Ultimate Guide: Types of Laser Cutting Machines

Introduction

Laser Cutting: Uses high-power density energy produced by laser focusing for sheet fabrication.

Advantages: High cutting quality, fast speed, adaptability to various materials.

Applications: Widely used for metal and non-metallic material manufacturing.

Fiber Laser Cutting Machine

Working Principle: Uses fiber laser as the light source. Laser beams are guided and expanded by fiber-optic cable, focusing on the workpiece to realize cutting.

Materials: Primarily for metal materials like stainless steel, carbon steel, aluminum, and copper alloys.

Advantages:
High precision and speed.
High photoelectric conversion rate.
Low power consumption.

Limitations:
Not ideal for thick materials.
High initial investment.

Key Components: Fiber Laser Source, Cutting Head, CNC Controller, Bed and Gantry.

Future: Promising due to efficiency, speed, and precision.

CO_2 Laser Cutting Machine

Working Principle: Uses a high-power laser beam guided on the material's surface. The beam causes the material to melt, burn, or vaporize.

Materials: Can cut carbon steel, stainless steel, aluminum alloy, wood, acrylic, and more.

Advantages:
High accuracy.
Reduced material deformation.
Least harmful among lasers.

Limitations:
Higher cost compared to other laser machines.

Key Components: CO_2 Laser, Cutting Head, CNC Controller, Bed and Gantry, Auxiliary Cutting Gas Supply System, Cooling System.

Future: Expected to be more efficient and functional.

YAG Laser Cutting Machine

Features: Low cost, good stability, but energy efficiency is usually less than 3%.

Applications: Mainly for drilling and cutting thin sheets.

Characteristics:
Short wavelengths.
Good focusing performance.
Not suitable for non-metallic materials.

Future: Focus on improving stability and lifespan of the power supply.

Conclusion

Laser cutting machines have revolutionized metal sheet fabrication.

They offer high-accuracy cutting for complex shapes, improving efficiency and reducing waste.

Essential for companies aiming to optimize operations and increase productivity.