

MILWAUKEE ELECTRONICS NEWS

Q4 2021

About Milwaukee Electronics

Milwaukee Electronics designs and manufactures custom circuit board assemblies for the medical, transportation, military, logistics and a variety of other industries. The company has ISO-13485 medical manufacturing capability in its Portland plant.

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 PCB layout and DFM services through its San Diego PCB Design business unit and quick-turn prototyping and on-demand assembly through its Screaming Circuits business unit.

San Diego PCB Design Adds Biz-Dev Horsepower

Chris Heywood has joined San Diego PCB Design as Business Development Manager. Previously, he was a business development manager with Segue Manufacturing Services. He was earlier associated with Kimchuk, Inc., Providence Texture, Signature Cable and Federal Electronics in a variety of electronics manufacturing services (EMS) sales, program management and technical sales/consulting positions.



Chris Heywood

"Chris has over 17 years of program man-

agement, EMS sales and technical sales experience which means he truly understands the relationship between PCB layout and manufacturing costs as a product ramps to volume. That ability to help customers understand the way that San Diego PCB Design's technical expertise and approach to layout helps reduce total cost is an important skill. Additionally, his past experience should be beneficial in identifying opportunities where Milwaukee Electronics' full range of manufacturing services would be a better fit for a customer than just layout alone," said Paul Forker, Corporate Director of Sales.

Chris received an Associate of Arts of degree in liberal arts from the Community College of Rhode Island.

Message from Jered

The Lessons We've Learned in 2021

This year has been one of the most challenging, if not the most challenging year, anyone on our team can remember. Supply and demand imbalances, continuing global COVID-



Jered Stoeher

related shutdowns, logistics delays, labor market shortages and inflation were all part of the chaos factor every company in our industry has faced. That said, our job is to

apply our expertise to address these challenges. In some areas, we've done a good job and in other areas we need significant improvement. As we close the year, I thought it might be good to share a few lessons we've learned over the past year.

You Have to Break the Rules. Our industry has focused on efficiency for decades. Minimal inventory, just-in-time production and strong focus on continuous cost reduction are hallmarks of this philosophy. However, when market conditions drive suppliers to de-commit day of shipment and even non-authorized distributors run out of some parts, keeping production flowing requires a different mindset. We are working with customers to

forecast projects nearly two years in advance and are carrying much higher levels of inventory to ensure available parts. That said, we will be watching market conditions closely in 2022 because when supply and demand eventually balance, it will be important to return to efficient supply chain management practices to ensure appropriate inventory levels.

Cost Increases are Inevitable. Raw materials, shipping, stocking, energy and labor costs are increasing around the globe. This year we had to take the unprecedented step of announcing cost increases across our customer base to balance the

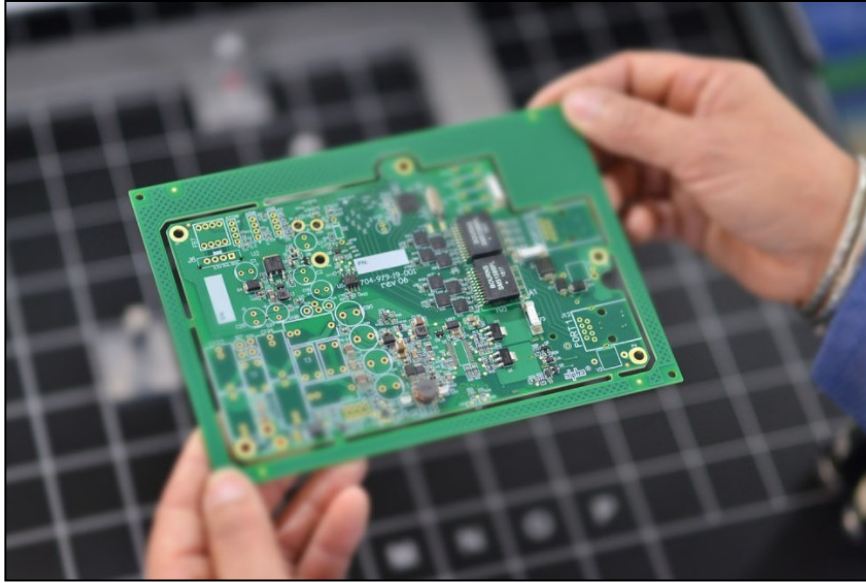
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Engineering in Action

Creative Solutions Ease Supply Chain Challenges

There is no question that materials availability is the dominant issue in electronics manufacturing right now. In a more normal environment, when one component manufacturer has availability issues, buyers or component engineers can identify similar components that are available with component database tools. However, that is usually not the case today. Fortunately, Milwaukee Electronics' engineering team is able to apply its expertise in ways that are resulting in solutions that keep products producible.

"In this environment, you need to take it up



Milwaukee Electronics' engineering team's understanding of PCBA circuitry adds options that may solve material availability challenges.

a notch. In most cases you aren't going to find a drop in second source. Instead, you have to analyze how the circuit works. From that point you can identify options

that may solve the issue," said Clint Hanson, VP of Engineering.

