of your samples. Create your own fluorescent filters to determine count and concentration of different algal populations.



Detritus and decomposing particles

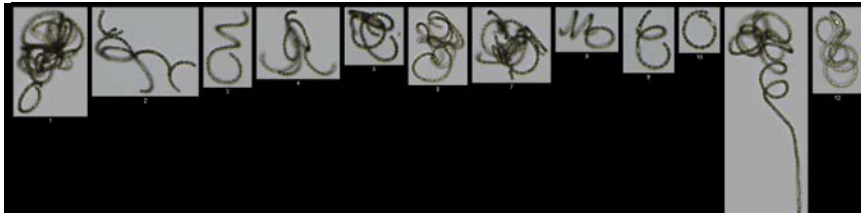


Cyanobacteria

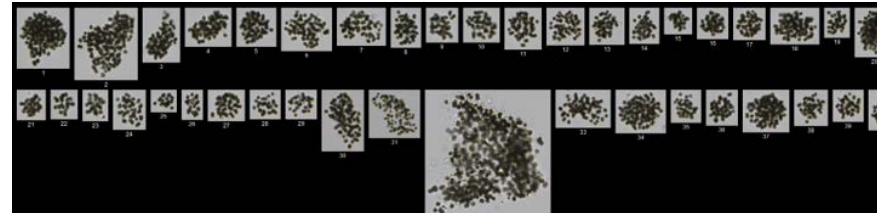


Diatoms and other algae

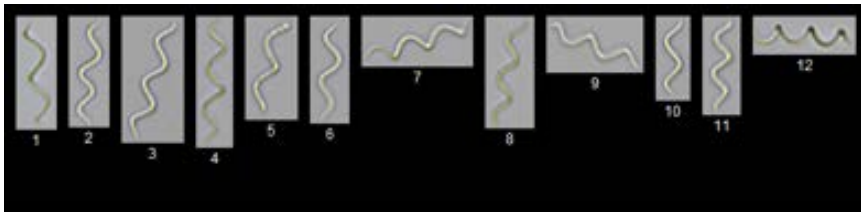
# FlowCam Cyano Applications



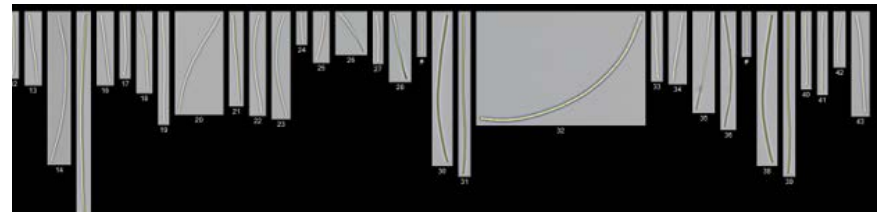
*Dolichospermum* (formerly *Anabaena*), cyanotoxin and taste & odor producer



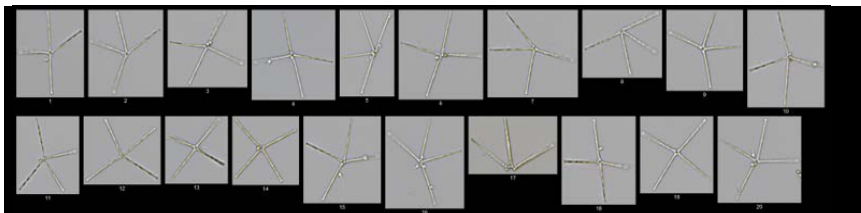
*Microcystis*, cyanotoxin and taste & odor producer



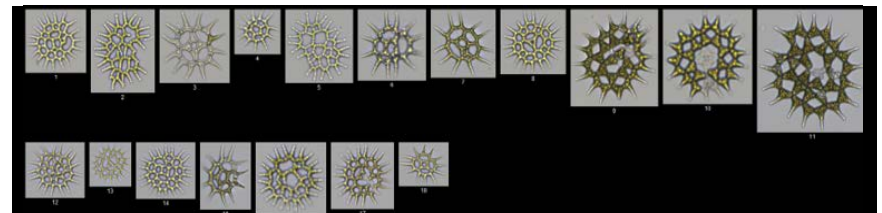
*Cylindrospermopsis*, cyanotoxin producer



*Planktothrix*, cyanotoxin and taste & odor producer



*Asterionella*, diatom



*Pediastrum*, green algae

- Manage drinking water, recreational, or ecologically significant water bodies
- Identify cyanobacteria, taste and odor, and other nuisance algae in source water
- Use algae concentration data to inform water treatment decisions

- Detect and identify cyanobacteria and other algae in freshwater and marine environments
- Calculate count, concentration, and biovolume for colonial units
- Semi-automate classification of taxa



