NO.： 2021JSFA LT-12035EA 01

Manufacturer for Laser Tube Cutting Machine

# LT-12035EA

## Technical Scheme

Jinan Acme CNC Equipment Co., Ltd.

Date:

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# 1. COMPANY INTRODUCTION



Corporate Vision: We are committed to becoming the leader in laser tube processing industry!

Corporate mission: We focus on laser tube cutting machine R&D and production, providing customers around the world with intelligent laser tube processing solutions.

Corporate values: Based on customer needs, we stick on continuous innovation, to share a win-win situation with both our customers and employees!

Acme laser, national high-tech enterprises, the company is mainly engaged in laser cutting machine equipment research and development, manufacturing and sales, for customers around the world to provide comprehensive solutions for laser equipment



Assembly Workshop Finishing Workshop Welding Workshop R&D Center Technology Center

Jinan Acme CNC Equipment Co.,Ltd. (Acme Laser) was founded in 2016 and is a national high-tech enterprise integrating R&D, production and sales of laser cutting equipment. Based on customer needs, Acme Laser focuses on the R&D and production of laser pipe cutting machines, providing customers around the world with intelligent integrated solutions for laser pipe processing.

Our production base in Jinan covers an area of 45,000 square meters, with dozens of high-precision imported CNC machining centers and large-scale gantry milling machines. The total value of production equipment exceeds 3 million US dollars. It realizes independent research and development design and high-precision manufacturing of the core components of the cutting machine. The company has more than 200 talents of various types and has an annual production capacity of 1,000 fiber laser cutting machines, of which more than 1,200 laser pipe cutting machines have been sold in total, and the products are sold in more than 60 countries and regions around the world.

## Honors & Certificate

Our core team has more than 15 years of experience in the field of laser equipment, has core advantages in the field of laser tube cutting, and is committed to providing customers with cost-effective laser tube cutting equipment. We have obtained more than 80 product and technology patents, and more than 40 new patent applications in 2020. The company has passed ISO9001 quality system certification, and its products have obtained EU CE and US FDA certifications. We have a number of scientific research results.






## R&D Team

The professional core R&D team of Acme Laser accounts for more than 15% of the company's total employees, including professional teams such as mechanical engineers, software engineers, electrical engineers, and industrial designers. The company has a comprehensive grasp of core technologies such as precision manufacturing of chucks, software cutting technology, and numerical control systems to ensure the stability and production efficiency of the equipment.

### After-Sales Service

Acme Laser high efficiency customer service team, accounts for 20% of the company's total employees, including professional teams such as pre-sales service, in-sale service, after-sales service, customer training, etc., from technical process consultation, incoming proofing reception, installation and commissioning, and free customers In terms of personnel induction training, equipment maintenance and repair, etc., we provide 24-hour all-round quick response services.

### Application

Our featured product laser pipe cutting machine is widely used in sports equipment, automobile manufacturing, steel and wood furniture, medical equipment, architectural decoration, mechanical equipment, electrical equipment, elevator equipment and other fields. Thanks to the good customer reputation and the continuous improvement of products, the market recognition of the our products is steadily increasing, and it is moving towards the goal of "becoming a global leading laser tube cutting machine manufacturer ".

# 2. MACHINE INTRODUCTION



(The picture is for reference only, the appearance and size are based on the actual factory equipment)

## 2.1 Scope of application:

E model laser pipe cutting machine LT-12035A is mainly used for cutting, modeling and blanking of metal pipes. It is suitable for square pipes, round pipes, rectangular pipes, elliptical pipes, flat elliptical pipes and channel steel with diameters of 20-350mm. , H steel, angle iron, triangular pipe, etc. and other special-shaped pipes and other various metal pipes of any shape.

## 2.2 Advantages

### 2. 2. 1 Machine Bed

- Stable and anti-vibration, good rigidity and high precision.

- The bed is specially designed to prevent it from being burnt down by high-power laser.
- Independent research and development of the bed and overall design. The imported machining center is processed as a whole to ensure that the guide rail surface and rack surface are processed and formed at one time to ensure accuracy.
- Long service life.

### 2.2.2 Chuck

Acme Laser independently designs, develops and produces the chuck. It is for small tubes in the industry. The special chuck for laser pipe cutting machines has high efficiency and good stability. With the full servo control system, the efficiency is about twice that of ordinary pipe cutting machines.

### 2.2.3 Scrap Collection

- A scrap truck is set up at the bottom of the bed to collect scrap from the production process and small parts at any time.
- The equipment is equipped with a front-receiving platform, which can be customized to the customer's needs 3-6 meters of feed-assisted platform.

### 2.2.4 Rails

- Taiwan linear guide, high precision and wear resistance
- Selected special metal materials, high wear rigidity
- Smooth scrolling with a small coefficient of friction minimizes wear and tear

### 2.2.5 Transmission

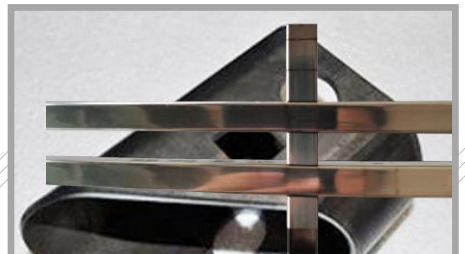
- Taiwan flanks, 2M oblique teeth, grinding level 6 ensure high-precision motion under a variety of complex conditions.
- The use of state-of-the-art grinding teething process, mass production accuracy is high.

