

ICI 3D SCANS

ITS WAY TO

AUTOMOTIVE

AFTERMARKET SUCCESS

Thanks to the FARO® Design ScanArm, ICI engineers have accelerated the laborious measurement process, allowing more time for design and creativity.





Developing a front and rear bumper design for a truck would have taken ICI engineers about 80 hours with their previous manual disassembly, measurement and modeling process. Now, using the FARO Design ScanArm, the same process can be done in 24 hours.

■ Bumpers, side steps, rocker panels and fender trims—they are the must-have accessories for drivers who love to trick out their rides. In the world of off-road vehicles and utility trucks, [Innovative Creations Inc. \(ICI\)](#) has a 30-year track record of delivering the goods that transform the everyday vehicle into something with personalized style.

A long-time supplier of stainless steel trim products, including a first-of-its-kind stainless steel polished side step bar, ICI began branching out in 2013 into a broad array of engineered products under the new MAGNUM brand, including highly formed goods like custom grilles. The company maintains a large portfolio of accessories, with options covering most of the leading truck brands, including Ford, Chevrolet, GMC, Dodge, Jeep, Toyota, among a handful of others.

As ICI's product line grew in breadth and sophistication, its long-standing design processes came under pressure, especially the way in which it captured vehicle measurements as a basis for building the core 3D CAD models to initiate accessory designs. While some car manufacturers make 3D models of popular trucks readily available through the Specialty Equipment Market Association (SEMA), it was hardly universal. That meant the ICI design team was often pressed to take an alternative route, which was not only inefficient, it also cut into design time, according to Nathan Lammey, ICI's Sales and Marketing Coordinator.

Here's how ICI's traditional design process typically unfolded: ICI worked its extensive dealer and customer contacts to borrow the latest vehicle makes and models, getting them in-house for a brief time so the design team could disassemble bumpers, physically record measurements, and create a mock-up of the pertinent vehicle areas by hand, Lammey explains. The resulting 3D CAD model served as the basis for defining or refining an accessory design; once it was validated and tested, it was sent off to ►

manufacturing, which with a few exceptions, ICI primarily performed in-house.

Typically, it might take anywhere from a month to two months to track down the latest vehicle model and get it in house, with another two weeks to do the disassembly, gather the requisite dimensions, build a prototype, and then test it on the vehicle to make sure it was an appropriate fit, Lammey explains. "Sometimes it might take a while to find a truck, which of course could delay the manufacturing and design process," he explains. "In addition, it was often crunch time because the team didn't really have the vehicle long enough to have all the design time they wanted."

Introducing 3D Scanning to the Mix

ICI put the brakes on the laborious measuring and design process last November when it decided to introduce 3D scanning into its design workflow. 3D scanning had become an industry best practice, and the ICI engineering group prides itself on staying current with the latest tools and technologies to create optimal and cost-effective offerings for its customer base. "Whether it's distributors, dealers, or consumers, they want to know that we are leveraging all of the best technology available to produce a product that's a perfect fit," Lammey says. Time to market was also a growing concern. "Our traditional process might delay our ability to release a fully completed product and others might beat us to it. It's nice to have first-to-market advantage."

After evaluating a number of options, ICI opted for FARO's Design ScanArm, a high-resolution scanning device targeted specifically for reverse engineering and CAD-based design applications. The FARO portable scanning device, equipped with an arm, was chosen over competing wireless options despite the fact that the lack of a fixed point had some appeal since there were no limits on flexibility during scanning, notes Kyle Dahlquist, ICI's Lead Product Development Engineer. Because ICI engineers don't need

to scan the entire vehicle—only the front grille area or the roof—Dahlquist says the fixed nature of the Design ScanArm was fine for their use.

On the other hand, the ease of use and lower cost of the FARO Design ScanArm were appealing selling points, Dahlquist says, explaining that ICI didn't really have a need for a lot of the bells and whistles featured on competitive, more expensive scanners, including capabilities like built-in Wi-Fi and flip-out screens.

Perhaps the biggest selling point of the FARO Design ScanArm was its tight integration with Geomagic® for SolidWorks®, a software tool that provides a fast and more seamless way to import scan data into ICI's CAD tool of choice, Dahlquist says. "The other options required us to use a separate program to convert something to use with SolidWorks," he says. "With this solu- ▶



By using the FARO Design ScanArm, ICI has significantly reduced its design time. The company can now release products to market much faster.

