



Metrology

## Case Study: MeasurLink® Transforms QC for Pinnacle Machine Works

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### Customer Profile

Located in Houston, Texas, Pinnacle Machine Works is a manufacturer of oilfield couplings ranging in size from 4.5" to 10.625", as well as a provider of threading services of full-length pipe in the same size ranges. Established in 2013, Pinnacle Machine Works has more than 100 employees and is housed within a state-of-the-art facility licensed by API to API 5CT and to API Q1 standards.

### Challenge

As Pinnacle grew, in late 2017 they embarked on a mission to transform and improve productivity. This involved a re-organization of the manufacturing plant, the rollout of lean initiatives and an investment in new tooling. As this transformation progressed, it unveiled additional opportunities for improvement. In particular, it became clear that quality still needed to improve and inspection only, as a means of improving the quality of their product, was not possible. The traditional inspection/QC (quality control) techniques of writing measurements down and not doing much with that valuable information were too slow and limited any potential manufacturing gains. Every product produced was already inspected dimensionally and visually, culminating in thousands of inspection points per day. More costly measuring equipment was not going to solve that. This prompted Pinnacle to investigate new QC options.

### Solution

In reviewing options related to improving and streamlining QC processes, Pinnacle realized they could either go the manual route and add additional QC personnel or go the digital route and invest in an electronic gaging solution. The company decided that switching to an electronic gage was the only logical choice—it would enable Pinnacle to maintain an accurate and increased product flow without increasing labor costs. In addition, it would allow for real-time data collection and the use of SPC (Statistical Process Control), which to this point had not been possible, to make serious improvements

to the manufacturing process to improve quality.

When selecting the data management solution that best fit their needs, the company considered a number of criteria: the ability to utilize traditional gages/techniques that were called out by API 5B; the ability to capture inspection values in the software and store them by date, work order, machine center, or other category; and the ability to report on, and analyze, any and all inspection field data in order to uncover trends and determine better control measures. Mitutoyo's MeasurLink® Quality Management Software turned out to be the only product that fulfilled the company's criteria and aligned with their future goals. "We knew MeasurLink® was the right choice for Pinnacle after looking at several other QC data collection options," says Jim Caldwell, General Manager of Pinnacle. "It was one of the few options that had the power to provide us with real-time data and analysis."

## Results

MeasurLink® has now been used on the coupling shop floor for over a year, with full implementation occurring within the last six months. As a result of installing MeasurLink®, Pinnacle has seen their reject rate drop from 3 percent to 1.3 percent. At the same time, overall shop productivity has increased by 45 percent. To date, their reduction in the instance of non-conforming product has saved the company more than \$180K in lost material alone.

Now that the software is in place, Pinnacle is beginning to utilize control (Cpk Ppk) measures/targets to better control the process. Run charts and control charts allow machine operators to visualize their work. This is having a positive impact on employees, who have been extremely happy with the product post-implementation—especially how it improves accuracy while at the same time streamlines their workflows.

Employees are also able to easily ascertain information about when and why a part goes out of specification, which allows the quality manager to use a Pareto chart and other quality tools to identify the best place to take actionable improvements. One unexpected benefit of rolling out MeasurLink® has been the ability to re-use the data for production throughput and tracking. Given the positive response to, and added benefits of, this MeasurLink® adoption, Pinnacle is now in the process of implementing the product in their thread shop as well.

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