### 2.2.6 System

- Acme Laser cloud system, processing can be automatically sought, real-time acquisition of Z-axis information, high-precision processing.
- Highly accurate identifying of processing tubes, simplifying the cutting process and improving processing efficiency.
- Support for three-chuck model, you can do zero-tail processing, saving raw material costs.
- The system can simulate 3D cutting on the computer, effectively restoring the real laser cutting process, improving processing efficiency.

## Cutting Sample









## 3. Processing capacity (2000w fiber laser)

| Material | Thickness (mm) | Speed (m/min) | Gas |
|---|---|---|---|
| Stainless Steel | 1 | 23 | 空气 |
| | 2 | 8 | 空气 |
| | 3 | 4 | 空气 |
| | 4 | 2 | 空气 |
| | 5 | 0.8 | 空气 |
| Carbon Steel | 1 | 17 | 空气 |
| | 2 | 8.5 | 空气 |
| | 3 | 3 | 空气 |
| | 4 | 1.8 | 空气 |
| | 5 | 1.5 | 氧气 |
| | 6 | 1.2 | 氧气 |
| | 8 | 1 | 氧气 |
| | 10 | 0.7 | 氧气 |
| Aluminum | 1 | 8.8 | 空气 |
| | 2 | 5 | 空气 |

| | | | |
|---|---|---|---|
| | 3 | 3.5 | 空气 |
| Brass | 1 | 14.5 | 空气 |
| | 2 | 4.9 | 空气 |
| | 3 | 1.7 | 空气 |
| | 4 | 0.8 | 空气 |

## 4 Main Configuration

| No. | Name | QTY | Brand |
|---|---|---|---|
| 1 | Laser Source | 1 | Chinese/Imported（1000W-6000W） |
| 2 | Laser Head | 1 | Raytools |
| 3 | Cutting System | 1 | TubePro |
| 4 | Front Chuck | 1 | Full Stroke Pneumatic Chuck（350mm） |
| 5 | Back Chuck | 1 | Acme Laser Pneumatic Chuck |
| 6 | Machine Bed | 1 | Acme Laser |
| 7 | Electrical Parts | 1 | Schneider /Chint |
| 8 | Pneumatic Parts | 1 | SMC/Airtac |
| 9 | Rail and Ball Screw | 1 | Taiwan HIWIN/ Equivalent configuration |
| 10 | Helical Rack | 1 | Taiwan YYC/ Equivalent configuration |
| 11 | Other parts for Machine bed | 1 | adaptation |
| 12 | Servo Motor and Driver | 1 | Panasonic EtherCAT |
| 13 | Reducer | 1 | Motoreducer/ Shimpo/Equivalent configuration |
| 14 | Front-receiving platform | 1 | Acme Laser |
| 15 | Pipe Support | 1 | Servo Floating Supporter |

| | | | |
|---|---|---|---|
| 16 | Water Chiller | 1 | Standard |
| 17 | Nesting Software | 1 | TubesT Professional Nesting Software（Option） |
| 18 | Control System | 1 | FSCUT5000B |
| 19 | Loading | 1 | Acme Laser |

**Customers can choose from the following configurations**

| No. | Name | Optional（tick is standard） |
|---|---|---|
| 1 | Tube Supporter | Servo Floating√ Adjustable Nylon Wheel |
| 2 | Cutting System | FSCUT5000√ FSCUT3000S |
| 3 | Loading | With√ Without |
| 4 | Nesting Software | With√ Without |
| 5 | Air Compressor System | As optional |
| 6 | Cutting length | 6m 8m 9m 12m√ |
| 7 | Unloading | With√ Without |
| 8 | Chuck diameter | □ 120mm □ 170mm □ 250mm √□ 350mm |

