

EMS - UNITED STATES

EYE-OPENING SPEED

The machine-shop heartland of America starts in Chicago and its suburbs. Here, mostly family-owned fabricators stamp, punch, bend, drill, tap and cut the metal components that feed U.S. industry.

"There are thousands of shops that fabricate sheet metal steel and aluminium. I wanted a highly specialised niche, so I focused on copper bus bar", says Tim Ellison, President of EMS Industrial & Service Co. "Other companies won't inventory copper, but I see it as an investment that differentiates EMS. The same holds true for my investment in fiber laser. It helps us go the extra mile to provide customers with superior speed, quality and service."

Tim explains that until he took the reins in 1993, EMS "made money by accident" because the company had little business structure or direction.

With the telecom and internet industries just taking off, the young Tim's vision to focus on copper bus bar coincided perfectly with growing market demand.

Cutting copper

While Ellison worked 24/7 to meet customer needs, cutting speed remained a bottleneck. Fortunately, Joe Dalo, LVD Strippit's sales representative, knocked on EMS' door in January 2014.

"I knew that fiber laser technology could help EMS achieve greater productivity," says Joe. "I explained that, unlike a CO₂ laser, fiber

laser could cut highly reflective material like copper. Fiber laser eliminates mirrors and optics. It better withstands a manufacturing environment and eliminates the maintenance hassles associated with CO₂, making it well suited for a 20- to 25-person shop such as EMS."

His interest peaked, Tim visited LVD's U.S. headquarters for a product demonstration. "After seeing the Electra cut copper, I couldn't believe such cutting speeds were possible", he says. While he immediately bought into fiber laser technology, Tim wanted to perform his own research as to the best technology providers. After months of research, he made his purchase decision.

"Comparing others to LVD, I realised LVD made a far superior machine," says Tim. "For a lot of the other manufacturers, it looks as if they took their CO₂ platform and threw a fiber laser on it. LVD actually started from the ground up, building a true fiber laser system that could handle the high cutting speeds possible with fiber laser technology."



Tim Ellison



Purpose built

Most large machines are inherently unstable, which means that they shake at very low frequencies. These machines are particularly difficult to stabilise sufficiently to achieve commercial production rates.

“The primary challenge associated with ultra-high-speed cutting is having a machine construction with the rigidity and stiffness capable of moving the gantry at high acceleration even while cutting”, says Stefan Colle, laser product manager, LVD. “To overcome this, we designed Electra fiber lasers with a welded steel monoframe construction that provides exceptional stiffness and weighs a massive 15 tons.”

“Moving from the Electra 4 kW to the 8 kW provided a massive increase in speed. It’s like buying time.”

As a result, the Electra can not only accelerate fast to move from one point to the next, but can (unlike most fiber lasers) keep an acceleration of 2g or 20 m/sec “during cutting” resulting in shorter production times for the part without losing accuracy. It can cut a 50 mm circle with a tolerance of ± 0.017 mm. The first *Electra* could cut 600 holes per minute on 20-gauge mild steel. Comparatively, CO₂ laser systems can cut 150 to 200 holes per minute. “To achieve the full potential of high-dynamic acceleration, *Electra* fiber lasers also feature a



lightweight yet rigid cast aluminium gantry controlled by specially tuned servo drives”, says Stefan. “Some competitors may have comparable gantry speeds, but they cannot accelerate as quickly. *Electra* delivers a distinct productivity advantage.”

Made for each other

With the technology a perfect fit, EMS purchased the first 4 kW *Electra* in North America in September 2015. “The speed of fiber laser will open your eyes. It is so much faster than a typical waterjet to do special contour cuttings, and the cut quality is very good,” says Tim. “Moving to fiber laser increased my capacity, so now I have more machine time that I can sell.”

However, if a 4 kW laser was eye-opening, the cutting speeds from an 8 kW laser are mind-blowing. A self-confessed “equipment junkie” who wants the highest production equipment possible, Tim attended the FABTECH 2017 show in November and purchased the *Electra FL* 8 kW. For the second time, EMS owned the first-of-its-kind fiber laser in North America.

Speed and focus

“Moving from the *Electra FL* 4 kW to the 8 kW provided a massive increase

in speed. It’s like buying time”, says Tim. He estimates that, on average, “the 8 kW laser cuts three times faster on thinner material. On thicker material, some of the parts are up to five times faster.”

The *Electra FL-3015* 8 kW doesn’t just feature a new, more powerful IPG YLS resonator. Its new cutting head incorporates “zoom focus,” a technology that adjusts the focal diameter of the beam from 120 to 320 μ m and enables independent setting of focus diameter.

“We live in a microwave society. It’s just been faster, faster, faster in terms of delivery times over the last 10 years”, says Tim. “To retain our leadership position, we continuously reinvest in our business. When customers come to EMS and see technology like the *Electra* 8 kW fiber laser, they know we’re the right partner to help them bring their products to market faster.”

EMS continues to invest in the speed of fiber laser technology. The company recently placed an order for their next *Electra* machine, due to be installed in January 2019.