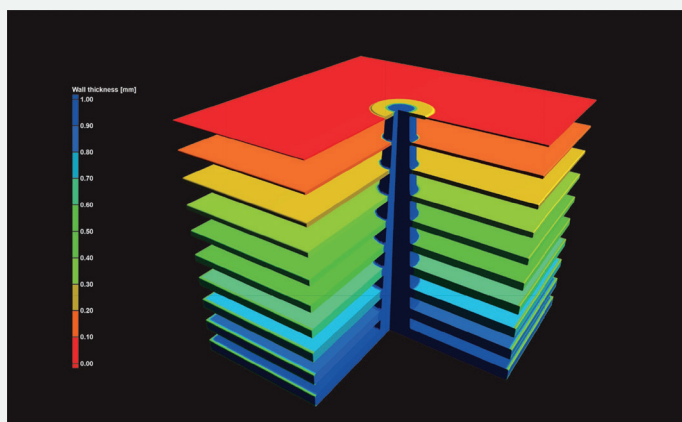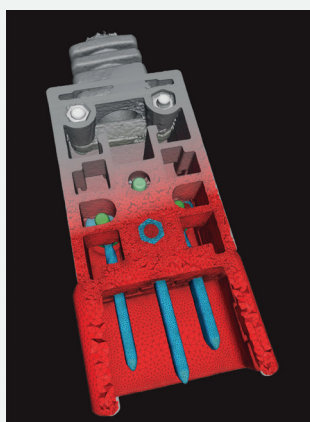# TOOLS & TECHNOLOGIES

By Isaac Villarreal

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Volume Graphics' new Volume Meshing Module allows users to create accurate and high-quality tetrahedral volume meshes from their CT scans for use in mechanical, fluid, thermal, electrical and other FEM simulations in third party software.

The Volume Graphics computed tomography scanning software can provide wall-thickness analysis, one of the many ways results can be exported in Q-DAS format.
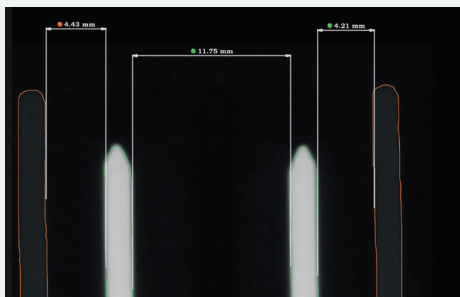
The CT scanning software allows for multimaterial surface determination.

Scanning software can assess data for better quality

Many manufacturing companies today focus on maximizing product quality for the customer. Recently, companies have started using non-destructive testing (NDT) methods as a means to improve product quality. When compared to more traditional destructive testing methodologies, NDT methods result in lower costs because destructive testing inherently destroys parts.

A common NDT method used today is computed tomography (CT) scanning. While having CT data is great, the data alone is not enough. To provide an analogy, sometimes we get CT scans when we go to the doctor. If we were to receive the CT images, we wouldn't know what conclusion to infer from the image. However, a doctor can look at a CT image and provide a diagnosis.

Similar to how we would need medical scans to be ana-lyzed by a doctor, CT scans of parts would need to be analyzed to properly assess the information available from the image. **Volume Graphics'** portfolio of CT software solutions provides the means to transform CT scan data into useful information.

Features in Volume Graphics' software portfolio include multimaterial surface determination, Q-DAS export capabilities, volume meshing for simulation and optional character recognition (OCR)-based automation. With multimaterial surface determination, after a part has been CT-scanned, the software can differentiate the materials that make up the part. Being able to identify the different materials in a part enables easy geometric dimensioning and tolerancing.

In addition to identifying different materials, the software can be used to identify desired features or dimensions for a

Teledyne LeCroy Inc. has demonstrated its first protocol analyzer platform for testing next-generation USB4 and Thunderbolt 3 systems. The Voyager M4x Protocol Analyzer platform leverages Teledyne LeCroy's T.A.P.4 probe technology and analysis software, allowing developers to verify interoperability and compliance for the rapidly expanding USB Type-C market. Designed to be fully backward compatible for testing legacy USB links, the Voyager M4x captures 100% of bus and protocol traffic for USB4 devices and systems. The T.A.P.4 probe technology locks on the signal-under-test without impacting critical link training and speed negotiation handshaking.

PowerStak powered stackers from Presto ECOA feature powered lift and drive, easing use regardless of an operator's size or physical strength. The compact design, low weight and quiet operation fit into a variety of work environments. Features include an ergonomically designed control handle that puts all functions including lift, lower, forward and reverse within easy reach. Redundant design allows all controls to be accessed by either hand. An instrument control panel features a key switch, emergency e-stop, battery status indicator and hour meter.

Temporary protective "strippable" films are peeled off by customers and used to protect surfaces during shipping, handling and installation. Unichem's liquid strippables vary from flexible to rigid that provide a strong, abrasion-, moisture- and chemical-resistant barrier. The liquid coatings solidify into a protective film after heating and processing. Unichem's uniGuard can be applied to polished metals, metals coated with thermoset coatings and some polyvinylidene difluoride (PVDF) coatings.

The Flow Sciences Nitrogenema enclosure series can nearly eliminate moisture or oxygen with the flow of inert gas. Operator safety and process is provided by HEPA filtration, a one-way check valve and the ability to connect to a house exhaust system. The glove box is designed with a 28-inch depth and comfortable 10-inch oval glove ports which allow for minimized technician arm, wrist and shoulder fatigue. There are two adjustable flow rates one for high flow purge and the other for low flow to maintain.

part. After collecting information on various parts, the CT data can be exported into Q-DAS format. This is a useful tool because CT data can contain wall thickness information, fiber composite information or other complex data that is difficult to utilize. The ability to easily export CT data in Q-DAS format allows for simple integration of CT technology with an existing manufacturing process. Once in Q-DAS format, any collected data can be used for statistical process control analysis.

Another feature of Volume Graphics' software is its ability to convert CT scans into high-quality tetrahedral volume meshes. This feature enables finite element method (FEM) simulations using the volume meshes obtained from the CT scans. FEM simulations allow for identification of weaknesses in components, which can increase quality with fewer prototypes or other forms of experimentation.

Parts that are manufactured via casting or injection molding often contain part identification codes. With Volume Graphics' OCR capabilities, those identification codes can be recognized and associated with the CT scans of a part.

"With version 3.3 of our software solutions, we are once again laying the foundation for customers to make their processes smarter," said Volume Graphics CEO and co-founder Christof Reinhart.

Volume Graphics' software has various features to convert CT images to information that can be acted upon. With features like multimaterial surface determination, Q-DAS exporting capabilities, volume meshing and OCR, it provides an impressive array of features to transform CT images into useful information.