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Expanding upward and outward A sheet storage tower helps Watson Engineering's laser operations grow up

By Dan Davis, Executive Editor
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Watson Engineering didn't have to add any laser operators during its most recent expansion effort. The reason was technology advancements associated with material handling and modern laser cutting devices.

It's elementary for Watson. If Watson Engineering wanted to keep up with its customers in the heavy-duty equipment industry, it needed to expand its fabricating operations, quickly and efficiently. CNC machining, laser cutting, tube fabricating, vehicle prototyping services, and welding had been part of the company's service offerings for years, but that wasn't enough. That's why the company added deep-drawing, heavy-gauge fabrication, and powder coating capabilities and more than 20,000 square feet of facility expansion to its 135,000-sq.-ft. campus in Taylor, Mich., in the last four years.

Watson Engineering didn't have to add any laser operators during the most recent expansion effort. It's not that the company was against the idea; in fact, it has expanded from 88 employees to 200 just in the last three years. The reason was technology advancements associated with modern laser cutting devices. The cutting speed, programming, and material handling improvements made higher productivity possible without higher labor cost.



The LVP^{PLUS} laser cutting machine not only is designed to be 50 percent faster than older models, but also features automatic lens focus and height adjustment.

Buzzing With Activity

"Sheet utilization' is the buzz word now," said Dave Watson, Watson Engineering's manufacturing manager, in a telephone interview as he visited potential expansion sites in South Carolina.

The company learned that concept quickly in November 2004. It had installed an LVPLUS 3015 laser manufactured by Mitsubishi, and the increased speed was a pleasant surprise when compared with older laser cutting units. Within a year the company ordered another 3015 laser, this time an LVP model, and a 12-shelf Auto-FlexMS HP material handling tower capable of storing as much as 6,000 pounds of material in each shelf.

The two newer lasers, with 4-kW laser resonators and 5- by 10-foot beds, replaced two older Mitsubishi models. The company still owns a Mitsubishi laser it purchased in 2000. The older laser, with its 4- by 8-ft. bed and a pallet changer, was the company's first experience with semiautomated material handling in laser cutting.

"The old equipment was nice, but the new technology is so much better," Watson said.

Firsthand Experience

Brian Nycz, a 13-year company veteran and a laser operator since the company got its first laser in 1994, can testify about the new equipment's performance.

"Things have changed a lot," he said.

When asked how his job has changed, Nycz said he's not on a forklift as much. Shop personnel will load the racks up with sheet, mostly from 0.06 to 0.24 inch (1.5- to 6 mm) thick, and the two laser cutting machines can operate for several hours without stopping.

"If we know we are running a really large job," Nycz said, "we'll use two or three racks with the same [sheet] thickness, so we don't have to stop."

Because he's not on the forklift as much, Nycz can spend more time programming the lasers. MetaCAM nesting software, developed by Metamotion Inc., is used to plan laser cutting patterns. The software features a part rotation function to maximize material usage on a rectangular or an irregularly shaped sheet and filler part placement to minimize scrap. Once a program is created, it can be saved in a library for reuse when the part has to be cut again.

"Before [planning the nest] was a struggle. It was an up-and-down concept, and it was time-consuming," Nycz said. Each laser operator was responsible for programming his machine for the day's operations.

Now one laser operator programs jobs for not only his shift, but the overnight shift as well. Nycz does the programming from the shop floor, so that he can keep an eye on all laser operations and the laser cutting schedule coordinated with Ncell software.

With the Ncell software, Nycz can find out what is being fabricated, what is scheduled to be fabricated, and when it will be fabricated—either at the PC on the shop floor or in the front office. The software determines which laser is the best choice to cut specific parts and bases that decision on variables such as material type, thickness, and part size. And because the software's database can read CAD geometry, it is always aware of any drawing changes.

Nycz, however, is spending most of his time on the shop floor nowadays. There, he can keep tabs on machine performance, which is not as demanding as it once was. He said laser operators had to spend plenty of time manually adjusting laser torch height and lens focus on the older machines. Anytime the older laser cutting machines cut 0.31-in. (8-mm) sheet, Nycz added, the laser operators manually had to clean the lens of spatter. But with the newer machines, those activities are automated. When new material is introduced to the LVPLUS, the laser torch moves to the corner where the height is adjusted and the lens's focal point is found automatically. The LVP requires manual height adjustment, but does feature the automated lens focus feature found on the LVPLUS.

The LVPLUS has other features designed to maintain uptime as well. Through the "Mels Eye" feature, the laser's monitoring system can track each cut and stop processing when a burn is detected, preventing nozzle damage. Through the same technology, the laser can determine when the beam has gone all the way through the material during conventional oxygen piercing, which eliminates waste in the pierce time and minimizes nozzle exposure to the pierce.

The machine's performance is a considerable step up versus older generations, according to Nycz. Today the laser can cut a 0.12-in. (3-mm) sheet of parts in 3-1/2 minutes, whereas the same job might have taken eight minutes with the older machines.



Thanks to the 12-rack material storage tower, laser operators aren't spending as much time on forklifts loading the laser cutting equipment.



New nesting software helps to fit as many parts as possible on one sheet. These parts are destined for inclusion on heavy-duty equipment.



Laser cutting equipment and press brakes go hand-in-hand in a job shop. Approximately 80 percent of the parts that Watson Engineering laser-cuts are bent on three nearby Toyokoki press brakes.

More of the Same

By the end of the year Watson Engineering plans to add two more laser cutting cells with automated material handling. Watson said it's the only way that the company will be able to keep up with customers' demands. One of the cells may end up finding a home at the company's sister company yet to be opened in the Deep South.

After that Watson said his company is looking to add some sort of automated bending. The efficiency of the laser cutting cell is putting greater pressure on the three Toyokoki press brakes and the operators.

"I'm taking a 10,000-foot approach to our business, and I see that as an obstacle," he added. "It takes a long time to educate a person on making a good bend repeatedly."

Watson Engineering may not be totally where it wants to be with bending capabilities, but it is much more flexible today. Its new laser cutting cell has helped achieve that goal.

Hot Rods to Prototypes

It makes sense that Watson Engineering might have automotive roots since it's located in the Detroit area.

Chuck Watson Sr. founded the company in 1981 in the same town Watson Engineering is located today, Taylor, Mich. His business catered to hot rod owners, for whom he welded custom exhaust components.

Fast-forward 25 years later, and Watson Engineering has a wide customer base, not just automotive clients anymore. But the company still is involved with the automotive industry, occasionally even doing vehicle prototypes for the large U.S. automakers.

"That's the thing about Chuck Sr.," said Dave Watson, Watson Engineering's manufacturing manager. "When he decides to do something, he does it with the latest and greatest."

That's the attitude of a hot rodder—accelerator down and full speed ahead.

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