

Product News

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Ametek Gatan K3 Camera Provides First 3D Atomic-Scale Map of Coronavirus Structure

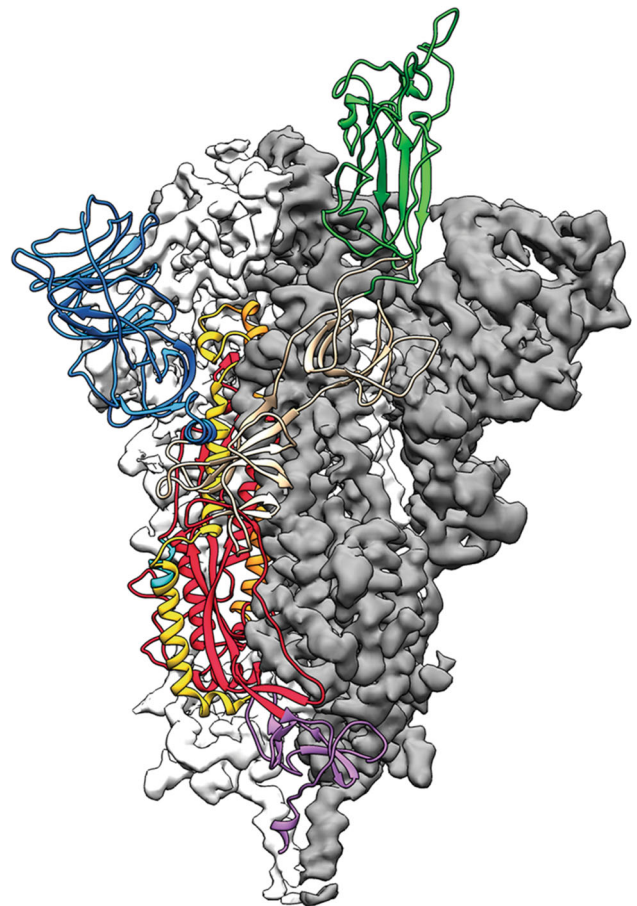
Ametek Gatan, Berwyn, Pa., reports that researchers at the University of Texas at Austin and the National Institutes of Health created the first 3D atomic-scale map of the 2019 novel coronavirus.

The researchers used Ametek Gatan's K3 camera to map a part of the virus called the spike protein, which penetrates host cells, allowing the virus to replicate. This breakthrough will allow for the rapid development of vaccines, therapeutic antibodies, and other medical countermeasures.

“Through single-particle cryo-electron microscopy, the researchers determined the atomic structure of the spikes,” states Christopher Booth, Director of Life Science for Ametek Gatan. “This helps explain the virus's resistance to antibodies that disable similar illnesses. The K3 camera was the key detector used to determine the native structure in record time.”

“The K3 camera not only gave us great images that provided the atomic-resolution structure, but also it prevented data collection from becoming a bottleneck, ultimately letting our team concentrate on getting the structure as quickly as possible,” said Jason McLellan, University of Texas at Austin Associate Professor and lead researcher on the project.

Ametek Gatan's technology is again at the forefront of groundbreaking discoveries to understand virus transmission and disease outbreaks. In 2016, Gatan's K2 Summit camera, the predecessor to the K3, was the key detector used to develop the first 3D structure of the Zika virus, which ultimately helped researchers better understand the illness and potential treatments.



This is a 3D atomic scale map, or molecular structure, of the 2019-nCoV spike protein. The protein takes on two different shapes, called conformations—one before it infects a host cell, and another during infection. This structure represents the protein before it infects a cell, called the prefusion conformation. Credit: Jason McLellan/Univ. of Texas at Austin

For more information: Gatan, Inc., 5794 W. Las Positas Blvd, Pleasanton, CA 94588; tel: 925/463-0200; web: info-gatan@ametech.com.

Buehler Introduces New Automated Castable Mount System

At this year's Minerals, Metals & Materials Society (TMS) 2020 convention, Buehler, Lake Bluff, Ill., debuted their new SimpliVac™ system. Buehler's new programmable SimpliVac offers excellent pore impregnation in a compact format.



Buehler debuts the SimpliVac™ during TMS 2020 at Booth #428 at the San Diego Convention Center in California

Quality control lab technicians working on delicate and precise samples in electronics, thermal spray coatings, additive manufacturing, and other specialty aerospace surface treatments can now optimize sample impregnation in a faster, more automated way.

