

# Consistency Builds Reputation

## Engineered Machining Solutions (EMS) Applies Same Approach to Metrology



*Engineered Machining Solutions partners, David Szabo (left) and Balazs Ormai.*



*In just seven years EMS has grown from a two-man shop with one machining center to a 20,000sqft shop with a team of 30 cross-trained machinists, manufacturing engineers and metrologists, running three shifts.*

Consistency tells a lot about a company; who they are, what they are good at, and what they stand for. As a job shop in today's highly competitive manufacturing industry you need to stand for something customers can relate to, whether that's good quality, great quality, low price, fast turnaround, or a myriad of other attributes. Customers need to know they will receive a consistent deliverable, based on their own profile of your company's capabilities.

From humble beginnings in 2011, EMS founders Balazs Ormai and David Szabo envisioned a manufacturing company that could consistently produce complex high-quality, close tolerance machined parts for the aerospace industry. The pair shared a passion for solving problems through teamwork, a culture that continues to drive the Company, today. "We have developed a strong sense of teamwork here, there is no room for big egos, everybody pulls together and at the end of the day we turnout great parts," said Szabo. In just seven years EMS has grown from a two-man shop with one machining center to a 20,000sqft shop with a team of 30 cross-trained machinists, manufacturing engineers and metrologists, running three shifts. "Throughout our growth we have never stopped challenging ourselves, we are constantly looking at process improvement and quality to see how we can be more efficient and continue to raise the bar on turnaround and customer satisfaction. There are five key points to our overall success, but they all include #1, Consistency," said Ormai.

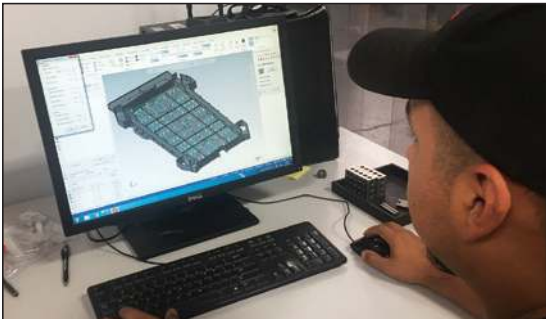
1. Consistency
2. Quality
3. Teamwork
4. Speed
5. Efficiency



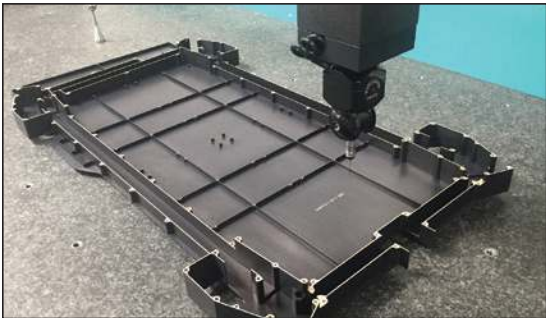
*EMS uses Verisurf software to run three different CNC CMMs, each with different controllers, as well as trackers and arms, as part of its 'consistency in metrology' strategy.*



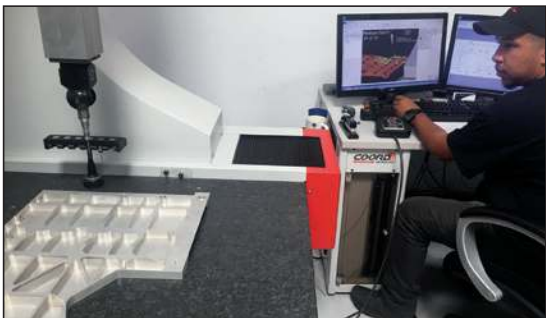
*The Mitutoyo, Wenzel and Coord3 programmable CNC CMMs shown are all driven by Verisurf software which reduces training costs while improving consistency in the inspection and reporting process.*



*Verisurf model-based inspection software allows EMS to quickly program each of their CNC CMMs using a consistent interface, tool-set and visual cues.*



*Verisurf automatic part inspection running a legacy Wenzel CNC CMM.*



*Verisurf automatic inspection routine being initiated on Coord3 CNC CMM.*

Consistency is what validates commitment and competency in each of EMS' five elements of customer satisfaction and overall success; so it is easy to see why the company placed an emphasis on this attribute when planning for and evaluating automated inspection solutions. Requirements included:

- Consistent measurement software platform
- Consistent hardware device interface and operation
- Consistent database
- Consistent processes
- Consistent training and support

## CONSISTENT QUALITY INSPECTION AND REPORTING

Quality verification and reporting is extremely important to EMS customers with most jobs requiring 100% inspection. As the Company grew the inspection lab became a bottleneck and needed to be rethought. Like every other initiative EMS engages in, they first looked to their team, workflow, current technologies in place and software being utilized in the quality lab and throughout the shop.

EMS had two legacy CNC CMMs in place, a Mitutoyo CMM and Wenzel CMM, both operated by different controllers and running unique software. This caused inefficiency in the quality lab and added to training and support costs. Following a full assessment, the team came up with the following criteria for an enterprise wide inspection and reporting solution:

- If possible, a single measurement application software must drive all metrology processes for the company.
- Software needs to be model-based on a CAD platform to allow flexibility in managing files and easily accessing datums within the design authority.
- Measurement software must import and export ALL CAD files and models seamlessly.
- Software must be able to import and allow annotation of intelligent GD&T data.
- Solution must be capable of interfacing with and controlling all existing and future measurement hardware devices.
- Software must have the flexibility and embedded tools to handle the range of inspection data, from manual contact probing to non-contact point clouds.

