

Trinity Forge Uses a Forward-Thinking Approach to an Ancient Process



Trinity Forge saw FARO's pricing, the equipment's ease-of-use, and the quality of the tool itself as their deciding factors. Within two months, they were at full steam and scanning, modeling scans, and reverse engineering dies and parts for maintenance.

"The speed at which we can operate is a great value to us. Several new dies from the CNCs can be scanned in the morning and approved in the afternoon. Reverse engineering of parts, maintenance of parts, or die models are all a snap using FARO."

FARO

From agriculture to oil, from railroads to aircraft, the dedicated craftsmen and support specialists at Trinity Forge maintain a standard of excellence that makes them a top-rated supplier in any industry. If your company utilizes forged parts, you can trust Trinity for unmatched flexibility, versatility, quality, and – most of all – a passionate commitment to service.



Based in Mansfield, Texas, Trinity Forge (www.trinityforge.com) is a modern, closed-die forging plant that specializes in complex shapes in a wide variety of sizes to meet the most stringent customer specifications. They also provide value-added machining to forgings as well as job-shop machining services and die-and-mold machining.

Trinity's commitment to quality requires them to not only stay on top of customers' needs, but to stay ahead of them. That's why Trinity Forge was the first closed die (or impression die) commercial forge in the United States to receive ISO 9000 certification and why they continue to invest in the latest forging and machining technologies and quality controls. They also earned an AS9100 certification ensuring their ability to meet the most stringent specifications, including those of the military and aerospace industries.

Problem

As might be imagined with a forging company, Trinity Forge must inspect very large dies – often weighing from 500 to 4000 pounds. To inspect such large and cumbersome dies, the typical practice was to pour a plaster cast and then measure that cast on a fixed CMM. The difficulty with this method was that the inspections were of the cast impressions and not of the actual die faces.

Trinity wanted to improve their inspection process to include scans of the entire die face, the actual die face and not just the impressions. Gaining this scanning capability would give them the ability to track critical die wear features, learn from the die wear, fix potential problems before they became actual problems, and engineer tooling changes to alleviate wear.

Solution



After surveying potential solutions, Trinity Forge decided to use the FARO Laser ScanArm® with Geomagic® Studio/Qualify 12 software. Their ScanArm combines the contact measurement of the FaroArm® Platinum with the non-contact capability of the Laser Line Probe V3. Geomagic's Studio/Qualify is one of the leading reverse engineering and inspection software solutions available. This hardware/software combination gives Trinity the total solution they were looking for to upgrade their inspection process.

Trinity saw FARO's pricing, the equipment's ease-of-use, and the quality of the tool itself as their deciding factors. Within two months, they were at full steam and scanning, modeling scans, and reverse engineering dies and parts for maintenance.

"We use the ScanArm daily – with three main objectives," said Todd Sheppard, VP of Quality and Engineering at Trinity. "It's used to inspect a die when it comes off the CNC machine. It's also used, almost daily, to track die wear. And it's used to reverse engineer a product that may not have prints or legacy data available."

Mr. Sheppard said that they use the ScanArm for part inspection, but very little. It's more important role is to inspect reworked dies by validating the CNC machining relative to the Pro/ENGINEER models. They also use it to monitor die wear on certain product classes by comparing a die face scan to the die face model or even die face scans to die face scans.

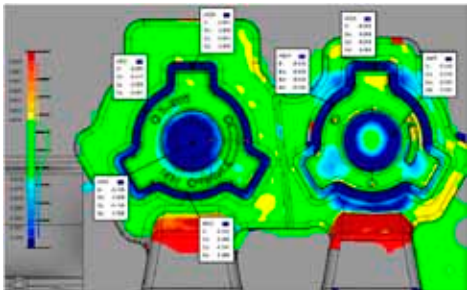
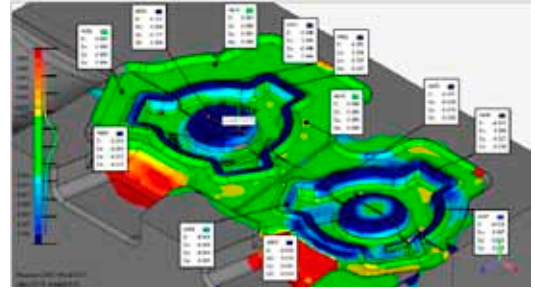
"The ScanArm has eliminated the need to make a plaster cast," said Sheppard. "We now go straight from the

die to the scanner. Obviously, being able to monitor die wear in a way that we couldn't before is huge. Before, we could only guess how bad a die was or take the time to pour casts and measure point-to-point. Not the same as laying a scan over the model or the previous scan as we can do now."

Return on Investment

Due in part to their engineers' careful die designs, Trinity often completes entire manufacturing runs with minimal rejects – thus saving man hours, materials, and delays. They use frequent quality-control inspections and statistical controls to monitor the forging process – ensuring consistency and quality throughout a production run.

By implementing the FARO Laser ScanArm solution into their processes, Trinity Forge is now able to check dies in about half the time as they did before using older techniques. They don't have to pour a plaster and wait for it to cure. Scanning is very quick and, on average, it takes only one hour per die and thirty minutes of modeling time. Mr. Sheppard said that, in other words, scanning helps their throughput.



Trinity is also scanning some of their older legacy dies and making changes to the scanned die models per customers' requests. This type of change was done on manual mills in the past. Now they can use their CNCs to make complex changes and have current data for their customers.

"The speed at which we can operate is a great value to us," said Sheppard. "Several new dies from the CNCs can be scanned in the morning and approved in the afternoon. Reverse engineering of parts, maintenance of parts, or die models are all a snap using FARO."

Trinity Forge has stood the test of time by using a forward-thinking approach to an ancient process. They have earned the trust and respect of the world's best-known OEMs one company and one project at a time. By looking outside the traditional box and implementing technology like that provided by FARO, Trinity Forge further embraces their history of innovation, success, and unyielding quality.