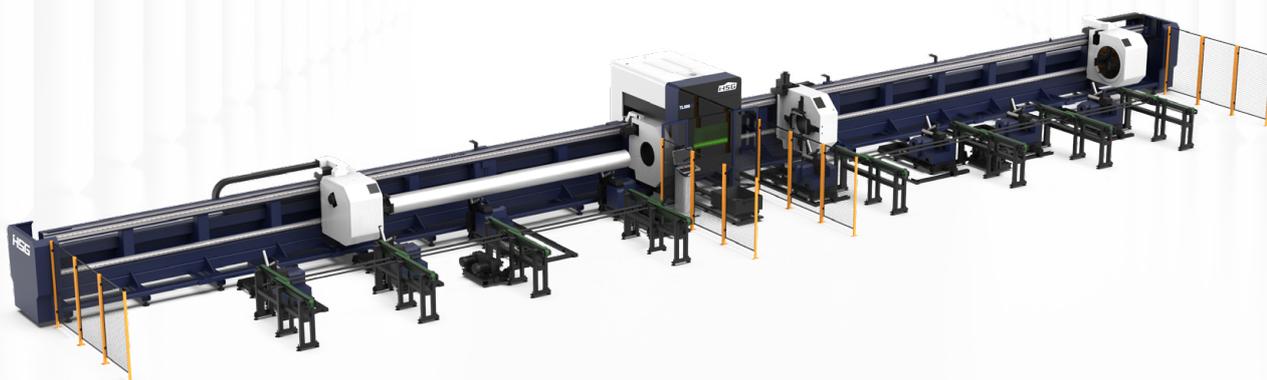


# ULTRA-HEAVY-DUTY TUBE LASER CUTTING MACHINE



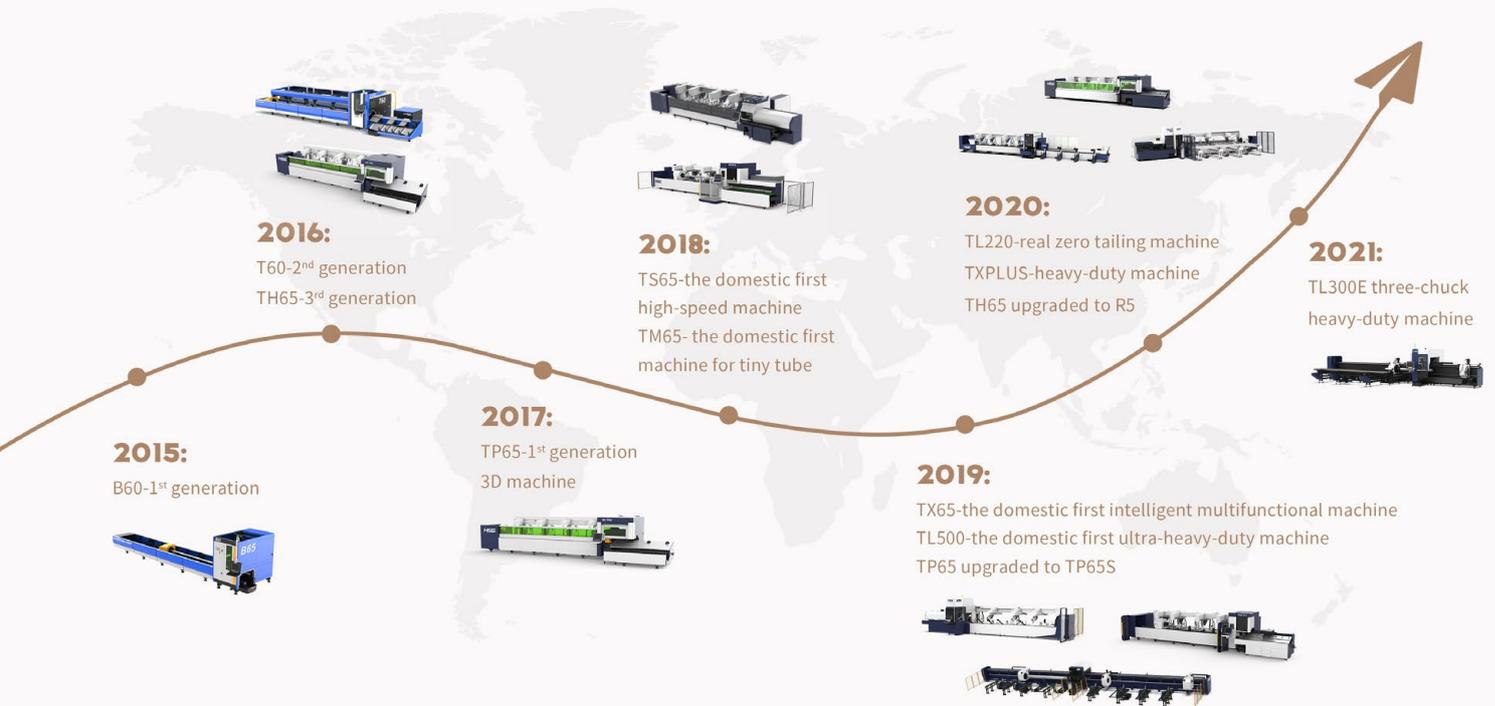
## TL500

First Choice for Engineering Machinery, Steelwork and Petrochemical Industry

Technical Parameter	TL500
Power	3000-6000W
Max. No-load Speed	40m/min
Max. Chuck Speed	30r/min
X/Y-axis Positioning Accuracy	$\pm 0.03\text{mm/m}$
X/Y-axis Repositioning Accuracy	$\pm 0.03\text{mm}$
Max. Acceleration	0.3G
Processing Materials	Round tube dia. $\Phi 80-426\text{mm}$ , square tube $80*80-300*300\text{mm}$ , rectangular tube: diagonal $\leq 426\text{mm}$
Max. Cutting Thickness of Tube	10mm SS, 8mm CS, 8mm AL, 6mm brass, 3mm red copper
Standard Cutting Length	12000mm
Max. Weight of Single Tube	1500kg
Overall Dimensions (L*W*H), incl. Loading Rack	31000*6550*3500mm

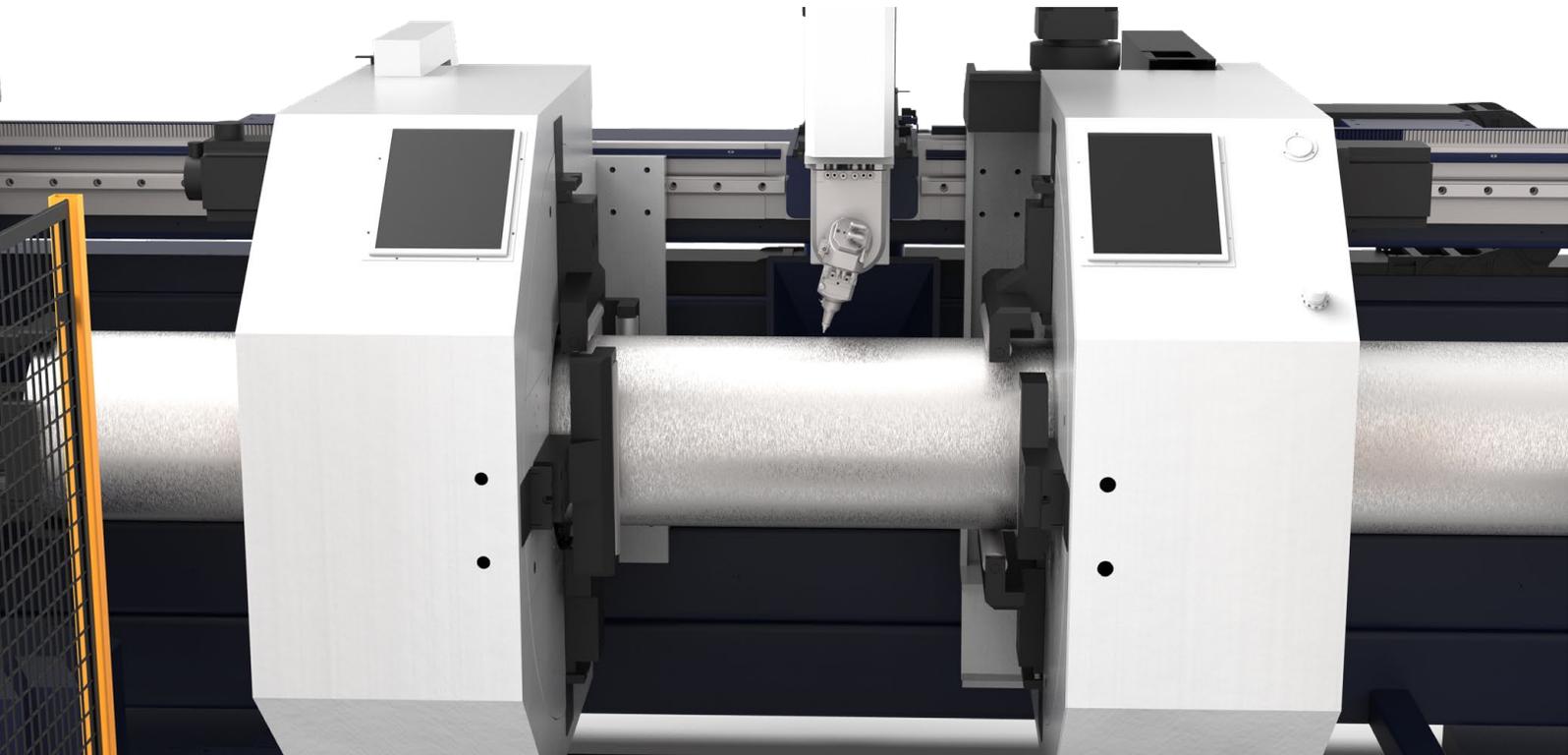
Tips: SS=stainless steel, CS=carbon steel, AL=aluminum alloy