## VERISURF SOFTWARE PROVIDES DIGITAL CONSISTENCY

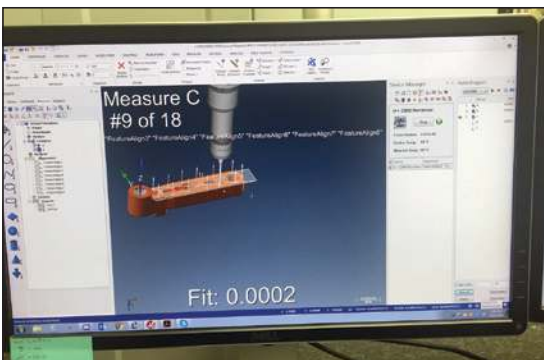
Verisurf Software was selected to support EMS' quality inspection and reporting objectives based on its open CAD-based architecture and



Legacy Mitutoyo CNC CMM being driven by Verisurf software.



Close up of a production part being inspected by Verisurf software, running a legacy Mitutoyo CNC CMM.



View of the Verisurf interface during inspection of a production part. During inspection, the software displays any deviation, +/- nominal, in real-time. Note the position of the dynamic virtual probe which matches the orientation of the physical part in the image above, and tracks the movement of the CMM during inspection.

model-based capabilities. Many software programs and hardware measuring device manufacturers want to lock customers in to their platform. Contrary to this approach, Verisurf software serves as a common platform and communicates openly with all CAD software and all metrology devices, across the manufacturing enterprise. This includes portable and fixed measuring devices as well as new and legacy equipment.

## VERISURF UNIVERSAL CMM

Case in point, EMS' Mitutoyo and Wenzel legacy CMMs did not support the open I++ protocol to facilitate integration. Verisurf Universal CMM software was able to provide an open standard communication protocol, allowing EMS to continue using the legacy CMMs while gaining the consistency of interface, operation and reporting with Verisurf. By incorporating the Verisurf CAD-based metrology platform across their manufacturing enterprise, EMS gained the flexibility to choose the right measuring device for each job, while realizing increased efficiency and reduced training, data management and support costs.



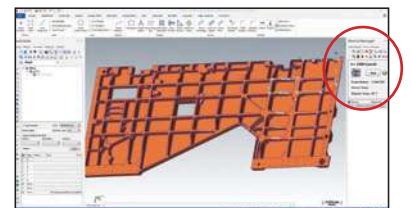
Software screen shows Verisurf Device Interface (VDI), indicating Verisurf Universal CMM I++ Interface is being used to control the legacy Wenzel CMM.

“Verisurf is our quality inspection and reporting platform, we use it to control all of our measurement devices, process measurement data, and generate custom reports,” said Szabo.

## VERISURF SOFTWARE SUPPORTS THE GROWTH OF METROLOGY AT EMS

Since implementing the software solution, a Coord3 CMM, which uses the open standard I++ protocol, has been added along with two Faro portable CMMs a Faro scanner and laser tracker. This has further improved capacity in the quality lab and allowed for in-process inspection on the shop floor.

“Integrating new hardware into our measurement toolset is easy, the team is already familiar with the interface and can be quickly trained on any nuances associated with an added device,” added Szabo.



Software screen shows Verisurf Device Interface (VDI), indicating I++ compatible CMM: Coord3 is engaged.

The addition of a laser tracker has allowed EMS to inspect larger parts, support assembly guidance and aid in toolmaking jobs undertaken by the company. Verisurf software supports each of these applications, along with reverse



*The quality team at EMS use Verisurf software to run all digital measuring and inspection devices, whether in the quality lab or on the shop floor. (Left to right) Brian, Isaac, Tyler and Eddie, lead inspector.*

engineering to determine ‘best fit’ scenarios, capture missing features or complex surface profiles directly to CAD and much more.

“Now that we have a solid metrology strategy in place, creativity and innovation is showing itself in the process. Our metrology capabilities are an arsenal of problem solving tools,” said Ormai.

For EMS, inspection and reporting used to be isolated in the quality lab. Today it is much more integrated with the production floor through in-process inspection using Verisurf, open CAD-based measurement software. Model-based inspection has helped close the digital loop; it feeds back to the CAD data authority, making inspection results more valuable and easier to attain, and eliminates interpretation and ambiguity concerning the design intent. Standardizing on Verisurf inspection software across the manufacturing enterprise has provided consistency of operation, quality reporting, data management, and reduced training and support costs.

## **ABOUT VERISURF**

Verisurf Software, Inc. is a measurement solutions company, committed to delivering advanced reverse engineering, surface analysis, quality inspection and assembly guidance. Verisurf products and processes are vital to maintaining a digital thread between design, engineering, manufacturing, and finished part validation. Based on a powerful CAD platform, Verisurf is committed to digital Model-Based Definition (MBD), open standards, and interoperability with all coordinate measuring machines and CAD software. Verisurf solutions help manufacturers produce higher quality products in less time. You can learn more about Verisurf at [www.verisurf.com](http://www.verisurf.com).

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