

Video Measurement Cuts Costs, Boosts Data Integrity

Parmatech Corp. (Petaluma, CA) needed a flexible and precise platform for collecting measurement data for a key customer part. The small surgical component featured intricate details and close tolerances, and the inspection system the company was using simply wasn't getting the job done.

"We had a vision system here on loan from one of our customers," recalls quality assurance manager Lyle Hilfigure Jr. "It wasn't user friendly, and it had poor repeatability and reproducibility. Our backup system was a toolmaker's microscope. Both systems were inefficient and ineffective for our needs."

Parmatech, a subsidiary of ATW Cos., manufactures components for customers such as Motorola, Johnson & Johnson, and Smith & Wesson in its 30,000 ft² (2790 m²) facility. Specific products include hinge assemblies for cell phones, components for minimally invasive surgical procedures, and handgun and rifle components. The majority of the parts are stainless, low-carbon, and alloy steels. Regular production rates exceed 1 million units/month.

Parmatech began searching for a video inspection system that would not only measure its parts, but also capture data and facilitate process improvement. After an extensive search, the company selected a SmartScope video meas-

urement system from Optical Gaging Products (OGP; Rochester, NY).

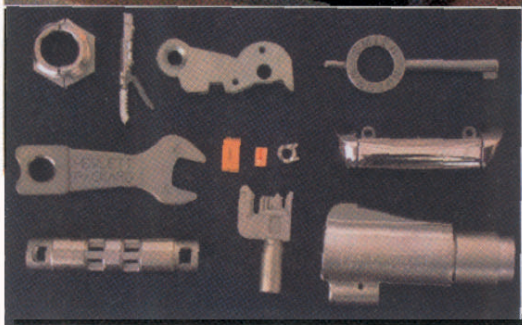
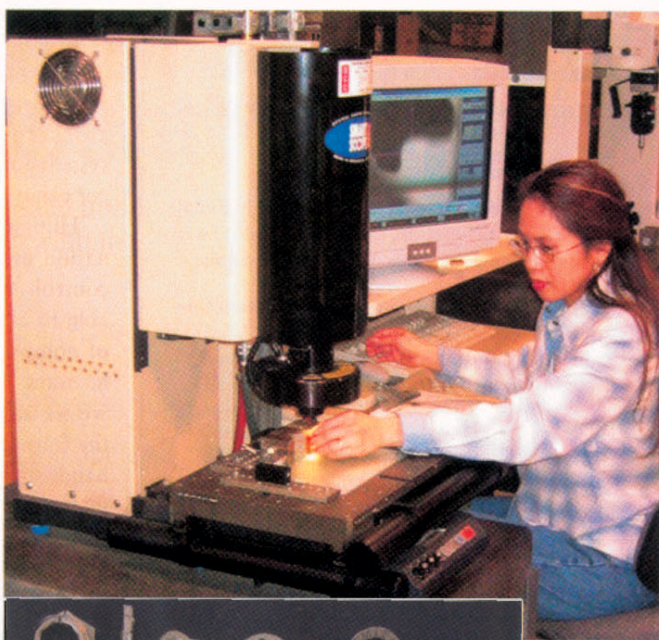
"We produce small components with intricate details and close tolerances, and our measuring datums are often difficult to define," Hilfigure explains. "We have a couple of customer projects that we could not have developed without the SmartScope system in place.

"We've been able to manage these accounts at a higher quality level and lower cost," he continues. "Our data are now over 50% more reliable than our previous methods based on gage repeatability and reproducibility [GR&R] studies. Product development cost is down by an average of \$1500 per project, because we've reduced the outsourcing of critical data acquisition. And, standard inspection time for parts is reduced by more than 30% compared with previous methods."

In 2002, a four-component project

that made extensive use of the system was awarded Grand Prize in an annual industry competition for use of metal injection molding (MIM) technology. MIM is a low-cost, high-volume manufacturing process that can produce small parts to near-net shape, resulting in fewer secondary operations.

The system's ease of use allowed Parmatech to quickly bring inspectors up to speed, improved measurement reliability, and helped engineers isolate operator and measurement error from



SmartScope video inspection system provided multiple benefits for precision components supplier Parmatech Corp. A sampling of the company's parts is also shown.

process variation. Resulting improvements have significantly streamlined and improved processes. And, data collected from the video inspection system are entered into either a spreadsheet or part tracking software

for statistical analysis.

Located in the Parmatech QA Lab, the system is used for in-process and final inspection, as well as product development and engineering design of experiments (DOE) studies. "The

SmartScope is the most-used piece of high-tech equipment in the lab," notes Hilfigure. "We use it to measure a wide range of features from lengths and widths to profiles of complex surfaces. We check a number of geometric tolerances on difficult-to-measure features."

Use of video inspection improved GR&R and reduced product development costs and inspection time.

According to Hilfigure, the system's flexible design lets Parmatech use both fixtures and open setups and reduces inspection time for a variety of jobs. "We're doing first-article inspections with 100 dimensions or more, as well as production samples," he says. "Our MIM process is batch-based using molds with one to eight cavities, and we use an acceptable quality level [AQL] system for sampling up to 35 pieces per cavity per lot."

Hilfigure says the system's combination of magnification and lighting control is especially useful. "We are able to clearly identify edges in spite of component feature aberrations," he notes. "We control how and where we see and obtain features. This puts the feature designation decision in the hands of the inspector and not in the interpretation of the gage."

System benefits have also extended into Hilfigure's role as a QA manager. "I have less training to do, so I can focus on other issues," he says. "With more reliable data to make decisions, I don't have to re-measure to have confidence in those decisions. I now have customer respect when it comes to measurement disputes. Although there are times when a customer checks parts and gets different data, we usually prevail. And, I have improved inspection throughput—we can now do more with less." ■ Circle 222