MILWAUKEE ELECTRONICS NEWS

Q3 2023

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 operates over 180,000 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 and on-demand assembly through its Screaming Circuits business unit.

Electronic Component Market Review

By Gary DeGrave, Jr., Corporate Materials Director

The first half of 2023 has seen the world talk again of rising inflation, high interest rates and recession. Despite this, the outlook on market growth globally still looks positive, albeit much of the growth is projected for the APAC region with the Americas projected to be relatively flat or slightly down. Due to the over-inventory position of many manufacturers, the actual sale of electronic components appears down more than it truly is.

General distribution inventory has continued on a increasing path for high use commodity components. More manufacturers appear to be increasing costs and extending leadtime for older product lines in an attempt to push customers to newer products. This appears especially prevalent in the microcontroller products.

Capacity and lead-time issues

While semiconductor shortages are still observed in certain technologies -MCUs specifically – the market in general is slowly improving with highservice distributors having more stock availability and broadline distribution

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A Q&A with Jered Stoehr Measurements and Results

"What's measured improves," is attributed to Peter Drucker. However, that was only one aspect of Drucker's view of critical elements in motivating



ients Jered Stoehr vating

performance improvement. His teachings valued employee buy-in and social interaction as part of performance improvement activities. So do we. This quarter's newsletter looks at ways our Milwaukee, Wisconsin and Tecate Mexico facilities are focusing on performance improvement, both in terms of metrics and employee involvement.

We also look at improvements in the materials situation. Our program managers and supply chain team members are continuing to work with customer teams in drawing down the excess inventory while addressing issues driven by constraints that haven't yet moderated.

In Screaming Circuits, we've recently upgraded an older placement machine with a new Mydata MY300 and continue to focus on improving throughput and ontime delivery metrics.

Internal measurement is only half the equation. We will be launching our annual customer satisfaction survey shortly. If you are selected as a survey participant, I'd appreciate if you would take the time to fill out the survey. Our leadership team meets quarterly and uses this valuable feedback to prioritize our continuous improvement activities and investments in our business.

Jered Stoehr

CEO



Tecate Tiger Team Develops Customer-centric Solutions

Milwaukee Electronics' facility in Tecate, Mexico has created a multi-discipline engineering team focused on developing technology solutions to support specific customer requirements. Originally created to focus on test solutions, the team is now working with manufacturing and quality personnel to address any challenge where technology or automation can improve customer outcomes.

A recent project involved automating quality data acquisition and analysis. The team developed APIs to extract data from inspection and test equipment throughout the production process. Products are serialized and the new tracking system enhances the traceability data now associated with each unit. With Milwaukee Electronics-owned inspection and test equipment, they were able to work with equipment manufacturers to find solutions. However, it has been more of a challenge with customer-provided test equipment, as programming in those test stations isn't always set up to record data or easily transfer it to a different system.



(L-R) Technical Solution team members: Kevin Corral, Test Engineer; Cristofer Moreno, Electrical Engineer; Luis Pacheco, Automation Engineer; and Kevin Sandoval, Mechanical Engineer. Not shown: Pablo Dominguez, Software Engineer, who works remotely.

Legacy customer-owned test systems are being linked to a central database on caseby-case basis, as this is the most time consuming part of the system development process. New procedures are in place for test development on new products to ensure that as customer-provided test equipment is developed, it is recording data and able to transfer that data to the database.

The new system is being utilized in several ways. On the production floor,

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Materials

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carrying increasing stock levels whilst also accepting orders to lead-time and pipe-lined inventories.

<u>TSMC</u> reported they would delay production at their new Arizona facility to 2025 as a result of skilled labor shortages. Its original operational target was <u>2024</u>.

SIA (Semiconductor Industry Association) reported <u>global semiconductor sales of</u> <u>\$40.7bn</u> during May 2023, an increase of 1.7% on April but this is still down on May 2022 where figures were \$51.7bn.

Both TE and Molex are still having supply issues on-and-off. TE has been constrained for a number of quarters dating back to pre-covid and Molex has had bottlenecks for a similar period of time, becoming more obvious in the first half of 2023.

Generally, Allegro products are no longer on allocation. Selected Infineon products still have ongoing extended lead-time for MCUs particularly, yet Texas Instruments availability is easing on consumer lines outside of automotive and hi-rel grade products.

ADI lead times have shortened to 16 to 20 weeks for consumer products. However, lead times are still between 40 to 56 weeks for the communication and medical industries. In particular, the LTMxxx and LTCxxx are experiencing constraints. Infineon shortages continue as lead times stretch to over 50 weeks for the most in-demand components. The TLE, IPD, and AUIR series have been the most affected, especially highvoltage MOSFETs like the IPW, IPB, and IPP series.

