



Farrar Goes From

Farrar Corp. has increased revenues by a factor of five since it devoted itself to becoming a one-stop ductile iron supplier in 1988.

World War II-era metal cutting lathes, mills and shapers turn endlessly in a corner of the old machine shop at Farrar Corp., Norwich, Kan. They crank away with mind-numbing repetitiveness, carving grooves into gears over and over again, just as they have done for 70 years. They are noisy, but not as noisy as their considerable size and heft portends, giving off a monotone drone. The amount of oil they require is startling, large basins of it sitting and stinking just beneath castings as they are cut by vertical lathes. Old as they are, the lathes still work like—literally—well oiled machines.

But what is remarkable is not that the machines still physically work, but that they are needed on certain jobs. After

Farrar Corporation Norwich, Kansas

Year Founded:	1933.
Metals Cast:	Ductile iron.
Casting Process:	Horizontally parted green sand.
Casting Range:	Ounces to 75 lbs.
Monthly Production:	1.5 million lbs.
Value-Added Services:	Patternmaking, painting, full machining capabilities, assembly, heat treat.
Employees:	150.

all, Farrar Corp. has spent more than \$5 million in the past nine months to expand its facilities—adding 18,000 sq. ft. to an existing 35,000-sq.-ft. space—and upgrade to the latest in machining and heat treating technology.

“The new machines offer more consistency and speed,” said Todd Farrar, Farrar Corp.’s marketing and sales manager. “But some parts are still justified on the manuals, and there will probably always be parts that work on them.”

And if the parts are being worked on at Farrar Corp., they’re almost certainly at the center of a profitable job. Since an industry-wide downturn in 2002, the ductile iron caster and machine shop has more than doubled its business, bumping up revenues from \$9.8 to \$22 million.

A Machinist in a Caster’s World

Entering Norwich, Kan., Farrar Corp.’s headquarters becomes visible almost immediately. And at a population of 551, entering Norwich means you’re about to exit Norwich. But since the headquarters’



A Farrar Corp. employee finishes a gearbox assembly, which the company makes in-house from pattern to working component.

Start to Finish

Shea Gibbs, Associate Editor

establishment more than three quarters of a century ago, Farrar Corp. has expanded its holdings and moved part of its operation into the larger city of Manhattan, Kan., located about 165 miles north of Norwich. The company's recent expansion and upgrade was in fact performed on the company's newer facility. But the administration at Farrar Corp. hasn't forgotten where it came from.

"We were established in 1933 by E.C. Farrar, my great-grandfather," Farrar said, seated next to a window that opens onto endless plains of grain. "It was a blacksmith shop at the time. He did a lot of repair work for agriculture—you can see why there would be a great need for that around here."

Soon after, Farrar Corp. began focusing its efforts on becoming a machining

business. It was not until the 1960s that it did any metalcasting.

"We approach the metalcasting business from the perspective of a machine shop, not the other way around," said Farrar Corp. President Joe Farrar. "We deal with machine jobs that have to hold +/-0.001-in. tolerances, and we carry that ability and attitude to our metalcasting operations. As a metalcaster trying to get into machining, if you don't know what you're getting into, you'll get clobbered."

That mentality has played a roll in earning the privately held, non-union job shop 150 customers with 2,000 active parts. Farrar Corp. now pours 60 tons of iron per day.

The Parts of the Whole

Farrar Corp. isn't like most metalcasters.

Indeed, it's not solely a metalcaster.

"Our business has three different parts on the P&L statement," Farrar said, "the pattern and metalcasting shop and the two machine shops."

The oldest portion of the business is the first machine shop—the 32,000 sq.-ft. building that houses the manual lathes—which sits on the original tract of land in Norwich. The 50,000-sq.-ft. metalcasting facility, which was constructed in the mid '70s, along with the pattern shop and corporate offices, takes up the land kitty-corner from the original machine shop. And the new machine shop and heat treat facility, which has grown to 50,000 sq. ft. since its construction in 2000, sits alone with a few corporate offices in Manhattan, Kan.

The pieces of Farrar Corp. individually



Farrar Corp. still has jobs that are performed most economically on World War II-era metal cutting lathes, mills and shapers.

boast strengths and weaknesses, but they are very much a part of a larger structure. In the pattern shop, the company prefers to begin with solid models and can machine a new matchplate pattern out of a solid slab of aluminum in 36 hours. Seventy percent of Farrar Corp.'s 2,000 active patterns were made in-house.

But according to Todd Farrar, it's the consideration that is paid to the other parts of the business that makes the pattern shop successful. Every matchplate that comes out of the facility in Norwich is carved with castability and machinability in mind.