# DEVELOPMENT HISTORY



## FAMILY OF OUR TUBE LASER CUTTING MACHINES

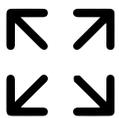
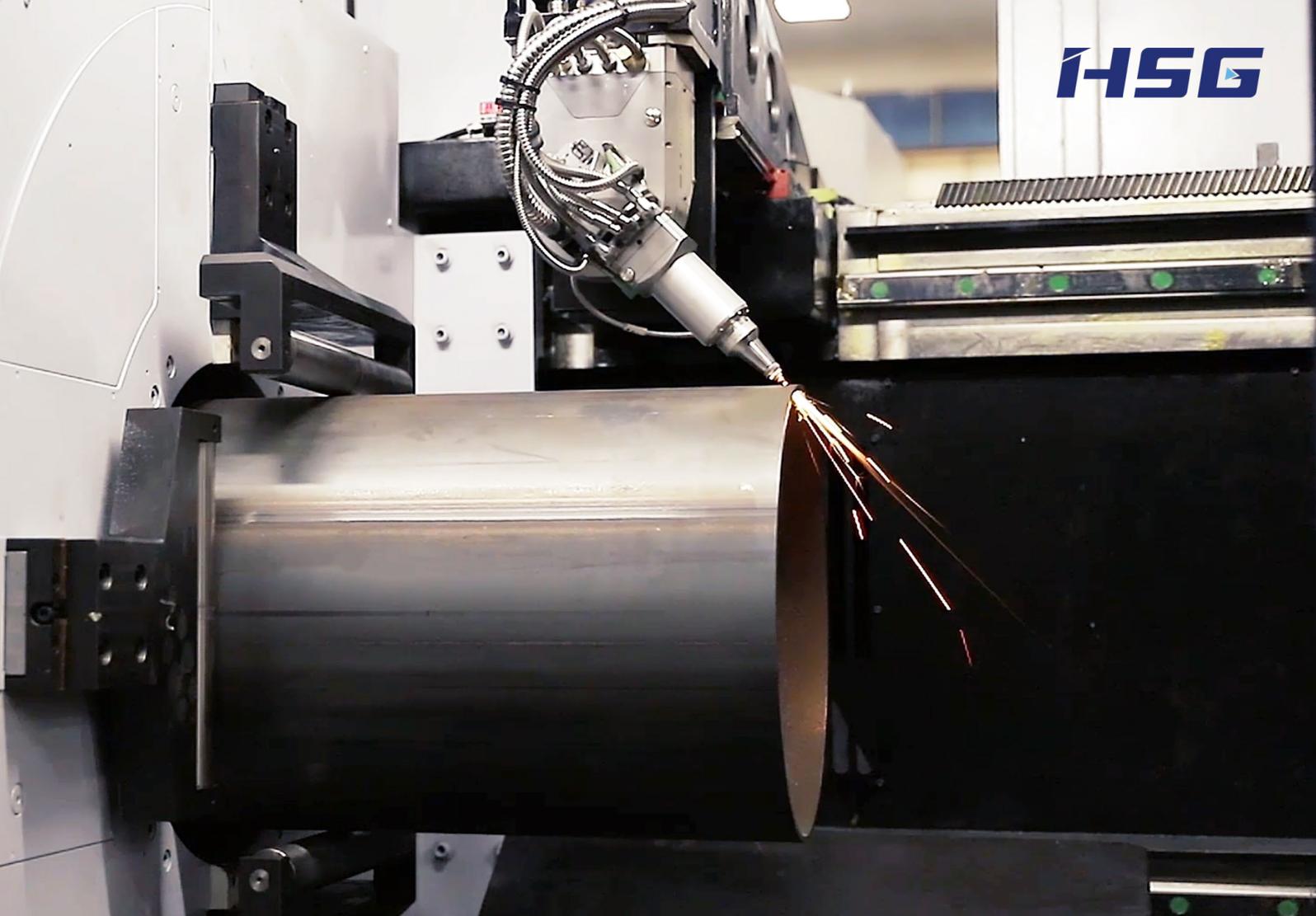
🏠 HSG Laser is the first to perceive the demands for tube cutting and devote itself to technical R&D. Until now, it has the most complete tube laser cutting machines and also lays more stress on machine details and batch cutting stability. We have applied for 100+ relevant technical patents. Our cutting range varies from 10mm to 426mm (round tube) or 10mm to 300mm (square tube). Profiles and various special-shaped tubes are also cut easily. The max. weight of single tube is 50kg-1500kg. The max. cutting length reaches up to 12000mm.



## A MODEL WITH THE GREATEST CUTTING ABILITY

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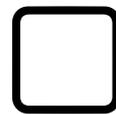
- ✦ TL500 was widely regarded as the domestic first laser cutting machine designed for ultra-heavy tubes after its first launch in 2019.
- ✦ It, specially intended for heavy and ultra-heavy tubes, can cut  $\Phi 426\text{mm}$ , 1.5t (single tube) and 12m entire tube at most.



