2025

# Laser Plate Cutting Machine

Hotstone Zhou

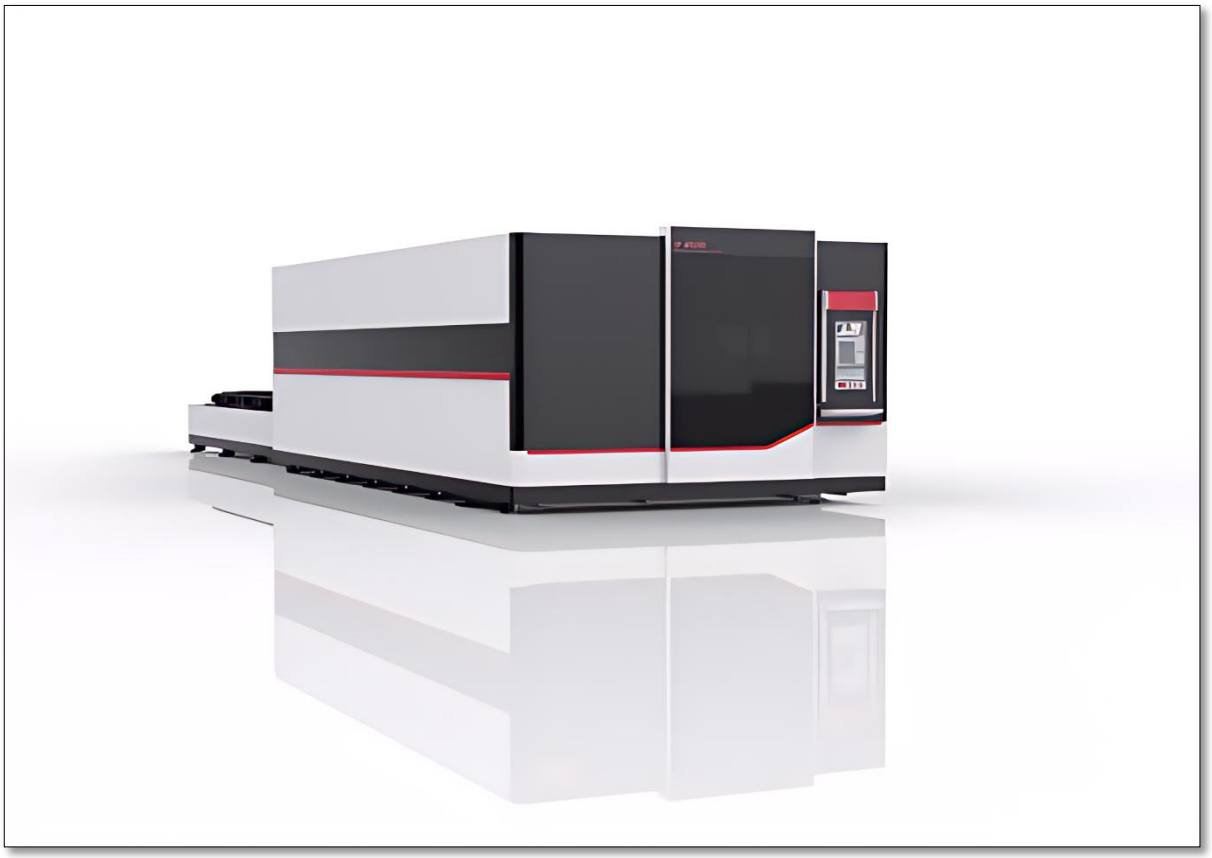
Hotstone Group Co., Ltd

2025-6-22

# High-Efficiency Fiber Laser Cutting Machine| HTLP6025D

Precision. Power. Productivity.

## 一 、Production Introduction: High Performance Plate Laser Cutting Machine



The **HTLP-6025D** is a high-performance fiber laser cutting system engineered for precision processing of medium to thick metal sheets. Designed with advanced laser integration, intelligent automation, and a robust mechanical structure, it delivers superior cutting accuracy, operational stability, and production efficiency.

This model supports a wide range of laser power configurations—from 6kW to 40kW, making it highly adaptable to diverse material types and thicknesses. Its modular architecture allows flexible customization to meet specific production requirements.

Equipped with a high-low dual exchangeable table, the HTLP-6025D enables rapid material exchange, significantly reducing idle time and labor intensity. The heavy-duty welded bed ensures structural rigidity and vibration resistance, maintaining high precision even under high-speed operation. The system is complemented by an intuitive large-format touch control interface, offering real-time process monitoring, diagnostics, and parameter optimization.

