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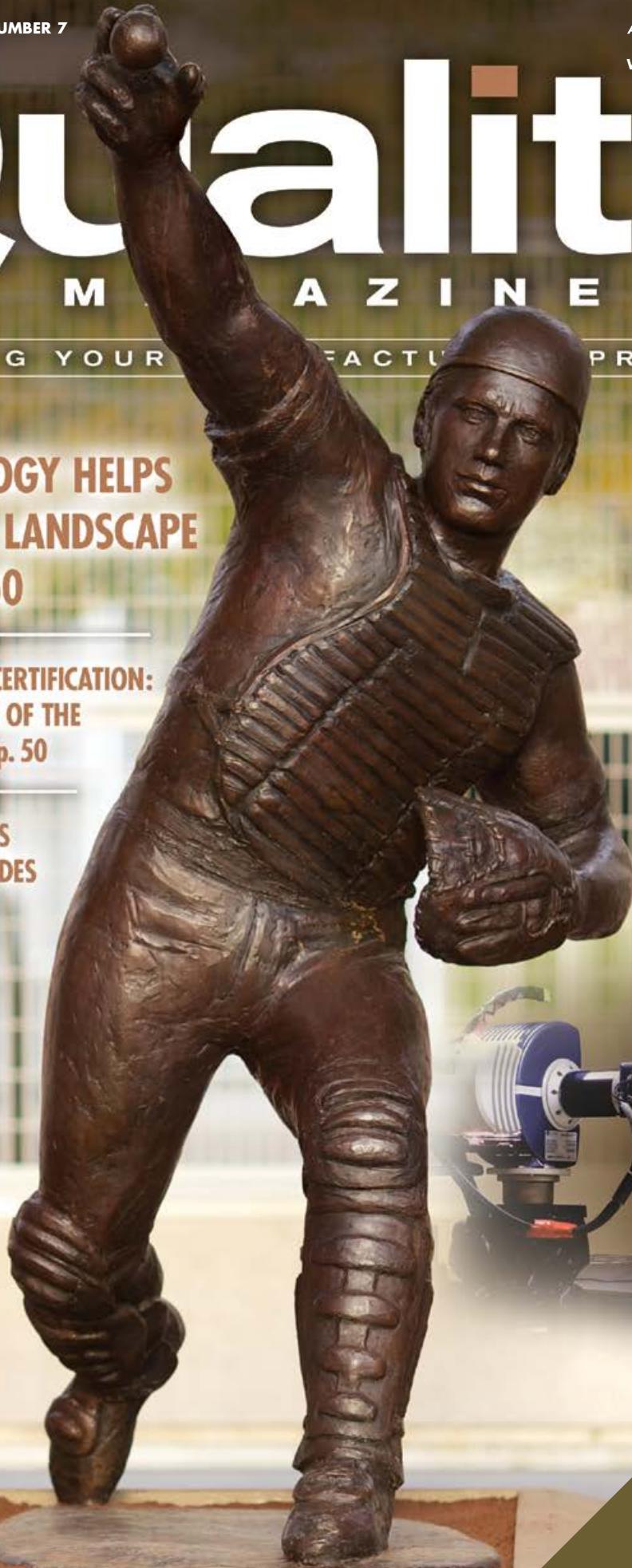
M A Z I N E

IMPROVING YOUR MANUFACTURING PROCESS

**3-D METROLOGY HELPS
TRANSFORM LANDSCAPE
IN CINCY p. 60**

**TIME, MONEY AND CERTIFICATION:
12TH ANNUAL STATE OF THE
PROFESSION STUDY p. 50**

**REGISTRAR, SERVICES
AND SOFTWARE GUIDES
BEGIN ON p. 32**



INSIDE THIS ISSUE
AEROSPACE
LOCATED AFTER p. 16
Vision & Sensors
LOCATED AFTER
p. 28



3-D METROLOGY

HELPS TRANSFORM LANDSCAPE IN CINCY

Exact Metrology Helps Make “Greatest Catcher Ever” Even Bigger.

As you enter Cincinnati’s Great American Ball Park for a baseball game, you’ll now be greeted by none other than Hall of Fame catching Johnny Bench. Well, not Johnny Bench himself, but a fantastic representation of the Reds great and member of the “Big Red Machine” team in the form of a bronze statue.

How did it get there? The combined talent of sculptor, Tom Tsuchiya, and the tools of Exact Metrology (Cincinnati, OH), a 3-D measurement services and solutions company.

