

# MILWAUKEE ELECTRONICS NEWS



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## IN THIS ISSUE

CI Initiatives	2
New Quality/Eng. Mgr.	3
DIY Grows	4

## 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 Provides RoHS II Solution

Beginning in July, RoHS II will be in effect in the European Union and will start phasing in restrictions for previously exempted medical devices for the same six hazardous substances found in RoHS.

While some medical device manufacturers began conversion when the RoHS initiative initially cut in; not all companies opted to convert their entire product lines. The team at Milwaukee Electronics' Portland facility recently helped one customer complete their conversion in record time. The product was equipment used in dental offices and the European Union (EU) has become a growth market for this customer.

Milwaukee Electronics builds 32 different assemblies that contain 580 separate line items. The customer notified the Portland team in December, but was not able to provide the documentation for conversion until March. Milwaukee Electronics was able to complete the RoHS conversions by mid-April. The project also included collecting appropriate documentation to support customer's requirements under REACH, the regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals, which streamlines and improves the EU's former legislative framework on chemicals.

Equally importantly, the team was able to mitigate the customer's obsolescence liability.

*(Continued on page 4)*

## Letter from Mike

Outsourcing has evolved in many ways over the last three decades. Location, capabilities, evolving technology complexity, lowest cost, supply chain



considerations, and most recently, a focus on lowest cost of ownership that includes greater measurement of the costs identified when working at a distance, are all part of the equation.

At Milwaukee Electronics, we've long un-

derstood that issue and it is one of the reasons we've focused on providing a strong North American manufacturing solution that includes both U.S. and Mexico manufacturing options. Not surprisingly, the latest Boston Consulting Group Competitiveness Index finds Mexico is less expensive than China and China's manufacturing cost advantage over the U.S. has now shrunk to 5 percent.

Another trend we are seeing in our Screaming Circuits quick-turn prototype business are engineers and new product

*(Continued on page 5)*

# Continuous Improvement Initiatives Boost Productivity

One of the benefits of Milwaukee Electronics' Epicor Enterprise Resource Planning (ERP) system is a wider array of shop floor control tools. This year the Company's continuous improvement (CI) efforts have been focused on better aligning processes and internal culture with the greater visibility inherent in the new system.

One example is the Cell Level CI initiative in the Milwaukee facility last November based on the results and recommendations of a performance analysis conducted by both internal and external participants.

"We piloted the CI format in SMT and have since rolled a similar project format out to our first assembly, post wave, final assembly and materials teams. We will be starting soon in our military and box-build assembly areas," said Terry Martin, Milwaukee's Operations Manager.

According to Martin, the project format focused on four key areas: organization structure/leadership, communication, process and metrics. In the areas where the CI project has been completed, there are now Quality, Delivery, Cost (QDC) cell level metrics for on-time delivery, efficiency, 5S performance and quality. Daily stand-up meetings are used to coordinate daily work, report performance and to drive/track team level actions to improve performance for customers.

"To date, the biggest impact to our customer base has been improvement in our overall on-time delivery, with an improvement of over 20 percent compared with our performance nine months ago. We are currently running at 98 percent and should finish this month in that range," Martin added.

The key point of focus has been ensuring that standard time is set up in the new system.

"In the old system, we didn't break



*Above, in the Milwaukee facility, daily stand-up meetings are used to coordinate daily work, report performance and to drive/track team level actions to improve performance for customers.*

down our standard times by individual processes. When we transferred data between systems we had to make assumptions since the new system lets us collect and track data in greater detail. The first part of CI process has been validating and fine tuning those assumptions to ensure product runs when scheduled for the length of time it has been scheduled in each process. Currently in SMT, we are running between 90-100% efficiency," said Bob Schultz, Milwaukee Production Manager.

Schultz also highlighted a change in escalation methodology as helping improve the metrics.

"If a machine goes down, the operator calls the team leader if it isn't back up in 5 minutes, the team leader calls a manufacturing engineer if he or she can't solve the problem in 15 minutes and so on. The concept of a ticking clock helps ensure that people assess the issue and initiate timely corrective action at the next level, if needed.

Now that we've finished this phase one activity, we are focusing on reducing set-up time," Schultz added.

Culture change is at the heart of this CI effort.

"Under the old system, measuring CI metrics could be difficult. CI projects tended to get put on the backburner if a customer priority needed to be addressed. That allowed waste to exist in our processes and drove a reactive management process because the issues that created bottlenecks were never fully fixed. The new system supports daily results measurement. We can be more responsive to customer needs and eliminate waste from processes as we identify it," said Schultz.

