



Laser Cutting Machine Technical Document

G7012

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Validity period: October 15, 2025

Company Profile



Hymson Laser Technology Group Co.,Ltd(Stock code: 688559), founded in 2008, is a national high-tech enterprise, which integrates research and development, manufacturing, sales and service in laser and automation integrated solutions provider.

The company focuses on laser core optics and control technology research and development, advanced laser innovative applications (cutting, welding, surface treatment, etc.), precision automation intelligent manufacturing, products are widely used in lithium, photovoltaic, new display, 3C, sheet metal, pan semiconductor and other industries.

With the mission of "changing the world's equipment pattern and promoting the progress of human intelligence", we are committed to becoming "the world's leading industrial laser and automation intelligence brand", providing high-quality one-stop intelligent manufacturing solutions for global customers.

Partners



PRODUCT CATALOG

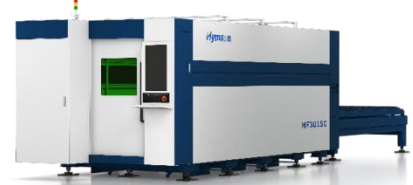
SHEET METAL LASER CUTTING MACHINE



HF-A SEIRES(Single Platform)



HF-B SERIES(High Power)

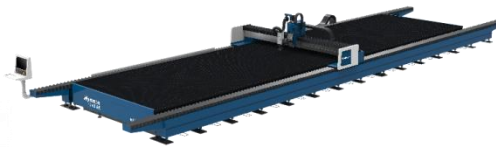


HF-C SERIES(Dual-platform)

SHEET METAL LASER CUTTING MACHINE



HF-G SERIES(Flagship Product)



HF-T SERIES(Large Format)



HP SERIES

SPECIAL PROFILE LASER CUTTING MACHINE



MP SERIES(Professional)



S SERIES(Standard)



TP SERIES(Heavy-duty)

TUBE METAL LASER CUTTING MACHINE

Product Introduction



Pictures are for reference only

Hymson's brand new G7012 series laser tube cutting machine is a new and all-round upgraded model, with a breakthrough in machining efficiency. It is your ideal production tool for high efficiency laser processing and tube cutting.

- The new side-hanging machine body, automatic feeding mechanism, all-round breakthrough of processing efficiency;
- High speed, high efficiency and high precision for small and medium-sized pipe cutting,
- The pneumatic, fully sealed, integral type chuck is more stable and realizes high machining precision and prominent effect of dust prevention,
- The brand new FSCUT professional tube cutting system integrates multiple tube cutting functions,
- Optional full-automatic/semi-automatic loading system for reducing labor cost,
- Optional short tail material for maximizing tube utilization rate.

Core Configuration

Optical system	Laser source	●MAX ○RAYCUS
	Laser head	●BOCI
	Bevel	○ tail length≥280mm
Mechanical system	Chuck	Pneumatic chuck
	Linear Rails	Hymson
	Rack	Hymson
	Cutting area Enclosure	●
	Chuck offside	●
	Servo-flipping cutting	●
	Semi automatic loading	○
	Automatic loading	○
Electrical system	Control system	●FSCUT
	Nesting	●TubesT -for small tube ○TubesT PRO
	X&Y&Z&A-axis Servo motor and driver	Hymson
	Door-open Protection	●
	Intelligent alarm	●
Peripheral system	Water Chiller	●
	Spark separator	○
	Dust removal	●Centrifugal fan ○Dust Collector
Service	WIFI internet connection	●
	Hymson Cloud service	●

REMARK:

Function & parameter List

- Standard configuration
- Optional configuration

Performance Indexes

Equipment Model	G7012
Tube size range	Round tube : $\Phi 5\text{-}\Phi 120\text{mm}$
	Square tube: $\square 5\text{-}\square 120\text{mm}$
	Rectangular tube: $5\text{mm}\leq\text{Side length}\leq 120\text{mm}$
	Angle steel $\leq 10\#$
	Channel steel $\leq 10\#$
Max. tube weight	150KG
Max. tube length	7000mm
Max. chuck rotating speed	180r/min
X&Y axis Max. acceleration	1.5G
X&Y axis Positioning accuracy	$\pm 0.03\text{mm/m}$
Min. remnants	0mm
Requirements for tubes	Diameter $<\varnothing 50\text{mm}$, thickness $\geq 1.2\text{mm}$;
	Diameter $\geq \varnothing 50\text{mm}$
	Wall thickness $\geq 2.5\%$ of Diameters of tubes
Machine overall dimensions	13000mm*3500mm*2800mm

Main Components



Fiber Laser Generator

A fiber laser refers to a laser with rare-earth element doped glass fiber as gain medium. As the diameter of the fiber core is small, high power density can be formed easily in the fiber core. Therefore, a fiber laser has high conversion efficiency, a low threshold value and a high gain and it can be connected to the current fiber communication system easily and efficiently.