According to Alicia Burns, Buehler product manager, "Using a compressed air source, this system quickly and efficiently pulls a vacuum to evacuate trapped air from any porous sample, resulting in optimized edge retention and additional support for processing delicate samples. The digital SimpliVac is easy to operate with an intuitive interface that is easy to set for multiple cycles. This greatly increases effectiveness, and as the only machine on the market able to run multiple cycles without user inference between cycles, there is both efficiency and quality improvement. Buehler's innovations continue to lead industry expectations and this one will not disappoint."

The SimpliVac Vacuum optimizes sample impregnation in a faster, more automated way and also allows lab technicians to set multiple cycles to complete the mounting process more quickly. SimpliVac can also accommodate larger samples due to its oversized chamber and sample tray insert, which creates a large flat surface for larger mounts.

For more information: Buehler Worldwide Headquarters, 41 Waukegan Road, Lake Bluff, IL 60044; tel: 847/295-6500; web: www.buehler.com.

Instron 3400 and 6800 Series Universal Testing Systems Introduce Advanced Features

Instron, Norwood, Mass., announces that the all-new 3400 and 6800 Series universal testing systems with advanced safety and operating features are available in single and dual column models, with capacities ranging from 500 N to 50 kN. Successors to the 3300 and 5900 Series systems, the 3400 and 6800 Series include many new features and improved specifications designed to make mechanical testing simpler, smarter, and safer than ever before. These include Collision Mitigation, Operator Protect, Smart-Close Air Kit, Built-In Safety Coaching, and Auto Positioning.



Instron's all-new 3400 and 6800 Series universal testing systems feature advanced safety and operating features

The 3400 and 6800 Series systems are built on Instron's new patent-pending Operator Protect system architecture, which limits the machine's movement during test setup, when accidents are most likely. When the system is in setup mode, crosshead movement is restricted to 600 mm/min, and the Smart-Close Air Kit restricts gripping pressure to the pre-defined safe level. Once the operators are ready to begin testing, a Virtual Interlock allows them to instantly enable the system's full crosshead speed and pressure capabilities. System movement on the 3400 Series is controlled from a newly redesigned Operator Panel, while the 6800 Series introduces a brand-new handset that allows users to operate the system from a distance.

Expanding on Instron's Bluehill Universal software, the 3400 and 6800 Series systems provide built-in Safety Coaching, which informs users whether the system is in a safe setup mode, a fully enabled caution mode, or active testing mode.

All 6800 Series systems are equipped with an Auto Positioning feature, which remembers the correct fixture separation and starting location for each test method. The 3400 and 6800 Series are equipped with maintenance-free brushless AC servomotors for increased cyclic and creep performance. The 3400 Series provides a data acquisition rate of up to 1000 Hz and the 6800 Series provides data acquisition up to 5000 Hz, ensuring that a test event is never missed. Both systems are equipped with advanced diagnostics to make troubleshooting through Instron Connect easier than ever before.

For more information: Instron Worldwide Headquarters, 825 University Ave, Norwood, MA 02062-2643; tel: 800/877-6674; web: www.instron.us.

Flaw Detector Redefines the Standard for Phased Array

The OmniScan X3 flaw detector by Olympus makes analysis and reporting faster. Setting up for a job is quicker and more efficient while total focusing method (TFM) images collected through full matrix capture (FMC) give users more confidence in their decision making. When an inspection is complete, leading-edge software tools make analysis and reporting easier.



Olympus OmniScan X3 flaw detector

The OmniScan X3 flaw detector combines the essential tools needed for PAUT inspections, such as TOFD, two UT channels, eight groups and 16:64PR, 16:128PR, and 32:128PR configurations, with powerful innovations, including:

- TFM/FMC with 64-element aperture support
- Improved phased array imaging, including an innovative live TFM envelope feature
- Acoustic influence map (AIM) simulator for TFM mode
- 25 GB file size
- Up to 1024 × 1024-pixel TFM reconstruction and four simultaneous, live TFM propagation modes
- Simplified user interface with onboard scan plan
- Wireless connectivity to the Olympus Scientific Cloud (OSC) makes it simple to keep the instrument's software up to date

The comprehensive onboard scan plan tool enables users to visualize the inspection, helping reduce the risk of errors. The entire scan plan, including the TFM zone, can be created in one simple workflow. Creating a setup is also faster with improved calibration tools and support for simultaneous probe and beam set configuration, onboard dual linear, matrix, and dual matrix array creation, and automatic wedge verification.