Milwaukee Electronics' Screaming Circuits business unit is also focusing on CI. Screaming Circuits has seen business increase significantly this year. The business unit runs 24 hours, six days per week utilizing four shifts to

*(Continued on page 5)*

## New Quality and Engineering Mgr. Named in Milwaukee



Brett Carlin

Brett Carlin has joined Milwaukee Electronics as Quality and Engineering Manag-

er for the Milwaukee facility. Previously he was Quality Manager for Duncan Solutions, Inc.

“Brett has over 20 years of quality management experience in a variety of manufacturing environments. His background includes support of Lean manufacturing initiatives and management of ISO 9001 and other industry-specific quality management system (QMS) registration processes, including AS9100. His breadth of experience is an asset in a company that serves a variety of mission critical industries,” said Terry Martin, Operations Manager for the Milwaukee facility.

Carlin earlier served in senior quality management positions at PhoTronics,

Inc., Ellsworth Adhesives and Bostik Findley, Inc. Prior to that he held industrial engineering and production supervision positions.

He received his Bachelor’s in Business Administration degree from the University of Wisconsin and an Associate’s degree in Industrial Engineering from Milwaukee Area Technical College.

He is an IPC-A-600 Certified Trainer, an RABQSA Certified Quality Management Systems Auditor and a Senior Member of the American Society for Quality.

## New BCG Study: North American Competitiveness Increases

By Jered Stoehr

The new Boston Consulting Group Cost-Competitiveness Index indicates Mexico has lower average manufacturing costs than China. It also found that China’s cost advantage over the U.S. has shrunk to less than 5 percent. Additionally, overall costs in the U.S. are 10 to 25 percent lower than those of the world’s ten leading goods-exporting nations.

This isn’t surprising to our team at Milwaukee Electronics. We’ve long seen the benefits of focusing on offering customers a strong North American strategy. Here are some of the most significant benefits we’ve seen:

**Logistics simplicity.** Our Tecate, Mexico facility offers the benefits of offshore pricing with virtually no finished goods inventory pipeline. Product is in the U.S. usually less than 24 hours after it is built. Our Portland, OR and Milwaukee, WI are optimally located to provide timely support within the U.S., as well.

**Time zone compatibility.** Our teams work hours compatible with our customers’ teams. This proximity also minimizes travel expense and eliminates the communication barriers that can develop when program management or engineering is located on the other side of the world and speaks English as a second language.

**Cost competitiveness.** Working with a global manufacturing partner makes sense when your product requires global manufacturing support. However, if your product really only needs North American support, does it make sense to pay the higher overheads associated with a supplier trying to manage capacity on a global scale? Often, a “right-sized” supplier is the most cost competitive choice.

**Responsiveness.** Closer proximity translates to faster response time in terms of personnel access and logistics. Our business model not only provides a responsive volume manufacturing footprint,

but also prototype and engineering support solutions.

**Collaborative Teaming.** Launching a Lean or other continuous improvement initiative and need supplier flexibility and support? This is another area where a North American solution often provides better results. Part of the reason U.S. cost competitiveness has increased is because businesses have focused on enhancing productivity through cross-training, automation and enhanced visibility into project status. Our recent ERP system enhancement is one example of ways we are expanding our capability to better team with customers in these initiatives.

**Intellectual Property (IP) Protection.** Whether IP protection is simply a competitive concern or mandated by ITAR requirements, utilizing a North American supplier provides a robust system of protection. Our U.S. facilities are ITAR-

*(Continued on page 5)*



## Screaming Circuits Helps DIYers Launch New Products

Back in the 70s and 80s, hardware engineering was king. The technology wave was hardware-driven and many of today's largest companies were getting their start in an engineer's garage or basement. However, the next two decades have been more focused on exploiting existing hardware via new software applications and enhanced connectivity. The entrepreneurial hardware engineer took a backseat to teenage software or college-age software whizzes in terms of the drivers of tech start-ups.

That trend has changed over the last couple of years, thanks to open source hardware, crowd funding and corporate support. Hardware engineers with an innovative idea no longer have to "swim with the sharks" to bring that product to market. And, the end result is new momentum for hardware engineering-driven innovation.

"Companies such as Texas Instruments, NXP and Atmel are pricing development hardware, often open source, at levels DIYers can afford with performance that professional engineers require. Screaming Circuits' short-run production is also priced at levels that are affordable to crowd-funded projects," said Duane Benson, Screaming Circuits' Marketing Manager.

Industry support for Maker's Movement and DIY projects is also growing.

"The Bay Area Maker's Faire, held in San Mateo this spring, was the most packed trade show I've been to in decades. Crowds were large enough that people

were often packed shoulder-to-shoulder in the aisles. The 3D printing industry and several semiconductor manufacturers had a large presence there," Benson added.

In addition to offering a pricing model that is cost competitive for short runs, Screaming Circuits also has a sponsorship program for some of the most innovative DIY projects it sees.