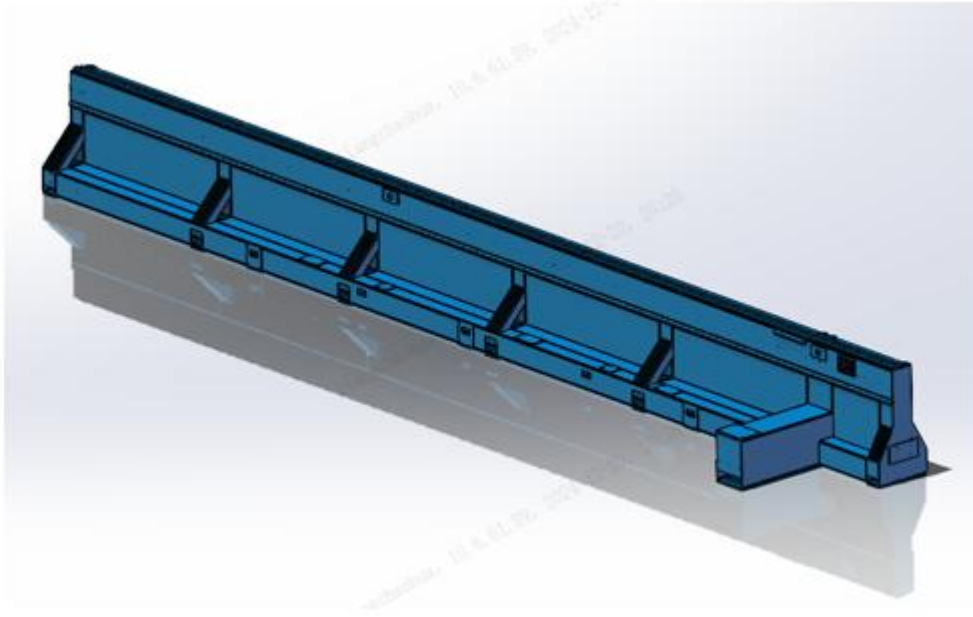
Fibers are very flexible, therefore, a fiber laser has the characteristics of being small and flexible, compact, cost-effective and easier system integration.

- High power/ small light spot
- High stability
- High electro-optical conversion efficiency
- Modular design and installation, for easy machine maintenance and reducing downtime
- Compact and stable design
- A low cost solution, taking semiconductor fiber as laser generation medium, without generation gas, which is environment-friendly.

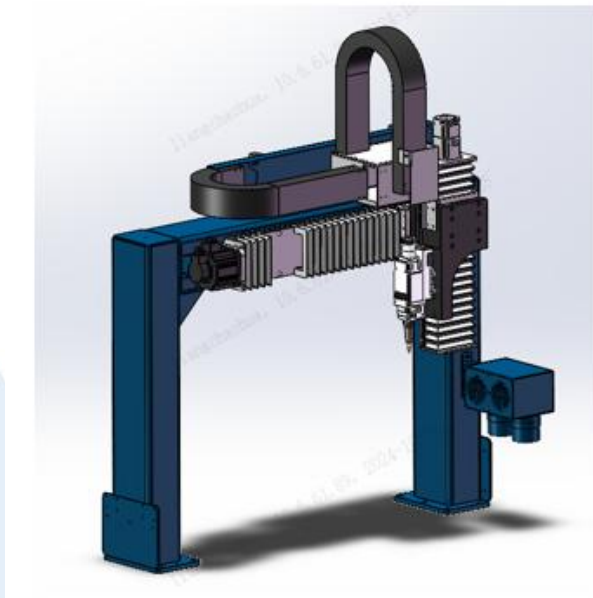
Laser Cutting Head

- Auto focus system
- Lightweight design, with fast acceleration
- Drift-free range sensor
- Continuous protective lens monitoring
- Closed optical path protection
- Automatic piercing
- The cooling technique cools the surface temperature of the sheet metal rapidly
- LED operational tell-tale shows the status of the cutting head
- With pressure sensors in the cutting head and at the nozzle
- smoothly worldwide
- Compliant with safety standards, realizing visual and safe system running

