



CASE STUDY



Manufacturer Streamlines Workflows and Improves Quality

Ryan E. Day | Contributing Editor / Content-Marketing Coordinator | Quality Digest
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3D Measurement Technology and Application-Specific Software Provide Competitive Edge

In the most basic terms of engine exhaust theory, more flow equates to more performance. The aim is to improve the efficiency of your vehicle's engine, boost performance, and save money on fuel. Auto-jet Muffler Corp. has implemented that "improved flow = improved performance" theorem on its shop floor and in its business model.

Headquartered in Des Moines, Iowa, Auto-jet has provided mandrel tube bending and aluminized 409, 304, and 316 stainless steel tubing for the OEM, construction, and agricultural equipment exhaust, truck exhaust, school bus exhaust, and off-road vehicle exhaust markets since 1959.

After decades of utilizing traditional manufacturing methods of tube bending, Auto-jet decided, for multiple reasons, that it could better serve its customers by utilizing 3D scanning technology.



"It's a very competitive world out there," confides John Rapp, president of Auto-jet. "From a management standpoint, reduction in mistakes and errors plus increased quality gives us a competitive advantage in the marketplace; we're trying to stay ahead of the curve."

From a production standpoint, the move from a manual system to a high-precision 3D measurement system was like night and day. Auto-jet took full advantage of the best the industry had to offer by implementing the FARO® Edge ScanArm® HD and Advanced Tubular's V-Tube LASER software.

The FARO Edge ScanArm HD is a portable coordinate measurement machine (CMM) capable of both tactile probing and noncontact 3D scanning. For Auto-jet, it was the device's blue laser scanning technology that delivers fast point-cloud capture with high-resolution and repeatable accuracy that was most impressive for its tubing applications. In addition to the high-resolution data, scanning speed, and precise accuracy, the system's best-in-class optics allow seamless scanning across diverse surface materials regardless of contrast, reflectivity, or part complexity, so Auto-jet never has to worry about needing to spray its parts.

Advanced Tubular's VTube-LASER software delivers the industry's leading solution for fast, accurate, and simple tube measurement, qualification, and bender correction.

By combining 3D laser scanning technology and application-specific software, organizations are able to quickly and accurately digitize tube shapes in order to correct their network of CNC benders. They can also set up and correct a bender in minutes, and transfer correction data in seconds.

"When each piece may be up to 8 ft long with multiple angle bends, and it's all done manually, the scrap can add up quickly. What that boils down to is a scrap-rate reduction of up to 25 percent on first-article inspections alone ... The ROI has been instant and ongoing."

Kelle Vos, General Manager, Auto-jet



Workflow Challenges and Improvements



Reverse Engineering

“On the OEM side of our business, we usually work from customer-supplied prints, but the FARO ScanArm and VTube-LASER also give us the ability to quickly reverse-engineer any customer-supplied pipes,” explains Kelle Vos, general manager for Auto-jet. “We used to do that manually with squares, tape measures, and calculators. Our guys are experienced professionals, they’re really good at what they do, but reverse engineering manually is very time-consuming. Now we scan the pattern, and the system does the rest. Everything runs through the FARO ScanArm and VTube-LASER software now. This system also creates and saves files for future use at the same time. We’ve essentially cut our reverse engineering time in half.”



Programming

“Our operators are saving somewhere between 10 to 15 hours per week in programming time – and that’s a conservative figure,” says Vos. “Some of these are very complex pieces. What our operators would have had to do manually is now done using the ScanArm and VTube-LASER. We can request IGES and STEP-files so it’s seamless communication with our VTube-LASER software. This allows us to basically upload part dimensions into our (tube-bending) machine exactly how the engineer drew it. It also helps us highlight any design flaws that we may need to communicate back to the customer before we ever actually set up the machine. No more setting up, determining problems, then experiencing downtime waiting for customer changes, and then adjusting our setup. The time and cost savings are tremendous.”



Scrap Reduction

“Previously, dimensioning and machine setup was all manual,” says Vos. “We had to manually figure dimensions from a print, which then had to be manually entered into the machine program. Now we upload a file or scan a part, then build that part program within VTube-LASER software, and then we have a template to work off of. So once we scan that first part, it compares the scan with the virtual part, and instantly makes any necessary corrections and sends the changes right down to the bending machine.

“The very next piece is 100-percent accurate,” explains Vos. “When each piece may be up to 8 ft long with multiple angle bends, and it’s all done manually, the scrap can add up quickly. What that boils down to is a scrap-rate reduction of up to 25 percent on first-article inspections alone.”

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The time and money saved with the improved workflow has also allowed Auto-jet to invest more resources in the continuing advancement of its employees. With assistance from FARO and Advanced Tubular, Auto-jet offers weekly training classes to help improve the operators' efficiency and overall awareness of the technology solutions available – as well as the solutions' applicability to any given project.

“We look at our investment in FARO and VTube-LASER as an investment in both our employees and customers,” concludes Vos. “It helps them work more efficiently, which in turn meets and exceeds our customers' high standards for quality. The ROI has been instant and ongoing.”

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