

Using 3D Scanning for Design and Quality Assurance

Ryan E. Day | Contributing Editor / Content-Marketing Coordinator | Quality Digest
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AWE Tuning Integrates the FARO® Edge ScanArm HD to Turn Concept into Reality



Brian Vinson may have one of the best jobs in the country. Vinson works as director of engineering with AWE Tuning, an automotive aftermarket company that provides award-winning, handcrafted performance exhausts, track-tested carbon-fiber intakes, and performance intercoolers.

“Well, we do get to play with some very interesting vehicles on occasion,” says Vinson. “We have a top-notch team, all focused on one goal: making best-in-class performance products.”

But it’s not all fun and games when engineering excellence is in your company’s DNA. It’s a considerable challenge for a company continually striving for higher standards in a dynamic market.

“This is not a company that’s going to do just a few applications per year,” explains Vinson. “We have more than 500 SKUs, and that continues to grow, but as products are no longer supported by the market due to aging car models and subsequent lagging model popularity, SKUs drop off the back end to make room for new ones. We’re always on the pursuit for new vehicles to support and new arenas where we have not previously been.”

Supporting that kind of quality and growth mindset requires the proper tools.

AWE Tuning Chooses 3D Scanning to Enhance State-of-the-Art Facility

“In 2015 we moved into this beautiful 33,000 sq. ft. facility on four acres in Horsham, Pennsylvania,” boasts Vinson. “It’s filled with new equipment, new people, and new processes. Our volume capability has gone up significantly, our product launch strategy has increased, and that’s where the FARO Edge ScanArm comes in. It’s one of those great tools to help get from concept to reality faster, which is one of my charges here as director of engineering. You have to have the right tools to do that.”

“The time savings is huge; there’s no way you could do that work by hand and be as accurate, and anywhere near as efficient and fast, without the scanner. Without the FARO ScanArm, it would be days of measurements. There is no comparison in its ability to provide accurate data quickly ...”

**Brian Vinson, Director of Engineering
AWE Tuning**



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The FARO Edge ScanArm HD (high definition) is the perfect contact/non-contact measurement system. Unlike other scanning systems, the ScanArm can quickly switch between hard probing and laser scanning, with the Laser Line Probe attachment, without having to remove either component. Users can accurately measure prismatic features with the hard probe, then laser scan sections requiring larger volumes of data – all in one simple tool.

Non-contact measurement devices are becoming increasingly popular. Portable Measurement Arms provide a quick and effective way to inspect and reverse-engineer complex parts and surfaces. They turn everyday objects into digital computer models. Soft, deformable, and complex shapes can be easily inspected – all without ever coming in contact with the part.



The FARO Edge ScanArm is the ideal tool for inspection, point cloud-to-CAD comparison, rapid prototyping, reverse engineering, and 3D modeling, and has become an indispensable part of AWE Tuning's processes.

Using the ScanArm from Start to Finish

“When we decide to design a system for a certain vehicle, first we do our initial evaluation for performance and exhaust tone, etc. The very next thing we do is get it up on a lift and start scanning the full (original equipment) exhaust system and the path that it takes,” explains Vinson. “We have to create a digital model before we start any work. It’s the same process for any air box we do. Then we’ll do our design according to the data we took with the ScanArm, and create prototypes that are tested on the vehicle.”

After doing yeoman’s duty in the R&D phase, the ScanArm continues to be useful in the production phase, adding value end-to-end in the value chain.



“Once we decide we have what we want, we have to create fixtures for production,” says Vinson. “We use the prototype, which we measure against the CAD, and create the fixtures based on that, then we use the ScanArm to validate that the fixtures are correctly built. Next, we use the scanner again as a quality control (QC) tool for our own production and also for pieces that we have contracted out. It’s a matter of minutes at the docks to compare the parts to the model and make sure we got what we ordered. The (ScanArm) is our beginning-to-end tool, and in the middle, too. It helps us make sure that reality matches design.”

The ScanArm’s time savings, quality, and ease of use are a big hit with the AWE Tuning team.

“We just got a new vehicle in today, and by this afternoon we will already have all the information we need to begin an initial design,” reveals Vinson. “Tomorrow morning we’ll begin designing what we are going to put in there.”