"The benefit of making our own patterns is accuracy and parting line elimination, which reduces grinding," Joe Farrar said. "Most of the problems in high pressure green sand occur when the two halves of the mold are not flat and parallel or the two halves don't line up; the mold is so hard, it doesn't squash together. We eliminate those problems by completely machining the whole pattern. We have no back draft and no mismatch."

While Farrar Corp. focused the lion's share of its available capital on its machining facilities in the recent past, it has made capital improvements to its metalcasting facility, as well. But rather than expand the floor space and push the plant to do more business, the improvements have been made to streamline production.

"This year, we're putting \$8 million back in the company, most in value added, but some of it will go into lowering costs in the metalcasting facility," Todd Farrar said.

The metalcasting facility currently

pours about 60 tons of iron per day into molds on three lines, one that measures 14 x 19 in. and two at 20 x 24 in. Working four days a week, the metalcasting plant operates at between 80 and 85% capacity, so it could be pouring more iron. But Farrar said that's not the goal at this time. The company is happy with the current production of up to 3,000 molds/day yielding 35 tons of finished castings.

The machine shop, on the other hand, was built with expansion in mind. When the new Manhattan facility first went online in 2000, it had 10-12,000 sq. ft. of space available for new equipment. It now has open space for the addition of two or three more machines

in the original manufacturing area.

Some of the available square footage in the machine shop recently was devoted to an annealing station, yet another part of the Farrar whole. The station uses three heating furnaces and one cooling chamber for sub-critical annealing, a process that takes approximately five hours. The new heat treating station has a capacity of 2 million tons per year and is currently running the majority of the time.

"We made sure we had 75% of [the annealing capacity] used before getting into it," said Kelly Poe, machine shop operations manager. "We can add three more furnaces and one more cooling unit. We'd be willing to do heat treating for other metalcasters."

Farrar Corp. didn't bring heat treating in-house to win jobs from other metalcasters or make money, though. They brought it in to improve consistency and reduce work time.

"We'll gain a little on freight and a bit on labor," said Farrar. "But it will improve our throughput by 5% in the metalcasting facility. Basically, we hope to save a couple cents per pound and shorten our lead times."

Cautious Upgrades

Farrar Corp. has scarcely bought a piece of equipment that was not already scheduled for a certain job. Before acquiring new equipment, company executives secure the contracts that create the need for it. If a job will keep a new machine running at least 60-65% of the time, the company



Farrar's Manhattan shop was built with room for expansion but is reaching capacity. The automated machining center shown in the foreground can run 18 jobs with only a few operators.

will seriously consider the investment.

"We don't buy new machining capability to get new business, we buy it to secure the business that has been offered," Todd Farrar said.

The Manhattan machining center began with a considerable piece of hardware, but much of its operational capacity was sold before it went online. The centerpiece of the shop is a large, automated setup that can handle up to 18 jobs with only a few operators. With 16 jobs running on the robotic cell at present, laborers are required only to load and unload pallets on automated trains, which feed castings to the appropriate machine tool, of which there can be as many as 120 on each of two horizontal CNC machining centers. The flexibility of the center allows lead times as low as 48 hours, although that does require some inventory of raw castings. As with most of the machines at Farrar Corp., the success of the apparatus is measured in spindle uptime—it runs at 85% (machine hours vs. man hours).

"The run time of the spindle is important to us," Poe said. "What I judge success by is if I can see more machine hours than labor. I like to see 20% more, but 50% would be real good—and it could happen."

Newly purchased machines are held to similar standards, and Joe Farrar says he uses a three-part system to determine whether an investment makes sense for the company.

"We base it on inflation, 'going fishing' and risk," Farrar said. "If you're going to invest in your company, you need to account for those three things."

Farrar hasn't forgotten what business he's in. By "going fishing," he means the standard interest rate that one can expect to earn with his or her money in a zero-risk bank account. And while he doesn't divulge the exact formula by which it is done, he says that before making any decision to invest in his company, he considers whether the investment will outpace inflation and beat the percentage he could earn with his money sitting around in a bank, while incurring only a commensurate amount of risk.

Farrar Corp. has discovered quite a few investment opportunities that fit that equation over the past year. It has purchased and installed one new horizontal machining center roughly every 30 days since January and expanded its largest envelope size by 36 cu. in. The company now can machine pieces up

One-Stop Wonder

Farrar Corp. provides a one-stop shop for customers requiring a part from start to finish—from solid model to finish-machined component. It also can offer its services selectively, participating in a variety of the steps in the process and outsourcing any other necessary tasks. Following is a look at four castings Farrar Corp. provides to customers with information on just how involved the company gets.

SHIFT FORK—Farrar made the pattern, cast it in ductile iron, had it austempered and did the machining. It is used in heavy truck applications.



REAR END HOUSING—Farrar made the pattern, poured the castings, did the machining on three castings and performed the assembly. The component includes two steel castings and two bearings that were outsourced. The piece is a rear end differential housing for a dragster.