Capable with cutting carbon steel, stainless steel, aluminum alloys, copper, brass, galvanized sheet, and electrolytic plate, the HTLP-6025D is widely deployed across industries such as sheet metal fabrication, machinery manufacturing, automotive components, electrical enclosures, and architectural metalwork. It is an ideal solution for manufacturers seeking high-throughput, intelligent, and sustainable production capabilities.

## 1.1 . Key Features of the Machine

- **Dual Shuttle Table System**: Enables fast material loading and unloading, enhancing production efficiency and reducing downtime.
- **Integrated Heavy-Duty Welded Frame**: Provides excellent rigidity and thermal stability, ensuring long-term cutting precision.
- **Smart CNC Control with Touch Interface**: Offers real-time monitoring, fault diagnostics, and intuitive operation for enhanced productivity.
- **Fully Enclosed Protective Housing**: Ensures operator safety and environmental compliance by containing laser radiation and dust.
- **Multi-Material Cutting Capability**: Supports a wide range of ferrous and non-ferrous metals, ideal for diverse industrial applications.
- **High-Power Laser Compatibility**: Supports up to 40kW laser sources, enabling ultra-fast cutting of thick plates with clean edges.

### 1.2 Industry Applications

The HTLP-620D is engineered for versatility and performance, making it suitable for a broad range of industrial applications:

- **Sheet Metal Fabrication**: Precision cutting of structural components, enclosures, and custom parts.
- **Machinery Manufacturing**: Efficient processing of mechanical frames, brackets, and assemblies.
- **Automotive Industry**: Cutting of chassis components, exhaust systems, and structural reinforcements.
- **Electrical & Electronics**: Production of cabinets, control panels, and heat dissipation components.
- **Architectural & Decorative Metalwork**: High-speed cutting of stainless steel and ornamental metal elements.

## 二、The Key Performance of the Machine

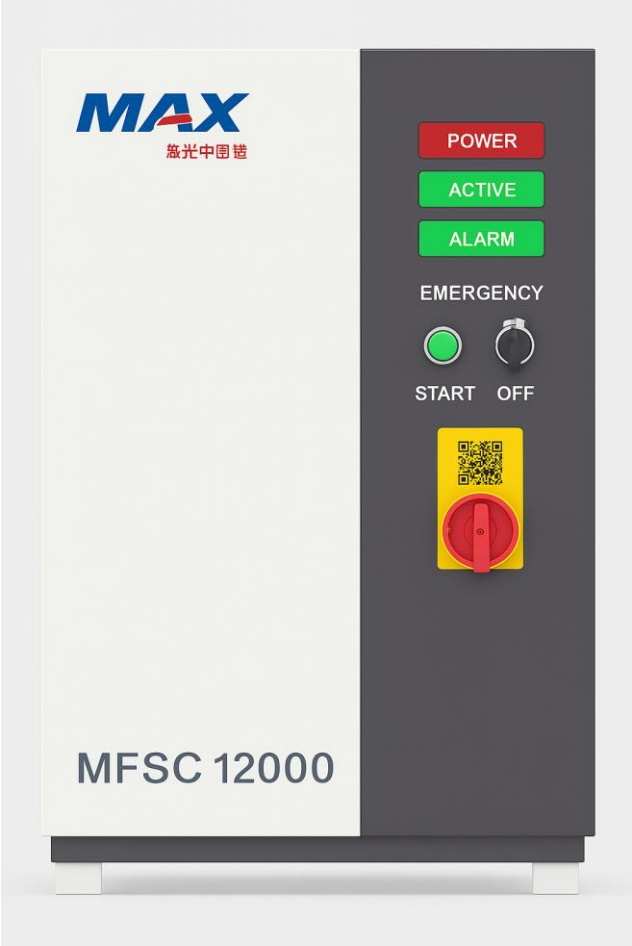
| No. | Item | Specification |
|---|---|---|
| 1 | Model | HTLP-6025D |
| 2 | Working Area | 6000mm × 2500mm |
| 3 | Max Moving Speed | 150m / min |
| 4 | Max Acceleration Speed | 1.5 G |
| 5 | Positioning Accuracy | ≤ ±0.03mm/m |
| 6 | Repeatability | ≤ ±0.02mm/m |
| 7 | Laser Power Options | 6kW – 40kW (customizable) |
| 8 | Machine Dimensions | 15400mm × 4300mm × 2900mm |
| 9 | Maximum Load Capacity | 4500kg |

