

Cross-Sectional Scanning Key in Molder's Competitive Strategy

Matrix Tooling (Wood Dale, Ill.) has a three-pronged approach to compete in the shrinking domestic tooling market: focus on challenging jobs, offer more value to its customers and leverage technology. Its latest endeavor, adding Cross-Sectional Scanning for first article inspection services, has enabled Matrix to achieve all three goals.

When first article inspection was initially considered, Matrix realized that there were two major obstacles. Paul Ziegenhorn, president, said, "Adding first article inspection seemed to be a good business decision, but to make it work, we needed to control costs by significantly reducing the labor hours required. More importantly, we needed to create a compelling reason for our customers to allow us to do their first article inspections."

Matrix found what it needed when it discovered Cross-Sectional Scanning. According to Gary Johansson, quality manager, "Cross-Sectional Scanning is unlike any other inspection tool. It is an automated process that eliminates inspection planning, fixturing and sectioning. When the scanning is complete, I have hundreds of thousands of measurement points that describe every detail of the first article."

Johansson estimates that his Cross-Sectional Scanning system, a CSS-1000, gives Matrix a minimum labor savings of 30 percent. However, he finds that the time savings are much bigger when doing first article inspection on multi-cavity tools and intricate, complex parts. Johansson said, "I can do multiple copies almost as fast as a single part. The CSS-1000 processes the parts as a batch, and the Spec.Check™ software lets me create a template that automates inspection reporting."

Internal Measurements

"Cross-Sectional Scanning also eliminates the time consuming and inherently flawed task of manually sectioning parts," Johansson stated. If using CMMs or optical gauges, each cross-section on a drawing, and every measurement that is not accessible, requires cutting of the part. This operation adds labor and introduces error.

"It is a lot of work to pick up a single dimension from a section. We have to make fixtures, cut the part, set it up and pick off the measurement," said Johansson. "When planning the inspection, I would allow roughly one hour for each section. With our CSS-1000, it only takes a minute or two," he said.

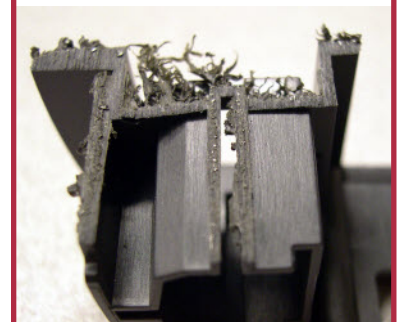
Matrix finds that Cross-Sectional Scanning reduces measurement uncertainty. Johansson said, "We have tried every alternative for cutting parts, but each one results in tearing, melting or rollover burrs. After cutting, the edges are then hand worked to clean them up. This changes the dimensions."



Matrix Tooling added first article inspection to strengthen its competitive position in the shrinking tooling market.



CSS-1000 automates inspection and eliminates planning, fixturing and sectioning.



Sectioning parts for inspection with CMM or optical gauges results in tearing, melting or rollover burrs.

He also noted that cutting a part is likely to cause distortion since molding stresses are no longer constrained. Johansson stated, "Our clients are calling out -0.000/+0.001 inch tolerances. Cutting a part to reveal a section will introduce error that exceeds these quality specifications." He continued, "With our CSS-1000, there isn't any tearing, melting, burrs or distortion. Measurements are fast and accurate."

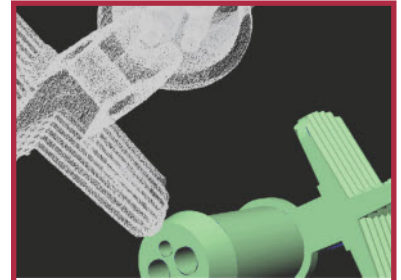
Unexpected Advantages

Beyond automation and accuracy, Cross-Sectional Scanning's unique approach to inspection offers unexpected advantages that have amazed Matrix's customers. Combining the dense data set from the CSS-1000 with powerful software, Matrix has unrivaled measurement and reporting tools.

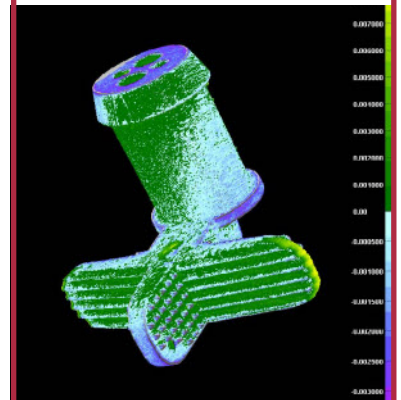
After submitting an inspection report, customers often request new, previously unspecified measurements. If using traditional tools, Matrix would repeat the inspection process, possibly having to section a part, to get the new measurement. "Since I have the CSS-1000 scan data on file and inspection templates archived, all I have to do is open the file and make the measurement. It takes me just a few minutes to respond to the customer's request," said Johansson. While the rapid response is appreciated, what grabs customers' attention is the inspection documents.

"Our customers know that we are leveraging new technology as soon as they open our inspection reports," Johansson stated. Accompanying the usual tabular reports are visual depictions of the inspection results. Measurements are annotated on section views in green (pass) and red (fail). Matrix also uses Innovmetric's PolyWorks® software to create vivid 3D color maps that illustrate deviations of the first article from the original CAD data. "Customers are absolutely amazed when we present these visual reports," said Johansson.

"We are giving our customers reports and data above and beyond what they could get if they performed their own inspection," said Ziegenhorn. "This is the compelling reason for them to consider our company for the first article inspection." He continued, "Our customers are impressed with our first article inspections services, and I am pleased that we can do this work profitably."



Dense point clouds (left) are aligned to CAD data (right) to generate color maps.



Customers are amazed when presented with visual inspection reports, such as color maps from Innovmetrics's PolyWorks software.