Cut oversized tubes



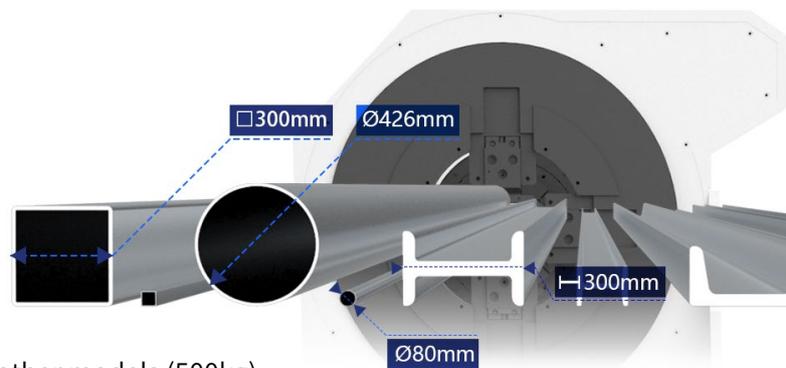
Cut extra-heavy tubes

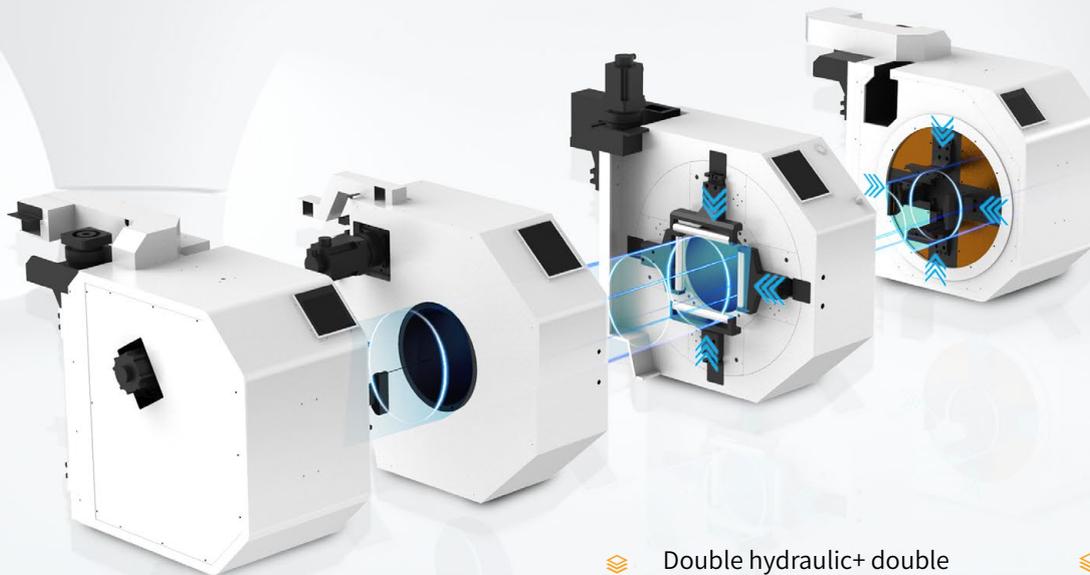


Cut ultra-long tubes

## MOST POWERFUL ABILITY OF TUBE CUTTING

- Round tube:  $\Phi 80-426\text{mm}$
- Square tube: 300mm
- Channel steel and H-shaped steel: 300mm
- Rectangular tube: diagonal  $\leq 426\text{mm}$
- Max. weight of single tube 1500kg, 3 times higher than other models (500kg)
- 12000mm entire tube





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# INTELLIGENT DIGITAL FOUR CHUCKS

## Real “0” tailing

Our four chucks, replacing traditional two or three chucks, have thoroughly figured out overlong tailing caused by the second or third chuck and made “0” tailing possible by their reversing cutting and cooperation among multiple clamping patterns. As thus, material utilization and costs are maximized and minimized respectively.

## Make good for deficiency

Our self-developed intelligent digital chucks gather up advantages of hydraulic (large clamping force and stable cutting for heavy materials) and pneumatic chuck (high clamping accuracy) and cover the shortage of them, namely, high energy consumption & easy to damage. With digital signal, the chucks can match with proper air pressure, adjust clamping force automatically and offer wireless data transmission. Due to closed-loop control, they are safe and reliable for users.

## Smart processing

Detect claw status and tube size , Access to tube data easily , Match with proper cutting pressure  
Adjust clamping force automatically , Clamp ultra-heavy tubes stably by large clamping forces

## Easy to operate

Ventilation system in front and rear chucks can prevent cutting debris and dust from affecting transmission precision.

The full-automatic centering chucks only need to be changed once while clamping  $\Phi 80-426\text{mm}$  tubes, which will save production time and improve cutting efficiency.



Wide range of application



Simple, rapid, easy-to-use and user-friendly



Improve material and machine utilization

High efficiency by simple programming

## IMPORTED SIGMATUBE NESTING SOFTWARE

### Wide range of application

Its programming and advanced automatic nesting are suitable for conventional tubes like round, square, rectangular, elliptical and conical tubes, and profiles like I-shaped, angle, channel steel and other sectional profiles.

### Improve material and machine utilization

SigmaTube offers automatic, manual and shape-based nesting logical algorithm to help users with material utilization improvement and scrap reduction. Its co-edge nesting and cutting reduce the frequency of piercing and improve cutting efficiency.

### User-friendly operation

Its automatic guide interface makes it easy for entry-level users to finish every step.

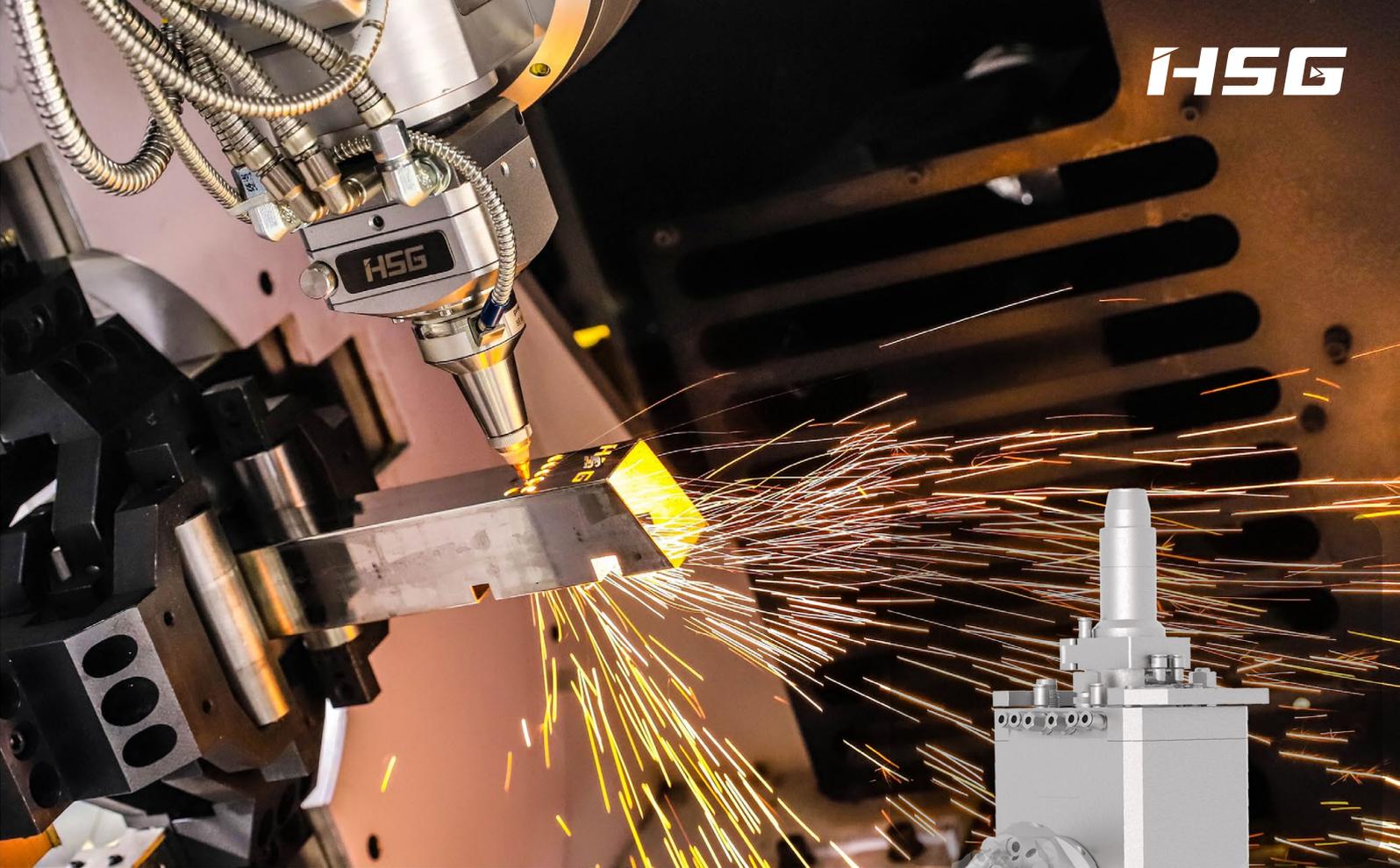
Cutting path generation and nesting in automatic or manual way allow to be selected at will.

Bevel cutting and welding bevel feature analysis are also supported.

Assembly drawing model can be imported into nesting with no need for breaking operation steps.

Cutting scraps are identified automatically.

Manufacturing report is created automatically.



Spin for N\*360° at will



Max. 45° bevel cutting



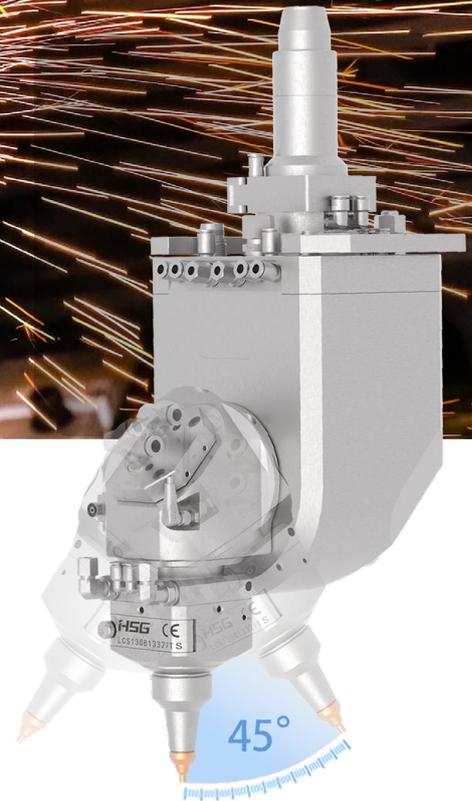
High cutting speed



High cutting precision



High degree of flexible processing



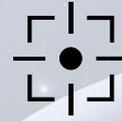
## 3D FIVE-AXIS CUTTING HEAD (OPTIONAL)

- 3D five-axis cutting head works with our self-developed height controller to provide professional cutting solutions for heavy tubes.
- This swing cutting head imported from Germany has contributed to excellent 3D five-axis cutting in combination with five-axis CNC technology.
- It can spin for N×360° at will and will be replaced rapidly without any additional adjustment.
- It can cut max. 45° bevel and make the last beveling possible.