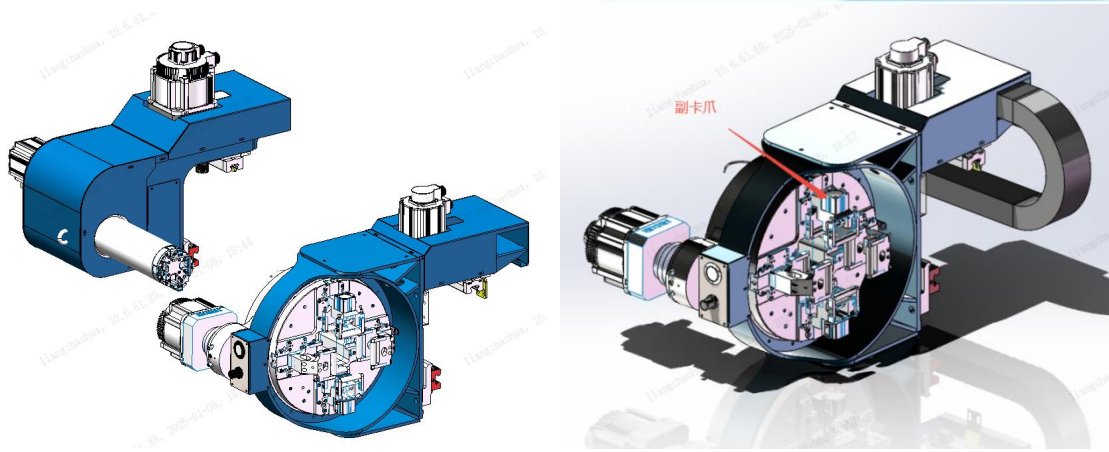
Machine Structure



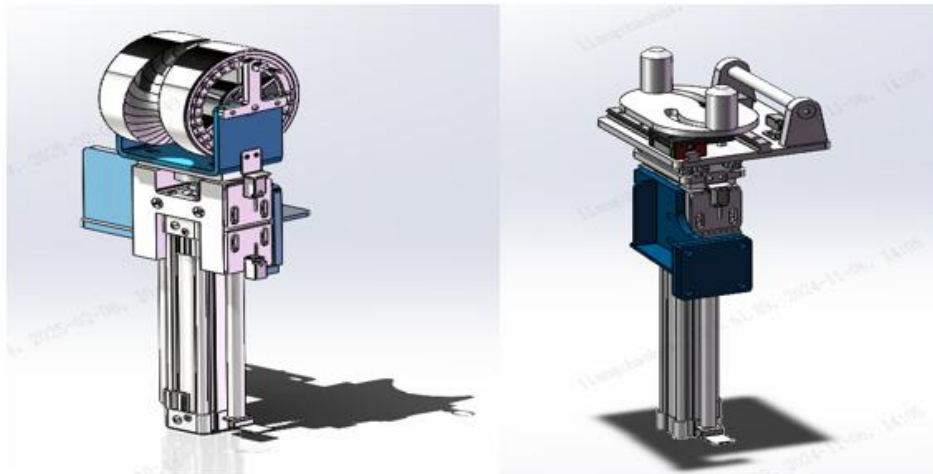
- Standard machine tool body, annealing treatment after welding, the overlong gantry processing center can achieve one-time processing, with high accuracy.
- The flatness and straightness of the guide rail are $\leq 0.05\text{mm/m}$, the maximum surface roughness can be up to 1.6.



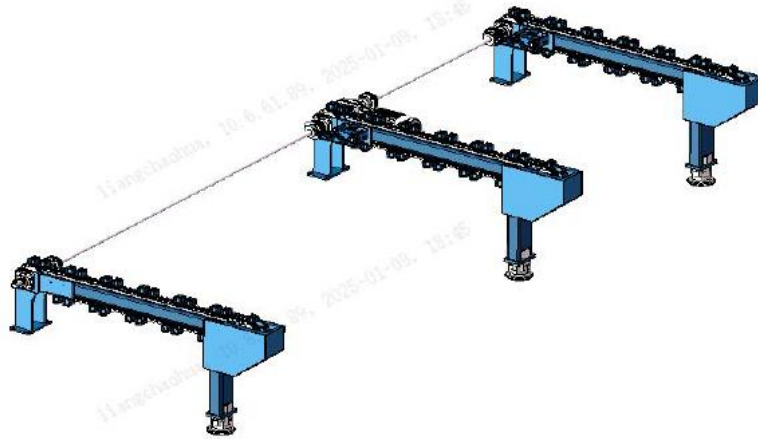
- The gantry-type beam structure has high rigidity.
- Z-axis 2g follow-up acceleration, with high efficiency.



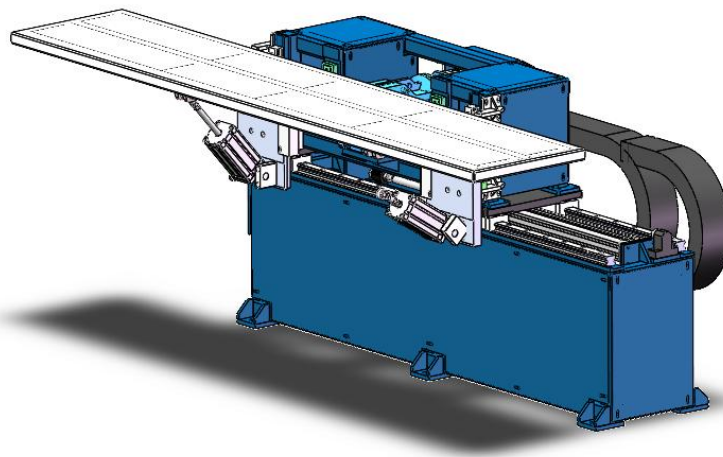
- The maximum clamping force is 150kg, which is industry-leading.
- The front and rear chucks adopt full-seal dust proof structure, and which can efficiently isolate dust and avoid stuck.
- The slant horizontal integral structure is convenient for feeding, and the feeding time is greatly reduced.
- The standard dual-roller clamping jaw, and high cutting accuracy.



- The reducing wheel support has better wrapping performance, which can efficiently avoid shaking of the fine pipe, and the cutting accuracy is higher.
- Servo follower, self-adapting to different pipe sizes, high degree of automation.
- Automatic centering mechanism for self-centering of tubes

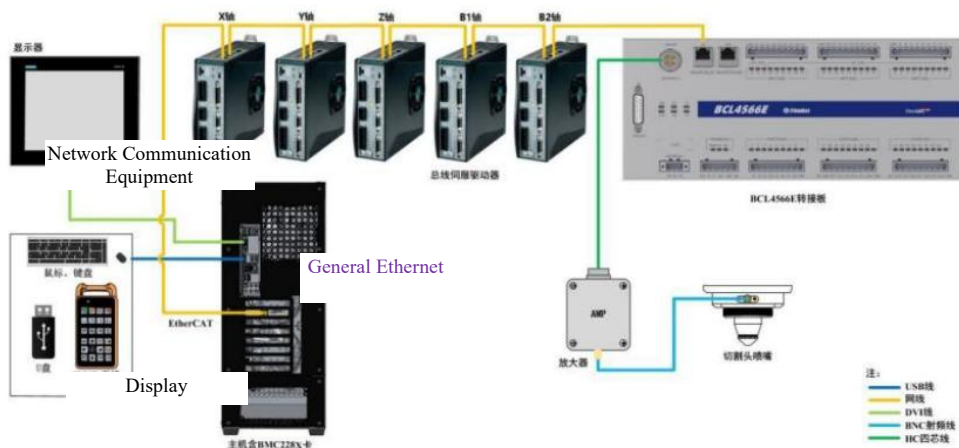


Images are for reference only



- The movable servo feeding device can better support the cutting of the slender pipe and solve the cutting accuracy problem caused by the shaking of the slender pipe.
- Automatic turning plate cutting, can ensure the continuous production of cutting.

