MILWAUKEE ELECTRONICS NEWS

CELEBRATING 60 YEARS

Q3 2015

IN THIS ISSUE

About Milwaukee Electronics

Milwaukee Electronics designs and manufactures custom circuit board assemblies for the medical, transportation, military, HVAC and a variety of other industries. The Company operates over 135,000 square feet of manufacturing in Portland, Oregon; Milwaukee, Wisconsin; and Tecate, Mexico. In addition to EMS and product design and engineering services, it offers quick-turn prototyping through its Screaming Circuits business unit.

Milwaukee Electronics
MANUFACTURING EXPERTS SINCE 1954

A specialized work cell for brushless DC (BLDC) motor production.

Tecate Facility Adds Value Beyond Electronics Assembly

Mexico continues to grow in competitiveness as a low cost production option. From an electronics manufacturing services (EMS) standpoint, that typically translates to printed circuit board assembly (PCBA) manufacturing and assembly of associated components.

However, electronic product assembly represents only part of Milwaukee Electronics' Tecate, Mexico facility's activities.

"The Tecate facility has strong mechanical and electromechanical assembly capabilities. While our specialized work cells can support system integration or box build

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Letter from Mike

As I write this we have just sent out our annual customer satisfaction survey. As in prior years, this is administered by a third-party to preserve respondent anonymity and encourage candid feedback. We will not see individual responses, just a compilation of the scores and a list of comments with no identifying information tying the comment to a specific respondent.

Over the last three years, Milwaukee Electronics has undergone an evolution and is beginning to build a business model that is somewhat unique in the electronics manufacturing services world. The niche we occupy combines the responsiveness typically found in much smaller regional manufacturers with the engineering and global procure-

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Ty Foster Named Screaming Business Unit Manager

Ty Foster

Ty Foster has been named Business Unit Manager of Screaming Circuits. Previously, he was Business Line Director for Micropump, Inc. He was earlier associated with Key Technology, Textronix, Inc., Fluke Corporation and Hewlett-Packard Company in a variety of senior management, marketing management and product management positions.

"Ty has nearly 20 years of experience on the original equipment manufacturer (OEM) side of the electronics industry. This gives him unique understanding of the challenges OEMs face in both getting products to market and finding the right manufacturing partner to support that effort. His mix of business segment and product management expertise makes him a key asset as Screaming Circuits continues to grow and evolve. We see him as a leader who can help Screaming Circuits continue to build on its reputation for market leading innovation in the services and customer experi-

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Letter from Mike

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ment expertise; systems infrastructure; and manufacturing location options typically found in much larger firms. Survey feedback has been invaluable in evolving our systems and processes to meet customer needs while still focusing on the responsiveness that attracted those customers in the first place.

This year we are now focusing on our most current technology manufacturing equipment platform strategy, with the goal of meeting the needs of transitioning Screaming Circuits cutting edge prototype customers. This will better support the transition to volume manufacturing needs and increase our ability to transition latest technology. The feedback we receive in this year's customer satisfaction survey will be part of that analysis because we want to understand both customer perception of performance improvement areas and key customer requirements and expectations going forward.

We don't simply want to provide a comprehensive North American engineering and manufacturing solution. We want to be the partner you can't live without. Achieving that goal requires close alignment of our processes, equipments and capabilities with your requirements. If you've received a customer satisfaction survey, help us serve you better by providing detailed feedback on how we can best serve you.

P. Michael Stoehr

President & CEO

Tecate Facility

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electronic product assembly, they are also an excellent solution for mechanical products. These projects can capitalize on the infrastructure found in our facility which includes significant expertise in manufacturing engineering, quality management and workforce recruitment and training," said Pirouz Pourhashemi, the facility's General Manager.

For example, the facility assembles a variety of small motors and associated controllers in specialized work cells. Another work cell project involves assembly of solder termination shields used in aerospace products. Volumes on the aerospace project average about 200,000 per month and traceability data is transmitted directly to the customer.