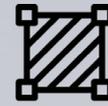
Cool down automatically for long-term cutting



Autofocus accuracy 0.01mm



Save cutting gas



Easy to realize mirror-like cutting



Cut more kinds of tubes



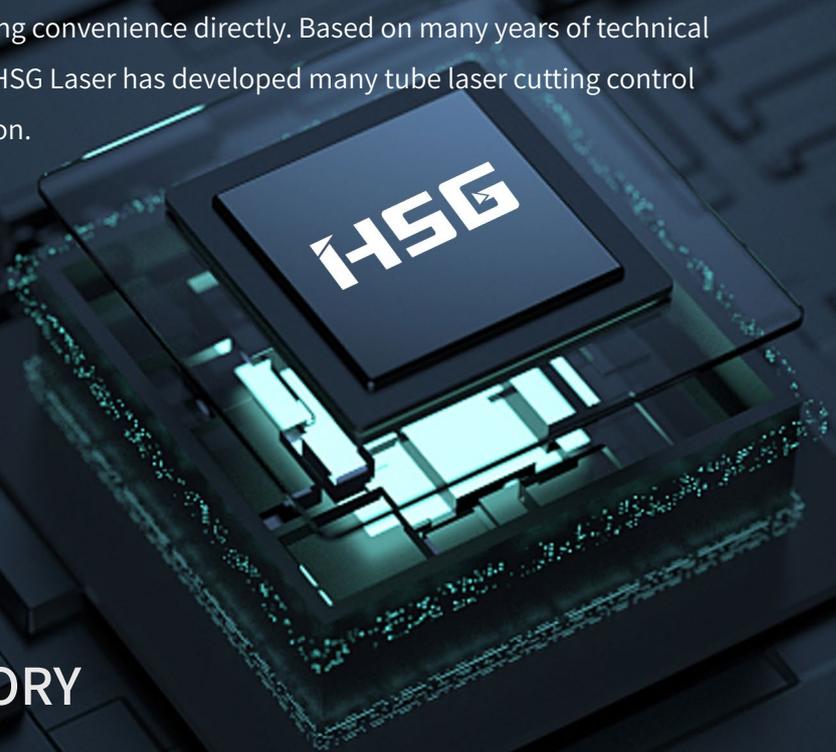
Dust-proof design

## KLINGE AUTOFOCUS LASER CUTTING HEAD

- ☞ Made of stainless steel, has water-cooling function, dual-path ultrasonic red copper cooling nozzle and ceramic ring.
- ☞ Japanese focusing & collimating lens, dual focusing protective lens.
- ☞ Gas flow is accurately controlled to realize mirror-like cutting easily.
- ☞ Water and gas hoses are protected by stainless steel tube to avoid spark splashing.
- ☞ Fast in piercing and cut tubes in most shapes and materials.
- ☞ Dust cover on Z axis prevents dust and ensures high precision.

# FAMILY OF OUR CONTROL SYSTEMS

For tube laser cutting machines, control system is the heart and soul because it decides the control stability, running smoothness and operating convenience directly. Based on many years of technical foundation and persistent improvement, HSG Laser has developed many tube laser cutting control systems that allow functional customization.



## DEVELOPMENT HISTORY

**2015**

X8800 (I)-keep performance stable by complete functions

**2016**

X8900 (II)- allow functional customization

**2017**

X9000 (III)-upgrade from automation to intellectualization

**2018**

X9500 (IV)-break technical monopoly, serve subdivided areas

**2019**

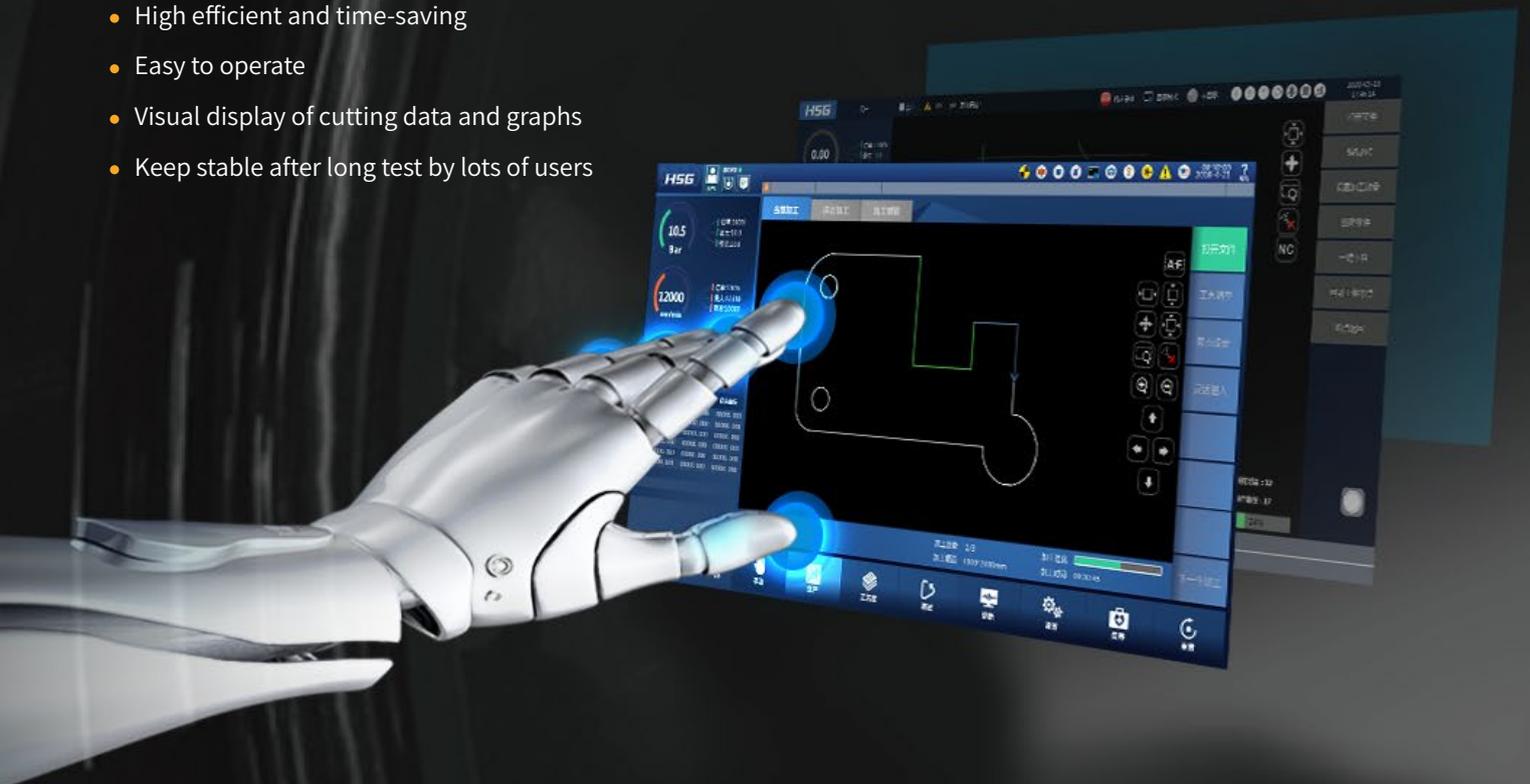
X9800 (V) -the domestic first control system aimed at four chucks and real zero tailing

**2020**

XMT (VI)-the domestic first multi-touch operating system

# HSG-X9800 INTELLIGENT CONTROL SYSTEM

- Adapt to intelligent four chucks
- Intelligent control
- High efficient and time-saving
- Easy to operate
- Visual display of cutting data and graphs
- Keep stable after long test by lots of users



- ⊞ X9800 is our fifth generation control system. It is specially designed for laser cutting machines with four chucks and can make tube cutting easier and lower its dependence on technicians by its intelligent functions.
- \* Built-in tube graph library reduces the need for programming and realizes efficient and time-saving effects
- \* Create processing records and reports automatically
- \* Click anywhere to enter the system, easy to operate
- \* Show graphs of conventional and special-shaped tubes in real time
- \* Real “0” tailing helps to maximize material utilization and save purchasing costs
- \* Imported SigmaTube nesting software



Weaken labor intensity



Minimize accident rate by safety hazard removal



Protect tubes loaded from collision



Save labor costs



Improve production efficiency

## AUTOMATIC PRODUCTION LINE (OPTIONAL)

- Automatic loading and unloading are provided for selection. With these, tubes will be loaded on machine bed in automatic, rapid and safe manner. Loading speed is improved by 100% at least.
- The automatic loading protects tubes loaded from unexpected collision, reduces labor intensity, saves labor costs and enhances loading speed.
- Cutting scrap collection device is also provided to avoid any effect on cutting progress and efficiency.
- The loading and unloading is so fast that users can gain more time.