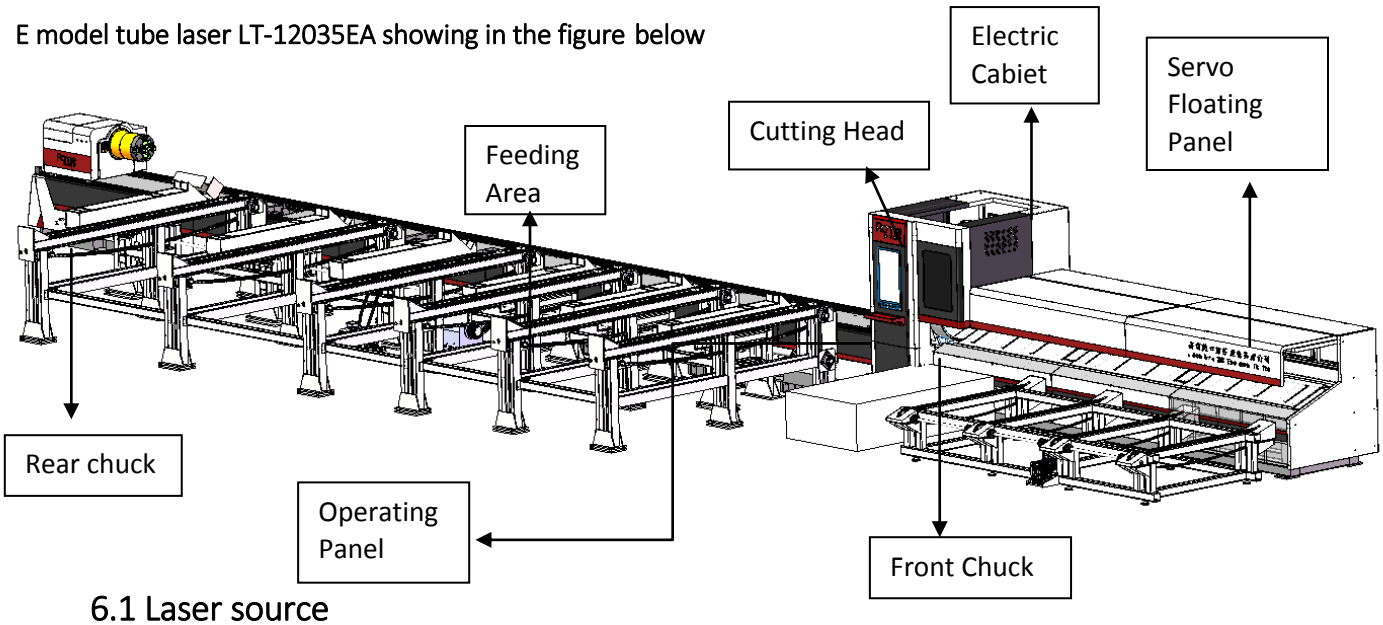
## 5 TECHNICAL PARAMETER

| Technical Parameter | | | |
|---|---|---|---|
| Model | LT-12035EA | Size | 21424×5626×2306（L×W×H） |
| Cutting Length | 13000mm | Diameter | Φ □ 20-350mm |
| Total Power | 45KW | Laser Power | 1000W 1500W 2000W 3000W 4000W 6000W |
| Tail | ≥65mm | G.W. | 19 Tons |
| Y Travel | 13700mm | Power Supply | 380v50Hz±10% |
| X Travel | 400mm | G Speed | 1.2G |
| Z Travel | 250mm | Front chuck load | 1480kg |
| X,Y Positioning Accuracy | ±0.05mm/1000mm | Feed rate | 80m/min |
| X,Y Repeat Positioning Accuracy | ±0.03/1000mm | Control System | FSCUT5000 |
| Max Rotation Speed | 50r/min | Gas | O2、N2、Air |

| Fiber Laser Source | | | |
|---|---|---|---|
| Work Mode | Continuous | Laser Power | 1000W-6000W |
| **Auxiliary System** | | | |
| Cooling System | Constant temperature control chiller for laser machine (external connection) | | |
| Circuit and protection system | According to CE standard | | |
| **Software** | | | |
| Software | TubesT Professional Nesting(Option) | | |
| Support file format | Solidworks、Pro/e、UG etc. | | |

# 6 FEATURES OF EACH COMPONENT

E model tube laser LT-12035EA showing in the figure below




## 6.1 Laser source

E model high cost-effective laser tube cutting machine LT-12035EA adopts domestic well-known brand Maxphotonics fiber laser.

The laser is a new generation of semiconductor-pumped single-mode continuous ytterbium fiber laser system in the near-infrared spectral range (1060~1080nm). It has the characteristics of high power, ideal beam quality, fiber transmission and high electro-optical conversion efficiency.

This type of laser system has unparalleled high reliability of other solid-state lasers and gas lasers. Its advantages are: a wide range of wavelength selection, extremely low signal-to-noise ratio, extremely high stability and long service life.

Main features: There is no lens in the laser generator, maintenance-free, and the light guide system is composed of optical fibers.

- No start-up wait time required;
- The beam quality is good
- and the power density is high.
- The efficiency of electro-optical
- conversion is up to 35%;
- Beam mass TEM00 (M2<1.1);
- More than 100,000 hours of
- pumping source life;
- Maintenance-free operation,
- single-mode fiber transmission;



Main Technical Parameters of Laser Source

| Name | Parameter | Name | Parameter |
|---|---|---|---|
| Laser Type | Fiber Laser | Beam Quality | 2 mm*mrad |
| Work Mode | Continuous | Laser transmission instability | ≤ 5% |
| Wave Length | 1070-1080 nm | Indicator Light Wave Length | 635/658nm（Red） |
| Rated Output Power | 2000 W | Indicator Light Parameter | 1mW |

## 6.2 Laser Cutting Head




With Raytools fiber laser cutting head, equipped with capacitive non-contact high automatic tracking system, the cutting head can automatically adjust the height with the deformation of the work piece, without affecting the

cutting of the work piece. The response speed and processing efficiency of the Z-axis direction are greatly improved.

Characteristics:

- Includes linear drives, cutting systems, adjusters and lying units
- Integrated contactless capacitor sensors
- Compact appearance for easy space cutting
- Water-cooled optics and fiber optic sockets
- All water-conducting components are made of stainless steel
- Integrated collimation units

Main Technical Parameters of Laser Head

| Name | Parameter | Name | Parameter |
|---|---|---|---|
| Focal Length | 125 mm | Auxiliary gas input | O2, N2,Air |
| Cutting Head | Equipped with capacitive height adjustment system | Auxiliary gas output | Dual air source air circuit, numerical control selects proportional output |

## 6.3 Machine Bed



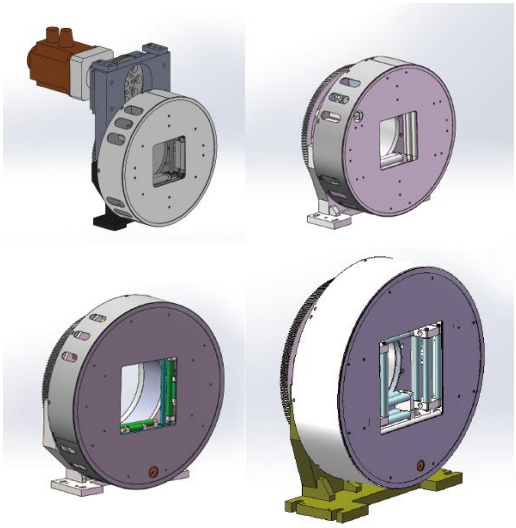
Self-developed. Precision welding

E model cost-effective laser pipe cutting machine LT-12035EA is composed of bed, chuck, transmission system, electrical system, lubrication system, optical system, cooling system, loading and unloading system and other components.

