

Higher Productivity: A Breath of Fresh Air

Shops using compressed air for laser cutting, instead of laser-assist gases such as oxygen and nitrogen, achieve double-digit productivity gains and cost savings.

Cutting with clean, compressed shop air has shown considerable benefits, including speed increases and significant cost savings over nitrogen and oxygen assist cutting. More and more, processors are using air assist laser cutting with great success on a wider range of material types and thicknesses, including parts where edge quality is a factor. Cincinnati Inc. has championed the process of using clean, filtered air as a substitute for more expensive nitrogen assist gas for both CO₂ and fiber lasers. After all, air is approximately 80 percent nitrogen, with the

Initially, there was a concern that shop air's lower pressure would be a limiting factor, so a series of test cuts were conducted using existing shop air at 100 psi, plus added filtration with a refrigerated dryer, which feeds a high-pressure booster (450 psi maximum) to a high-pressure receiver. This ultimately supplies 350 psi of regulated clean, dry air to the machine.

Weld quality after the part is cut is a big concern, as a nice clean edge is required for a good weld. Parts processed on the fiber laser with air assist welded perfectly, and now the customer cuts all its 18-gauge through quarter-inch 304 stainless steel and 14-gauge through 10-gauge mild steel using high-pressure air assist. Most stainless steel parts cut with air exhibit a bright edge with only traces of straw color, while most mild steel parts cut using air assist gas can be taken immediately to painting without the usual secondary operation of oxide removal.

In addition to higher productivity, running the fiber laser cutting system using air assist is also saving money due to the lower cost of air compared to nitrogen. A nitrogen system requires a 50-HP compressor to generate the necessary pressures, but with air assist the required compressor is only 15 HP. Some shops have reduced the cost to run the fiber down to less than \$4 per hour, which is about 90 percent cheaper than using nitrogen as the assist gas.

In-house testing at Cincinnati Inc. showed that using compressed air with a fiber laser to cut 18-gauge mild steel generated a 39 percent reduction in operating cost compared to nitrogen assist gas, and increased the feed rate 17 percent—from 1,575 to 1,835 inches per minute.

The savings of using air assist also applies to CO₂ laser systems. Cincinnati Inc.'s testing determined that using compressed air with a 4,000-watt CO₂ laser cutting system on the 18-gauge mild steel yielded a 12 percent savings and 62 percent increase in feed rate versus nitrogen assist gas. With cost savings and productivity increases like that, to "air" is divine. ■



Air assist laser cutting offers considerable cost savings over nitrogen and oxygen assist cutting.

(Photo courtesy Cincinnati Inc.)

remaining components mostly oxygen and trace gasses.

This approach is being proved out in the field where shops have reduced processing time more than 90 percent by cutting with air assist gas—at a fraction of the cost of nitrogen. One customer produces more than 11,000 different parts, with annual quantities of more than 10,000 pieces each, so highly productive laser cutting is key to cost-efficient operations. The shop replaced two older CO₂ lasers, a 1,500- and 3,000-watt, with a fiber laser and immediately reduced processing time from 64 hours to four.

Cincinnati Inc., Harrison, Ohio, manufactures a wide range of metal processing and fabrication equipment. For more information, call 513-367-7100 or visit www.e-ci.com.

Editor's note: This article was contributed by the experts at Cincinnati Inc.