While the bulk of specialized work cell projects often involve project-specific fixturing, automation and test equipment, the facility can provide shared services for more generic processes such as conformal coating or use of its Checksum tester.

"We've mounted Checksum test equipment on a rolling cart to make it easy to share between work cells assembling electronic products," Pourhashemi added.

"While Mexico can offer competitively-priced solutions on highly automated production; production with higher labor content represents an even larger savings. Often mechanical assembly projects that would be a great fit for Mexico get missed by the outsourcing team because there is an assumption that they would be difficult to bid or that they wouldn't be of interest to an EMS provider. Our pricing model easily accommodates bidding on these types of projects. Customers get the benefits of a full service facility with world class infrastructure, the logistics simplicity of a shared border and the full benefits 'offshore' pricing. And, in many cases, the customer's internal production team is happy to see a project that was outside their production 'sweet spot' free up needed space on their production floor," said Pourhashemi.

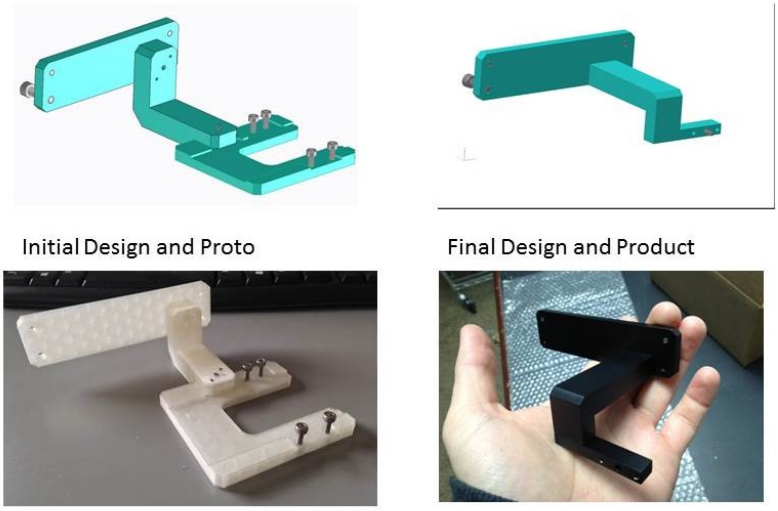
Engineering in Action

Helping Customers Fine Tune Their Ideas

Milwaukee Electronics Design Engineering Group solves both big and small customer challenges. Occasionally a customer has an "aha" moment after a design is completed. For example, recently the design team helped a customer which manufactures printers develop a test system that would enable its product development team to precisely position ink cartridges, high speed video cameras and lighting for real-time observation of ink droplets ejecting from ink cartridges.

Once the system was delivered, one of the customer's engineers wanted to add a mechanical adapter fixture that would allow for fast changes of cartridges. The goal was to reduce the setup time required when changing cartridge types so that they could take measurements on a variety of products faster.

The engineer didn't know exactly what the adapter should look like, so the Design Engineering Group team worked with him to create a specification for the fixture. The customer's team provided 3D models of all units under test (UUTs) and descriptions of where they wanted the mechanical pieces to end up physically on their tool.



The fixture evolved as 3D prototypes allowed for fit checks and testing.

After a few discussions and adjustments to the UUT model parameters, the Design Engineering Group team developed a 3D model of the proposed fixture and presented it to the customer. Once the fixture design was approved, the team created a rapid prototype of the unit for a fit check, using its in-house 3D

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Customer Base Continues to Grow and Diversify

Milwaukee Electronics is continuing to diversify its customer base. The majority of these new projects include both an engineering component and a manufacturing follow-on.

"We are reaping the benefits of some key engineering project wins over the last year. Once the product is designed, we are getting the opportunity to bid the manufacturing. Customer engineering teams build relationships with our team during the product development phase and get a chance to see our competency in these areas. We end up with a high win probability based on the fact that customer teams feel comfortable with our team and its ability to get the job done," Scott Pohlmann, Senior Director of Business Development.

