

Building the Las Vegas Sphere with Hexagon



For owners Jeff Van Horn and Cindy Van Horn, Industrial Technology Solutions Inc. (Industrial Tech) in Jonesboro, Arkansas, is a family affair. The 12-employee company has his wife as president and two sons working with the company as mechanical engineers. Austin Van Horn owns and operates E & M Solutions as a Professional Engineer (P.E.).

The engineering experience the family has brought to the business was key in the definition of the Metrology CAD Assisted Solutions (MCAS) process that Industrial Tech has developed – using Hexagon’s laser trackers and scanners – which has saved fabrication shops and erection crews hundreds of thousands of dollars.

One such project was the MSG Sphere, which opened near the Las Vegas Strip in September 2023. Industrial Tech was tasked with verifying the placement of the steel trellis and immersive structures that make up the inside and outside screen support surfaces.

What’s critical with the steel erectors is that the product is correct before flying into place,” says Van Horn. “It costs a million dollars a day on major projects, so if you have something messed up that you have to bring back down, you just cost everybody a lot of money.”

Challenge

The MSG Sphere was envisioned as the most impressive indoor entertainment venue in a town where every attraction seeks to outdo all others. At a final cost of \$2.3 billion, the completed Sphere stands as the most expensive attraction in a city famous for its extravagance.

The Sphere features the world's biggest and most detailed wraparound LED screen, which form the outer and inner surfaces of the large immersive venue inside. Those 580,000 square feet of LED displays on the outer shell can transform the Sphere into anything from the Moon to a gigantic scoreboard for racing events. And with 875,000 square feet of interior space on nine levels, it's also the world's biggest spherical building.

However, to succeed, the Sphere's construction process had to be verified in real-time to avoid costly mistakes. That's why W&W AFco Steel and W&W Steel Erectors tapped Industrial Tech to help with the tracking of the trellis and immersive fabrication in several shops and on the job site. The two companies had previously worked together on projects such as Portland's new airport terminal, the Texas Rangers stadium (Globe Life Field), several Intel production facilities and the Taiwan Semiconductor Manufacturing Co. site in Arizona.

The Sphere had to be ready for its opening in November 2023. That was when the Formula 1 Grand Prix race would roar through Las Vegas, and the Sphere's owners wanted the new attraction to play a starring role in live coverage of the race.

Solution

After seeing a demonstration at W&W AFco Steel headquarters in Oklahoma City, Van Horn and his son Austin selected Hexagon's Leica Absolute Tracker ATS600 for their work on the Sphere because it can measure objects 60 meters (196 feet) away without reflectors. To them, it represented a game-changer. "We were just like, 'Oh. My. Word,'" Van Horn says of his reaction to the device.

The ATS600 enables a faster, safer process for large-scale metrology. "We can shoot things from a 200-foot distance to scan them and put them into a CAD model to verify their placement," Van Horn says. "When you do that with a traditional type of tracker, you have to get up on a platform, you have to fly yourself up or climb or crawl up into those spaces – which could be 250, 300 feet up above the ground—on a harness, hanging upside down sometimes.

The ATS600 also requires fewer people on site, while simultaneously taking up less time for measurements. "I can go all by myself, whereas a traditional metrology group would have two or three people," Van Horn says. "We do a lot of work in steel mills around the country and now we do not have to wait for downtime in order to take measurements. This is a big game changer for the steel industry – saves a lot of downtime."



Results

According to Van Horn, the MCAS, the ATS600 and the well-planned erection process from W&W Steel Erectors helped shave months off the Sphere's construction time. The outside of the Sphere was completed far ahead of the Grand Prix on 18 November, and imagery was even able to be displayed by the Fourth of July Independence Day holiday.

During the Grand Prix, the Sphere displayed real-time race statistics as the Formula 1 cars raced past. It also showed driver profiles and advertisements from major brands, including American Express, Mercedes Benz and Netflix.

Even before the race, the Sphere treated the Las Vegas area to such sights as scale models of the Moon, Mars, Earth and the Sun. It has also become a giant Jack o' Lantern, an eyeball, a tennis ball, a basketball and a number of cartoon characters. Inside, audiences have been treated to concerts by iconic rock bands like U2 and the Eagles, as well as the second edition of "Noche UFC".

Meanwhile, Van Horn and the company have doubled down on Hexagon metrology solutions, including adding two more ATS600 devices and a Leica Absolute Tracker AT500 to their toolkit.

The AT500 enables measurement distances of up to 160 meters (524 feet) from the tracker, making it ideal for Industrial Tech's work measuring the ML2 launch pad for NASA's Artemis program that aims to return us to the Moon and then to Mars.

Van Horn calls the ATS600 his company's workhorse. The company now has three of them in addition to the single AT500, along with an Absolute Arm for measuring smaller parts. Together, the tools replace nine trackers made by another manufacturer.

The shorter time on job sites enabled by the trackers has proven to be a boon to employee hiring and retention – Industrial Tech was able to double its headcount after acquiring the ATS600. "We can get on and off job sites very quickly compared to what we used to, and this makes everybody happy," Van Horn says. Now, employees can spend more time with their families.

Plans are being made to build more Spheres, and Van Horn says his company is ready, thanks to the experience gained from the original Sphere and the unique functionality of Hexagon's laser trackers. "If asked, we will go all around the globe doing other planned Spheres," he says.





Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter.

Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at [hexagon.com](https://www.hexagon.com) and follow us [@HexagonAB](https://twitter.com/HexagonAB).