CNC Numerical Control System



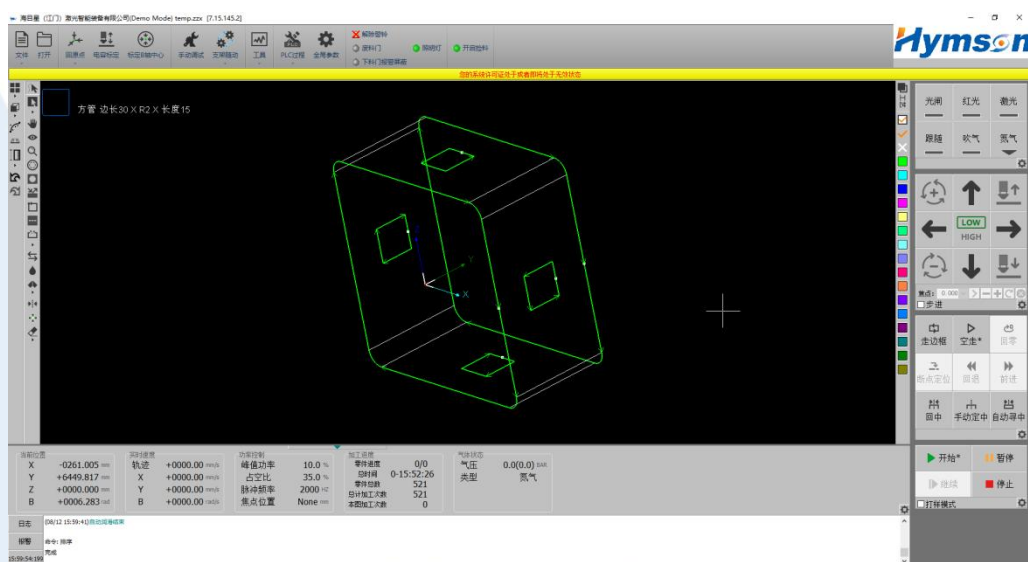
FSCUT control system

Four-core Wire

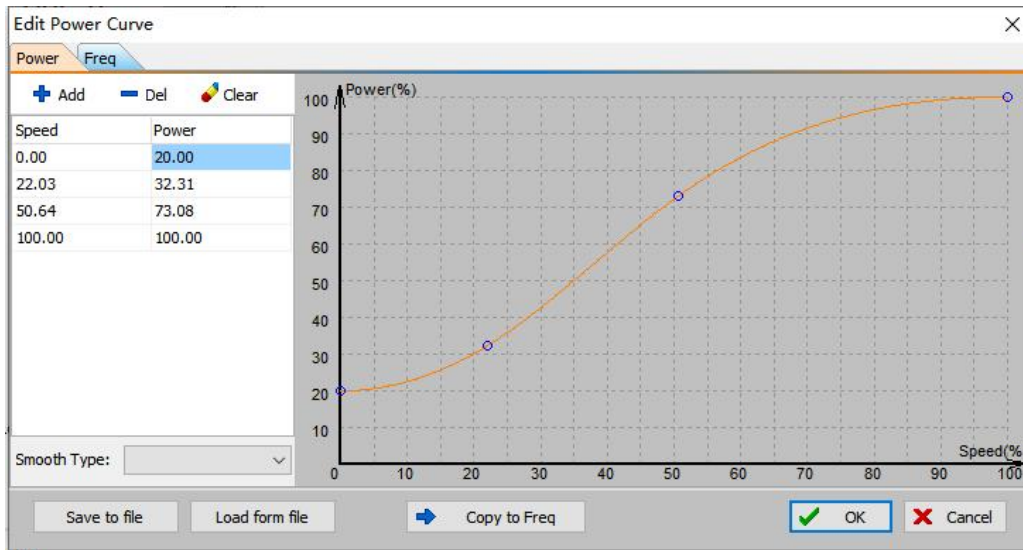
- FSCUT laser cutting control system, developed on the basis of Windows 10 operating system, Mouse and Keyboard connects through Erthercat bus and integrates laser cutting [Radio Frequency Line](#) special functions. The simple and concise interface, power and practical functions, touch display screen and wireless keyboard U Disk WKB Wireless Handheld Box and m (Optional) it easy to operate.

Real-time frequency/power curve

- To obtain high-quality acute and right angles, the software is equipped with a real-time frequency/power curve, which can be used to automatically adjust the laser radiation power according to the moving speed of the cutting head. When the speed of the cutting head is zero (stopping at the corner), the output radiation power is equal to the minimum power set in the

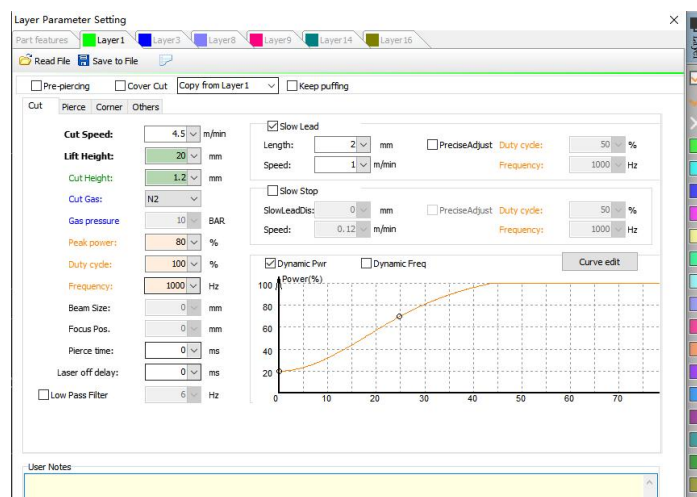


setting to prevent the corner from burning out.



