

continuous basis. The FlowCAM images in a few seconds as many particles as a skilled lab technician with a high-end microscope can image in the course of a week, and with finer resolution and superior detail, according to the physicist. It also reduces chemical handling and minimizes exposure to staff and the environment. Plus, it is easy to use. "It's a piece of cake to setup. I set the instrument up with minimal assistance," says the physicist. "And it's very user-friendly." But it is the FlowCAM's unique ability to image each particle and store it for analysis that has sent a shockwave through the entire manufacturing and quality assurance team.

"None of us have ever seen these particles with such clarity and everyone is amazed when they can actually see exactly what we're working with," says the physicist. "Now that we know exactly what's in each sample it's next to impossible for a bad batch to get the green light for production."

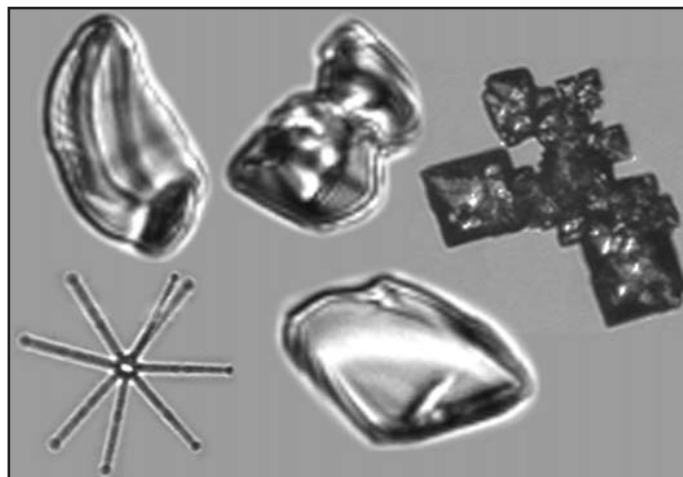
With this new library of visual, tangible knowledge, the quality assurance team can quickly email the images to manufacturing and help pinpoint the root cause of a process interruption while providing a common basis for the discussion. The speed and certainty of documenting the culprit particles saves time, reduces waste production and ensures peak material quality. "With the FlowCAM, we're getting an amazing insight into the entire process that has provided a level of understanding that just could not happen with any other technology," says the physicist. The company is

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**-Senior Development Physicist,
Fortune 200 chemical company**

even establishing a new set of batch testing criteria based on the unique abilities of the FlowCAM. Ironically, while imaging each particle has become critical for verifying quality, few anticipated its impact. "I was amazingly impressed with the results of the initial samples," says the physicist. "But we still didn't know imaging would be so valuable until we actually saw each particle and completely assessed the quality of the material." Though the company had several proprietary tests that were useful, those tests simply could not extract the same magnitude of data. "We didn't realize we had so many more questions about our material that weren't being asked until they were answered by the FlowCAM."

For more information, contact Lew Brown at Fluid Imaging Technologies, Inc. at 207.882.1100 or go to www.fluidimaging.com.



These particles were imaged by the FlowCAM® and archived for analysis. The FlowCAM® uses patented technology to automatically image every particle in a continuous fluid stream or sample, up to hundreds of particles per second.

Processing

SOLUTIONS FOR THE PROCESS INDUSTRIES

FEATURED INSIDE:

How a restless chemical giant got peace of mind

Fluid Imaging Technologies demonstrated its high-speed imaging system at Pittcon 2005. One of those that viewed the demonstration was a scientist for a Fortune 200 global chemical company. This *Processing* exclusive article discusses why the chemical company utilized the FlowCAM® system to solve a quality assurance issue the company was having with one of its challenging specialty chemicals, and what made the technology stand out from other existing technologies.



BREAKTHROUGH

PRODUCTS of 2005

CHEMICAL GIANT GOT peace of mind

HOW A restless

GLOBAL CHEMICAL GIANT SOLVES QUALITY ASSURANCE CHALLENGE WITH BREAKTHROUGH PARTICLE ANALYSIS INSTRUMENTATION

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The crowd hovering around booth #3292 at Pittcon 2005 buzzed with eager anticipation as they saw with their own eyes – many for the first time – exactly what particles existed in the fluid samples they brought from their own processing lines. As one astonished scientist after another elbowed his or her way into the booth for a closer look, Lew Brown sampled every vial with barely time to look up. Brown, the director of sales and marketing for Fluid Imaging Technologies, Edgecomb, Maine, presided over the center of attention, the FlowCAM®, and was running each sample through the breakthrough instrumentation. Nearly three times per second, digital images of algae, minerals, metals and other organics and inorganics were revealed in real time on the computer screen.

The FlowCAM is a high speed imaging flow cytometer that automatically takes high-resolution, digital images of every individual, fluid-borne particle in a sample and saves them to provide visual documentation of contamination or verification of purity. It also measures particle size, length, width, shape, fluorescence and other

parameters, and records the data in an interactive scattergram for instant display and analysis. One scientist for a global Fortune 200 chemical company who witnessed the new technology quickly grasped the potential for such a process analysis system and involved a senior development physicist on his team with expertise in imaging and microscopy to evaluate the FlowCAM. “I knew exactly what technology was out there and instantly recognized the FlowCAM is a novel concept,” says the physicist, who envisioned integrating the FlowCAM into his company’s quality assurance program for a particularly challenging specialty chemical.

The solvent-based chemical used in the production of a globally ubiquitous consumer product required a specific ratio of solid, black specks dispersed throughout the opaque liquid. If a sample lacked the proper ratio of particulates, the entire batch was discarded. With production humming in quantities measured by the metric ton, each bad batch could cost thousands upon thousands of dollars. But more alarming to the quality assurance team was the potential for a bad sample to slip through testing, earn approval and ship to a customer. Once there, a bad batch would manifest itself in a variety of costly production woes that would ultimately be traced back to the quality of the chemical. “One bad batch could trigger a switch to another supplier,” says the physicist, keenly aware how his team contributes to the product’s multi-

million dollar revenue stream. To determine whether each batch sample contained the proper amount of particulates, the company relied on a manual inspection system combining traditional microscopes and the naked eye. But making slides and grabbing images of every particle of every batch was time consuming, labor intensive and impractical at best, if virtually impossible. “Our initial attraction to the FlowCAM was its ability to automate and accelerate the entire testing process, which it has done remarkably well,” says the physicist.

The company uses the FlowCAM for particle property extraction to determine the length, width and opacity of each particle and then characterizes, documents and archives each one for further analysis. Typically, the “Auto-Trigger” mode is used, which automatically images every particle sampled in the fluid stream using patented technology with an advanced digital firewire camera to image up to several hundred particles per second. It can be operated on discreet sample batches or in-line on a

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