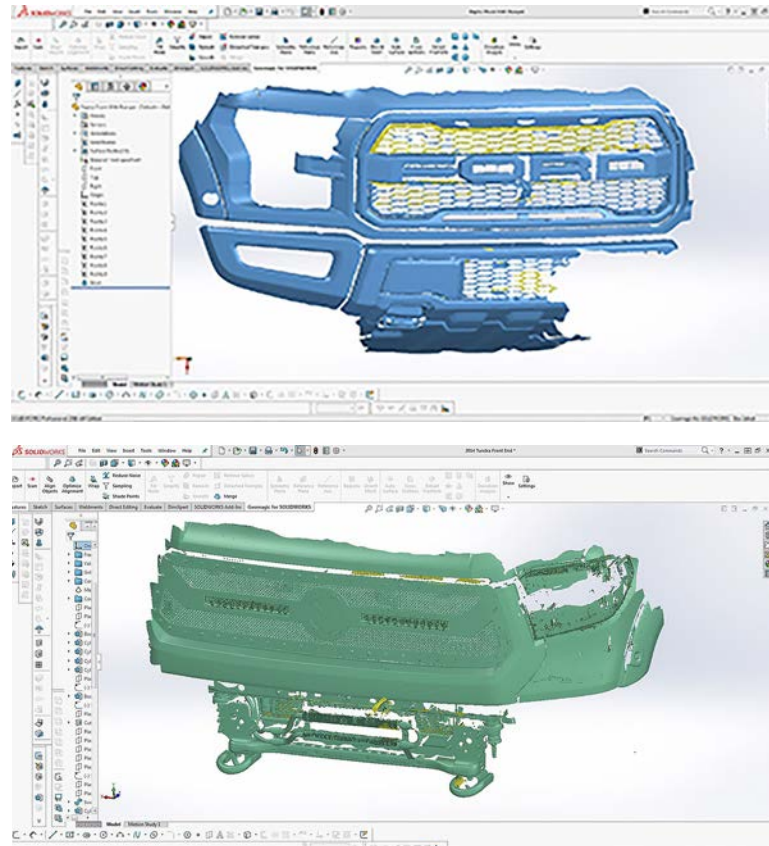
tion, the whole time you are using the scanner, you are using SolidWorks. It reduces the learning time.”

Despite the tight integration with SolidWorks, Dahlquist admits there was still a bit of a learning curve to master how to work with the scanning world’s point clouds and file conversions. “You have to clean up the file in order to turn the model into a surface you can design off of,” he says. FARO provided ICI engineers with eight hours of training to ensure they were fluent in the software.

Time-to-Market Advantage

■ Since swapping out manual measurement processes for 3D scanning, ICI has been able to significantly reduce its design time and consequently, release products to market much faster. As an example, Dahlquist cites a recent project to develop a front and rear bumper design for the Toyota Tacoma. With the old workflow, he estimates it took about 80 hours in total to get to a prototype that properly fit the vehicle, not to mention, building five prototype bumpers before they got one right. “Now, with the scans as a basis for creating the 3D models, I can do that same thing in about 24 hours,” he explains. It also gives the team more time to spend exploring design concepts since they aren’t pressured with time constraints related to having to return a vehicle, Dahlquist adds.

In addition to leveraging the FARO Design ScanArm to create CAD models, the group is also using the 3D scanner for reverse engineering applications. While ICI manufactures most of its products in-



FARO’s tight integration with Geomagic for SolidWorks allowed ICI to work with scan data in a familiar software interface.

ternally (it’s a fully certified steel plate facility), it does not have production competency for some manufacturing technologies like tubing, for example. Instead, it forges partnerships with other manufacturers, which produce those goods according to ICI’s specifications. However, many of those firms don’t have the proper 3D CAD files for ICI’s design team to work on. ▶

At a Glance

Company: Innovative Creations Inc. (ICI), Peoria, AZ

Year Founded: 1990

Markets served: Manufactures and sells a wide range of aftermarket vehicle performance parts and cosmetic accessories for all Chevy, Dodge, Ford, GMC, Jeep, Nissan, and Toyota cars and trucks.

Design ScanArm Stats

The FARO Design ScanArm is a portable 3D scanning solution tailored for 3D modeling, reverse engineering, CAD reconstruction, and maintenance, repair, and overhaul applications, among others. Its notable features include:

- Optically superior blue laser technology to ensure capture of highly detailed and noise-free scan data.
- Rapid scanning speeds to do an extra wide scan stripe and fast frame rate, which expands laser coverage for fast point cloud capture.
- Advanced algorithms enable scanning across challenging materials without degradation due to contrast or part complexity.
- Simple user interface designed for easy operation even for those lacking 3D scanning experience.
- Support for a variety of 3D Systems' Geomagic software packages, including Design X, a reverse engineering application, and Geomagic for SolidWorks, which directly imports scan data into the popular CAD tool.

That's where the 3D scanning capabilities come into play. The ICI design team scans the prototype of their partner's design to create a SolidWorks model that they can further iterate, test, and make sure it properly fits on the vehicle prior to production, Dahlquist explains.

The 3D scanner is used pretty heavily during the front-end of the design workflow. It has been a game changer for ICI's design process, primarily because of speed. ■

"All of our stuff is based around time. How long it takes to design a product or how long it takes to get a product to sales so they can run with it. That's the most critical aspect, and all of our metrics with 3D scanning are related directly to that."

— Kyle Dahlquist,
ICI's Lead Product
Development Engineer

For more on FARO's scanning solutions, visit faro.com

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