

Comparator Boosts Inspection Accuracy

Acu Twist Co. (Ridgeway, PA) was facing a dilemma. The company, a small manufacturer of special-order cutting tools, had a potential new customer who wanted a helical tapered tool with tight, angular tolerances of ± 2 minutes. Acu Twist could make the tool, relates President Marcus Young, but the company's optical comparator was inadequate to measure the part to the accuracy and documentation level required by the customer.

Young used metrology equipment at a friend's shop to confirm that the tool was within tolerance. "Then I took the tool to the customer, and he said, 'Everything looks good, but I need a report of the angle you got when you measured the tool, not just whether it's good or bad. If you can't check it, you can't make it,'" Young says.

Young found the improved inspection accuracy and documentation capability he needed to get the business in a Series 1600 Horizontal Beam Optical Comparator acquired by Acu Twist last December from S-T Industries Inc. (St. James, MN). "The clarity of the optics allows the use of a 50X lens to detect even the smallest flaw or to view the smallest undercut," Young says of the 1600 system. The optics on the Acu Twist's previous comparator, by con-

trast, provided sufficient clarity to only 15X magnification.

The new system is also equipped with a variety of options that help improve measurement accuracy while reducing inspection setup times and simplifying reportability. The previous comparator used by Acu Twist relied on manually controlled micrometer heads and a vernier protractor, which "was somewhat subjective," says Young. In addition, much of the inspection reporting to customers had to be written manually.

The S-T Industries comparator, by contrast, is equipped with a Model 200 Quadra-Chek DRO (digital readout) system and controller, which not only provides better measurement accuracy, but also allows for automated report generation. "I now can hook up a printer to the Quadra-Chek,"

Young says, "and write a program to it with all the dimensions and required checks on it. It has reportability that I didn't have before."

Because most of Acu Twist's output consists of rotary cutting tools, Young opted for S-T's new concentricity fixture to enable checking each tooth. "The concentricity gage mounted on the adjustable helical stage allows for the smooth rotation of the tool about its axis so it can be viewed as it would perform," he says. "The taper and radius on helical tools can be easily measured." Previously, the tool had to be set in a V-block and rotated manually to a stationary stop. This took more time, Young notes, "and you couldn't get the same kind of accuracy."

Speed with accuracy is important, because, unlike large tool-making companies characterized by long production runs of the same item on the same machine setup, Young says that Acu Twist typically produces only one to six pieces per run. In this environment, faster setup and inspection time for the first piece makes a huge difference.

Acu Twist previously had to supplement measurements made on the old comparator with additional measurements made using a microscope and height gage, Young says. This procedure typically required 30 minutes to an hour to perform a thorough inspection of the first piece of a run, he points out. Now, with the S-T Industries comparator, the critical first-check of a new piece takes about five minutes, "which can be done while other tool orders are running," Young reports.

The Model 1600 comparator has not only helped Acu Twist improve product quality, Young concludes, but it has also "definitely improved our productivity."

BENEFITS

- Optical comparator equipped with a digital readout system can be linked to a printer for automated inspection report capability.
- The clarity of the optics allows the use of a 50X lens to detect even the smallest flaw or to view the smallest undercut.
- First piece inspections that previously required 30 minutes to an hour can now be done in about five minutes.



Acu Twist was able to boost inspection accuracy, simplify documentation and reduce setup times by upgrading to a new optical comparator. Photo: S-T Industries

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