The beds used by the company's products are all independently developed and processed as a whole. The bed, which is designed with the principle of structural dynamic design and the variable analysis technology of the finite element method, has excellent dynamic and static characteristics. The frame structure welded by high-quality steel plates and steel pipes has undergone independent welding, secondary aging treatment, and precision machining by a large gantry milling machine.

The company has cooperated to introduce high-precision CNC machining centers such as HAAS from the United States, Mazak from Japan, and Yingyuan from Taiwan. The precision milling of the bed uses a large Italian gantry milling machine, and the independent research and development design and high-precision production and processing of core components have been realized. Ensure that the guide rail surface and rack surface are processed and formed at one time to ensure accuracy. These design and processing methods ensure the machine tool has excellent shock resistance, high rigidity and stability.

## 6.4 Self-developed Intelligent Full-stroke Chuck

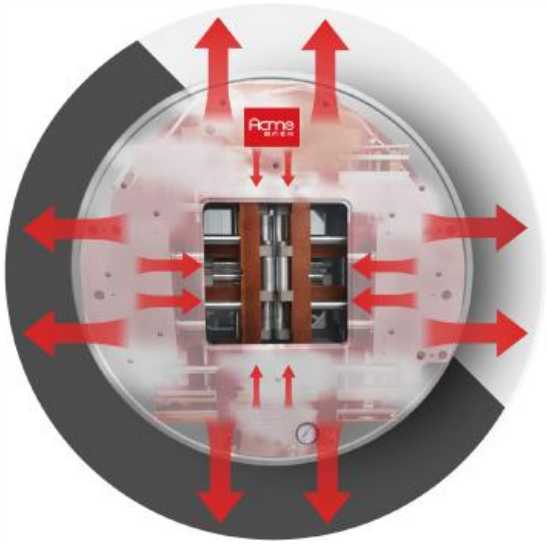


Acme laser chuck R & D team insists on independent innovation, strong R & D capabilities, obtained a number of technical patents, completely independent intellectual property rights. There are many high-precision CNC machining centers worth more than 20 million yuan, such as Haas from the United States, Mazak from Japan, Taiwan and Switzerland.

| | |
|---|---|
| 120mm | 170mm |
| 250mm | 350mm |

Aiming at the pain points of the current laser pipe cutting machine chuck, with great concentration, we have designed and developed a special smart chuck for the Acme laser pipe cutting machine, which is more suitable for the application of pipe cutting machines than other manufacturers.

## Performance advantage



- Square hole design, stronger passing ability;
- The clamping force can be adjusted intelligently, suitable for different types of pipe processing requirements;
- The clamping range of full stroke, without manual adjustment;
- With an eight-cylinder structure, the clamping force is twice that of ordinary chucks;
- Precision grinding gear drive, stronger power and higher efficiency;
- The highest level of dustproof, stronger stability
- The lengthened design of the rear chuck allows the front chuck to achieve "zero tailing" cutting with two chucks.
- It can effectively clamp various shapes of profiles, such as: square tube, round tube, rectangular tube, oval tube, flat oval tube, channel steel, H steel, angle iron, triangle tube, etc.









Chuck Manufacturing Workshop

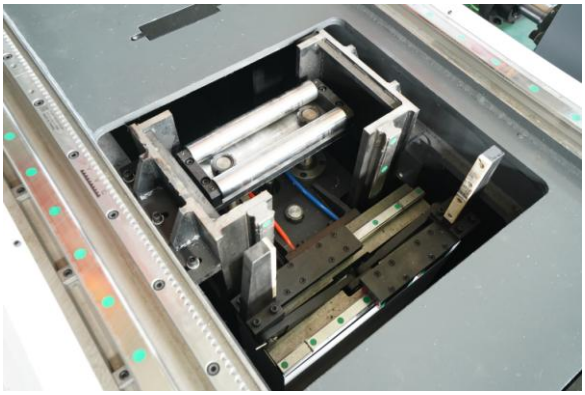
Self-developed Smart Chuck System



Technical parameters (front chuck)

| Diameter mm | MAX. Size mm | Repeat Positioning Accuracy | Rotarion Speed r/min | Maximum clamping force kg | Weight kg |
|---|---|---|---|---|---|
| 120 | 120 | 0.05 | 200 | 100 | 62 |
| 170 | 170 | 0.05 | 100 | 250 | 160 |
| 250 | 250 | 0.05 | 85 | 300 | 300 |
| 350 | 350 | 0.05 | 50 | 600 | 550 |

## 6.5 Tube Supporter



Servo Floating Tube Supporter

Servo tracking support system can adjust the height according to the height of pipe rotation during cutting to realize the perfect support in the cutting process.

