Metalformer Laser-Cuts in 2D, Manages Growth in 3D

Integration of sales, operations and business management opens the door to contract fabrication for cylinder-product manufacturer American Cap Co., which in just one year maxed-out capacity on its new 4000-W laser-cutting machine, and has just installed a second machine.

BY BRAD F. KUVIN, EDITOR

Who says there's no way to succeed as a metal fabricator in this day in age, when rising material costs eat fabricators alive and foreign competition circles the remains like buzzards? Eighteen-year-old American Cap Co., Wheatland, PA, sure has found a way to, as Jim Morrison sings, "break on through to the other side." Entrenched for nearly 20 years as a leading supplier of cylinder caps and related compressed-gas-cylinder products, American Cap has, since 2004, reinvented itself to include contract manufacturing on its resume, built on a foundation of high-power laser-beam cutting. Now, its standard product lines account for only 60 percent of business, the rest made up of a variety of custom fabrication contracts for a customer list of 30.

Editor's Note: To view a video of laser cutting of armor plate at American Cap Co., as described in this article, please log on to www.metalformingmagazine.com and surf to our online Multimedia Center.

When the firm installed its first laser-cutting machine in January 2005, American Cap owner-managers Todd Diehl (COO) and second-generation family owners Phil Moroco II (president) and Rich Moroco (CEO) envisioned a machine useful for producing laser blanks. The firm, 80-employees strong, deep-draws the blanks into cylinder caps and other related products. Much of its deep-draw metalforming is relatively low volume, not justifying investment in a blanking die.

A 4000-W Mitsubishi laser-cutting machine at American Cap Co. carves up 6-mm-thick primed armor-plate steel at a speed of 50 in./min.

"We had been sending out a fair amount of laser cutting to regional processors," recalls Phil Moroco, "and we felt that we could better control edge quality as well as lead time if we brought that capability inhouse. Any edge roughness can hamper our ability to deep draw, and some suppliers priced us out of the business because our volumes were too low."

While the firm used to develop its blanks using a circle shear, early on it found that the ability to cut a variety of blank designs on a laser-cutting machine was extremely valuable.

"For example, we just finalized a new design for one of our valve guards where a custom laser-cut deep-draw blank allows us to consolidate parts and eliminate an arc-welding process," shares Diehl. The process required a forward extrusion with a large cavity in the extrusion. Efficient blank development was critical to getting the job into production quickly, and to optimizing material utilization.

"In a very short period of time," Diehl says, "we were able to evaluate 13 blank variations without having to build a blanking die, stamp the prototype part and modify the die several times."

Taking it to the Streets

American Cap was founded in 1988 by Phil Moroco Sr., following his long and successful career in the steel-supply and brokerage industry. By the time the torch passed to the sons in 2004, the company had evolved to include CNC machining, welding and powder coating. Today it is owned by PTR Group, LP, which also owns sister company Joint Venture Tool & Mold, LLC, a supplier of injection-mold and die-cast tooling.

With its new laser-cutting machine tool up and running, the American Cap management team quickly found that it had a lot of spare processing time on its hands, and thanks to the operations expertise of Diehl (who the Moroco brothers brought on in 2004, soon after Phil Sr. passed away) crafted a plan to evolve into a laser job shop. Today, 75 percent of the laser run time—the machine runs 24 hours a day seven days a week—is for outside customers, typically OEMs and Tier One suppliers in a range of industry segments, including construction and farm equipment.

"While the cylinder-products business is solid and creates a great baseline for the company," Rich Moroco says, "we felt that we had to find a new path toward growing into a worldclass company, moving in a new direction. The key to that success is of course much more than just capital equipment. For us, it's been a three-dimensional management strategy—sales, operations and business management—that has ultimately allowed us to build our custom fabrication business to the point where we completely filled the laser with work in just over one year, and were able to invest in a second laser-cutting machine, installed in August."

"At our heart we were an integrated finished-goods supplier," continues Rich. "Our well-staffed engineering department, for example, can help customers develop designs based on manufacturability, and help manage costs. That type of integration eventually allowed us to successfully enter the laser-fabrication arena."

The laser-cutting machines at American Cap (Model 3015LVP-40 CFX units from Mitsubishi) run 4000-W resonators, with 5-by-10-ft. sheet capacity. Mitsubishi's machinery distributor for the area, RosCommon Machinery (Newbury, OH), helped American Cap's team select the right machine for its needs.

"RosCommon's laser-engineering expert, Mark Hanley Sr., also helped us evaluate the potential for marketing our laser-cutting capability," says Phil Moroco, "and brought us customers—other shops that were shopping for laser-cutting machines to support their own inhouse needs, but that weren't quite ready to invest in a machine."

RosCommon also sold American Cap a new press brake, a 10-ft. 125-metric-ton machine from Toyokoki, to complement its new cutting capabilities. "Phil said early on that if were going to be serious about moving into laser cutting," says Rich, "then we needed bending capability."

Press-brake bending is not the only complementary process to laser cutting that American Cap added.

