

Manufacturing REALITY

By Justin Campfield

THINK AMERICA DOESN'T MAKE ANYTHING ANYMORE? NOT ONLY IS THE U.S. A WORLD LEADER IN MANUFACTURING, BUT HERE IN CENTRAL FLORIDA, THE INDUSTRY IS STILL GROWING.



Central Florida manufacturers, such as Big Cat HPV, produced more than \$2.04 billion in total wages last year.

BIG CAT HPV (3)

▶▶ Visitors to Correct Craft's Orlando headquarters may wonder if it really is where the company makes its renowned line of Nautique boats. After all, with its showroom-floor lighting and operating room-like cleanliness — not to mention the two tree-lined water ski lakes on site — the company's local manufacturing facility is about as far removed from the smokestack-stained stereotype of manufacturing as you can get.



But Correct Craft is just one of a surprisingly large number of companies in the Orlando area that are doing what many in political and business punditry claim can't be done in the United States any longer: make things and provide good-paying jobs while doing it.

The U.S. manufacturing industry has been much maligned in recent years, with the general idea being that nothing is being made in this country anymore. The truth is that the U.S. ranks No. 1 in the world in manufacturing. And the competition for the top spot isn't even close.

According to data compiled by the United Nations, the U.S. produced \$2.15 trillion worth of manufactured goods in 2009. That's a pretty comfortable margin over China's \$1.48 trillion. Interestingly, that same year, America produced 20 percent of goods worldwide, which isn't far off from the 1990 figure of 21 percent.

Locally, the argument that manufacturing has all but disappeared doesn't hold water, either. In Central Florida, there are 1,723 manufacturing companies, 150 more than five years ago. Nearly four percent of Metro Orlando's total employment is in the manufacturing industry, which also accounts for five percent of Florida's workforce.

Not only is the area's manufacturing industry growing, but it pays well, too. The average wage for a manufacturing job in Central Florida is \$54,213, or more than \$13,000 higher than the Florida average. Last year, local manufacturers produced more than \$2.04 billion in total wages.

So how are companies able to hold their own against the likes of China and India with their cheap labor and export-friendly government policies?

For a number of Orlando companies, the answer has been to fully dedicate

themselves to advanced manufacturing principles. While there is not one widely accepted definition of the term, for the following local businesses, it means utilizing the latest technologies and processes to operate smarter, faster, and more efficiently than their competitors.

BIG CAT HPV

At a time when conventional wisdom suggests that U.S. manufacturing is moving overseas, one Winter Garden company has been working hard to bring as much manufacturing as possible under its own roof.

For Big Cat HPV, which produces and distributes 2,000 high-quality recumbent trikes and bikes a year through a world-wide dealer network, being able to build its bikes from scratch gives it a distinct competitive edge.

"We are working to become more self sufficient so that we can respond to demand more quickly," says Paulo Camasmie, a Brazilian-born mechanical engineer who started the company in 1990. "We are much more flexible than our competitors, who buy from

China. We can make anything within three days and ship it the next day because our production system is so efficient."

The company recently invested heavily in robot technology that has allowed its eight manufacturing employees to produce themselves a key component they've been working for years to bring in house: wheels.

At one point, Big Cat was importing wheels from Taiwan, but Camasmie grew weary of having such an important part of his product be so disconnected by geography. He says that more and more U.S. companies are going to start realizing the disadvantages of relying on imported parts.

"When you outsource important parts, they get stuck somewhere in the production process, you have to forecast everything ahead four months or more and then wait four months to get them," Camasmie explains. "Then you get them and they got it wrong, so you have to discount everything. We can turn anything into exactly what we are selling. It may cost more, but it is much more sustainable."



Every year, Winter Garden-based Big Cat HPV manufactures 2,000 recumbent bikes and trikes from the ground up.

»STEM: A National Concern

Today's manufacturing facilities aren't like they used to be, and neither are the employees who work in them. The advanced machinery and innovative production principles used in many of today's manufacturing facilities mean that manufacturers are increasingly in need of employees who are well educated in science, technology, engineering and math, collectively referred to as STEM.

Although the U.S. is still the world's No. 1 manufacturer, producing approximately 20 percent of the world's goods, fretting about the state of American STEM education, and by proxy the country's ability to keep its competitive edge against rising economies, such as those of China and India, has become something of a national obsession.

That has never been more apparent than during President Barack Obama's most recent State of the Union address, in which he called for an investment of \$100 million in STEM education that would, among other things, research and develop better methods of STEM teacher preparation, recruitment and retention models, and train an additional 100,000 STEM teachers over the next 10 years.

These proposals are in addition to previous STEM-related initiatives pursued by the administration and the business community, such as STEM's prominent role in the \$4 billion "Race to the Top" education funding competition and the \$700 million in financial and in-kind support for STEM programs that was contributed by industry, university, foundation, and science and engineering professionals.



CORRECT CRAFT (3)

Correct Craft's signature Ski Nautique boats are built in its east Orlando manufacturing facility. Right: Innovative T5 lighting ensures a high-quality finished product.

MERCURY MARINE

While Big Cat has been successful in nearly eliminating imports from its supply chain, one of Central Florida's oldest manufacturing facilities is actually building parts that are exported to China and Japan before they are included in finished products that sell across the world.