## 6.6 ACME Cloud System

Acme Laser cloud system is based on real-time data collection of laser cutting equipment, and through industrial big data analysis, it realizes processing intelligence and assists users in improving management. Acme Laser cloud system provides users with real-time monitoring, equipment digital management, processing report analysis and display, historical processing data analysis, processing efficiency comparison, abnormal working condition detection, health assessment reminder, power sheet consumption analysis, preventive maintenance reminder management and other functions . The Acme Laser cloud system helps users to dynamically grasp the health status of equipment, remotely monitor operating status and fault information, thereby improving







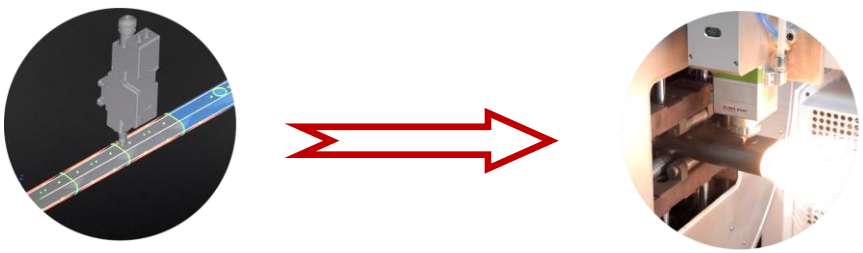
equipment maintenance efficiency, reducing equipment unexpected downtime, and extending equipment life cycle. Ding point cloud system provides historical processing analysis and efficiency analysis functions, and helps users improve work efficiency through data analysis.

- Display of key equipment information such as total start-up time, total cutting length, start-up rate and effective cutting rate, daily work history change trend, laser, etc.
- Real-time monitoring of the real-time processing progress of the current task
- 
- 
- 
- 
- Speed Height Cutting Position Processing time
- Processing daily report to check the daily processing situation
- Efficiency analysis pays attention to the dynamics of machine tool efficiency
- Task statistics keep abreast of changes in the number of machine tool tasks
- Electricity cost analysis and basic cost information such as sheet usage
- Running statistics Check the running status of the machine tool at any time, data monitoring, processing statistics, travel statistics
- Maintenance management provides maintenance reminders based on machine tool working condition information
- Health management of core components such as lasers and cutting heads, and health monitoring of core components
- The rich knowledge of knowledge centers such as cutting software, nesting software, knowledge center, short video cutting and nesting software, etc. can be seen at a glance.

## 6.7 Nesting Software--TubesT

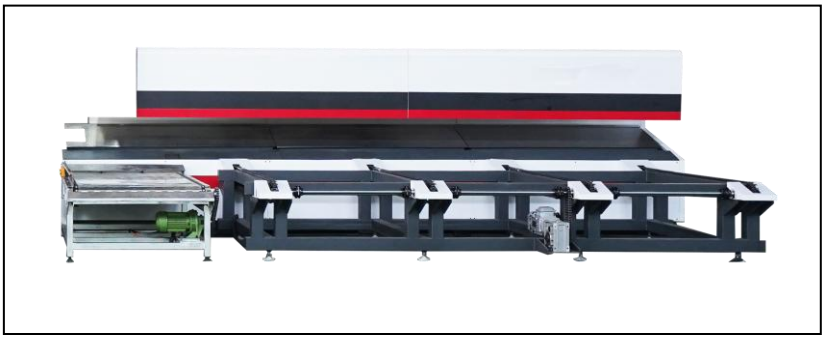
TubePro tube cutting software is a professional cutting software for processing all kinds of tubes. Seamlessly docking with the layout software TubesT, TubesT realizes the processing of the layout, co-edge, basic process and special process of parts. After exporting the processing file, you can directly use TubePro to cut. The three-dimensional cutting function can effectively simulate the real laser cutting process and greatly improve the processing efficiency. Abundant cutting functions, realizing precision cutting of various special-shaped and complex graphics that are difficult to achieve by conventional processing, such as pipe drilling, cutting, intersecting line cutting.

3D simulation (the nesting software model is exactly the same as the actual one):



## 6.8 Front Receiving Platform(Optional)

The cut work piece can be automatically transferred to the work piece area, and the waste box is placed under the cutting area. Automatic material collection. Real-time support. Prevent pipe shaking. Ensure accuracy and cutting effect. Unique design can realize automatic separation of waste and finished products. Finished products fall into the finished product box, and waste falls into the waste box.



## 6.9 Automatic Feeding Device (Optional)

(1) Manual Fast Speed Tube Feeding--Patent Design

ACME patented feeding mode: a feeding hole is set between the rear chuck and the base, and the pipe can be pushed into the bed directly through the material rack with rollers, cutting and feeding are performed at the same time, which can save about 15s of feeding time. Maximize efficiency. After the first pipe is cut, the back chuck returns to the position, the feeding mechanism automatically rises, and the second pipe is finished feeding. Save labor costs and improve efficiency.

(2) Automatic Tube Feeding Device



- Self design and production, can adapt to various tube types such as round tube, square tube, rectangular tube, H beam, channel steel, L beam etc.;
- Whole loading weight 2 Tons, each pipe maximum 300kg;
- Servo feeding, accurate feeding position, closely matched with the bed;
- Steel Chain Transport, stable structure, suitable for batch processing;
- 50mm diameter drive shaft, good rigidity;

- One person can guard multiple devices, saving manpower and improving efficiency.

