

Managing Quality Management

Automation continues to make quality management more efficient and cost effective

For job shops, as for any kind of business, the quality of the work produced is the cornerstone of a good reputation. For job shops in particular, where quality means attaining tolerances to thousandths of an inch, quality management is especially critical, and worth spending time and money on.

But spending more time and money than you need to can also be a drag on productivity and cost effectiveness. Like any other aspect of operations, quality management needs its own quality management: it needs to be done efficiently and cost effectively. New automated systems and software enable new levels of accuracy and efficiency and help to make the quality management process faster and more cost effective.

“If you have to manually record all your measurements, on a spreadsheet or some other medium, your productivity goes way down,” says David Wick, manager, product management, Carl Zeiss Industrial Metrology. Advances in automation are progressively eliminating human intervention where machines can do the job better and faster.

With Industry 4.0, quality data can be captured automatically from machines on the shop floor. An automated CMM can capture all of a product’s measurements and critical dimensions, summarize the data for the shop and the customer, and do it all automatically so that productivity is improved, Wick says.

“Quality data management software like Zeiss PiWeb is completely integrated with our measuring software so you can format your measurement results the way the customer



Blum-Novotest's Tool Monitoring Adaptive Control TMAC 3.0 monitors tool wear and breakage and sends a notification or stops the machine if necessary.

IMAGE: BLUM-NOVOTEST

wants to see them,” Wick says. “You can set it up any way you want, send it to your customer and let them know you’ve measured every single dimension of every single part.” Formatting can be done quickly and easily, and the data can be sent to the customer to demonstrate that the requested work has been done to specifications.

“Without a tool like this, you’re less productive, and you have no easy way of showing

you’ve measured what you were supposed to measure – and can therefore guarantee what you’re delivering,” Wick says.

Real time monitoring of machine performance is another capability that has made great strides with the advent of comprehensive, wall-to-wall automation. Machine monitoring means that tool wear can be controlled and tool life extended. In the past, assessing tool life was largely a matter

of setting averages based on past observed performance. It worked well enough as a rough guide, but was subject to often significant variation and error, potentially impacting cost effectiveness.

“Consider that most shops have taken the time to test different tooling, find the best solution and then set a consistently achievable tool life based on a part count or time in cut,” says Jamie King, regional manager, Canada, for Blum-Novotest. “We all know that not all tools make it to that tool life, and some come out looking like they could run more parts.”

Systems are now available to monitor metrics like horsepower, vibration, coolant flow and pressure, and other parameters in real time as a machine is running and adapt feed rates automatically to maintain consistency of process. One such tool is Blum-Novotest’s Tool Monitoring Adaptive Control (TMAC), a software package that can monitor tool wear and breakage and send a notification or stop the machine if necessary.

“With TMAC providing real time feedback on what’s happening at the cut, you get to use your tooling to its full potential and catch the anomalies that fail in the middle of their tool life,” says King.

Advances in information technology have also increased the capabilities of non-contact metrology. Vision systems are increasingly tolerant of ‘casual’ part positioning prior to scanning, rather than requiring parts to be placed in very precise positions before they



Zeiss' PiWeb quality management software is completely integrated with the company's measuring software so users can format measurement results for customers.

IMAGE: ZEISS

THE 7 QUALITY MANAGEMENT PRINCIPLES

- Customer focus
- Leadership
- Engagement of people
- Process approach
- Continuous improvement
- Evidence-based decision making
- Relationship management

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Zoller's genius 3 is a universal measuring machine capable of logging measurement details and allows the operator to transfer data directly to machines instantaneously.

IMAGE: ZOLLER

can be measured. And they’re also small enough to be more and more portable.

“Simple ‘benchtop’ video measurement systems powered by a PC and independent motion control systems are an excellent choice for many applications,” says Mark Arenal, general manager, Starrett Kinematic Engineering. “These systems are small, powerful and affordable.”

One such system is Starrett’s HVR100-FLIP Digital Video System, which can be used in a vertical or horizontal format to measure a single feature, an entire part, or multiple parts up to 93 x 76 mm (3.65 x 3 in.). Onboard MetLogix M3 software allows for single-touch feature measurement.

M3 also enables auto-detect part recognition. The software accesses a digital parts library for automatic recognition of a part placed on the stage, eliminating the need for the operator to do a manual search to find the correct match. When the software finds a match for the part placed on the stage, it automatically measures it and compares the data against the stored parameters.