Three new projects have reached this stage.

A maker of large scale backup battery systems used to support power generation equipment originally selected Milwaukee Electronics to assist them with development of a main printed circuit board assembly (PCBA) and sensor PCBA to detect all gases and send alerts via RF communication to a control station. The pilot phase has been completed and production will be done in the Milwaukee facility.

"The customer likes the idea of working with a company able to provide a total North American solution. Today, the best place for this project is our Milwaukee facility, but should they decide they'd like to manufacture in Mexico over the longer term, we can offer that option through our Tecate facility," Pohlmann said.

A maker of an electronic point-of-purchase equipment worked with Milwaukee Electronics on a prototype project and is now bidding production. Milwaukee Electronics' design engineering team helped design a prototype for a device that measures the amount of liquor poured in each glass at bars. The system also updates a cloud-based inventory and sales database, and sends pull signals to a distributor when consumption levels reach a point triggering the replenish-

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Engineering in Action

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printer. The customer evaluated the fixture and found the adapter design blocked some of the light the customer wanted reflecting off the UUT. Design changes were made and approved. The Design Engineering Group fabricated the required adapter fixtures and shipped them to the customer.

"This is a classic example of the challenges inherent in any design project. Often product development teams have a good idea of the basic functions they want in a product, but not the finer details. Fine tuning the details is part of what the Design Engineering Group is all about. Armed with tools such as the 3D printer, the team can quickly provide samples or even small runs of fixtures or parts," said Brandon Loo, the Design Engineering Group's Director of Engineering.

Ty Foster

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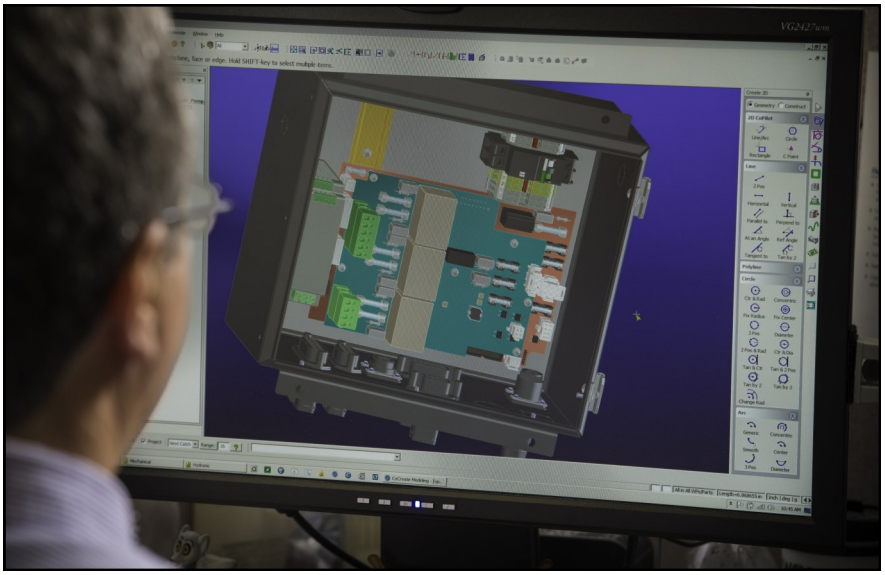
ence it offers," said Rick McClain, Milwaukee Electronics' COO.

Ty holds a Bachelor of Science degree in Microelectronic Engineering from the Rochester Institute of Technology.

Customer Base



Design projects are opening the door to manufacturing opportunities.

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ment order process.

In addition to making design recommendations, the design engineering team was also able to identify an alternative component for a custom antenna with long lead-times.

The third project involves a marine fire suppression system. Milwaukee Electronics' design engineering team is helping the customer convert a pneumatic system which requires a person to activate the release of Halon to put out the fire, to an electrical system which would automatically release Halon when it sensed fire was present. The team has completed preliminary design work and has developed a prototype control box. A production follow-on is anticipated.

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