Certified IP65 dust proof and water resistant, the instrument has the reliability and ease of use that OmniScan flaw detectors are known for combined with high-quality images that help make interpreting flaws more obvious. With the total focusing method, users can produce geometrically correct images to confirm the characterization of flaws identified through conventional phased array techniques and obtain better images throughout the volume of a part.

Additional features that enable outstanding images include a 16-bit A-scan, interpolation and smoothing, and a vivid 10.6-inch WXGA display that provides clarity and visibility in any light.

The OmniScan X3 flaw detector makes analysis and reporting quicker, both onboard the instrument and on a PC. The instrument also comes with a variety of helpful data interpretation tools:

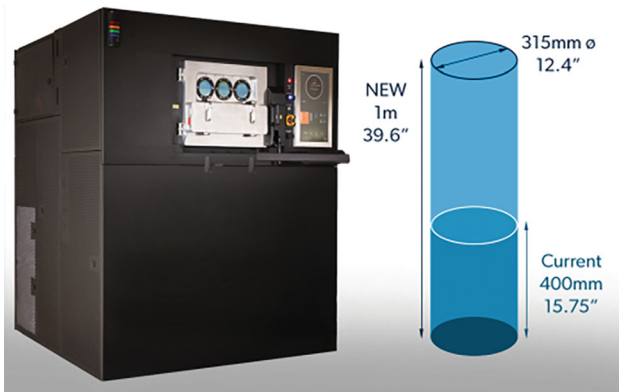
- Circumferential outside diameter (COD) TFM image reconstruction to facilitate interpretation and sizing of long seam weld indications
- Merged B-scan to facilitate the screening of phased array weld indications while keeping the workflow simple

Whether inspecting pipes, welds, pressure vessels, or composites, the OmniScan X3 flaw detector enables users to complete their work efficiently and interpret flaws with confidence.

For more information: Olympus Scientific Solutions Americas Inc., 48 Woerd Ave, Waltham, MA, 02453; tel: 800/225-8330; web: www.olympus-ims.com.

Velo3D Launches Next-Gen Sapphire 3D Metal Printer with Build Envelope 1 m High

Digital manufacturer Velo3D, Campbell, Calif., plans to launch a next-generation Sapphire industrial 3D metal printer with a vertical axis of 1 m. The system will ship in Q4 2020, with precision-tool and component manufacturer Knust-Godwin securing the first order to produce parts for an oil and gas application.



Velo3D's next-generation Sapphire industrial 3D metal printer will have a vertical axis of 1 m

“Our vision at Velo3D is to enable end users to build whatever they want without the constraints of yesterday's standards,” states Benny Buller, founder and CEO. “One of those constraints is the build envelope. A meter-tall system enables industrial applications that could not be built before,

especially for oilfield service tools and flight hardware. Best of all, it will still utilize our highly patented SupportFree process, in situ calibration, and process control for quality assurance.”

The immediate part opportunity that Knust-Godwin will address with the meter-tall Sapphire printer is a part for oilfield drilling that is currently manufactured by more than five subtractive processes. Additive manufacturing enables consolidation of such traditional processes, improving part quality and performance.

“There tends to be a trade-off between large-format additive machines and part quality,” says Mike Corliss, VP of Technology at KnustGodwin. “Velo3D is attractive because of its semiconductor heritage and engineering disciplines around process control and metrology. We have confidence that we'll be able to build mission-critical industrial parts without compromises to quality.”

The technical features of the meter-tall Sapphire printer include a 315 mm diameter build plate, dual 1 kw lasers, in situ optical calibration, and many of the same characteristics of the existing Sapphire machine. It will be the world's tallest production metal-powder laser additive manufacturing system, exceeding the build height of both the SLM 800 and the GE Additive X Line 2000R.

The system will be commercially available starting late 2020 and compatible with nickel-based alloys.

For more information: Velo3D, 511 Division St, Campbell, CA 95008; tel: 408/610-3915; web: www.velo3D.com.

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