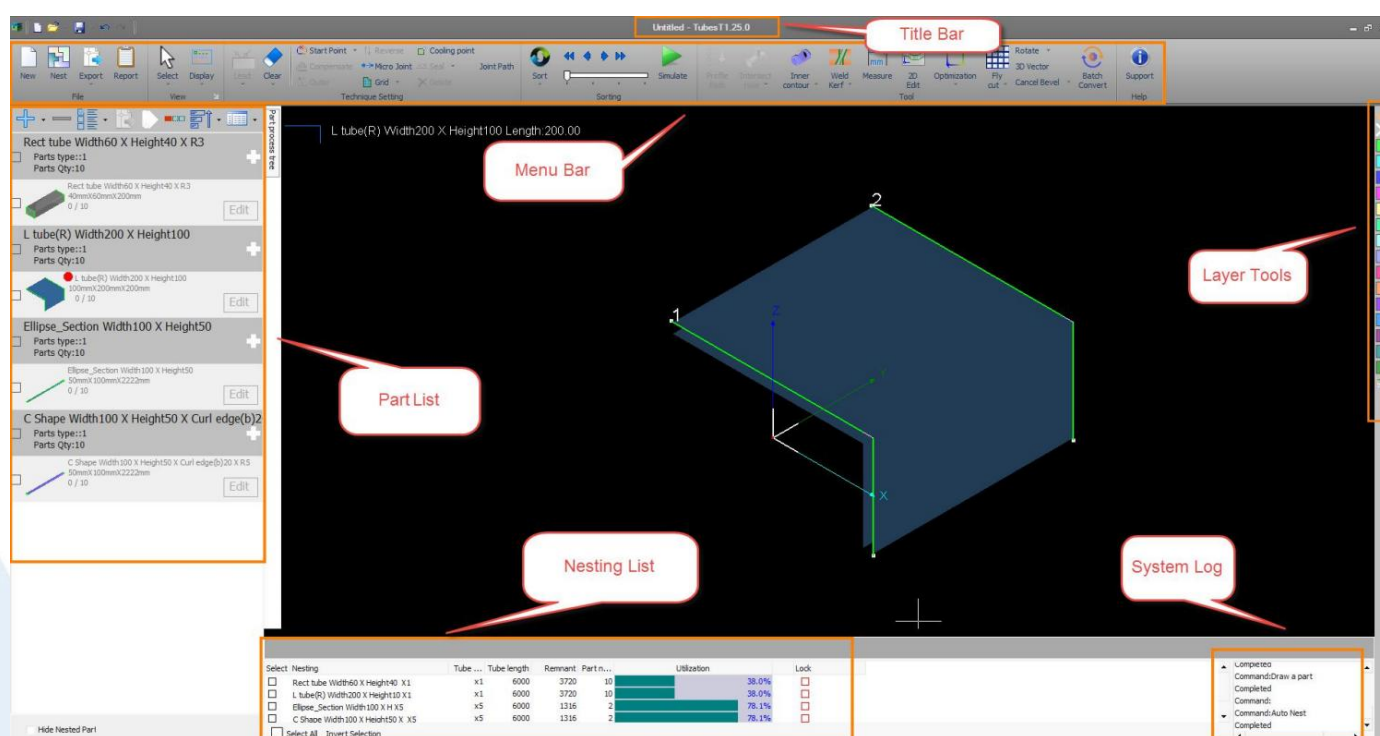
Extensive technological layer interface

- FSCUT provides 16 cutting layers, each of which can be set with a separate cutting speed, laser power, air pressure, cutting height and other technological parameters. The color of each layer is unique, which makes it easy to browse and configure the cutting graphic parameters.

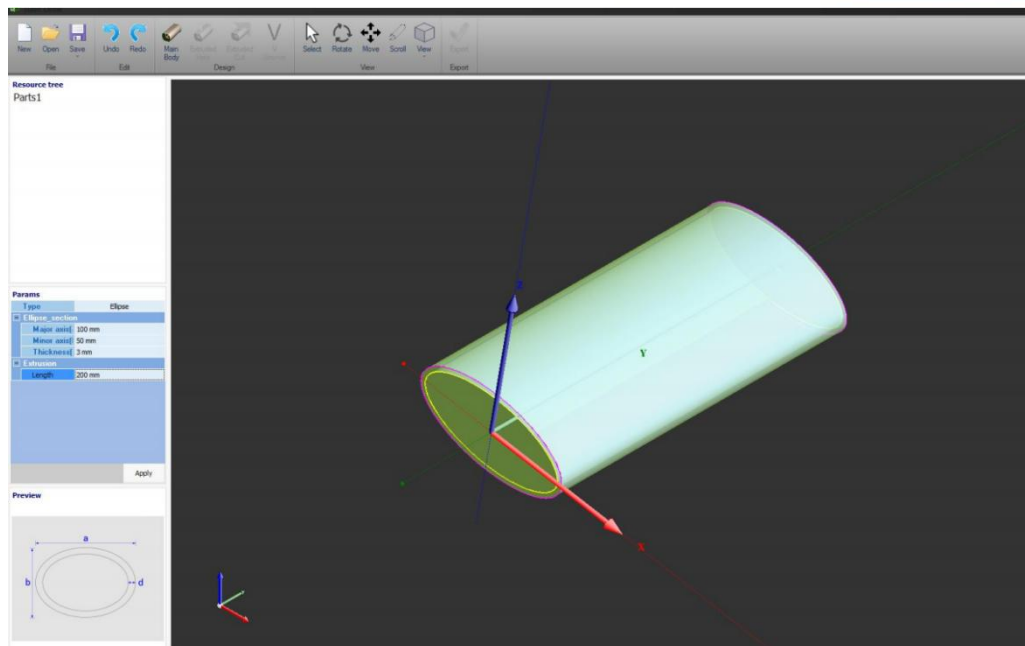


Nesting software

- TubesT is a complete set of integrated sheet metal CAD/CAM automatic programming software from design to production. It supports the whole-process CNC operations of the equipment, including drawing, automatic or interactive processing, CNC program simulation, manual and automatic cutting, machining program download and upload.
- The graphic files generated by SolidWork software can be input directly.