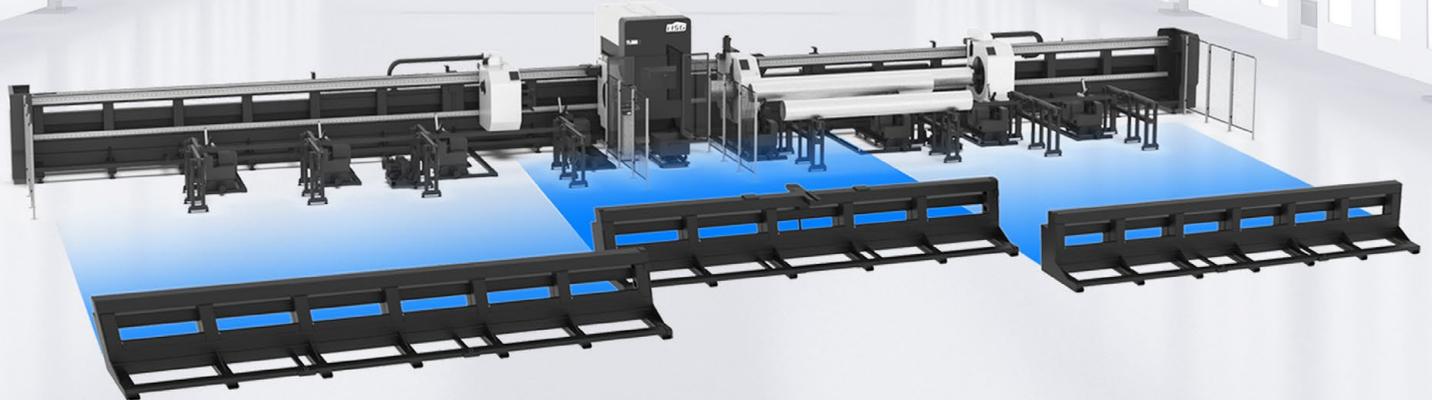
Max. tube length  
12000mm



High precision and  
good performance

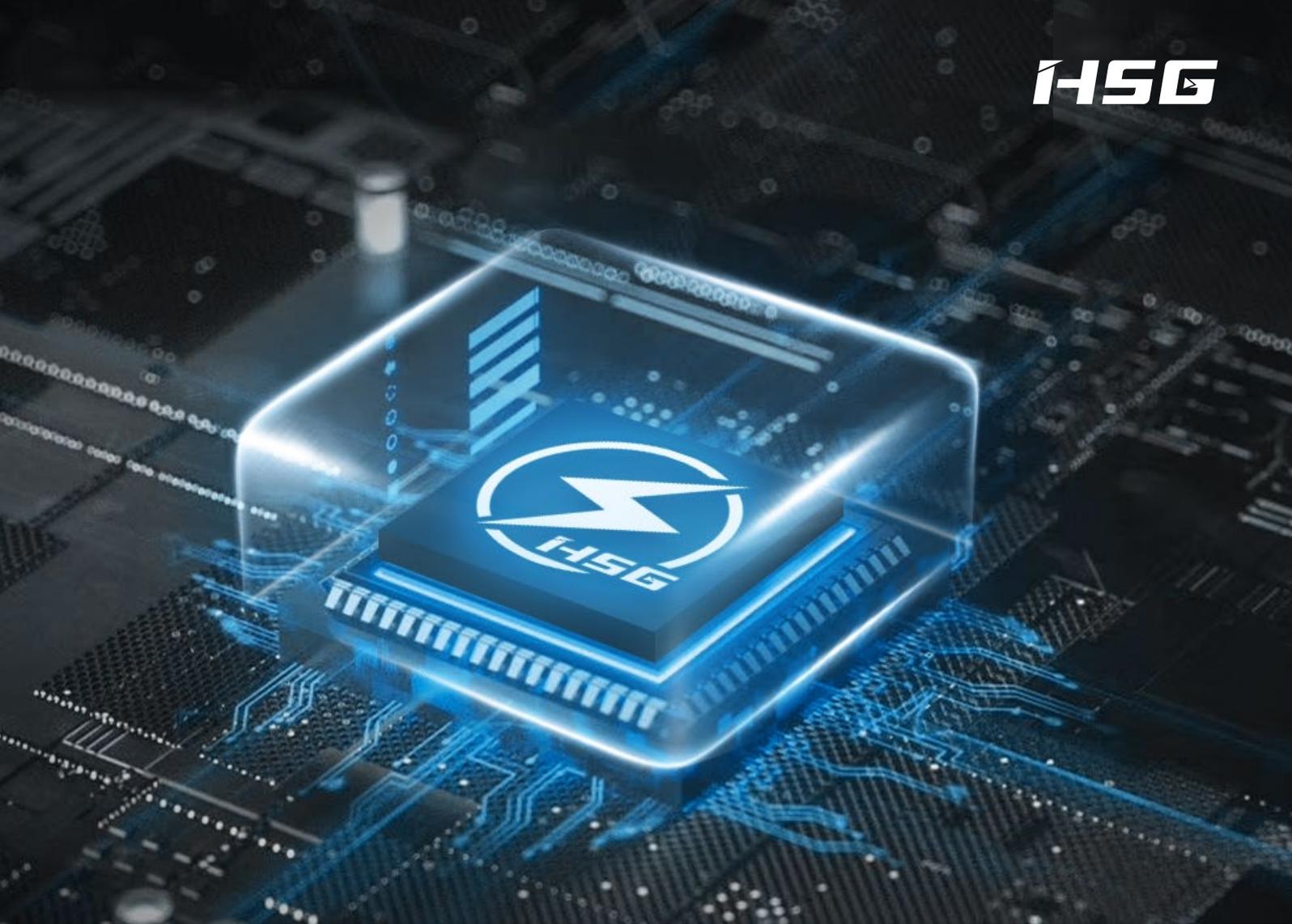


Easy to be  
transported



## THREE-SECTION SPLICING MACHINE BED

- ☞ The machine bed has three sections. Except for easy transport, it is also prolonged to cut the much longer tubes.
- ☞ Due to coaxial processing, our machine bed can always keep high precision and better processing performance.



No worry about power failure



Cut down avoidable material wastes



No effect on processing progress



Easy to operate

## POWER-OFF CUTTING RESTART TECHNOLOGY

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- Japan-imported servo motor contains an absolute encoder to not only ensure the high performance, but also offer power-off restart function, that is, cutting will restart only by clicking a button, no worry about power outage.



Wide range of application



No need for manual drawing



High accuracy of tube joggling



Facilitate the subsequent processing

## DATABASE OF NEARLY 100 KINDS OF TUBE JOGLING PATTERNS

- Our tube joggling patterns include splicing of square tube male & female head with 90° arc, splicing of round tube tee with penetrating hole, splicing of hexagon 45° angle, splicing of angle iron or channel steel, etc.
- The database is suitable for conventional tubes like round, square and rectangular tube, profiles like channel and angle steel, as well as various special-shaped tubes.
- Tube seamless splicing will start instantly after cutting, for the convenience of subsequent welding.

# WELL-SERVICED SAFETY MEASURES



## Anti-collision protection

The cutting head always keeps a safety distance from cutting surface, and has the touch stop function to reduce the risk of collision.



## Intelligent stroke protection

The cutting head always keeps a safety distance from cutting surface, and has the touch stop function to reduce the risk of collision.