## 三、The Mechanical Component

| No | Item | Specification |
|---|---|---|
| 1 | Control System | FSCUT 8000 Ethercat control system |
| 2 | Cutting Software | FSCUT |
| 3 | Laser Source | MAX 12000W |
| 4 | Laser Cutting Head | Raytool BM06K Auto Focus Cutting Head |
| 5 | Cooling System | S&A Water-Cooled Chiller |
| 6 | Servo Motor | Yaskawa Servo Motor system |
| 7 | Reducer | Nidec ( shimpoo Reducer from Japan ) |
| 8 | Transmission System | YYC Rack and Pin, HIWIN Guide Rails |
| 9 | Machine Bed | Plate-welded, Excellent engineered, Stress-Relieved |
| 10 | Gantry Structure | Cast Aluminum Beam |
| 11 | Electronic Parts | Schneide /Omron and Igus Cable |
| 12 | Hydraulic Parts | Schneide /Omron and Igus Cable |
| 13 | Electronic Cabinet | Independent |
| 14 | Smoke /dust Remove system | Yes |
| 15 | Exchangeable Bed | Yes |
| 16 | Protective Cover | Yes |
| 17 | Centralization Lubrication | Yes |
| 18 | Loading and unloading system | Optional |

## 四、Main Components Introduction

### 4.1 Laser Resources




The **MAX MFSC series** single-mode continuous fiber laser is a high-performance industrial laser source designed for precision cutting, fine welding, and micromachining. Built by a globally recognized brand, it features a modular and highly integrated architecture that ensures long-term reliability and maintenance-free operation.

With high **photoelectric conversion efficiency**, the system delivers stable, high-density energy output while minimizing power consumption. Its **superior beam quality** ensures clean, accurate processing with minimal thermal impact. The laser supports continuously adjustable power and uses a **QBH fiber output interface**, making it compatible with a wide range of laser processing systems. Designed for industrial environments, it offers **long service life** and consistent performance with minimal downtime.

## 4.2 Raytool Laser Cutting Head

The Raytools high-power laser cutting head is engineered for demanding industrial applications, offering exceptional performance, reliability, and adaptability. It supports laser power levels up to 12kW or more, making it ideal for thick plate cutting and high-speed production environments. One of its standout features is the integrated motorized auto-focus system, which enables rapid and precise focal adjustment. This significantly enhances piercing speed and cutting quality across a wide range of material thicknesses.

The optical system is modular in design, allowing for easy replacement of collimation and focusing lenses, while a triple-layer protective lens structure ensures long-term optical integrity by shielding critical components from contamination and thermal damage. To maintain thermal stability during extended high-power operation, the head incorporates dual-channel water cooling for both the optics and nozzle area.

Its IP65-rated housing, combined with a patented sealing system, provides robust protection against dust, backflow, and process debris, ensuring consistent performance in harsh industrial environments. The cutting head is compatible with standard QBH, QD (LLK-D), and G5 interfaces, allowing seamless integration with mainstream fiber laser sources such as IPG, Raycus, Max, and nLIGHT. Optional sensors for gas pressure, cavity pressure, and temperature monitoring further enhance operational safety and process control, making the Raytools high-power cutting head a reliable choice for precision laser cutting systems.

## 4.3 FSCUT8000 Control System


**FSCUT8000** is an advanced EtherCAT-based control system specifically developed for ultra-high-power fiber laser cutting applications above **12kW**. Engineered for rapid deployment, it features plug-and-play functionality, simplified installation and calibration, and a comprehensive suite of intelligent cutting control capabilities.

With strong support for customization, automation integration, and digital manufacturing, FSCUT8000 delivers a scalable and flexible solution tailored to modern industrial needs. As a leading-edge EtherCAT laser cutting control platform, it offers exceptional performance, reliability, and connectivity—making it the preferred choice for high-end laser cutting systems operating at 12kW and beyond

---

## 4.4 Machine Transmission System

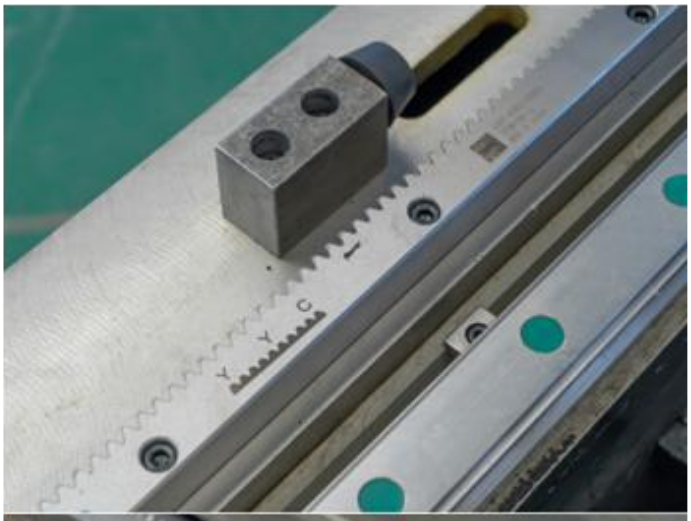
The machine is equipped with **Yaskawa servo motors and drives**, delivering fast dynamic response and excellent speed stability. This ensures smooth and precise motion control during high-speed operations. The system supports a **maximum idle speed of up to 150 m/min** with an acceleration of **1.0 G**, enabling rapid positioning and enhanced productivity.