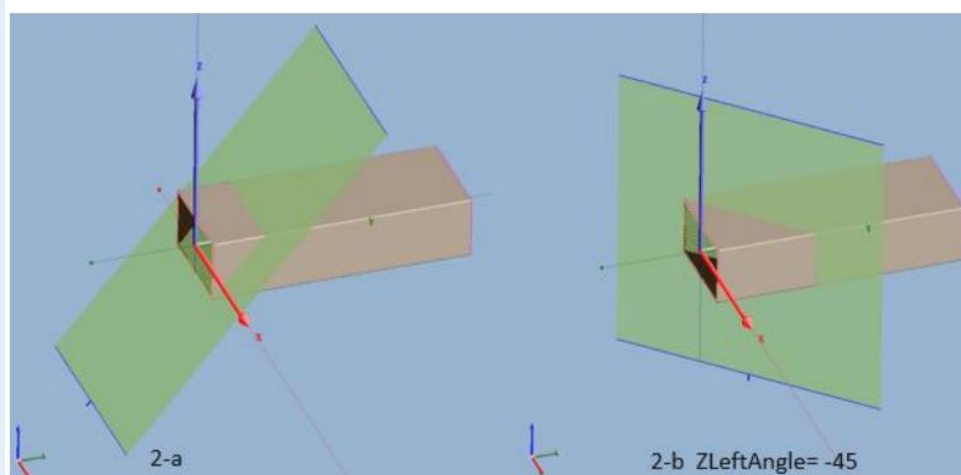
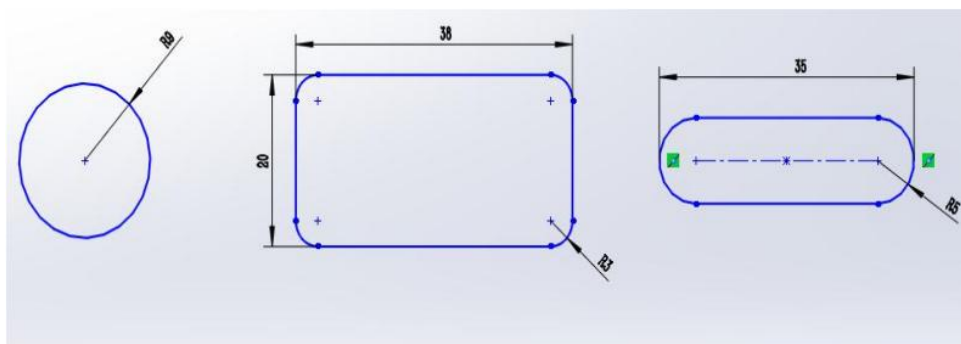
- Drawing 3D parts.
- The built-in function of drawing parts can be applied to draw circular pipes, rectangular pipes, waist-type pipes, angle steels, channel steels, C-type steels, rounded triangles, ellipses and other standard pipe types. Circular holes, rectangular holes and waist-type holes are all viable; the holes can be arrayed along the X/Y/Z direction; and the cutting surfaces in any direction can be acceptable.