"Our sponsorship program provides a specific labor allocation during the course of a year. The entrepreneur still covers the entire cost of material and any labor costs above the allocated number of hours. We're very selective in evaluating which projects we sponsor. We look for unique ideas and ideas that help society as a whole. Projects that bridge the gap between open source and commercial are of particular interest," said Benson.

One of the projects Screaming Circuits has sponsored this year is called Turtle Sense which has been developed by Nerds Without Borders ([www.nerdswithoutborders.net](http://www.nerdswithoutborders.net)). The product combines networking and open source hardware to monitor egg nests on beaches in Outer Banks of North Carolina. Currently, large stretches of beach are shut down during turtle nesting season. Turtle Sense monitors egg nests and determines hatch times so that the Park Service can pinpoint hatch times within one to two days, minimizing the time period beaches need to be shut

down. Nerds Without Borders Founder Eric Kaplan also points out this type of specificity can help encourage eco-tourism and greater awareness of the plight of large sea turtles.

Another Screaming Circuits sponsored project is part of a satellite known as CSUNSat1 which is being developed by California State University-Northridge (CSUN). It is designed to test a new energy concept in space. CSUN will build the satellite and the Jet Propulsion Laboratory (JPL) will build the payload.

Screaming Circuits' blog is also oriented to delivering information that is helpful to DIY and professional engineers.

"We get many favorable comments from DIY people. Our goal is to make it easy for engineers with great ideas to build well-designed, innovative products," said Benson.

Benson believes the next era of hardware engineer-driven innovation is underway.

"Crowd-funding sources such as Kickstarter and Indiegogo, open source products such as TI's Beagleboard and Launchpad plus NXP/ARM's embed, and support from companies like us are removing the barriers to entry for someone with a good idea and decent skill who wants to start a company. Pent up innovation now has an outlet," Benson added.

## RoHS II

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ity.

"Our customer wanted to completely switch from leaded to RoHS-compliant product on their cut-off date of May 30, rather than attempt to stock both RoHS and non-RoHS product. We had \$250,000 in raw materials and Kanban inventory. We were able to return parts to distribu-

tion or ship finished goods for all but \$46,000 in that inventory. The customer helped by offering U.S. customers discounted prices on existing products in inventory," said Pam Kimbrough, the Portland facility's Operations Manager.

"Some of the custom components coming from smaller suppliers were challenging to document. However, the

customer had hired a consultant who briefed us on exactly what compliance documentation was required from these suppliers. Our team did a great job on tight deadline," added Pam.

The product is undergoing compliance testing and production volumes on the new product line are expected to increase in a few months.

## Letter from Mike

*(Continued from page 1)*

developers with great ideas who are able to leverage their time with the latest technology offerings. Open source hardware, crowd funding, immediate viewing of real time on hand materials inventories and service providers who work in partnerships with each other are all examples of this. Our Screaming Circuits website currently provides live and active exam-

ples of these partnerships, with Sunstone, Digi-Key, Mouser and three other distributors, enabling the fastest possible accumulation of materials availability to provide screaming, fast prototype assembly. We are pleased to be part of some of these efforts and excited to see the emergence of a new wave of innovation in the U.S. hardware engineering community.

This quarter's newsletter looks at these trends and specific ways our business model is supporting them. We are entering exciting times in U.S. manufacturing and are proud to be contributing to increased U.S. competitiveness.

**P. Michael Stoehr**

**President**

## Continuous Improvement

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support the responsive environment required for prototype builds. Shifts are 12 hours long and team members work three days either Monday-Wednesday or Thursday-Saturday. Mandatory Sundays are alternated between shifts at full capacity.

However, one of the challenges of this type of scheduling is that shifts have very little interaction with each other. The changing nature of prototype and short

run production can lead to process variation.

"We wanted to increase utilization by standardizing best practices across all four shifts. We'd seen a lot of overtime in a production spike in first quarter and knew June was traditionally also a spike in production. We began this CI project in April and set a 90-day timeline for completion, said Ashley Rochholz, Mil-

waukee Electronics' Continuous Improvements Manager.

As anticipated sales did spike in June.

"We have had 100% on-time delivery in June and it is shaping up to be one of our record booking months. Overall, productivity has improved among the shifts as processes have standardized. On some days we've seen it double," Rochholz added.

## Increased Competitiveness

*(Continued from page 3)*

registered and we are fully cognizant of export licensing requirements, plus our legal obligation for proprietary information protection based on agreements

with individual customers.

As companies analyze total cost of ownership, reshoring projects that were a marginal fit for offshore sourcing is becoming more commonplace. If changes

in global cost structure are making reshoring these types of projects more attractive, consider Milwaukee Electronics.

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