While Texas Instruments' delivery has become much more stable overall, there are certain products that are still subject to fluctuating costs and supply constraints. Prices for the LMXXX, SNXXXX, and TPSXXXX series, particularly the TPS38 and TPS54 series, are shifting as demand is on the rise. Factory lead times are hovering around 68 weeks.



Tecate Tiger Team

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monitors display real time test results enabling fast action if products are failing in inspection or test. This level of data availability also serves as a check and balance on product quality prior to conformal coating or potting, which eliminates the ability to rework a product. In final inspection, inspectors are verifying that each product has completed all production and programming steps, and passed all tests in the routing prior to shipping. At a customer level, engineering teams now have access to real-time quality data.

"We've had two customers come in and audit the new system with good results. It is still a work in progress and our team is working on customer-driven, proactive enhancements," said Manuel Fornes, Program Manager.



The Tecate Manufacturing Routing System features a graphical dashboard interface that makes it easy to look up and view data and trends.

Continuous Improvement Focus Drives Results in MKE

The team in Milwaukee Electronics' MKE facility is using a variety of core tools to drive continuous improvement. Metric boards are visible for work center, plant and engineering activities. Huddle meetings are held daily in each work center. The work center leader discusses metrics with his/her team including any misses from the prior day, plans for the current day and goals for the next day.

At a management level, a weekly order tracker is used to review all orders for production against supply chain constraints to identify shortages. A sales and order planning meeting is also held monthly to review production capacity (people, equipment and supplies) over the next six months.

Office and production leadership are taking weekly Gemba walks to observe metrics and strategize with team leaders on improvement areas or constraints. Work center leaders use orange markers to signal a help chain request on actions they'd like assistance on from outside the work center. The help chain concept is also used by operators to signal the team leader that they have a need for assistance with a bottleneck or issue by raising their hand.

The MKE GM holds a monthly town hall meeting and shares updates on metrics and key changes in business, plus invites employees to share feedback or ask questions.

Employees have also been participating in problem solving training designed to improve their skills in measuring performance, determining where a problem has occurred, evaluating the "why" associated with the problem to determine root cause, creating a hypothesis on the impact of possible corrective actions, implementing the best corrective action and determining the best method for detecting/preventing reoccurrence. Better integration of employees into the problem solving process has reduced defects by 48 percent since January 2022. Some of the specific improvements have included:

- Reduction in solder bridges was achieved after better focus was placed on maintaining precise solder paste temperature during storage via a medical-grade refrigeration unit.
- Reduction in conformal coating missing around headers was achieved via updated work instructions and additional operator training
- Reduction in damage to PCBAs during the depaneling process was achieved by re-laying out the array to enable use of an automated router.
- The reduction in defects has also (Continued on page 4)



Screaming Circuits Upgrades SMT Assembly Capability

Screaming Circuits has replaced one of its older SMT placement machines with a Mydata MY300. The Mydata product family has been Screaming Circuits' SMT platform of choice because of the precision, flexibility and ease of changeover it provides in the prototyping and short run environment.

The new machine is equipped to easily handle both low volume prototypes and short run volumes. In particular its ability to support on-the-spot board revisions, and handle short tape strips and non-standard carriers have helped Screaming Circuits maintain a leadership role in the prototype market.



Screaming Circuits' SMT area is focused on quick changeovers and flexibility. Above, Song Heu, checks a PCBA.

Portland Facility Adds New Industrial EMS Customer

A company that manufactures environment monitoring and control systems for laboratory, life science and health care facilities has selected Milwaukee Electronics' Portland, OR location for boardlevel assembly.

"This company was previously a Scream-

MKE Improvements

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reduced scrap by 15 percent this year as compared with 2022.

The team is currently focusing on reducing transportation waste by optimizing routing on the most frequently built assemblies. Single minute exchange of die (SMED) principles are being used to reduce changeover time. SMT area breaks are being staggered to keep machines ing Circuits customer for quickturn prototypes that is headquartered in the Midwest. Following a presentation at their facility, we were invited to quote our EMS services and won the project," said Scott Pohlmann, Director of Business Development. The team in Portland is currently doing a 40-piece Factor Analysis of Information Risk (FAIR[™]) sample build on the first of the 3-4 printed circuit board assemblies (PCBAs) associated with the project. In full production, the project will represent over \$1 million in revenue annually.

running continuously. Manual labor and bottlenecks have been reduced through better automating part prep and depanelization, and adding an in-circuit tester.

"While we still have significant improvements to make, focusing our entire team on a broader range of metrics and problem solving is helping us achieve incremental improvements every month. The people closest to the work are often in the best position to identify ways we can improve. Added training, visible metrics, and the focused communication driven by daily huddles and gemba walks is motivating everyone to contribute to this effort," said Jeff Theys, MKE GM.

Newsletter Contact

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