- Importing standard parts in batch

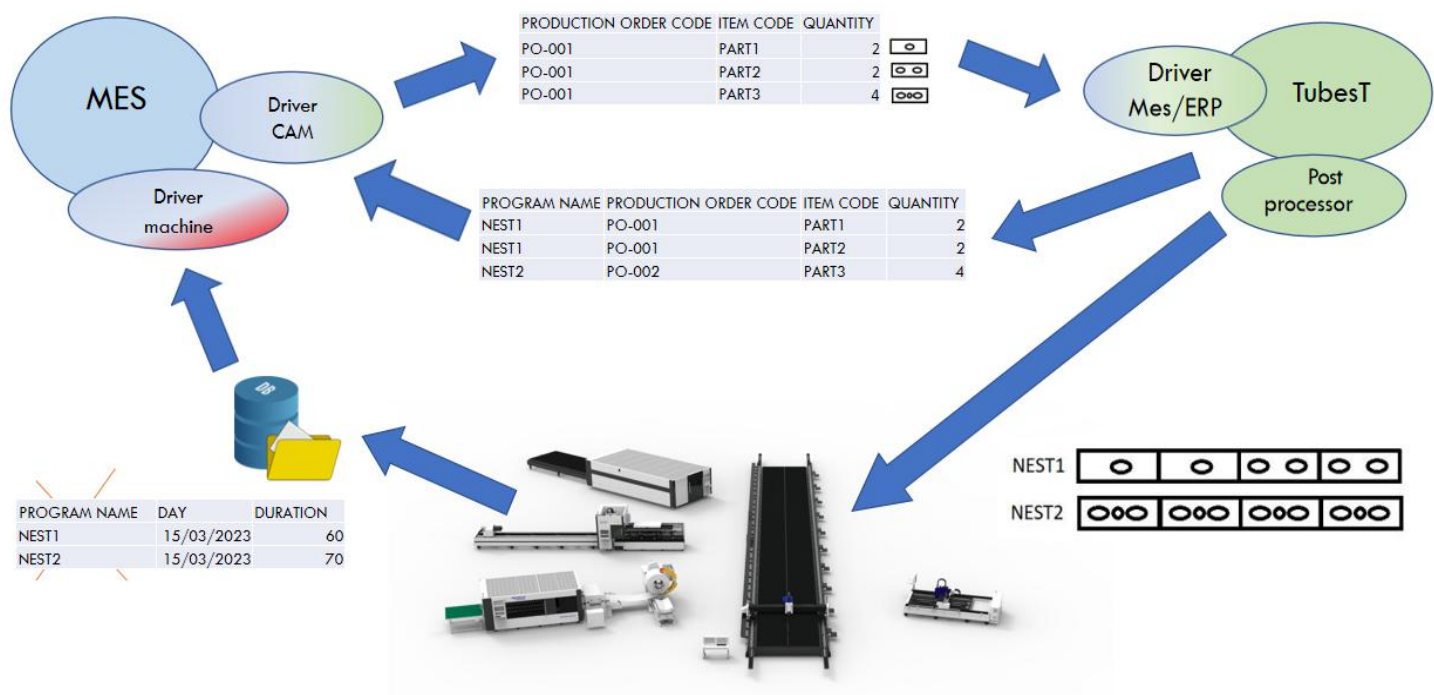
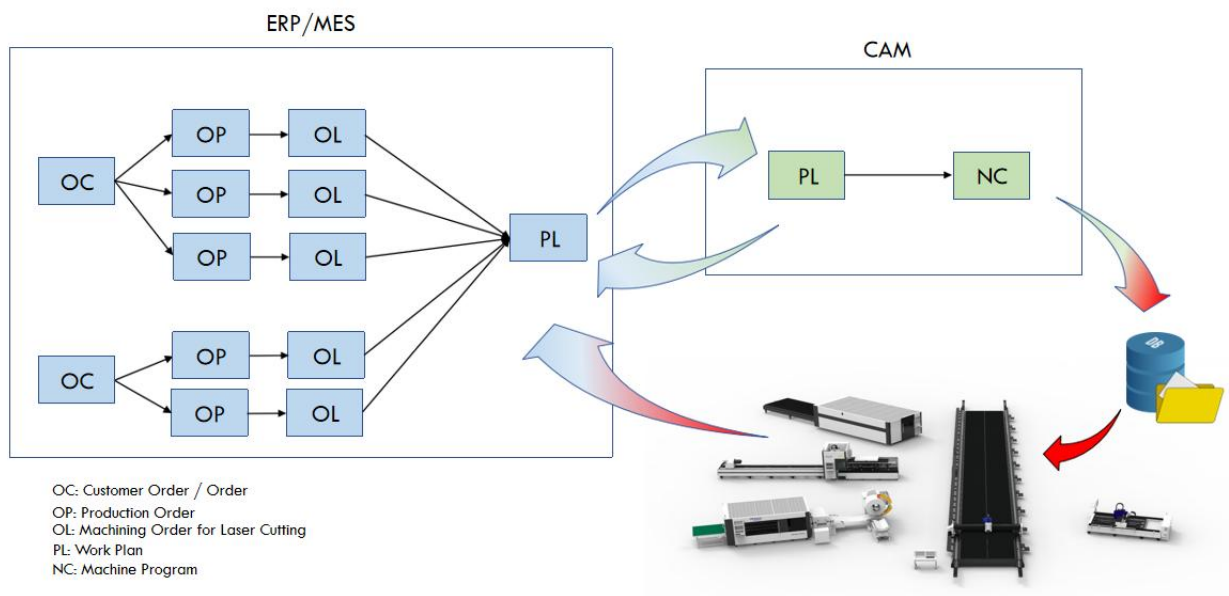
<Importing standard parts in batch> refers to the automatic generation of corresponding parts by the software after importing the section type, dimension and other information of the parts into Excel.

Three types of non-hole parts, i.e. circular pipes, rectangular pipes and waist-type pipes can be imported. The diagonal planes are also acceptable.



Industry 4.0 Solutions (Optional)

Hymson's laser cutting equipment provides solutions in line with Industry 4.0, can be connected with customers' own MES/ERP, builds a bridge between plate/pipe processing and ERP/MES data transmission, and achieves the return of parts generation and processing progress without manual participation, to meet the construction needs of digital and intelligent factories.



3000W Cutting Speed Reference Table

Thickness (mm)	Material	Cutting Speed (m/min) O ₂ /N ₂
1	Carbon Steel	8.0/ 18
2		6.0/ 10
3		4.0/ 5.0
4		3.5/ 4.0
5		2.5
6		1.5
8		1.0
10		0.8
1	Stainless Steel (N ₂ /Air)	18.0
2		13.0
3		6.0
4		3.0
5		2.0
6		1.5
1	Aluminum (N ₂ /Air)	10.0
2		8.0
3		5.0
4		2.5
5		1.6

Cutting Capacity

G7012-3000	
Material	Processing range
Round pipe	Φ10mm-Φ120mm
Square pipe	□10mm-□80mm
Thickness	
Carbon steel	1mm-16mm
Stainless steel	1mm-12mm

Sample display



User's Machine Installation Site Condition Preparation

S/N	Content
1	Power Supply Capacity: $\geq 50\text{KVA}(3000\text{W})$
2	Power Supply Requirements: (1) Three-phase voltage stability $< \pm 5\%$; (2) Unbalancedness of three-phase power supply $< 2.5\%$ (Note: Abrupt changes in supply voltage and sudden power failure are not allowed, otherwise, the laser may be damaged easily. Good grounding is required (ground resistance $< 3\text{ Ohm}$).
3	Compressed Air Supply Requirements: (1) Air supply capacity: $\geq 0.8\text{m}^3/\text{min}$ (2) Air supply pressure: $\geq 7\text{bar}$ (3) Dewpoint $\leq 5^\circ\text{C}$ (4) Oil content $\leq 0.01\text{ppm}$ Solid particle $\leq 0.01\mu\text{m}$
4	Auxiliary gas for cutting: Oxygen (O_2)/ Nitrogen (N_2): Purity $\geq 99.99\%$
5	Sheet (Tube) Cutting: Black skin, smooth, level, rustless, evenly rolled, reaching the ISO standard.
6	Installation Site Requirements: 1. The foundation for equipment installation does not settle and should be constructed according to the foundation drawing provided by Party B; 2. Temperature Requirement: $[5-30]^\circ\text{C}$; 3. Humidity Requirement: $< 70\%$; 4. After the equipment is installed and commissioned, separate the laser and install an air conditioner.
7	The equipment operator should have been graduated from a secondary specialized school or above and have the experience in operation of computers and general numerically-controlled machines. The equipment should be equipped with a programming computer.

