

MILWAUKEE ELECTRONICS NEWS

Q2 2020

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.

Tecate Facility Adds Capabilities, Navigates COVID-19 Challenges

Milwaukee Electronics' facility in Tecate, Mexico is adding capabilities while continuing to navigate the challenges created by the COVID-19 pandemic.

"Mexico began seeing larger numbers of COVID-19 cases about a month after the U.S. started to see spikes in their cases. Our facility began prevention training and use of personal protective equipment (PPE) in March concurrent with mitigation efforts in our U.S. facilities," said Pirouz Pourhasemi, Tecate General Manager.

When Baja California entered its COVID-19 red zone status, the facility volun-



Above, employees and visitors go through a screening process prior to entering the Tecate production facility.

tarily shut down production for a brief period in April, leaving a small crew to do preventative maintenance on equipment and ship finished goods out. The management

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Message from Mike Milwaukee Electronics is Navigating the New Normal

The COVID-19 pandemic has tested our team and companies around the world on an unprecedented scale. Our employees have had to develop new



Mike Stoehr

work routines, our supply chain management team and suppliers have had to work through an evolving landscape of restrictions and logistics challenges, our management team has had to figure out how to balance the needs of essential product customers and employee safety, and our customers have been dealing with their own set

of challenges. In short, stress levels are high across the board and the new normal keeps evolving daily.

That said, while we can't completely control the way the pandemic tests our company, we can control the way we react to it. And while a continually changing set of challenges does add stress, it has also demonstrated that much of the strategy our team has implemented over the last several years has added resilience that far exceeds our expectations.

For example, one of the biggest challenges in our Milwaukee facility is that many team members are single parents. When schools shut down it created childcare challenges for many employees. Our facility had started a cross training initiative at the end of 2019 to enable production workers to shift among workstations as production de-

mand changed. Documentation was also enhanced. As a result, when the schools closed, we were able to offer impacted production team members the ability to move to a different shift or work schedule that would better align with their childcare schedules.

Our Tecate, Mexico location is part of a campus containing our facility, two other companies, and additional common and training spaces. Our facility had been expanded the previous year for anticipated growth in production. The team used the recent facility expansion plus available space elsewhere in the campus to accommodate social distancing needs for production and breaks, in addition to implementing a broad range of safety measures to minimize the potential of disease

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Engineering in Action

Universal Test Platform Reduces Cost of Test

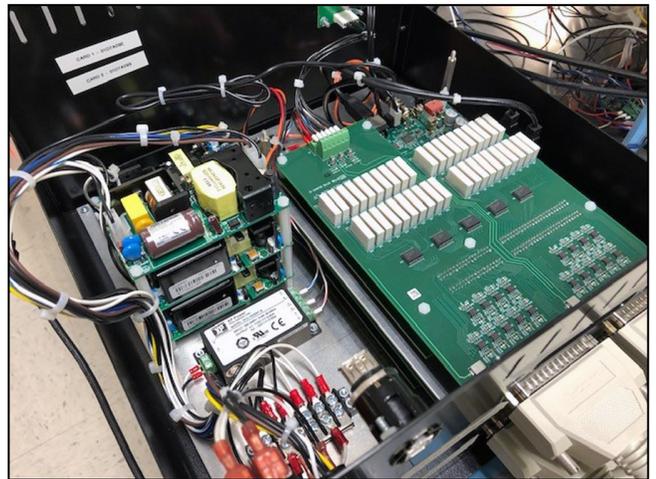
Milwaukee Electronics' engineering team has been offering a Universal Test Platform since 1997 to help customers address the need for low cost product functional testing. Over time, the platform and associated fixture options has evolved into a very flexible solution.

"As an engineering-driven company, we recognized the need to develop a standardized, low cost test platform for customers whose volumes wouldn't cost justify complex fixturing back in the 90s and we've continued to enhance our offering as technology has improved. We are now in the second generation and continuing to work on enhancements in conjunction with our Corvallis design team," said Larry Holten, Technical Sales - Manager of Special Accounts.

This universal test fixture is based on the National Instruments platform. The test engineering team has developed a

firmware test engine capable of doing functional test on a wide range of products via high performance breakout PCB fixtures. The fixtures connect to products via connectors or bed of nails. The test engineering team writes the test firmware based on the customer test plan. Depending on the configuration required, the test platform can do impedance testing for shorts and loads, functional tests, signal analysis, circuit test and component tolerancing. For compliance testing requirements, the system can save a test record of each test and the setpoints that were used to qualify the test. The team also works with customers to fine tune test parameters based on yield trends observed over time.