## 7. SPARE PARTS, SPECIAL TOOLS AND CONSUMABLES

### 7.1 RANDOM ACCESSORIES

| No. | Name | QTY |
|---|---|---|
| 1 | Nozzle | 5 |
| 2 | Protection Lens | 5 |
| 3 | Ceramic Holder | 2 |

### 7.2 CONSUMABLES

| No. | Name |
|---|---|
| 1 | Nozzle |
| 2 | Focus Lens |
| 3 | Collimation Lens |
| 4 | Protection Lens |
| 5 | Ceramic Holder |

### 7.3 LIST OF DOCUMENTS WITH MACHINE

| Quality Certificate | Packing List | Electrical schematic diagram | Machine Manual |
|---|---|---|---|
| 1 | 1 | 2 | 1 |
| Consummable List | Laser Source Manual | Water Chiller Manual | Nesting Software |
| 1 | 1 | 1 | Option |

## 8. OPERATING COST ANALYSIS

| Name | | Option 1: Air compressor cutting | Option 2: Oxygen cutting | Option 3: Nitrogen cutting |
|---|---|---|---|---|
| Power consumption (peak power consumption) | Laser Source | 5KW | 5KW | 5KW |
| | Chiller | 6.3KW | 6.3KW | 6.3KW |
| | Air Compressor | 11KW | | |
| | Machine | 3KW | 3KW | 3KW |
| | Dust Extraction | 1.5KW | 1.5KW | 1.5KW |
| Consumables | | 0.5CNY/H | 0.5 CNY /H | 0.5 CNY /H |
| Gas | | 0 | 15 CNY /H | 60 CNY /H |
| Total Power (Power factor 0.8) | | 26.8KW | 15.8KW | 15.8KW |
| Total power consumption | | 16.1KW/H | 9.5KW/H | 9.5KW/H |

| | | | |
|---|---|---|---|
| (if 60% cutting efficiency) | | | |
| Total operating cost (if 1CNY/Kwh) | 16.6 CNY | 25 CNY | 70 CNY |

## 8.1 CUTTING SPEED FOR DIFFERENT POWER AND MATERIAL THICKNESS

Material cutting thickness analysis (the actual cutting speed is affected by the pipe diameter)

| Metal | Thickness (mm) | 1000W Speed (m/min) | 1500W Speed (m/min) | 2000W Speed (m/min) | 3000W Speed (m/min) | 4000W Speed (m/min) | 6000W Speed (m/min) |
|---|---|---|---|---|---|---|---|
| CS | 1<br>2<br>3<br>4<br>5<br>6<br>8<br>10<br>12<br>16<br>20<br>22<br>25<br>30 | 15.0-22.0<br>5.00-6.60<br>2.50-3.85<br>2.00-3.30<br>1.40-2.00<br>1.20-1.65<br>0.90-1.32<br>0.60-0.90<br>0.40-0.70 | 18.0-25.0<br>7.00-10.0<br>4.00-5.50<br>2.50-3.50<br>2.00-2.80<br>2.00-2.42<br>1.20-1.65<br>1.00-1.32<br>0.70-1.00<br>0.60-0.80 | 25.0-33.0<br>7.00-10.00<br>4.00-5.60<br>2.80-4.00<br>2.00-2.75<br>2.00-2.42<br>1.20-1.65<br>1.00-1.32<br>0.70-1.00<br>0.60-0.80 | 28.0-38.0<br>5.50-7.00<br>3.60-5.00<br>3.00-4.50<br>2.50-3.30<br>2.30-2.86<br>1.80-2.20<br>1.20-1.65<br>1.00-1.32<br>0.60-0.90<br>0.50-0.80 | 30.0-44.0<br>5.50-7.70<br>3.70-5.50<br>3.50-4.62<br>2.50-4.00<br>2.50-3.52<br>2.00-2.80<br>1.20-2.20<br>1.00-1.76<br>0.70-1.00<br>0.60-0.90<br>0.66-0.90 | 35.0-48.0<br>6.00-8.25<br>4.00-5.50<br>3.50-5.50<br>2.60-3.52<br>2.00-2.80<br>1.80-2.30<br>1.60-2.10<br>0.70-1.00<br>0.65-0.95<br>0.60-0.77<br>0.40-0.65 |
| SS | 1<br>2<br>3<br>4<br>5<br>6<br>8<br>10<br>12<br>16<br>20<br>22<br>25<br>30<br>35<br>40<br>45 | 16.5-22.0<br>4.50-6.10<br>2.00-3.10<br>1.00-1.65<br>0.40-0.70<br>0.20-0.45 | 20.0-26.0<br>18.0-22.0<br>4.50-5.50<br>2.00-2.50<br>1.50-2.00<br>0.70-3.10<br>0.20-0.45 | 27.5-33.0<br>18.0-22.0<br>4.50-5.50<br>2.20-2.80<br>1.50-2.00<br>0.70-3.10<br>0.35-0.60 | 31.0-38.5<br>10.0-16.5<br>7.00-10.0<br>5.00-7.20<br>1.80-2.45<br>1.00-1.65<br>1.20-2.00<br>0.70-1.00 | 33.0-45.0<br>10.0-20.0<br>7.50-12.0<br>5.50-9.00<br>4.00-5.50<br>2.60-4.50<br>1.60-2.80<br>0.70-1.65<br>0.50-0.90 | 50.0-65.0<br>30.0-40.0<br>18.0-25.0<br>10.0-15.5<br>8.00-13.5<br>6.00-9.00<br>4.00-5.50<br>1.80-2.80<br>1.20-1.65<br>0.80-1.20<br>0.60-0.90 |

## 9. COOPERATION BRAND




## 10. INSTALLATION AND COMMISSIONING

On-site power distribution cabinet: 380V, 50HZ, three-phase four-wire, and the capacity is not less than 60 KVA.