## Intelligent system alarm

The machine has the function of self-inspection. Main interface can show abnormal alarm, reducing hidden dangers and improving equipment troubleshooting efficiency.



# INTELLIGENT REMOTE CONTROLLER



- ☞ TL500 supports one-key remote control, incl. calibration, blowing, analog, pause, etc. With magnet design, users will pick up or put down at will.

# STANDARD WIRING

**CE**CE-compliant  
electrical cabinetNo worry about  
wiring errorMuch safer in  
operation

- 🔗 The electrical cabinet caters to EU CE standards and separates weak current from strong current area to prevent electromagnetic interference, dust entry and possible ignition.
- 🔗 External control elements are equipped with Phoenix pluggable fail-safe wiring terminal.
- 🔗 Every line matches with its own code. The optical fiber line, gas hose, water hose, strong current line and weak current line in wiring duct are arranged in different zones to prevent signal interference and frictional loss among lines.



Meet ocean shipping criteria



\$1500 higher than other manufacturers

## HIGH-STANDARD PACKAGE

- Our machines are packed by aluminum foil, metal framework, fumigation wooden case, anti-rust oil+oilpaper, moisture-barrier bag, plastic waterproof film, filled with foam and covered by vacuum aluminum foil and plastic film.

## FAMOUS-BRAND COMPONENTS

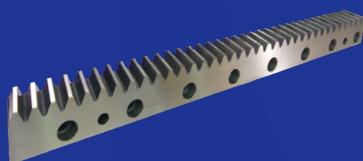
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**German WITTENSTEIN Alpha**  
Speed reducer (incl. gear wheels)

**IPG/Raycus**

Lasers



**Taiwan brands**

High-precision racks and  
linear guides

# CLASSY MACHINE APPEARANCE

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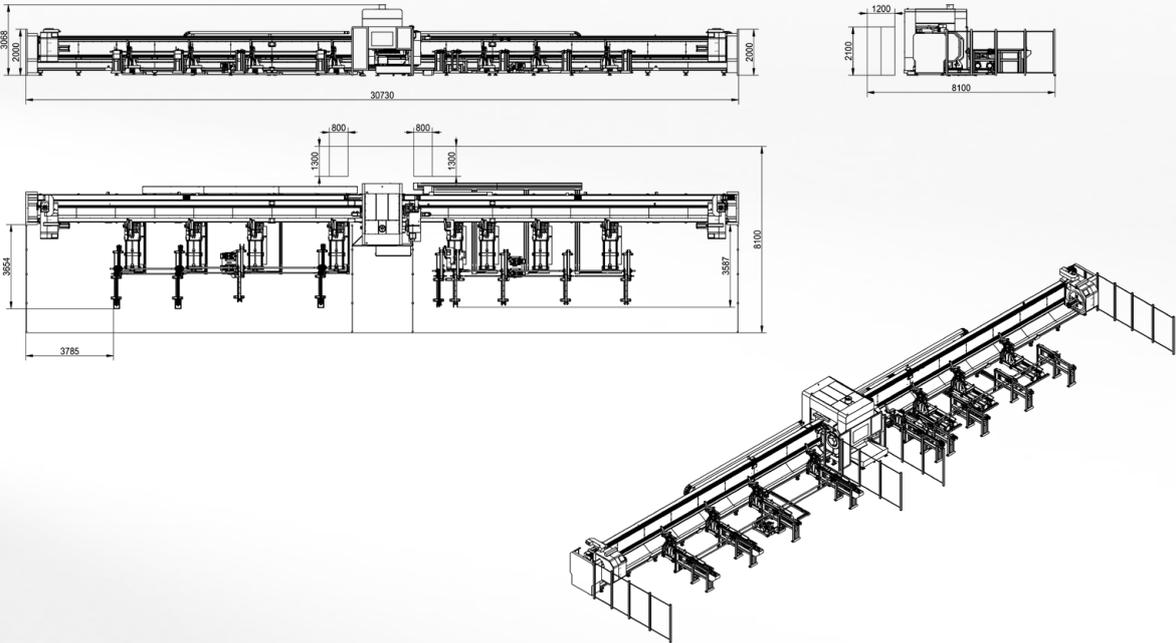


- 📏 In strict accordance with European design standards, HSG Laser adopts humanized console, suspension lamp and stainless steel edging for our machines.
- 📏 TL500 is in blue and white, which will don't look dirty.
- 📏 Large touch operating screen and electric console. Our console will lift or fall only by pressing a button, which is friendly to all users of different heights and in different postures.

# CUTTING SAMPLES



# MACHINE FOUNDATION





# Intelligent Manufacturing Changes Future

## A HI-TECH ENTERPRISE IN CHINA

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HSG Laser, founded in 2006 as a hi-tech enterprise focusing on R&D, production and sales of laser equipment, is dedicated to serve global customers with intelligent metal forming solutions.



33 patents for  
invention



316 patents  
in total

# STRESS ON MACHINES

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## Complete

We have the most complete types of laser machines, incl. sheet metal laser cutting machines, sheet & tube laser cutting machines, tube metal laser cutting machines, welding machines, bending machine, automatic loading & unloading system.



## Wide

Range of machine power, 1.5-30kW, wide range of cutting dimensions,  $\Phi$ 10-426mm, 50kg-1500kg, 6000-12000mm sheets or tubes are easily processed.



## High

Our machine bed, beam, platforms, operating system, chucks, ventilation system and others are above industry criteria. Cutting is higher, faster, more stable and better in cutting effects. It is easy to get bright surface cutting with no need for subsequent polishing.



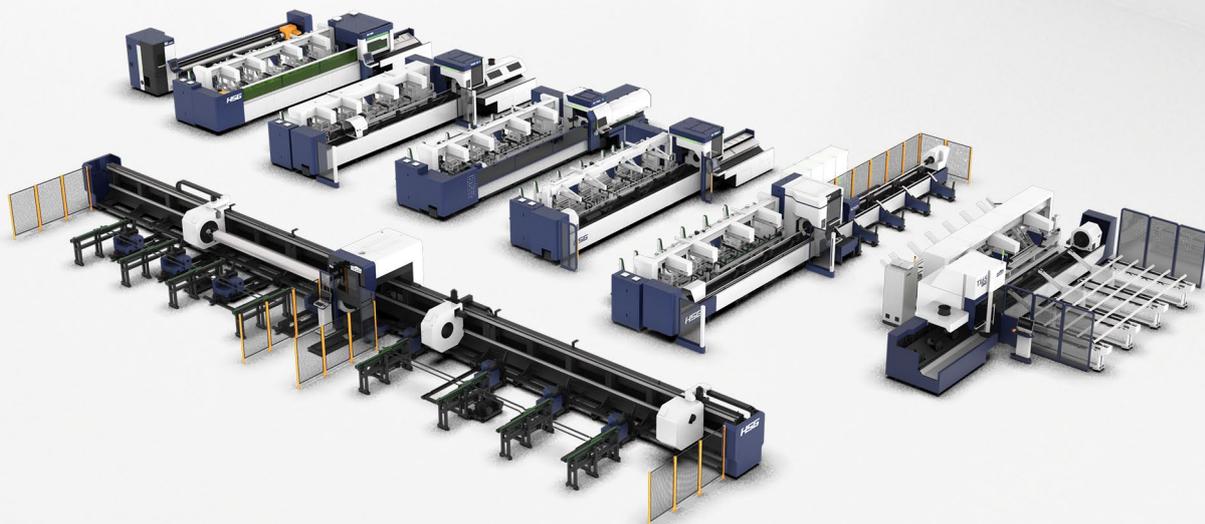
## Intelligent

HSG cloud intelligent system works with our Alpha T bus control system to enable remote repair, maintenance and working guidance. Users will get a full understanding of production and workers.



## Save

Our automatic loading & unloading system and intelligent operating system will free you from inefficient and time-consuming manual operation and help you to save labor forces and production costs.



# STRESS ON SAFETY, ENVIRONMENTAL PROTECTION AND DETAILS

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## SAFETY

Our machines are designed as full-protective and equipped with laser-proof glass in line with international standards. Safety grating will protect workers effectively and our cutting heads are anti-collision.