Mercury Marine's St. Cloud parts manufacturing facility has been churning out boat engine components for more than 50 years. Specializing in high-performance plastic and electronic components and assemblies,



MERCURY MARINE

Mercury Marine makes electronics and other components here in Central Florida.

the plant and its roughly 125 employees has relied on innovation and a dedication to quality to maintain its competitive edge.

"You have to be very flexible and forward looking," says Mark Hamilton, the plant's engineering manager. "We work closely with our engineers and our suppliers to stay as close to the leading edge of technology as we can. And we work really hard on quality and price."

FARO TECHNOLOGIES

Not many manufacturers are glad the economic downturn of 2008 and 2009 happened, and neither was Faro Technologies. But the Lake Mary-based company didn't let a good opportunity go to waste as it took advantage of a temporary lull in business to completely reshape its manufacturing process.

Faro Technologies, which designs, manufactures and markets computer-aided 3-D measurement and imaging products, used the downturn to jump headfirst into implementing "lean manufacturing." A descendent of the Toyota Production System, lean manufacturing focuses on the relentless pursuit of reducing waste in the manufacturing process. Waste targeted for elimination can be anything from raw material to an inefficient number of footsteps a worker must take in order to reach a tool or accomplish a task.

"We looked at everything in our facilities to see what we didn't need," says David Morse, Faro's senior vice president and managing director for the Americas. "We ended up gutting the manufacturing facility and starting over with the most efficient production line possible. As a result, we've seen a 40-percent increase in efficiency from the same footprint."

Faro also used the opportunity to rethink the way they did things by letting their production line workers show them what worked and what didn't.

"Our workers really designed the process," says Morse. "We took every operator we had and had our engineers and managers shadow them to see how



they built the products and where they had issues. We learned a tremendous amount from the operators and have used those standards to better perfect the manufacturing process."


CORRECT CRAFT

Unlike many companies who have to reconfigure their manufacturing facilities in order to fully take advantage of lean manufacturing principles, Correct Craft had the benefit of being able to construct a brand-new, state-of-the-art, 216,000-square-foot building.

Matt McGinnis, director of operations, says, "Our company has completely evolved over the last few years."

As it designed its new facility, Correct Craft implemented many lean manufacturing techniques, such as making the transition from batch building to one-piece flow, allowing it to make components one at a time as they're needed for customer orders. The effort has paid off, as each of the 1,200 boats that roll off the manufacturing line at the plant each year now requires 40 percent less labor hours to build than just three years ago. But that doesn't mean the company is done.

"I always tell people who come out to the factory that if they come back in six months, it'll look different," says McGinnis. "We are always changing and continuously looking to improve."

If anyone doubts that products can be manufactured in such a clean, organized facility, people are welcome to go see it for themselves: Factory tours are offered by appointment twice daily, Monday through Thursday. 

»STEM: Local Solutions

Central Floridians are well aware of the importance of STEM education. One of the most widespread local efforts to increase awareness of STEM-related manufacturing careers was the production of "Manufacturing Heroes," a coloring/comic book that was recently distributed to 14,000 fourth graders during career week.

Developed by the Manufacturing Association of Central Florida (MACF) in partnership with Orange County Public Schools (OCPS), the activity book profiles Orlando-based manufacturers and highlights careers they offer. Statistics about the industry's significant presence in Central Florida are sprinkled throughout.

"We want teachers and students, and especially parents, to understand that there are high-paying jobs in manufacturing," says MACF Executive Director Sherry Reeves. "People talk a lot about bio-, green, and medical innovation, but advanced manufacturing is the base of all these industries."

MACF and OCPS may be targeting students, but another local group is focusing on those on the other side of the equation.

"The students are the end users; educators and parents are the influencers," explains Bill Duerden, vice chairman of the Central Florida STEM Education Council. Started in 2009 in response to the growing need for workers with advanced STEM education, the Council is comprised of a who's who in defense, technology, and entertainment, with representatives from Lockheed Martin, Harris, Boeing, Disney, Northrop Grumman, SAIC, and NASA.

"India and China alone are graduating more scientists and engineers than the U.S. is total students," says Duerden. "We won't have enough students coming out of STEM in the next ten years to fill retiring positions, let alone fill new jobs."

The Council hopes to reverse that trend by communicating STEM opportunities to parents and teachers via a multi-media campaign.

The group also tries to engage students by offering hands-on education that includes video games, science camps, and robotics competitions.

"Students are always going to learn more when they are engaged in something rather than reading about it or listening to someone lecture about it," says Duerden.

Two Orlando-area companies are not only taking that sentiment to heart, they're betting their companies on it. TEQ Games and FX Design Group have developed school-based flight simulators that use immersive games to teach core concepts in math, science, and physics. FX Design Group builds the simulator shells, while TEQ Games focuses on integrating the software and curriculum.

Currently being used by 7th- to 12th-graders at the National Flight Academy in Pensacola and in beta testing at two high schools and one middle school in Northern Florida, the product is already showing results. Math retention at the middle school has increased by 25 percent, and 7th graders at the flight academy have shown a 24-percent gain in math efficiency, compared to just a five-percent gain for non-academy students.

"When students are in a cognitive, pragmatic situation, they tend to retain things a lot better," says TEQ Games Chief Operating Officer John Fitzgibbon. "Instead of giving lectures, teachers give mission briefings. Instead of doing homework, students do mission challenges and create flight plans."

Of course, it never hurts to have an innovative solution to a problem that has the attention of those at the highest levels of government and industry — all the way up to the President himself.