1. The equipment should be installed with dedicated grounding, and its grounding resistance should not exceed 4Ω.
2. Provide necessary lifting equipment and personnel, lifting and handling equipment: cranes with a minimum lifting height of not less than 3 meters and a minimum lifting weight of 10 tons, or those meeting the above conditions and a minimum lifting weight of more than 10 tons Crane or forklift, and 2 jacks.
3. Provide materials such as steel plates for on-site debugging of equipment. Before the equipment arrives at the site, the buyer needs to prepare various materials for equipment debugging.
4. Provide temporary pass for debugging personnel.
5. The buyer needs to prepare before the equipment arrives at the site: cutting gas: high-purity nitrogen (purity ≥99.999%), oxygen ≥99.99%, clean air without water and oil.
6. Equipment space and foundation requirements: the ground bearing strength is at least 2000kg/m2, and the ground flatness is less than 5mm;
7. On a solid and firm foundation, pour a 350mm thick cement layer. The cement number is not less than 425#, and a shock-absorbing groove is set around the equipment foundation.
8. Compressed air pipeline: The compressed air pipeline connected to the machine tool is required to be made of stainless steel and withstand the maximum pressure of 15bar (the length of this pipeline is determined according to the installation of the field equipment)

### 10.1 Factory inspection standards

| NO | Name | | Content | Note |
|---|---|---|---|---|
| 1 | Time | | After the machine is installed and debugged | / |
| 2 | Location | | In Acme Laser Factory | / |
| 3 | Acceptance content | Machine appearance, operation and function demonstration | Meet product specification and technical agreement requirements | Including spare parts and tools |

| | | | | | |
|---|---|---|---|---|---|
| | | Machine accuracy check | Geometric accuracy | Refer to the acceptance report provided by the seller | The seller randomly provides an acceptance report with inspection content and corresponding acceptance inspection standards |
| | | | Motion accuracy | Participate in the acceptance report provided by the seller | |
| | | Transmission function verification | | Test machine's program USB interface transmission function | / |
| | | Verify delivery content | | Verification according to contract supply content | / |

## 10.2 Buyer inspection standards.

The drawings provided by the buyer can be used as the buyer's acceptance standard after being signed and confirmed by the seller, and the drawings are attached to this agreement. If there is no appendix drawing provided, it shall be implemented according to the factory inspection standard.

# 11. INSTALLATION

## 11.1 Installation

15 days before the equipment is shipped, provide the customer with the installation layout plan (including the civil works and the water, electricity, gas consumption and piping, interface requirements of the equipment installation).

The equipment is installed in the user's factory, and the user is required to provide enough space, power supply and ventilation system to install the equipment. The installation is installed by our trained engineers. We are responsible for equipment installation and commissioning. The customer is responsible for the civil work of the equipment installation and the water, air pipe, and power cord are connected to the machine tool designated by our engineer. The pipeline connected to the machine tool is our responsibility, but the user should provide the necessary cooperation and assistance for the equipment installation and commissioning of our engineer .

## 11.2 Training

ACME supplies door to door services all over the world. Charging standards and service processes are as below:

The training time is 3-5 days and is completed in the user's factory. Mainly learn equipment maintenance, operation, laser protection, processing technology, graphic editing, common troubleshooting, etc. The trainees are required to be mechanical, electrical or optical assistant engineers or engineers, understand computer operations, and know SolidWorks drawing. Trainees should pass the assessments on equipment operation, basic laser knowledge, safety protection and maintenance organized by the supplier before they can take up their posts.

(A). Charging standards：

Technician visa fees, domestic travel expenses (including transportation cost occurred during handling documents);

Training and maintenance fees: $150/day/person （take the time of landing and starting off of plane in customer's country as standard）;

International round-trip tickets (reserved and paid by the buyer, and supply the e-ticket information to our company );

Abroad accommodation(arranged and paid by the buyer)

(B).Overseas training/maintenance processes:

ACME company will calculate the fees of item 1 and item 2 above, and then inform the buyer. After the buyer pays the fees, ACME company will arrange for the technician to apply for a visa.

We will inform the buyer after the technician gets the visa. The buyer should supply the round-trip ticket information mentioned above in item 3, and arrange accommodation from item 4 after the technician arrives.

Only after getting the approval of ACME company, the buyer can apply for an extension for the training and maintenance. The buyers should pay for the" extend training and maintenance service fees" before the start of the extend service.

# 12. WARRANTY AND SERVICE

## 12.1 General principles

I We are responsible for the maintenance of facilities which are within the Warranty conditions.

II Users must keep the machine's integrity and independence during operation. In the following situation, our company will not take any direct, indirect or joint liability. Furthermore, if any equipment is damaged or there are any losses in either economic or reputation to our company due to the following situation, we, ACME company, reserve the right to investigate any legal liability.

1) Using the equipment in an environment that it was not designed for..

2) Altering the machines privately, including, adding parts, reducing parts, dismounting, using another brand's parts, etc.

3) Human damage or doing operations and maintenance without following the requirements in the instructions.

4) Damage caused by movement or transportation.

On condition of not influencing the machine's performance, our company reserves the right to change the product's specifications and name the products before informing the customer.

Our company is responsible for the quality and performance of the machine we sell. However, we are not responsible for other indirect obligations and responsibilities.

