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FRONT PAGE NEWS

Yamaha Builds Capability at EBW Electronics

HOLLAND, MI — EBW Electronics has been designing and manufacturing high-tech, electronic products in West Michigan since 1992. The company set out to prove that the design and manufacture of high-tech electronic and mechatronic products does not require a country of origin with low labor cost but can be accomplished in West Michigan. More than 30 years of innovation and highly automated manufacturing experience proves the case.

Cory Steeby, president, says that EBWE's business model is to build for the future. "EBWE's 71,000 sq. ft. manufacturing facility is designed specifically for high volume electronic and mechatronic production. EBWE produces products in an ISO Class 7 designated clean room. Our manufacturing space is organized and brightly lit featuring ESD conductive tile floors throughout. Positive air pressure, temperature, and humidity are controlled and monitored continuously. We currently have rated capacity to place over 100 million electronic components per week using nine high-speed, automated surface mount technology (SMT) assembly lines. Numerous customized, robotic work cells assemble mechatronic products."

Higher Capacity

The need for higher capacity is expected to continue to grow. As a result, EBWE has added new assembly equipment — the goal being faster PCB assembly speeds and higher accuracy. Some of this speed and accuracy has been gained by investing in newer, more modern component placement and solder paste stencil printing equipment from Yamaha Motor Corporation, USA, including YRM20 modular component placement robotics systems.

Toby Crittenden, Yamaha (left), Ross Nagelkirk (center back), Mike Voorheis (right), Adriana Salazar (front left), Fernanda Vangsouthi (front right), EBW Electronics.

Ross Nagelkirk, manufacturing engineer for SMT at EBWE, says that "EBWE makes lighting products mostly for automotive applications, and also for some non-automotive," but then "we had a program launch occur that stressed our SMT manufacturing capacity, so naturally we had to look at adding another line. We took that opportunity to reevaluate the capabilities of the machines that we were using, and we evaluated Yamaha against a competitor, and as part of that process, we created a goal."

"We set a goal of 40 seconds for an array, one side, and we could hit that with the current machines, we calculated, if we bought three of them; then we could achieve that. Actually, we were shooting for 36 seconds with Yamaha with two machines. The alternate vendor that we were evaluating was very similar, but we looked at the overall value proposition and chose to go with Yamaha. Since we implemented Yamaha, we have surpassed that 36 seconds; in fact, we're now under 30, so we're doing better

than what we expected. We realized that we only needed to upgrade a line, not buy a new one, so in the end we were able to obsolete some older technology that we were using and install two Yamaha assembly machines, upgrading our capacity without having to invest in totally new lines."

Nagelkirk says "Doing this enabled us to satisfy that need to manufacture our new product, an LDM for a headlight for a major automotive OEM, enabling us to fit that, plus all the other product that was already on that line into our capacity and still have some room. So instead of buying another line and then having to buy three machines and the whole setup, we could buy two machines and not anything else."

Moreover, he adds "As far as performance goes, accuracy throughput is our biggest win, now better overall, and as a result we have chosen to put most of our more difficult product on the Yamaha lines. This includes electrolytic caps and coils, fine pitch micros and BGAs, the products that in the past have tended to have a higher fallout."

Nagelkirk says that EBWE has two Yamaha lines currently (out of 9 lines total) and seven of them use pre-existing technology. "It is not necessarily older, it's just the equipment that EBWE had before buying the Yamaha machines."

Nagelkirk says, "When we evaluate first pass yield with AOI on all of them, Yamaha is typically in the top two or three, and we have two Yamaha lines, so the best one can do a second. So there is one predecessor technology line that is always at the top, but the board is just basically LEDs and the connector, so it's a super simple board, whereas the Yamaha lines can do more placements."

CPH

As far as components per hour goes, everyone wants that number, Nagelkirk says. "So we're seeing in the field 100,000 components per hour on the two machines. Real time on one of our products that we have, not all of them, but that one specific product basically was accidentally designed perfectly for Yamaha, so it wasn't intentional. We didn't know about that when it was happening, but that's what happened. So that seems like it's a pretty good win for Yamaha, I would think if both of those two machines on paper are supposed to be around a hundred thousand components per hour each and then in real life, we're hitting that for the two of them, I would assume that's quite positive."

In terms of planning for the future, EBWE is currently using all of their Yamaha capacity, Ross says, but in the last year and a half he has added more product to those machines. "We've moved other critical parts to those lines to keep them busy all the time while gradually obsoleting old equipment," he says.

EBWE's overall quality increased, with less component failure on first pass yield. "For example, this week we added a product to the Yamaha lines and the first run it had a first pass yield of 99.98% with only one bad board and that was expected," he says. "It's a pretty simple board, with two large micros and a bunch of caps and resistors, all chips. So we all expected it to do tolerably well, but it did really well starting on day one, and we feel that it is a testament to the Yamaha machines."

"There was one more number that might make sense and that was from what we had to what we have now by buying Yamaha," Ross adds. "We have about two and a half times the throughput on one line. We were slated to buy a 10th line, and shortly thereafter an 11th line, but yet we're still at nine lines. We have only two Yamaha lines and we're hitting that volume that we needed to." Nagelkirk also bought two Yamaha YSP10 printers.

To summarize, EBWE installed two initial Yamaha placement machines, which had a significant impact. Ross says, "In 2023 we added the two printers. So we have two lines with two YRM20s, and both of those lines have YSP10s, which really are their own story. We're happy with what we now have. I'll program the printer, I'll show that and then say, here we are with this is what it actually is doing, and so then we can improve other areas because the YSP10 has the stencil cleaning in parallel as far as cycle time goes, happening at the same time as the feed. It shortens the cycle time significantly from our older machines, from the legacy equipment. So our cycle time floor has gone down quite a bit with the Yamaha printer and the quality has gone up."


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