# VisualSpreadsheet Software

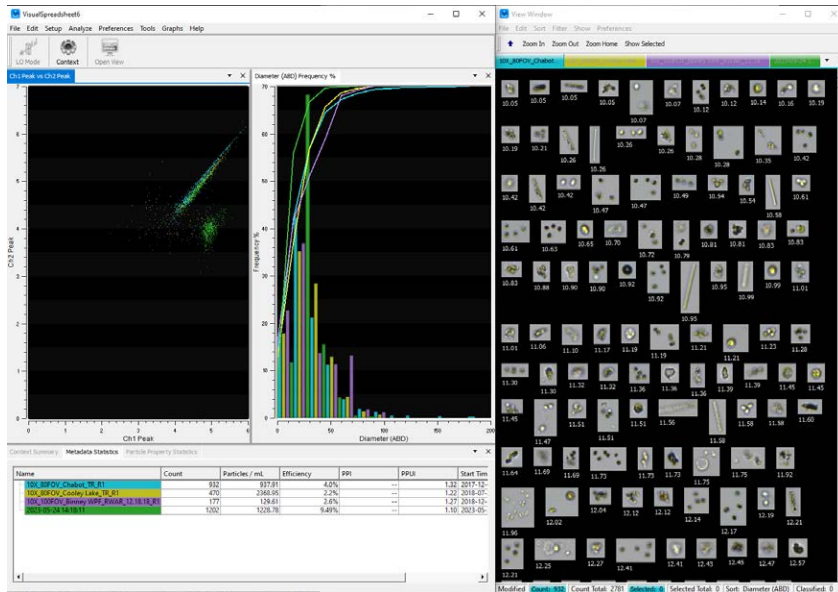


## Turning Data into Insight

VisualSpreadsheet is a powerful, all-in-one software program capable of setting up methods, acquiring data, and processing images captured with FlowCam.

Analyze, sort, filter, group, and classify images based on 40+ morphology parameters and their combinations, or use the “Find Similar” function in the software to identify what is in your sample. Group data from multiple runs or samples for easy comparison.

FlowCam Cyano provides three built-in filters to differentiate Cyanobacteria from diatoms and other algae and detritus.



# World-Class Customer Service

Our customer service team is available to help with all things FlowCam, including:



- Technical Support
- Remote and On-Site Training
- Application Support
- Preventative Maintenance
- Repairs and Upgrades

Maximize your FlowCam utilization with a full training package led by our experts – customized for your application. This hands-on, in-depth training provides a thorough understanding of flow imaging microscopy. Learn from our scientists how to run and analyze samples; and get a wealth of tips and tricks to get the most out of your instrument.

Every new instrument includes a one-year warranty, unlimited email and phone support, and one year of free access to FlowCam University training.

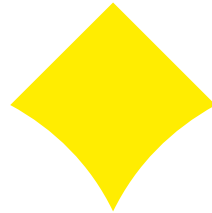
For continuous support we offer Gold or Silver service plans that include annual preventative maintenance services, software upgrades, access to virtual training, personalized remote support, and other benefits.

# Specifications

<b>PARTICLE SIZE RANGE</b>	2 µm to 1 mm
<b>MAGNIFICATION &amp; FLOW CELLS</b>	20X (~200X magnification), flow cell: 50 µm FOV 10X (~100X magnification), flow cell: 80 µm FOV or 100 µm FOV 4X (~40X magnification), flow cell: 300 µm FOV or 600 µm FOV 2X (~20X magnification), flow cell: 1 mm FOV
<b>MINIMUM SAMPLE VOLUME</b>	100 µL
<b>SAMPLE PROCESSING CAPABILITY</b>	0.05 mL/minute at 20X and up to 10 mL/minute at 2X
<b>FLUIDICS</b>	Micro-syringe pump with multiple sizes to optimize flow rates: 0.5 mL, 1 mL, 5 mL, 12.5 mL
<b>MAXIMUM PARTICLE CONCENTRATION</b>	5 million particles/mL at 2.5 µm particle size
<b>DATA ACQUISITION METHOD</b>	Fluorescence-based laser triggering and auto-imaging
<b>FLUORESCENCE DETECTION</b>	Red 633 nm laser, 2 fluorescence channels (Chlorophyll - Ch1: 700 nm ± 10 nm, Phycocyanin - Ch2: 650 nm ± 10 nm)
<b>CAMERA</b>	High resolution (1920 x 1200 pixels) CMOS, Color
<b>FRAME RATE</b>	Shutter speed up to 100 frames per second
<b>FOCUS METHOD</b>	Automatic
<b>MEASURED PARAMETERS</b>	<p><b>Basic Shape Parameters:</b> Area, Aspect Ratio (width/length), Diameter (Spherical and Area-Based), Length, Volume (ABD-based), Volume (ESD-based), Width, 3 Biovolume Measurements</p> <p><b>Advanced Morphology Parameters:</b> Area (Filled), Circle Fit, Circularity, Circularity (Hu), Compactness, Convex Perimeter, Convexity, Elongation, Fiber Curl, Fiber Straightness, Geodesic Aspect Ratio, Geodesic Length, Geodesic Thickness, Perimeter, Roughness, Symmetry</p> <p><b>Grayscale and Color Measurements:</b> Average Blue, Average Green, Average Red, Blue/Green Ratio, Red/Blue Ratio, Red/Green Ratio, Edge Gradient, Intensity, Sigma Intensity, Sum Intensity, Transparency</p>
<b>AUTOMATION</b>	Compatible with ALH for FlowCam automated liquid handler
<b>DIMENSIONS &amp; WEIGHT</b>	36 cm wide x 43 cm deep x 38 cm tall, 27 kg (43 kg shipping weight)
<b>POWER REQUIREMENTS</b>	115 watt maximum

Specifications are subject to change without notice





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## Yokogawa Fluid Imaging Technologies

Yokogawa Fluid Imaging Technologies manufactures industry-leading particle analysis instrumentation based on digital imaging technology. Our flagship product, FlowCam, is the first automated particle analysis instrument to use digital imaging for measuring size and shape of microscopic particles in a fluid medium. FlowCam has been deployed in over 50 countries, supporting research, development, and environmental monitoring in the life sciences, materials research, and industrial applications.



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