For example, one product had 7 out of 155 printed circuit board assemblies (PCBAs)



Universal Test Platform interior assembly.

fail by only 1-2mV. The test engineer contacted the customer and discussed the trend since it involved an error that likely wasn't going to impact product performance. The customer ran internal calculations based on the design and adjusted the test limit windows.

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Milwaukee Electronics Adding New EMS Customers

In spite of the COVID-19 pandemic, Milwaukee Electronics has been winning new EMS projects. The latest two involve production in Tecate, Mexico and Milwaukee, WI.

The Tecate facility was recently awarded a project involving the manufacture of an electronic actuator for an industrial controls company. The actuator can be remotely controlled to open and control valves/piping in remote locations.

"We've worked with this customer on prototypes, but this is the first EMS program we've won," said Scott Pohlmann, Midwest Director of Business Development.

Project volumes are anticipated to run 10,000 units per year. The Tecate team will be doing a comprehensive PPAP

level 3 qualification process which includes a 30-piece validation build, pre-pilot production and beta stage prior to full production. The PCBA requires IPC Class 3 workmanship and conformal coating. While the customer will supply basic functional test software, Milwaukee Electronics is building the in-circuit test and 10-15 expanded functional test towers.

"This program capitalizes on our test engineering expertise and our ability to support secondary processes such as conformal coating, needed for products operating in harsh environments. We are also quoting an additional 7-PCBA sensor unit," added Scott.

The Milwaukee facility has won EMS business from a Milwaukee-area customer who has awarded engineering projects in the past.

"The customer had 7,000 backup/standby generator units built by another contract manufacturer that needed reprogramming. The process required unboxing, programming, testing and repackaging. As a result of that project, we are taking on the raw material inventory from the current contract manufacturer and beginning to build the PCBA, as well," said Scott.

This project has the potential represent over \$1 million per year in revenue at full volume.

"Our willingness to help this customer out with a programming project that didn't guarantee follow-on business, essentially won the follow-on business. It is another example of the way our willingness to flexibly adapt to our customers' needs helps our business grow," said Scott.

Director of Systems and Technology Named



Justin Moulton

Justin Moulton has joined Milwaukee Electronics as Director of Systems and Technology. Previously, he was Director, IT at DW Fritz Automation Inc. He earlier served in a variety of systems management, consulting and engineering roles at Sure ID, Future Visions, Alliant Technologies, the University of Louisville Speed School of Engineering and General Electric.

“Justin has significant experience in Epicor ERP system implementation and the business transformation efforts necessary to fully leverage system benefits in a multi-facility manufacturing environment. He also has significant expertise in overall systems security and compliance in areas

such as ITAR. We feel he will be a valuable asset in executing our systems strategy going forward,” said Rick McClain, President.

Justin received his B.S. in computer engineering and computer science from the University of Louisville. He is a Certified Information Security Systems Professional (CISSP) through the International Information System Security Certification Consortium (ISC). He is also a Certified Scrum Product Owner (CSPO) and a Certified ScrumMaster (CSM) through the Scrum Alliance.

Tecate Update

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team met with Mexican government officials and got approval to re-start operations provided there were no more than 50 employees per shift and that employees with known comorbidities not be brought back to work at this time.

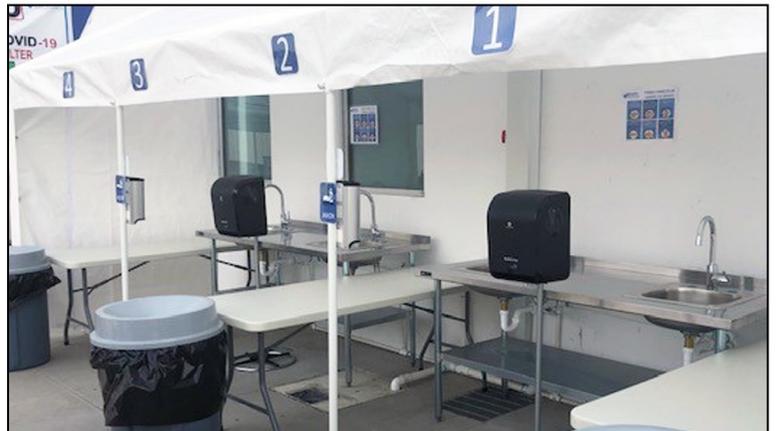
The Tecate facility is part of campus run by MMS, a shelter company that has a strategic relationship with Milwaukee Electronics. The Tecate facility had been expanded the previous year for anticipated growth in production. The team used the recent facility expansion plus available space elsewhere in the campus to better spread employees out for production and breaks, plus switched to 12-hour shifts which included weekends to enable more employees to have a full work week under the 50-employee per shift rule.

