

# WHAT IS THE DIFFERENCE BETWEEN FIBER LASER CUTTING MACHINE AND CO2 LASER CUTTING MACHINE?

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In recent years, the competition around "intelligence" has become increasingly fierce, which is giving birth to a great change in the production mode of the manufacturing industry. Under this opportunity, the [laser cutting machine](#) has become a widely used processing equipment in the industrial field. Due to its superior performance, fiber laser cutting machines have gradually replaced CO2 laser cutting machines and become the mainstream equipment for industrial processing. Next, let's mainly look at the difference between fiber laser cutting machine and CO2 laser cutting machine?

#### 1. Different luminescent media

For CO2 laser cutting machine, the gas is the medium for generating the laser beam, and the beam is transmitted through the mirror. Fiber laser is transmitted through diodes and fiber optic cables. Multiple diode pumps generate laser beams, which are then transmitted to the laser cutting head through flexible fiber optic cables instead of beams transmitted through mirrors.

#### 2. The appearance of fiber laser cutting machine is more compact

Due to the different laser transmission structure, the fiber laser cutting machine with the same power is more compact than the CO2 laser cutting machine in appearance size, thus saving the workshop space.

#### 3. The electro-optical conversion efficiency of fiber laser cutting is higher

With the complete solid-state digital module and single design of fiber laser, fiber laser cutting machine has higher electro-optic conversion efficiency than carbon dioxide laser cutting. The actual general utilization rate of each power supply unit of CO2 laser cutting machine is about 8% to 10%, while that of fiber laser cutting machine is about 25% to 30%. The overall energy consumption of fiber laser cutting system is higher than that of carbon dioxide cutting. The system is about 3 to 5 times less, making the energy efficiency greatly improved.

#### 4. The processing effect of fiber laser cutting machine is better

The fiber laser has a short wavelength, which increases the absorption of the cutting material to the beam and enables the cutting of materials such as brass and copper as well as non-conductive materials. When cutting materials up to 6mm thick, the cutting speed of a 1.5kW fiber laser cutting machine is equivalent to that of a 3kW carbon dioxide laser cutting machine.

#### 5. The maintenance cost of fiber laser cutting machine is lower

The CO2 laser cutting machine uses gas as the light-emitting medium. Due to the purity of CO2 gas, the resonant cavity will be polluted and needs to be cleaned regularly. The reflector needs to be maintained and calibrated, so the daily maintenance workload is greater. For a

kilowatt-class CO2 laser cutting machine, this item needs at least tens of thousands of yuan per year. In general, fiber laser cutting is more environmentally friendly and convenient in the daily maintenance of equipment.