A **Shimpo planetary gearbox** is perfectly integrated with the servo system, working in tandem with a **helical rack and pinion** to significantly improve both **positioning and re-positioning accuracy**.

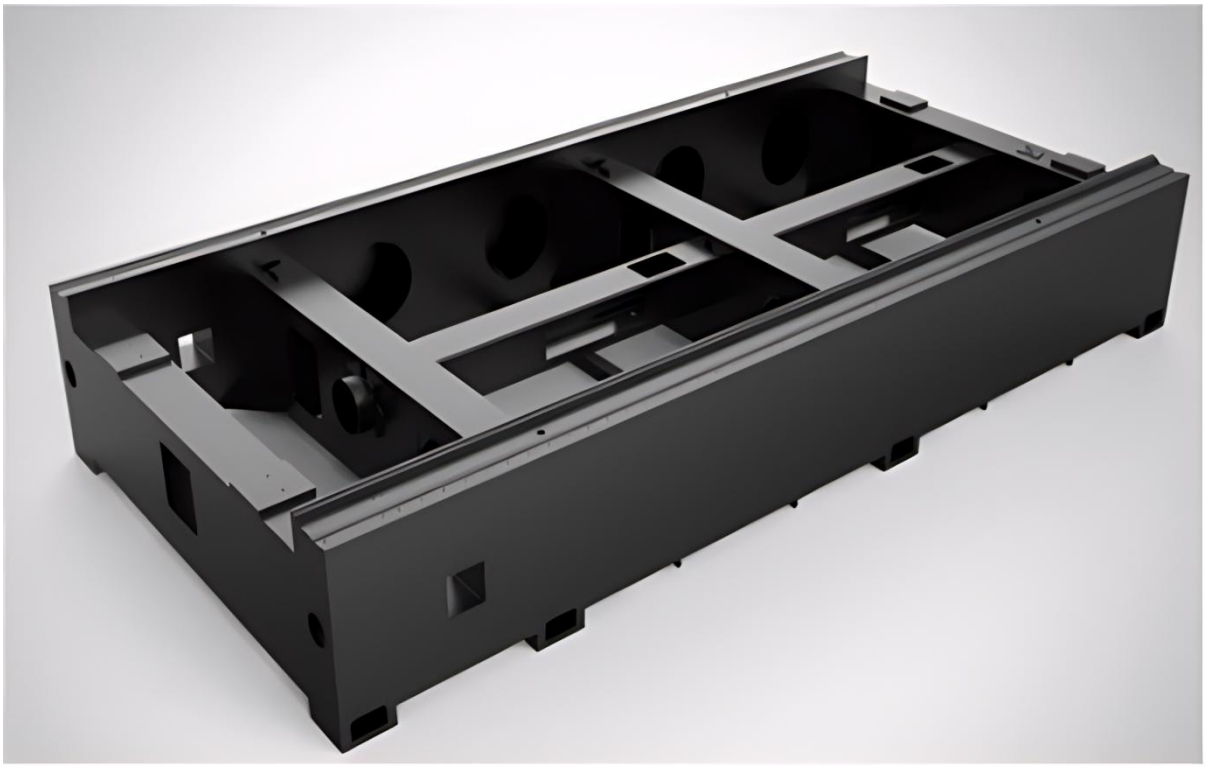
This combination ensures consistent performance even under demanding production conditions.

The **linear transmission system** features high-precision components, including **PEK helical racks** and **HIWIN linear guide rails**, which contribute to improved motion accuracy, reduced vibration, and higher overall efficiency.

The machine's **gantry structure** is made from **high-quality cast aluminum**, which is significantly lighter than traditional cast iron. This not only reduces the moving mass but also enhances **gantry rigidity and structural strength**. The **lightweight, high-rigidity, and modular design** ensures long-term operational stability and supports high-speed, high-precision cutting.