“For high volume applications that require significant throughput and repeatability, especially when inspecting complicated parts, automated vision systems are invaluable,” Arenal says.

An ounce of prevention is worth a pound of cure, and while automation has helped to move quality control from an after the fact check of finished parts to a real time inline process that monitors quality as

a part is processed, it also promises cost effectiveness payoffs for the phases of quality control that traditionally take place before processing begins: in tool presetting/ inspection and measuring.

“You need to be able to verify that your process is a good process, and ensure that your first part is a good part, every time,” says Matt Brothers, Industry 4.0 Technology Center manager, Zoller Inc. The objective here is to be able to hone in on individual tool criteria/ dimensions or even perform automated checks without any human intervention.

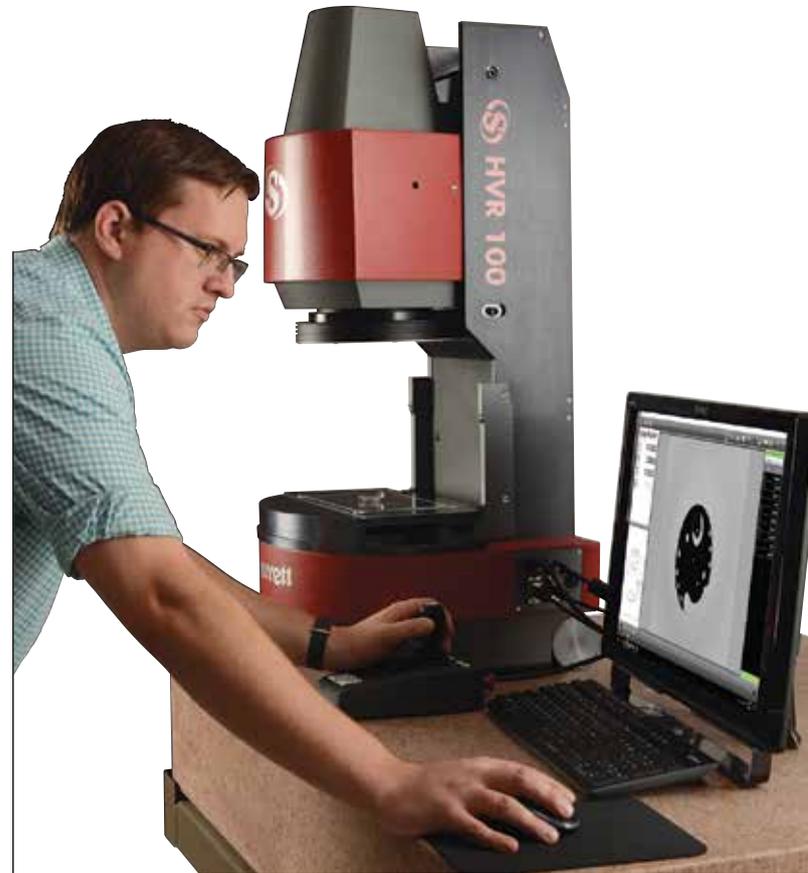
Tools like Zoller’s genius 3, billed as a “universal measuring machine,” are capable of logging measurement details and enable the operator to transfer that data directly to the machines instantaneously.

“With our tool presetting and measuring, tool inspection and measuring, and automation solutions, Zoller looks at your process and finds a machine that fits that application to create a better, higher efficiency process that allows you to get your product out the door faster and more accurately, while maintaining competitive pricing,” Brothers says. “If you can ensure that the tools or parts you’re supplying to your customers are good, then you’re happy.”

In the end, however, quality management isn’t purely a technology game. The human element is, and will always be, a critical factor in ensuring consistently high quality in the finished product.

“As technology continues to advance our industry, steadily eliminating human involvement, it’s ironic that your people are still your greatest asset,” says Jamie King. “The job requirements are changing in shops, with redundant tasks being replaced by automation, but we still need employees – just higher skilled employees.”

For Brothers, “quality employees” and “well trained employees” are the first two considerations for any quality shop. They may seem like the same thing, but



Simple benchtop video measurement systems powered by a PC and independent motion control systems are a good choice for many applications, says Mark Arenal of Starrett Kinematic Engineering.

IMAGE: STARRETT

as he explains, “finding quality employees is a challenge a lot of shops face today. Simply finding quality isn’t enough, though. Once you have the staff on board, training them properly and nurturing that quality will help create a better working environment.” SMT

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