## 12.2 Detailed Principles

Equipment Warranty: 2 years. Calculated from the production date in machine's nameplate. Specific details are as below:

I Laser module Warranty:

Fiber Laser Source warranty： 2 years

Fiber Laser Cable: no warranty

(P.S. Laser module's warranty date calculated from the production date in laser module tag)

II The warranty does not include consumable parts, such as glass mirrors, belts, switches, gas nozzles ,foots/wheels, keys/press boards, etc.

III Warranty of peripheral devices (if the machine has them):

Warranty of peripheral devices is decided by supplier, calculated from the production date in the device's tag. Maintained by device's manufacturers as standard, Our company assist maintenance. Peripheral devices including water-chillers, fans ,air compressor etc.(If the machine has them).

Accessories repair and shipping cost

Within the warranty period

For free repair or replacement of accessories, the buyer should bear the shipping costs from their local place to our company if it needs to tested, repaired or replaced.

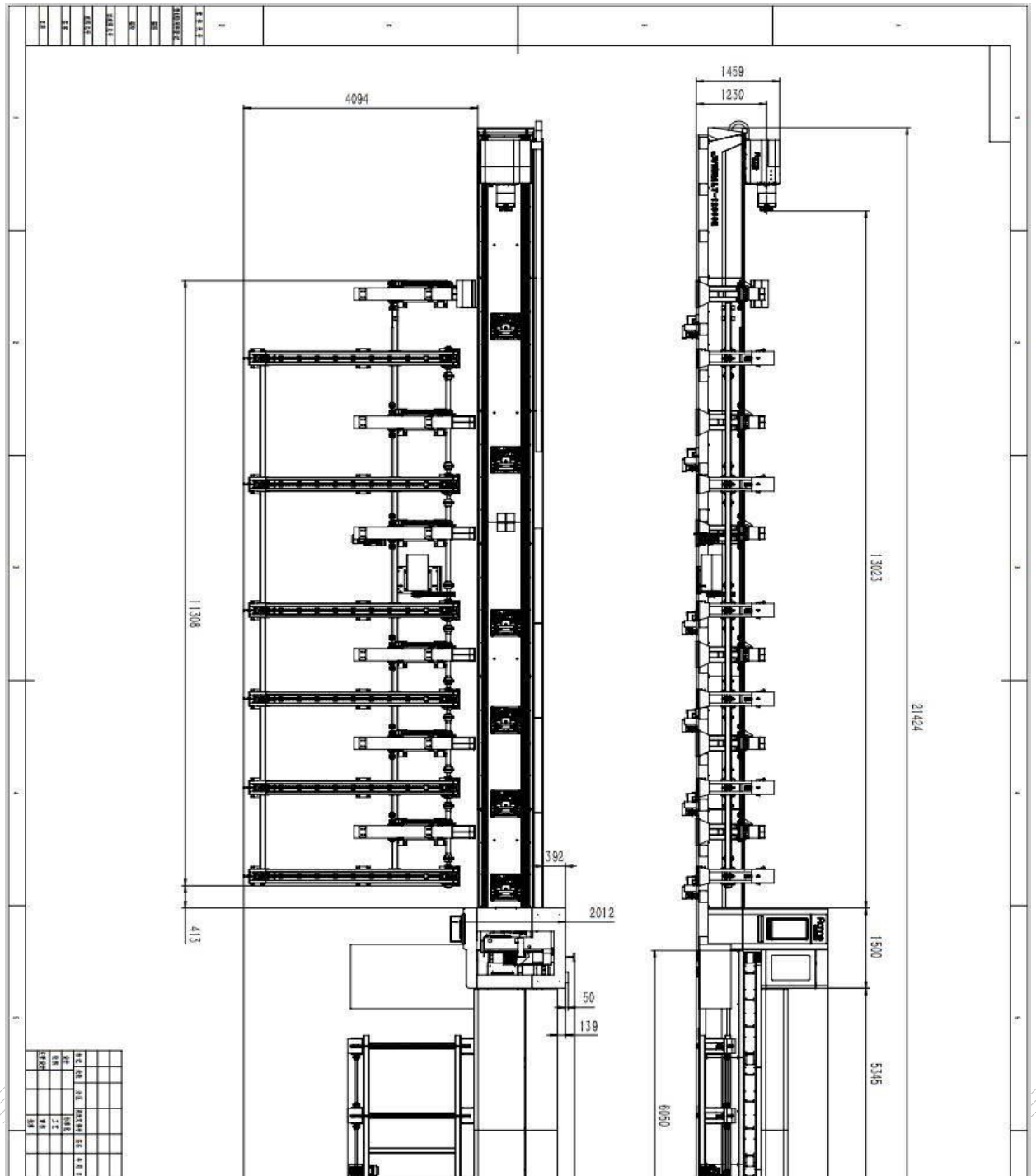
If the failure cause by the parts'quality after testing(non human factors and use environment etc.), it will be repaired or replaced free of charge, and ACME company will bear the return shipping cost. If the failure doesn't cause by the parts'quality, the buyer should pay the repair fees and round-trip shipping cost.

P.S. The repaired parts should be returned to our factory. if the buyer is in arrears of spare parts, ACME company will cancel the warranty terms of the machine).

Outside the warranty period

The buyer should paid for repairs and round-trip shipping.

13. The floor plan/foundation plan



## Contact us

Company Address: Acme Laser Intelligent Manufacturing Base, New and Old Kinetic Energy Conversion Pilot Zone, Jinan City, Shandong Province

Sales Hotline: +86 18678804631

Company website: www.acmelaser.net

www.acmelaser.cn

www.acme-laser.com/www.aseracme.com/www.fiberlaserchina.com

Company email: info@acmelaser.cn