Using 3D Scanning Technology for Design and Quality Assurance



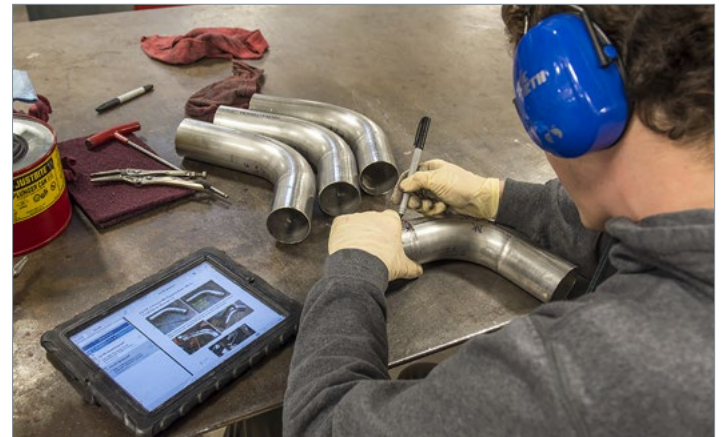
Integrating Equipment and Employees for Maximum ROI

“We have a robot we affectionately call “ABBi” to cut tubing and plates that are very difficult to cut by hand, so we’ve created programs to work with the robot,” says Vinson. “Data from the FARO ScanArm is used to help create those programs and validate the cuts. We have a beautiful CNC bending machine called a Crippa that is a big part of what we’re able to do now. We use the ScanArm specifically to create those paths through CAD by modeling with factory equipment in the area we’re going to work in. Everywhere you look here, there’s a slot for the ScanArm. Working in the digital world exclusively allows things to happen quickly. It’s an integral part of the way we do things.”

“The time savings is huge; there’s no way you could do that [work] by hand and be as accurate and anywhere near as efficient and fast without the scanner,” says Vinson. “Without the FARO ScanArm, it would be days of measurements.

Apparently, the ScanArm integrates with personnel just as well as it plays with other equipment.

“There is no comparison in its ability to provide accurate data quickly that is good enough for us to start our job right away. With the laser scanner you get all the bumps and wiggles in one pass. I love watching it happen; I just think it’s cool. You can see the point cloud appear as you’re scanning. It’s like spray painting. The ScanArm has great ability to see, even with shiny spots and areas that are difficult with other technology.” This ability to capture dark and shiny surface is a result of the ScanArm’s optically-superior blue laser technology. Many other systems still utilize dated red laser technology.



How fast does the scanner gather data? “After we got the laser scanner, I asked my guys how fast it was to use,” laughs Vinson. “They wondered if I would believe something like 500 percent!”

“You think of exhaust manufacturing as a kind of dirty dark business, but you come here, and it’s all very well-lit and organized into different build cell-type areas,” says Vinson. “These areas are equipped with iPads, so our people are able to access, zoom, and flip through build order instructions, which is kind of unique.



“It’s a different world now with people graduating who have played with much of this type of technology and integration. They certainly don’t want to show up at a shop and get handed a slide rule and micrometer. We have a guy here on the engineering staff who was new to the ScanArm, and he has become quite proficient with it in no time at all. He’s taking his own data and manipulating it and making designs out of it, and can be counted on to do QC with it as well. To have high-tech tools at their disposal communicates to our people that this company is moving forward and living in the future, not the past.”

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Both Feet in the Present with One Eye on the Future

In its quest to bring high-quality performance products to new audiences, AWE Tuning has finally won over the American auto enthusiast with offerings for the Ford Mustang.

“We’ve finally branched out, and we are super-excited about that,” says Vinson. “We have a very different approach to anything the Mustang market has seen. This is going to be very different in a very good way. The Mustang has come a long way with the body style, suspension, and a more upscale interior, so it blends well with the types of products we’ve been creating in the European market. It’s a natural progression as we look for other markets to get into that we haven’t touched.

“Put simply, our company culture revolves around one vision: to unlock performance,” says Vinson. “It’s in there – it’s just about unlocking it. With every test run, 3D scan, and CAD rendering, we ask ourselves, ‘Can this be better? Can we unlock more performance?’ I’ll tell you this: if you want to grow, you better be looking out the windshield at the future rather than at the rear-view mirror.”



Click above to watch a video on the Edge ScanArm.

To schedule a **FREE** 15-minute personalized live web demo of the Edge ScanArm

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