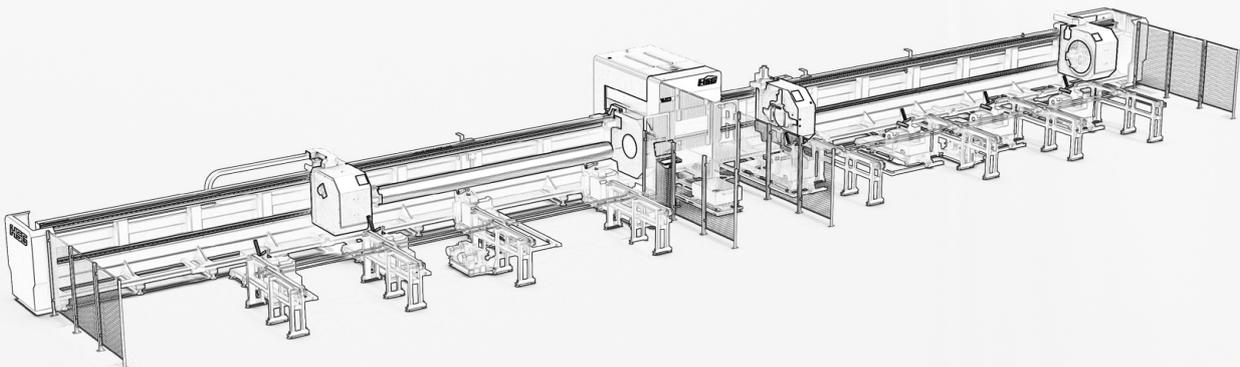
## ENVIRONMENTAL PROTECTION

Zoning hurricane-force ventilation system, under the control of butterfly valve, can realize almost smoke-free effects in combination with positive-pressure dust removal.



## MACHINE DETAILS

The front-placed electric cabinet will not be collided during loading or unloading. In this CE-compliant cabinet, weak current is separated from strong current area. The fail-safe wiring terminals and distributed wiring duct can prevent signal interference and frictional loss among lines.



# SERVE 100+ COUNTRIES AND REGIONS



10

branches/subsidiaries  
/sub-subsidiaries

30+

service outlets overseas

170+

R&D personnel

3000+

Global Sales in 2020

4

standardized manufacturing  
bases in China

1500+

employees

80000m<sup>2</sup>+

total area of production  
factories

5000+

annual productivity

**R&D**

ACHIEVEMENTS

- \* 3D five-axis bevel cutting technology
- \* P30 ultra-high-power intelligent laser cutting head
- \* Intelligent digital four chucks
- \* Alpha T bus system
- \* HSG-XMT multi-touch operating system

## STRESS ON COOPERATION WITH STRONG ENTERPRISES

We import international first-class spare parts. HSG is the world's largest cooperative partner of IPG. The speed reducer, gear wheel and racks of many machines are completely imported from German Alpha. We also develop extensive cooperation with Japanese SMC, Panasonic, German Lanny and Aventics, French Schneider, etc.



# STRICT IN QUALITY CONTROL FLOW

IN PURSUIT OF  
QUALITY  
EXCELLENCE



STEP 1  
COLORIMETER



STEP 2  
FILM THICKNESS GAUGE



STEP 5  
COLLIMATOR  
(beam)



STEP 4  
HARDNESS TESTER



STEP 3  
2D CATHETOMETER



STEP 6  
COLLIMATOR  
(bed)



STEP 7  
INTERFEROMETER

## PROFESSIONAL AFTER-SALES SERVICE



### One-year Warranty

All unit components are warranted for 1-year, except items listed in the Exclusions section below. Our after-sales engineer or local agent will supply new or remanufactured component of equal or better quality to replace the failed one.

### Exclusions

Unit components subjected to normal wear during the Warranty Period are not covered by warranty, including:

1. Nozzle
2. Protective lens
3. Ceramic ring

Machine breakdown caused by part handling/misuse or corrosion due to exposure to caustic materials, voids the warranty.

Component failure caused by customer misuse/abuse of the unit (e.g. using incompatible materials or wrong axial position settings), voids the warranty.



OUR  
HEADQUARTERS



SUZHOU  
SUBSIDIARY



GERMAN  
SUBSIDIARY



JINAN  
SUBSIDIARY



JAPANESE  
SUBSIDIARY



## TABLE OF TUBE THICKNESS AND CUTTING SPEED

Material name	Thickness (mm)	IPG CUTTING SPEED (m/min)				Raycus CUTTING SPEED (m/min)		
		2000W	3000W	4000W	6000W	1500W	2200W	3300W
Carbon steel (O2)	1	7.0-12.0	7.0-12.0	7.0-12.0	7.0-12.0	6.0-11.0	7.0-12.0	7.0-12.0
	2	5.0-6.5	5.0-7.0	5.0-7.2	5.0-7.2	5.0-6.6	5.0-6.5	5.0-7.0
	3	3.0-4.6	3.5-5.0	3.5-5.3	3.5-5.3	3.0-3.6	3.0-4.6	3.5-5.0
	4	2.8-4.0	3.0-4.2	3.0-4.4	3.0-4.4	2.0-3.0	2.8-4.0	3.0-4.2
	5	2.2-3.2	2.5-3.6	2.5-3.8	2.5-3.8	1.8-2.4	2.2-3.2	2.5-3.6
	6	2.0-2.8	2.4-3.0	2.4-3.2	2.4-3.2	1.5-2.0	2.0-2.8	2.4-3.0
	8	1.3-2.0	1.8-2.4	1.8-2.6	1.8-2.6	1.0-1.3	1.4-2.0	1.8-2.4
Carbon steel (N2)	1	6.0-20.0	6.0-20.0	6.0-22.0	6.0-23.0	6.0-20.0	6.0-20.0	6.0-20.0
	2	4.0-13.0	5.0-14.0	5.0-15.0	5.0-16.0	3.5-9.0	4.5-12.0	5.0-14.0
	3		4.0-10.0	4.0-11.0	4.0-13.0			4.0-10.0
Stainless steel (N2)	1	6.0-20.0	6.0-20.0	6.0-22.0	6.0-28.0	6.0-20.0	6.0-20.0	6.0-20.0
	2	5.0-15.0	5.5-17.0	5.5-27.0	5.5-28.0	5.0-9.6	5.0-13.0	5.5-17.0
	3	3.0-7.0	5.0-11.0	5.0-15.0	5.0-17.0	2.0-4.0	3.0-6.5	5.0-11.0
	4	1.5-4.5	3.0-6.0	3.0-7.5	3.0-8.5	1.0-3.0	2.0-4.5	3.0-6.0
	5	1.0-2.5	2.0-4.0	2.0-5.0	2.0-6.0	0.5-1.5	1.2-2.5	2.0-4.0
	6	0.4-0.8	1.0-3.2	1.0-4.0	1.0-5.0		1.0-1.8	1.0-3.2
	8		0.6-1.8	0.6-2.6	0.6-3.2			0.6-1.8
Aluminum alloy (N2)	1	6.0-20.0	6.0-20.0	6.0-22.0	6.0-24.0	6.0-20.0	6.0-20.0	6.0-20.0
	2	4.0-15.0	4.5-16.0	4.5-21.0	4.5-23.0	3.0-9.0	3.0-10.0	4.5-16.0
	3	2.0-6.0	3.0-6.0	3.0-9.0	3.0-10.0	1.0-3.0	2.0-6.0	3.0-6.0
	4	1.0-3.6	1.0-3.6	1.0-4.5	1.0-5.5		1.0-3.0	1.0-3.6
	5	1.0-2.4	1.0-2.4	1.0-3.0	1.0-4.0			1.0-2.4
	6	0.5-1.5	0.5-1.5	0.5-2.5	0.5-3.5			0.5-1.5
	8		0.3-0.7	0.3-0.7	0.3-1.2			
Brass (N2)	1	6.0-20.0	6.0-20.0	6.0-22.0	6.0-24.0	6.0-20.0	6.0-20.0	6.0-20.0
	2	2.5-9.0	2.0-11.0	2.0-13.0	2.0-15.0	2.0-6.0	2.0-8.0	2.0-11.0
	3	1.5-4.0	1.0-6.0	1.0-6.5	1.0-6.8	1.0-1.8	1.5-4.0	1.0-6.0
	4	1.0-2.2	1.0-4.5	1.0-5.2	1.0-5.7		1.0-2.2	1.0-4.5
	5		0.7-2.0	0.7-3.0	0.7-3.5			0.7-2.0
	6		0.5-1.6	0.5-2.0	0.5-2.5			
Red copper (O2)	1	6.0-18.0	6.0-20.0	6.0-22.0	6.0-23.0	6.0-12.0	6.0-13.0	6.0-20.0
	2	2.5-6.5	3.0-9.0	3.0-10.0	3.0-13.0	1.8-3.6	2.0-6.0	3.0-9.0
	3	1.0-1.8	1.0-3.0	1.0-3.5	1.0-4.5			1.0-3.0