## 4.5 Machine Bed Design & Structural Optimization



The machine bed of the system is engineered for long-term stability, precision, and dynamic performance. Utilizing **ANSYS**, a professional finite element analysis (FEA) software, the bed structure has undergone multiple rounds of simulation and optimization to enhance its mechanical rigidity and dynamic response under high-speed operation.

Constructed from **carbon structural steel**, the bed features a **misaligned honeycomb internal structure**, which effectively mitigates thermal stress deformation and absorbs vibrations generated during high-speed movement. This design ensures that cutting accuracy is maintained even under demanding production conditions.

The bed is equipped with **high-precision linear guide rails** and a **rack-and-pinion transmission system**, enabling a maximum positioning speed of **150 m/min**. This configuration supports both high-speed and high-accuracy cutting applications.

To ensure long-term structural integrity, the bed undergoes a rigorous multi-stage stress relief process:

- ✧ **Post-weld annealing** to eliminate internal stress from fabrication.
- ✧ **Rough machining** followed by **vibration aging** and **natural aging** treatments to fully release residual stress from both welding and machining processes.

Thanks to this comprehensive approach, the machine bed offers **exceptional rigidity and dimensional stability**, capable of maintaining high precision and structural integrity for up to **20 years** without deformation

## 4.6 Zoned Dust Extraction System

The machine is equipped with a **partitioned dust removal system** designed to efficiently extract fumes and particulates from specific processing zones of the worktable. Depending on the size of the worktable, it can be divided into **4, 6, 8, or more independent zones**.

When the laser cutting head operates within a designated zone or multiple zones, the system activates **targeted dust extraction** in those specific areas. This intelligent zoning approach ensures that dust and smoke are removed precisely where they are generated, significantly enhancing the overall extraction efficiency.

By focusing suction power only where needed, the system not only improves the **working environment** and **air quality** but also contributes to **better cutting results** by maintaining a cleaner optical path and reducing contamination on the workpiece surface. This design is particularly beneficial for high-speed, high-power laser cutting operations where effective fume control is critical.

## 4.7 Upgraded Automatic Lubrication System


The machine features an **enhanced automatic lubrication system** that goes beyond conventional designs by providing **comprehensive lubrication coverage**—not only for the linear guide rails, but also for the **gears and ball screws**. This system delivers **precise, timed, and metered lubrication**, ensuring optimal performance and significantly extending the service life of critical transmission components.

Unlike standard systems offered by many manufacturers, which typically lubricate only the guide rails, this upgraded solution includes a **felt wheel lubrication mechanism** specifically designed for the **gear and rack**. The system automatically calculates lubrication intervals based on **cumulative travel distance and operating time**, ensuring consistent lubrication without manual intervention.

By maintaining proper lubrication across all motion axes, the system reduces mechanical wear, minimizes maintenance downtime, and enhances the long-term reliability and precision of the machine—making it especially suitable for high-speed, high-duty-cycle laser cutting operations.

---

## 4.8 Hanli Industrial Water Chiller

The Hanli Industrial Water Chiller features a compact and durable design, offering reliable performance in a wide range of industrial applications. Its space-saving structure allows for seamless integration into laser systems, CNC machines, and other precision equipment.

All key components are sourced from well-known domestic and international brands, ensuring exceptional quality, safety, and long-term reliability.

Equipped with a fully automatic control system, the chiller

provides intuitive operation and precise temperature regulation, making it ideal for continuous, high-accuracy cooling requirements.

## 五、Cutting Capacity Reference

| Pipe Laser Power Cutting Performance Reference | | | | | |
|---|---|---|---|---|---|
| **Materials** | **3000W** | **6000W** | **12000W** | **15000W** | **20000W** |
| **Carbon Steel** | 14mm/20mm | 18mm/23mm | 23mm/48mm | 28mm/60mm | 38mm/80mm |
| **Stainless Steel** | 6mm/10mm | 14mm/18mm | 28mm/48mm | 28mm/70mm | 28mm/99mm |
| **Aluminum** | 3mm/6mm | 8mm/14mm | 14mm/20mm | 16mm/23mm | 20mm/50mm |
| **Copper** | 3mm/6mm | 8mm/14mm | 14mm/20mm | 16mm/23mm | 20mm/25mm |
| When the material thickness falls within the green zone, it is suitable for large-batch cutting with good quality. The red zone is only suitable for small batch cutting | | | | | |

## 六、Working Referral Video

## 七、Contact Us

**Hotstone Zhou**

Email: Hotbiz88@outlook.com
Email : Hotstone@dsrobots.com

Whatsapp: +8618006414500

Website: www.hotstoneautomation.com