Exact Metrology had the pleasure of working with Tsuchiya on other projects, like his 50-foot “Light of

the World” statue visible from Ohio’s Interstate 75. The process for transforming his smaller Johnny Bench model into the final version followed a similar path too—from the development process to the scanning technology used.

“When you create a sculpture out of bronze, it’s something relatively permanent that’s going to be around for hundreds, maybe a thousand years. With someone like Johnny Bench, who’s very popular and a lot of people know about him, you feel that you’ve got to do it right. There’s that kind of heavy responsibility,” said Tsuchiya.

Exact Metrology chose to scan the scale model statue with its Breuckmann StereoScan white light scanner, as this 3-D scanner provides the highest resolution of any scanner in its toolbox. *Source: Exact Metrology*

First, Tsuchiya spent hours with the legendary catcher as well as other players to capture just the right pose for the sculpture. He then created a scale model version around that pose of how he envisioned the Johnny Bench statue to look.

Of course, he would need to accurately turn that model into a much larger one, which is where Tsuchiya turned to Exact Metrology once again.

MAKING THE GREATEST CATCHER EVER BECOME EVEN GREATER

Once his smaller scale model was ready, Tsuchiya brought the concept to Exact Metrology. Exact Metrology is an ISO9001-certified, full-service measurement services company, with a vast array of probing and scanning technologies at their disposal. From parts as small as a human hair to jumbo jets, they’ve scanned just about everything imaginable.

Exact Metrology chose to scan the scale model statue with its Breuckmann StereoScan white light scanner, as this 3-D scanner provides the highest resolution of any scanner in its toolbox. The StereoSCAN consists of a patented MPT (miniature projection technique) projection unit combined two high resolution digital cameras that offer up to 6.6 mega pixels. This non-contact scanner projects a white light fringe pattern on to the part, and then the dual cameras capture up to six million points per scan. The StereoSCAN also features three different triangulation camera angles to capture areas that would be challenging to access otherwise.

Since Tsuchiya wanted a high level of detail in the final scans, Exact Metrology scanned the scale model statue using a small field of view (FOV). Although the StereoSCAN is capable of capturing the majority of the scale model statue in one scan, by reducing the FOV, Exact was able to capture six million points of data on a very small portion of the scale model statue. This

scanning process was repeated, and the data was processed and merged in Breuckmann's OptoCAT 3D image processing software.

Both high resolution and low resolution data was delivered to Tsuchiya, which he was able to review using the Polyworks IMView™ free viewer utility. In addition to the as-is scan of the scale model, Exact Metrology scaled up the final scan to provide a full-size version, helping the sculptor to create the mold for the final statue.

"Exact Metrology's scanning has revolutionized the way I make sculptures today," states Tsuchiya. "In the past, the process of enlarging from a scale model to the life-size by hand was arduous. The digital scanning enlarges the model with 100% accuracy and ease."

WHITE LIGHT SCANNING, NOT JUST FOR ART & CULTURAL APPLICATIONS

With its extremely high resolution and quick scan times, white light scanning is an ideal technology for the 3D digitization of just about any object, but the practical uses don't end there. "We've found the applications for white light scanning to be almost limitless," states Dean Solberg of Exact Metrology. "The portability and ease of use of the technology allows for quick and accurate mold analysis, first article inspections, deformation analysis, reverse engineering and more."

The Breuckmann white light scanners used by Exact Metrology capture up to six million points of data per scan, and those six million points can be captured from areas ranging from a few square inches to a few square feet. "For sizeable objects, we can use a larger field of view to reduce the overall scan time," states Solberg. "When resolution and scan quality are critical, such as with the Johnny Bench scale model statue, we can use a smaller field of view to concentrate the scan in a very small area of the part, giving us very detailed scan data."

THE UNVEILING

After supplying the initial poses, Bench himself never saw the statue prior to the unveiling. He said he wanted to be surprised and anyone in attendance that day could see he certainly was emotionally moved. In fact, Bench said



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with all seriousness that the statue along the Reds Hall of Fame meant even more to him than his plaque in the Baseball Hall of Fame.

"I'll never take off the Hall of Fame ring, but how many hundreds of thousands of people will walk by (this statue)?" said Johnny Bench. "Here, it stands alone as a symbol for what I stood for."

DID YOU KNOW?

Tom Tsuchiya has created the other four player sculptures currently

located at the main entrance of Great American Ball Park. When the Johnny Bench project was completed, Exact Metrology used white light scanning technology to scan the small versions of the other four statues for the Cincinnati Reds to develop into models and promotional giveaways.

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