Precautions for Starting the Laser Cutting Machine

As a laser cutting machine uses electronic and optical devices, excessive temperature difference between inside and outside may cause dew formation on the surfaces of optical lenses and elements, thus reduces the performance of and even damage the laser and cutting head. Dew formation inside a fiber laser is closely connected with the bad operating habits of the fiber laser operators of the customer. In order to reduce the fault rate of the fiber laser and decrease the losses caused by the downtime of the fiber laser machine of the customer, the operators of the customer are asked to pay attention to the following when using the fiber laser machine:

Switching sequence of the fiber laser machine (By switching on/off the machine strictly according to the switching sequence, the risk of dew formation inside the fiber laser may be reduced, thus decreases the faults of the laser!)

1、Switching-on sequence of the fiber laser machine

(1) Turn on the main power switch of the laser and allow the air conditioner or dehumidifier of the cabinet to run for over 30 minutes.

(2) 30 minutes after the laser has been switched on, turn on the power switch of the cooling-water machine.

2、Switching-off sequence of the fiber laser machine

- (1) Turn off the power switch of the cooling-water machine.
- (2) Turn off the power switch of the laser.

Precautions for Pause

If the duration of pause during the switching-on by the customer exceeds one hour, we suggest that the high voltage of the laser be turned off, the power switch of the fiber laser not be turned off, and the cooling-water machine be turned off. If you need to cut products again, turn on the cooling-water machine and allow it to run till the actual temperature of the high temperature water and low temperature water of the cooling-water machine reaches the set temperature $\pm 1^{\circ}\text{C}$. Then turn on the high voltage of the laser, and enable the beam emission for cutting.

Note: The cooling-water machine must not be still running after the power switch of the fiber laser has been turned off!

Environment Requirements of the Fiber Laser:

- 1、Prepare an independent air-conditioned room for the laser, improve the external work environment for the laser, and allow the laser to work in a dry, constant temperature environment.
- 2、We suggest that you purchase a hygrothermograph and put it in the air-conditioned room for the fiber laser to monitor the temperature and humidity of the air-conditioned room.
- 3、According to the ambient temperature, adjust the temperature of the cooling-water machine. Set the high temperature to $28-32^{\circ}\text{C}$ and set the low temperature to $23-27^{\circ}\text{C}$.

In summer, we suggest that you set the high temperature water in the water tank to $30-32^{\circ}\text{C}$ and set the low temperature water to $25-27^{\circ}\text{C}$ to prevent dew formation in the laser.

In addition, there are many thunderstorms in summer. In order to guarantee the normal use of the machine, we suggest that you disconnect all power supplies of the laser cutting machine when it thunders and do not power on the machine until after the thunder and lightning. Damages by thunders and lightning are not within the scope of warranty.

It is hereby declared that you should operate the machine strictly according to the above precautions. Dew formation or damages by thunders and lightning due to failure to operate the machine in accordance with the above requirements are not within the scope of warranty provided by the supplier and the using unit should bear all losses arising therefrom.

Hymson (Jiangmen) Laser Intelligent Equipments Co.,Ltd.

**We thank you for the opportunity to offer this technical proposal and
look forward to serving you in the future!**

Sincerely Yours,

Hymson Corporation

Requirements for Pipe Materials

1. There shall be no serious rust on the pipes to be processed, rust of the carbon material may affect quality of the cutting section.
2. The distortion and bending degree of the pipe shall be not less than the value specified in *GB/T 6728-2002 Cold Formed Steel Hollow Sections for General Structure--Dimensions, Shapes, Weight and Permissible Deviations*, the bending degree: 1mm/1m (3 mm/10m) ; the distortion degree of the pipe in length direction, and the total distortion degree shall be less than 0.02% of the total length.
3. During feeding of the pipes, safety of personnel and equipment shall be paid attention to, the bundled materials shall be lifted with a travelling crane, and the qualified personnel shall operate the crane. The travelling speed shall be able to control, when the bundled material moves close to the feeding table, the crane shall move slowly.
4. Outer diameter tolerance of the profiles shall be not larger than $\pm 0.5\%$ of the outer diameter, the minimum is 0.2mm (as *GB/T 17395-1998 Standardized Outer Deviation Grade D4*).
4. Processing accuracy of the work piece: On the basis of material error, the position error is IT12, the shape contour error is IT12.
5. End of the profile shall be flat, no burrs, if there are hot burrs, height of the burrs shall be less than 2mm.
6. Because the weld's height affects laser penetrability and clamping action, so that the processing and accuracy are affected, when the pipes to be processed are welded pipes, excessive height outside of the welds shall be removed, so that the welds are basically flat, height of the external weld shall be less than 0.3mm, height of inner cavity welds shall be less than 2mm.
7. Party A must regularly maintain and care the machine according to the instructions of Party B, if the machine fails to be regularly maintained, resulting in damage, Party B has rights not to provide repair service.
8. The maximum weight of single pipe is 25kg/m.
10. The pipe forms to be processed shall be square pipe, rectangular pipe and round, if the pipe is other form, which shall be determined through negotiation by the both parties. When the automatic feeding is used, if the bending deflection exceeds relevant national standard, the fine long pipe feeding may not be successful, and the cutting accuracy is difficult to guarantee.
11. The requirements for wall thickness clamped by the chuck: The wall thickness of round pipe and arc face pipe shall be larger than 0.8mm.



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