

Best Practices Case Study

Jones Metal: Switching from CO₂ Lasers to Fiber Lasers

Company

Since 1942, Jones Metal has been a fully integrated precision metal fabricator for industries such as nuclear power generation, renewable energy, agriculture, construction, and defense. Their metal fabrication capabilities include laser, rolling, forming, cutting, machining, and welding. Jones Metal is also paper-free on the shop floor, having transitioned to an ERP system that allows work orders to be sent to each workstation on a touchscreen that is easily accessible to every operator.



Motivation

Jones Metal has the goal of becoming the most technologically advanced fabricator in their region. The company understands the importance of investing in state of the art equipment in order to maximize productivity while keeping costs down. One area where the company has made a significant stride forward is in their laser cutting process for cutting sheet metal. A large part of their success has focused on the benefits of understanding laser technology.

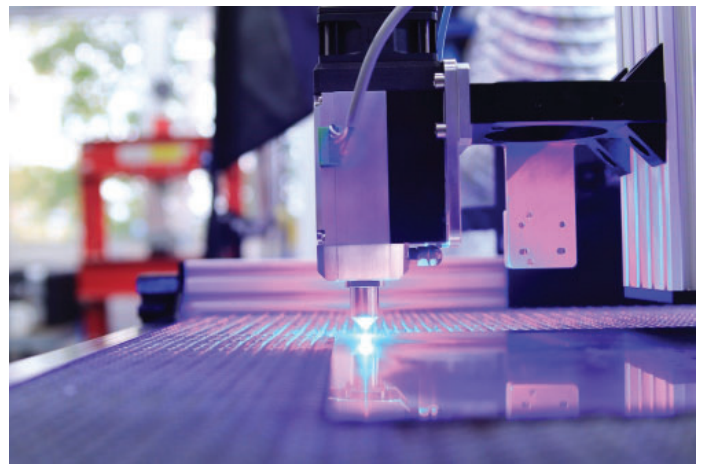
Opportunity

Jones Metal was using a CO₂ laser for their cutting process. The CO₂ laser generates a laser beam that shoots from the beam generator through a series of mirrors before reaching the material. The beam loses power each time it hits a mirror, resulting in an energy loss of approximately 25% once it reaches the material. The company realized that there was an opportunity to upgrade to a more efficient laser technology for their cutting process to improve energy efficiency while also increasing production throughput.

Approach

After researching and understanding the different styles of laser cutting tools available, the company landed upon using fiber laser technology. The beam generated in a fiber laser travels through a fiber optic cable as opposed to a series of mirrors. Its primary advantage is that there is minimal energy loss as the beam travels through the cable, which results in maximal cutting power at the material, superior performance, and lower energy consumption. The fiber laser had a significant increase in cutting speed of the sheet metal, which improved the company's ability to meet production demands.

The previous CO₂ laser ran on 30 kW of power and cut 1 inch thick steel at 20 in/min; the new fiber laser runs on just 10 kW yet delivers a cutting speed of 40 in/min, representing an approximately six-fold increase in efficiency.



"Laser Cutter Laser Machine Laser Engraver" by Max Pixel, licensed under CCO Public Domain.

Opportunity Potential

Based on 1000 hours of annual operating time, the new fiber laser would save 20,000 kWh/yr while doubling production. Using a utility rate of \$0.08/kWh this equates to a savings of \$1,600 annually. The increase in production improves customer satisfaction, on-time delivery of the product, and overall bottom line.