"A lot of products being quoted required laser cutting and then CNC finish-machining," says Diehl. "So we have added four new turning centers and three new mills to improve our market position."

Focus on Operations Management

All of this new capability could strangle a relatively small and stable company, so the three-headed American Cap management team focused on operations management to help it digest so much new capacity.

"Back in 2004-2005, operations was our weak link," admits Phil. "So to help us better integrate operations and sales, we also set out to attain ISO certification by the end of 2005, which we accomplished. We had to get the plant ready for the work we were preparing to bring in."

Laser-blanking capability allowed American Cap to quickly redesign the base of this valve guard (see arrow) to consolidate parts and eliminate arc welding of the base plate to the cylinder (top left). The new process uses the developed blank shown to the right, and requires a forward extrusion with a large cavity in the center.

American Cap's laser-cutting machines process carbon-steel sheet and plate (50 percent) to 1 in. thick, stainless steel (15 percent) to ½ in., and aluminum (35 percent) to ⅜ in. Its active customer base includes an aftermarket DoD supplier that develops custom armor products for the military.

"Since 2004 this customer has grown by 300 percent," says Rich. "If we can support a company like that and feed its growth, then we are fulfilling the objective of building value with our customer, which in turn builds value in our company."

"Military work now comprises about 10 percent of our fabrication jobs," adds Phil, "and we hope to find other customers that not only need laser processing but that also can leverage our abilities to support design needs and get products out to the field quickly. While we expect our second laser-cutting machine to support the added capacity needs of our current customers, we've identified around 10 potential customers that we're confident can utilize our added laser-processing capacity."

American Cap has grown from $7 million in sales in 2005 to a projected $9 million this year, and expects to earn $11 to 12 million in 2007. Payback for each laser-cutting machine is less than three years.

Fine Tuning Keeps it Humming

When we toured the American Cap fab shop, one of the laser-cutting machines was busy carving up 6-mm-thick armor plate at a speedy 50 in./ min. However, the machine once struggled to keep that pace.

Says Diehl: "At one time our guys were running that job somewhat slower than we had expected, so I felt we had to change something. The material comes to us with a primer on it. Our first reaction was to blame the material, but we quickly found that not to be the problem. We found that we needed to go in and perform some maintenance and realignment chores. In a 9-hr. process, we realigned the cutting head, adjusted bend mirrors and replaced mirrors that were worn. We've been at full speed ever since, and now, along with weekly preventive maintenance on the machine, we schedule quarterly mirror alignment and replacement (as needed), as well as head alignment. You can lose a lot of power at the cut due to worn mirrors, and we can't afford to miss our run-rate projections and get behind.

"In a lot of cases we're supplying parts with a lead time of only 7 to 10

In one year's time, American Cap maxed-out capacity on its first Mitsubishi laser-cutting machine (background), so it decided to invest in a second identical machine (foreground), installed last August.

days," Diehl continues. "To ensure on-time deliveries, we are keeping an inventory of raw material of around $100,000. And for about half of our customers, we're stocking parts and shipping from stock."

"We shrink customer orders down to manufacturing orders," adds Phil Moroco. "In a typical month, we might receive 600 customer orders that we will squeeze down into around 100 manufacturing orders. Cost-wise, it often is cheaper for us to process several sheets in one run through the laser and stock the parts then it is to break into a job four or five times. The goal is to turn our raw-material inventory every 21 days."

Pay Me Now, or Pay Me Later

Diehl has learned a couple of lessons regarding raw materials as he's guided American Cap down the laser-cutting path. "Early on, we were experiencing difficulties processing steel that arrived with excess scale," he recalls. "So we decided to pay a little more upfront for pickled and oiled sheet steel. The added upfront costs—about a 2 percent premium—are easily justified in improved productivity and a more controlled process."

A better-controlled process of course means more predictable and accurate delivery quotes, not only making Diehl's job easier from an operations viewpoint, but helps Phil navigate the market for new work and ensure customer satisfaction, yet another example of the benefits of close integration between sales and operations.

"We establish target run times for every job," says Phil, "and let our operators know how much time they should need to complete a job on the laser. It's a great metric for us. Then we look closely at the quoted and actual run times so that operations is accountable. Our ISO procedures have helped with this, and now that we're meeting our target run times on more than 75 percent of our jobs, we've tied this directly to scheduling.

"Our manufacturing and sales teams are very tightly woven together," he summarizes. "They have to be able to challenge each other, work through the occasional conflict and push each other. That's the only way to continue to improve and grow."

Next on the Firm's Wish List

"Soon we'll look to add a sheet-storage and automatic-loading tower to serve both laser-cutting machines," says Rich. "That'll help us better manage our process and our labor rate, which is another key metric here. We're aiming for a revenue-per-employee goal of $250,000 to $300,000 as we try to bring more value to the company, which in turn should bring more value to our customers. We'll also look at another press brake, perhaps by year end, with more capacity, maybe a 20-ft. 400-ton model."

"And, who knows," interrupts Phil. "Maybe soon we'll have waterjet cutting. I like bringing in new technology." **MF**