For example, when the team analyzed a smart lighting product with multiple configurations, they found that only a few configurations required a single source part that was in short supply. It was possible to bypass the problem circuit with a 0 ohm resistor on the configurations that didn't include that function. Existing inventory of the single source part was then reserved for the products that required that circuit.

In another case, an electrolytic capacitor was unavailable. Purchasing looked for a parameter match on components that might be a good cross and could find nothing. Engineering evaluated the circuit and



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Could Your Test Strategy be Improved?

A key benefit of outsourcing is that EMS providers are manufacturing experts and when that expertise is channeled into optimizing the product manufacturing process, defect opportunities are eliminated and overall cost is reduced. Milwaukee Electronics views the test process as one area where there is great potential for optimization.

Many OEMs prefer to develop their test engineering strategy. However, that lack of collaboration can result in inefficiencies. The team at Milwaukee Electronics sees four areas where a collaborative approach typically adds value:

- Reduction in overall cost of test
- Tester/test fixture sustainability
- Defect mitigation
- Productivity.

  <p>Four Ways Your EMS Provider Can Improve Test Strategy</p>	<p>Do You Have the Most Efficient Test Strategy?</p> <p>Milwaukee Electronics' latest whitepaper looks at four areas where collaboration with your EMS provider can help optimize test strategy.</p>
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Milwaukee Electronics' whitepaper, "**Four Ways Your EMS Provider Can Improve Test Strategy**," explores the typical im-

provement opportunities in each of these areas in detail.

Download the full whitepaper [here](#).

Message from Jered

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increased cost of doing business that we are facing. We didn't like taking this approach. That said, this process has helped strengthen program teams' ability to analyze cost trends and discuss available options for addressing them and we appreciate the support our customers have given in addressing this challenge.

Relationships Matter. The environment we've all faced over the last two years can't be solved by any one team. We all need to work together to provide better visibility into forecasts, identify likely constraints and escalate items in short supply. The challenges we've faced together have built stronger working relationships and we plan to incorporate lessons learned through these efforts into our post-COVID processes.

We Need to Improve. It would be easy to blame all issues we've encountered this year on global challenges that COVID has created. The reality is that these chal-

lenges have also shown us where we need to increase resources or improve processes. In short, we take ownership of areas of inefficiency and are making changes to fix problems as we identify them.

We anticipate challenging market conditions will continue through most of 2022. We are committed to continuing the investments in people, systems enhancements, equipment and inventory to support customer requirements. We appreciate the support we've gotten from our customers and suppliers in working through material availability issues. We remain committed to transparency, focused improvement and creative solutions. If there is anything that Rick or I can do to improve the performance elements we have the power to change, please let us know.

I'd like to wish you and your families a Merry Christmas and a happy and healthy New Year!

Jered Stoebr
CEO

Stay Up to Date on Materials Constraints



Here is Your Supply Chain Bulletin

December 08, 2021

What's happening in the global supply chain as we reach the end of a volatile year in our industry? It should come as no surprise that global supply chain problems are continuing, and ever escalating.

Not only is the world still working through COVID related difficulties, but China has a shortage of electricity, the UK has a shortage of HGV drivers and Hong Kong has been battered by typhoons which forced stock market trading to be suspended. Panic buying is continuing in the consumer market with iPhones, PlayStations, and sought-after Christmas gifts all in short supply.

China's energy supply crisis is threatening production, with electricity being rationed and coal pricing increasing. Power outages and further restrictions of supply are predicted over the coming winter period.

Capacity & Lead Time Issues

- Vishay's CRCW series of resistors are on allocation
- 60% of Analog Device's catalog of products are on 39 weeks lead-time.

Milwaukee Electronics is here to help with supply chain management and engineering expertise. Corporate Director Supply Chain Gary DeGrave publishes a monthly Supply Chain Bulletin outlining trends, specific component manufacturer updates and tariff activity. Past Bulletins can be accessed [here](#). All Milwaukee Electronics customers automatically receive an emailed bulletin monthly.

Engineering

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found that the circuit the capacitor was used in had been overspecified for the application. The specification required a 35V capacitor, while a 25V capacitor was more than adequate for the application. That part was available.

The team is also helping speed validation for redesign or product development.

"In one case we had a product that had six different revisions and had gone back

to UL 4-5 times. On the last validation cycle we were able to virtually demonstrate the product test UL wanted which shortened the recertification time significantly," said Clint.

Milwaukee Electronics recently purchased dynamometer automation and a power analyzer. Utilizing those tools, the team was able to perform Live Witness testing with UL. Rather than sending the device to UL for testing or having a UL engineer come to the Milwaukee plant, the UL engineer was able to virtually witness testing. The process in-

cluded having two cameras set up to provide a constant video feed, so the UL engineer could observe the motor in operation and all of the data being captured by the power analyzer.

"Challenging times require creative solutions. Our engineering depth gives us the ability to support our customers' engineering teams in identifying options that may not have been previously considered," added Clint.

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