TORQUE PLATE—Poured from 100-70-03 ductile iron, Farrar casts, machines and paints the plate. Sixty three parts are made from the same six castings. The torque, or anchor, plate is used in heavy truck high performance brake applications.



TRUNNION—Used in the suspension of heavy trucks, Farrar built the trunnion's pattern, poured, painted and machined the casting, and pressed the bronze bushing (r) into the center.

to 150 lbs. The two new machines that offer the added envelope capacity also bring higher low-end torque.

Situated several feet from the new machining centers is a new coordinate measuring machine. That piece of equipment was brought in specifically to answer a customer's requirement to ensure tight tolerances on a particular job.

And Farrar Corp. is not done with its machine shop expansion. Twenty employees currently work in the Manhattan machine shop, and company executives believe they can bring in about \$7 million in additional business with few more hires.

Keeping the Metal Flowing

While the majority of Farrar Corp.'s capital improvements in recent years have been devoted to increasing machining capacity, it has made several moves to keep its metalcasting plant on pace. Farrar Corp. tries to make a yearly investment in the metalcasting plant to ensure it keeps up with the company's machining capabilities.

"Twelve to 15 months ago, we bought a new miller, doubling our sand capacity," Todd Farrar said. "Our molding and melting capability was already up to speed. We've also installed robotic grinding capabilities. Does it help you pour more iron? No. Does it help you get more out the door? Yes."

The robotic grinding capabilities, according to Norwich operations manager David Dohrmann, can run some jobs up to 20% faster than previous methods. But the decision to put a job in the robotic cell is based on more than just looking for a little more speed. It is also necessary on jobs that require increased consistency and quality.

Following the robotic finishing cells, Farrar Corp. purchased a new IMF core machine, which will replace five out of seven of the old machines at the facility, making both shell and coldbox cores in a 15 x 21-in. envelope. Now in production, it nearly will keep up with the molding lines on its own. The next improvement on the horizon will be in the finishing room once again, according to Todd Farrar. The company will be looking

to implement further continuous flow, optimizing the journey from shakeout to shipping.

Revenues, however, are growing quickly along with the machine shop additions. Currently, company executives say, 60% of sales are through casting-related products, with the remaining 40% coming from value-added services. Sales from the Norwich facility still are outpacing those in the machine-only Manhattan branch. However, post-casting operations are growing at a rate of 5-10% per year, and the company has reason to believe that by 2008, that balance will shift, and value-added sales will eclipse those of castings.

But Farrar Corp. nevertheless considers metalcasting essential to its business model. Regardless of how quickly machining sales grow, there is no danger of the metalcasting facility getting supplanted for newer, increasingly high-tech machine centers.

"At the end of the day, it's all about the castings," said Todd Farrar. "It all comes from our iron. The need for castings won't go away. It's just a question of finding the market."

Providing Solutions

It's an advertising buzzword, but the

top brass at Farrar Corp. say it so often, it's clearly more to them than empty rhetoric—the company believes that it is selling "solutions."

"We do not just pour castings," Todd Farrar said. "We provide turnkey ductile iron solutions." In an interview several weeks later, Joe Farrar agreed. "We don't try to sell pounds or finish-machined parts," he said. "We sell solutions."

It's taking that empty advertising buzzword and filling it with meaning that has made Farrar Corp. so successful over the past decade. The company's 150 customers serve a variety of end-use markets with small to medium-sized ductile iron castings that must be machined to very close tolerances. In addition to a preponderance of heavy truck customers, Farrar Corp. services companies in the valve, energy, lawn and turf, bridge, construction equipment and race car markets.

Because it has the ability to take a solid model, machine a pattern, mount it on an in-house molding line, pour the casting, heat treat the casting, machine it, paint it and assemble a working component, the company keeps its hands on each manufactured product from start to finish, assuring the level of quality that is expected internally. When the

business first began pouring castings, it machined only 10-15% of what it poured, but that number has grown to 80-85%. Farrar Corp. currently achieves an average yield of 57% and runs between 3 and 4% internal and 0.52% external scrap.

"If we bid on a job, we focus on why that customer is asking for us to offer a solution," Joe Farrar said. "What we try to do is solve that problem. Then we sell it to them at a higher price than they're currently paying."

That price isn't arbitrary, of course. But instead of pricing a job by the pound, Farrar Corp. determines the cost of a component based on the costs incurred as it goes through the plant. Machining jobs, on the other hand, are based on cycle times, or parts per hour, whether they are turned by the newest machine in the place, or one that is close to a century old. *MC*



Farrar Corp.'s new annealing station, which includes three furnaces, can handle 2 million lbs. of castings per year and is at 75% capacity.