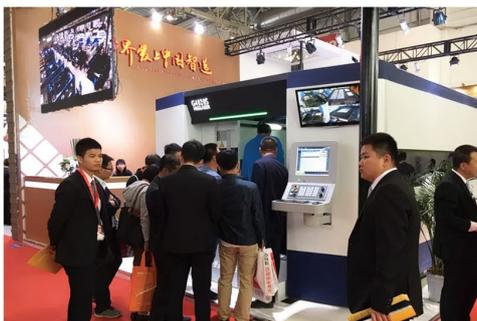
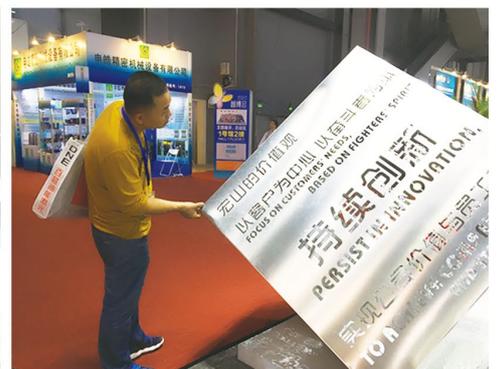
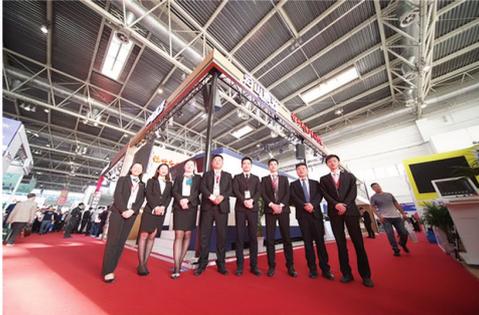
## COMPARISON OF CUTTING GAS AND COSTS BETWEEN LOW AND HIGH POWER

		2000-3000W				8000-15000W			
Material Name	Thickness (mm)	Cutting pressure (Mpa)	Gas consumption (M <sup>3</sup> /H)	Weight of liquefied gas (kg/H)	In total (RMB)	Cutting pressure (Mpa)	Gas consumption (M <sup>3</sup> /H)	Weight of liquefied gas (kg/H)	In total (RMB)
<b>Stainless Steel (N2)</b>	0.5-1	1.2	14.625	13.16	13.16	1.2	14.625	13.1625	15.795
	1.1-2.0	1.3	15.75	14.17	14.17	1.3	15.75	14.175	17.01
	1.5-2.0	1.4	16.875	15.18	15.18	1.4	16.875	15.1875	18.225
	2.1-3.0	1.5	34	30.6	30.6	1.5	34	30.6	36.72
	3.1-4.0	1.6	53.125	47.81	47.81	1.6	53.125	47.8125	43.03125
	4.1-5.0	1.7	72	64.8	64.8	1.7	72	64.8	77.76
	5.1-6.0	1.9	90	81	81	1.9	90	81	97.2
	6.0-8.0	2.2	140.875	126.78	126.78	2.2	140.875	126.7875	152.145
	9.0-10.0	2.3	192	172.8	172.8	2.3	192	172.8	207.36
	10.1-12.0					2.4	200	180	216
	14.0-16.0					2.5	208	187.2	224.64
	18.0-22.0					2.5	208	187.2	224.64
	24.0-26.0					2.5	208	187.2	224.64
	30.0-50.0					2.5	208	187.2	224.64
<b>Carbon Steel (O2)</b>	0.5-1	0.5	6.75	6.07	7.29	0.5	6.75	6.075	7.29
	1.1-2.0	0.45	6.1875	5.56	6.68	0.45	6.1875	5.56875	6.6825
	2.1-3.0	0.4	5.625	5.06	6.07	0.4	5.625	5.0625	6.075
	3.1-6.0	0.2	3.375	3.03	3.64	0.2	3.375	3.0375	3.645
	6.1-8	0.15	5	4.5	5.4	0.15	5	4.5	5.4
	10.0-12.0	0.15	5	4.5	5.4	0.15	5	4.5	5.4
	12.1-14.0	0.15	7.815	7.03	8.44	0.15	7.815	7.0335	8.4402
	14.1-16.0	0.15	11.25	10.12	12.15	0.15	11.25	10.125	12.15
	16.1-20.0	0.15	20	1.8	21.6				
	16.1-50.0					0.15	20	1.8	21.6



# EXHIBITIONS

ALL OVER THE WORLD



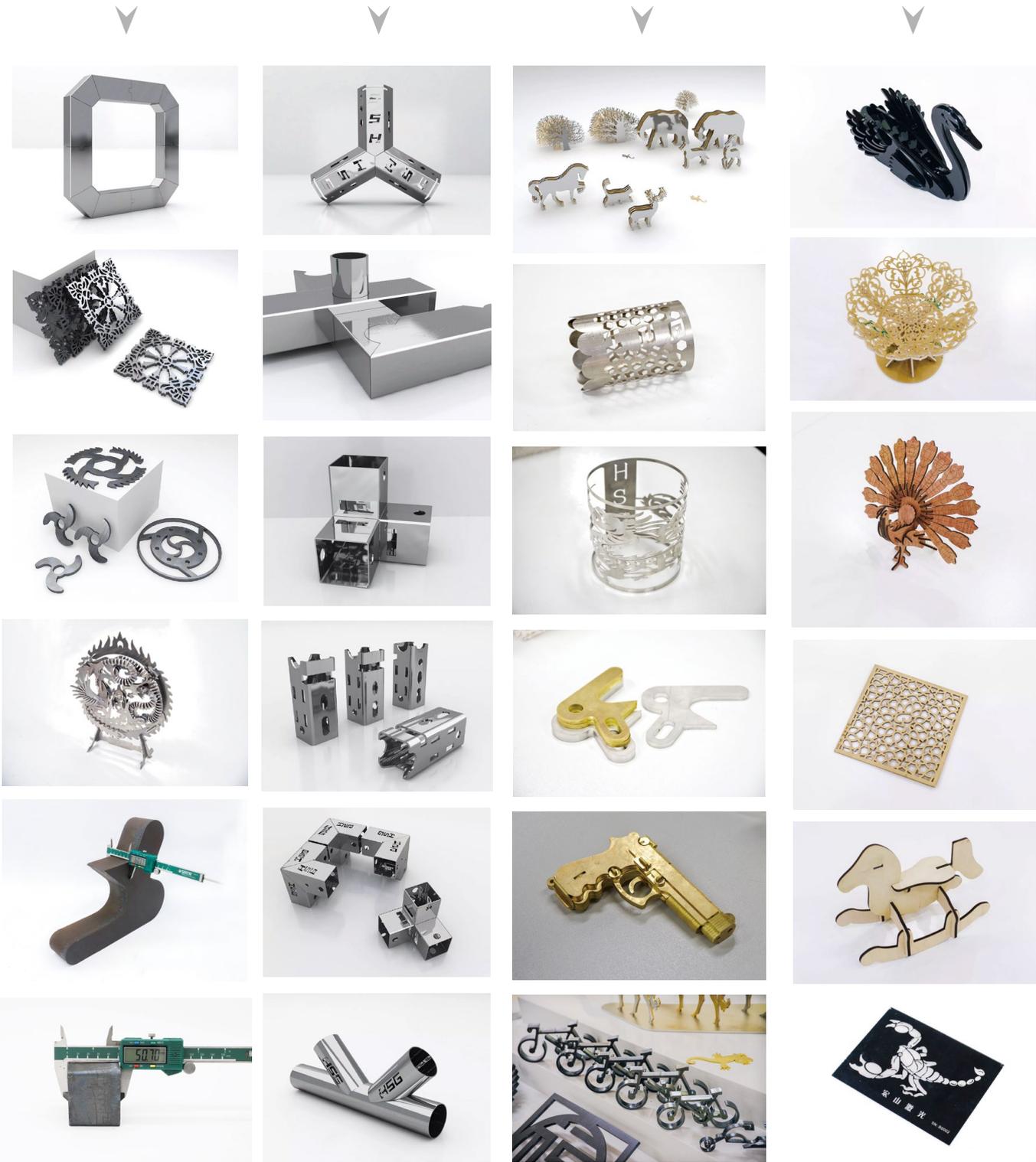
# CUTTING SAMPLES

Sheet cutting

Tube cutting

High-precision cutting

Artistic decorations



Edition No.: 2021.06

All technical parameters shall be subject to the latest edition.