



## Cost Comparison: Fiber Laser vs. CO<sub>2</sub> Laser – High Power Cutting

	Fiber Laser (3,000W)	CO <sub>2</sub> Laser (4,000W)
<b>Laser System</b> • Laser and power supplies • Computer and software • Motion system	A combination of GE Fanuc (optional) heavy duty industrial motion systems and revolutionary fiber laser technology offer an easy-to-use and efficient alternative to large, bulky Nd:YAG and CO <sub>2</sub> systems for precision cutting applications. The motion systems also feature reliable worldwide support.	---
<b>Reflectivity</b>	Much less power is required for cutting reflective materials like aluminum or copper since more of the laser energy is absorbed by the substrate. This allows for intricate high-quality cutting at higher efficiencies than comparable laser cutting systems.	---
<b>Reliability</b> MTBF (Mean Time Between Failure)	50,000 to 100,000 hours (estimated)	Only around 20,000 hours
<b>Power Consumption</b> Electrical power requirements  (1kW cost \$.06 per hour based on working 250 days)	<b>Very low power consumption</b>  A 3000W fiber laser requires 10kW of electrical power plus 5kW for a chiller with a total of 15kW.  <b>\$1,350</b> per year 15kW per hour at 6 hr. shift  <b>\$2,700</b> per year 15kW per hour at 12 hr. shift	An equivalent 4000W CO <sub>2</sub> laser and chiller combination could be as high 250kW for operation.  <b>\$19,350</b> per year @ 215kW per hour at 6 hr. shift  <b>\$38,700</b> per year @ 215kW per hour at 12hr. shift
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>• No maintenance</li> <li>• No consumables</li> <li>• No cleaning or aligning of mirrors or beam path</li> </ul>	<i>Consumables:</i> <b>\$17,500</b> gas use in 6 hr. shift  <b>\$35,000</b> gas use in 12 hr. shift  Nitrogen: 99.9999% pure CO <sub>2</sub> : 99.9999% pure Helium: 99.9999% pure  <i>Maintenance:</i> <b>\$45,000</b> per year on an average 8 hr. shift
<b>Power Efficiency</b> Electrical Power Efficiency	<b>Up to 50%</b>	Only as high as 20%
<b>Beam Quality &amp; Spot Size</b>	TEM00 (<1.15) beam profile results in significantly higher power density directed to the material surface. Requires less power for the same result in comparison with CO <sub>2</sub> systems	---
<b>Optical Path/Beam Path</b>	<b>Flexible Cable</b> (up to 50m)	<b>Mirrors and optical path</b> Loss of beam quality and significant power drop-off
<b>Cooling</b>	Requires smaller chillers than equivalent CO <sub>2</sub> laser cutting systems	---
<b>Total Cost of Ownership</b> First Year	<b>\$1,350</b> yearly at 6hr. shifts <b>\$2,700</b> yearly at 12 hr. shifts	<b>\$81,850</b> yearly at 6 hr. shifts <b>\$118,700</b> yearly at 12 hr. shifts