Additionally, under Mexican law, every employer with more than 100 employees must have an infirmary and a nurse onsite. As a result, daily temperature checks using an infrared scanner are done on all employees. In Mexico, many employees do not have personal vehicles, so employers contract with bus companies to provide transporta-

tion to and from work. The Tecate facility contracted extra buses and had the bus company install plexiglass shields between seats, plus limit one employee per two-employee bench seat to maintain appropriate spacing. Mitigation practices similar to those used in the U.S. facilities such as mandated social distancing in work cells and break areas, and partitions in some workspaces are also in place.

While some work was transferred to the Portland and Milwaukee facilities during the shutdown, the Tecate facility is now staffed at 80-85 percent and has resumed production.

The facility has added another SMT line and a pre-heater and fluxer module to its selective solder system. It has also added two inline 3D solder paste inspection (SPI) systems to its existing SMT lines. The conformal coating system is being upgraded. Additionally, a potting machine and two



As part of the daily screening process, arriving employees use hand-washing stations prior to entering the facility.

cure ovens are being added in a dedicated workcell for a new customer.

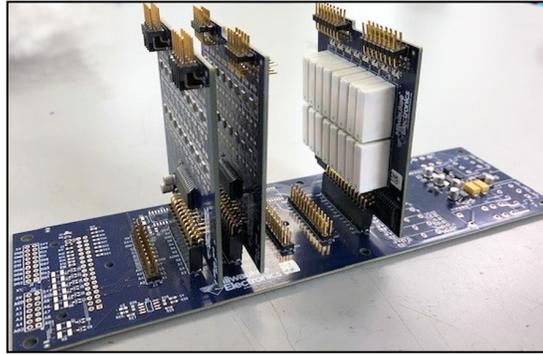
“We’ve seen a 70 percent increase in our existing motor/motor control customer’s demand. As COVID-19 increased product shipments to homes and businesses, there has been a spike in demand for material handling systems and their motors and controllers are used in those systems. We are also seeing new projects come online that utilize our encapsulation expertise, so we’ve increased that capacity, as well,” said Pirouz.

Universal Test Platform

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In determining the best configuration for each customer, the team considers budget, the product's volume and mix, test access points and the product technology requirements when selecting the Universal Test Platform that the product will ultimately be tested on.

"Our goal is to give each customer the right solution for their product's requirements at a reasonable cost. We've also de-



Standalone Test Fixture Board with Expansion Cards mounted

signed the test process so that it can be performed easily by a test operator rather than a technician. We want the test program to make the pass/fail decision. This frees up technicians and enables them to focus on debug and troubleshooting processes," added Larry.

The universal test platforms are the primary tester used in the Milwaukee facility. There are over 50 universal test heads and 10 Universal Test Platforms currently in use.

Message from Mike

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spread.

Both U.S. and Mexican officials have changed regulatory requirements as the pandemic has progressed, which drives a need for continuing management review of new regulations. To date, the mitigation procedures implemented at the beginning of the crisis have met or exceeded evolving requirements.

Our factories build a variety of essential products including printed circuit board assemblies (PCBAs) used in dialysis of critically ill patients, laboratory equipment used to clean glassware used in glove boxes in biological containment facilities, material handling system components, alternative

energy products and a variety of critical industrial infrastructure products. And our team of employees have supported those needs admirably throughout this evolving situation. In one case, a medical customer placed a single order that exceeded their typical annual volume. In other cases, we are seeing doubling of normal demand. To meet these demand spikes, we have shifted production seamlessly among our three production facilities on several occasions.

Our priorities have been simple: we want to keep our employees safe and we want to meet our commitments to our customers. We've found that approaching the situation with agility, flexibility and concern for others, works well. We've seen shifts in business rather than a large drop in business. In fact, we are hiring new employees as a result of con-

tinuing business stability. The concern we've shown for employee welfare and work hour flexibility has been returned by employees who are committed to ensuring our essential production gets out. We've also seen that strategic decisions we made well in advance of COVID-19, such as worker cross-training, systems enhancements and facility expansion are paying unexpected dividends. Ultimately, we are all in this together. From our perspective, common sense, creative solutions and concern for others is the best way to meet this challenge.

P. Michael Stoehr
CEO

Newsletter Contact

Jered Stoehr, VP Sales and Marketing

Email: jstoehr@milwaukeeelectronics.com

www.milwaukeeelectronics.com

Sales inquiries: sales@milwaukeeelectronics.com

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5855 N. Glen Park Road
Milwaukee, WI 53209
Tel: 877.960.2134