



TP65S

CE Department

DEC. 08, 2023



**A HOT-SELLING MODEL
IN HSG LASER**

TP65S

Multi functional

Tube Laser Bevel Cutting Machine

Cutting Size: Φ 20-273mm

\square 20-200mm

Side \leq 273mm

Max Acceleration: 1.2G

Chuck Speed: 120r/min

Machine Speed: 140m/min

Max Tube Weight: 200Kg

Tailing: 220mm



Model: HS-TP65S (3 ~ 4KW)

I.Product Profile



About HS-TP65S

**Optical
System**

**Nesting
Software**

**Mechanical
System**

**Control
System**

Brand		
Power Range	10%-105%	10%-100% (105% CE)
Module Number	Single/Multiple	Single/Multiple
Wall Plug Efficiency	> 40%	> 40%
Power Stability	± 1%	± 1%
Yearly Attenuation	< 3%	< 3%
Anti-laser reflection	Yes	Yes
Global after-sale police	Yes (Special mode)	Yes
Warranty	YLS 36months YLR 24months	≥12KW 36months

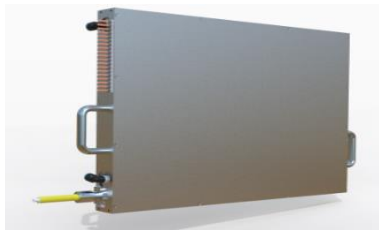
Strict produce process of Raycus

Step 1:Core compenents check



Inspect whether optical components and electronic components are qualified to ensure material quality

Step 4:Beam combiner install



The core components of the beam combiner are independently developed and manufactured, and the high-quality products meet the requirements

Step 2:Installation process check



In a clean state, ensure that the manufacturing process meets the production requirements according to the precision components

Step 5:Optical lens check



Check whether the end face of the optical fiber is clean to ensure that each optical fiber is at the nanometer level

Step 3:Optical fiber installation



Check the quality of each optical fiber and ensure that the installation process is clean

Step 6:Test before shipment

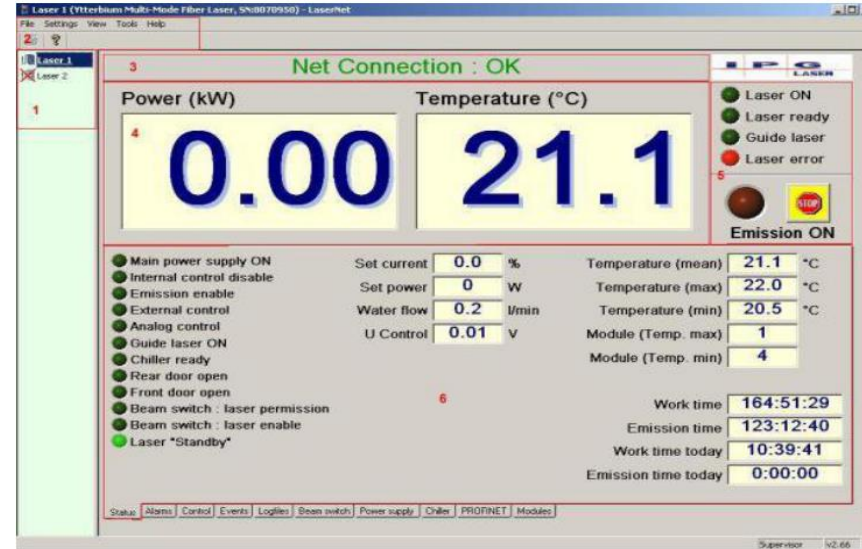


Each laser source will be tested before delivery to ensure that it meets the factory standard

Monitoring software of Raycus



VS



- ① Real Time Monitoring
- ② Troubleshooting Easily
- ③ Operation Log Recorder

- ④ Real Time Temperature Monitoring
- ⑤ Real Time Water Flow Monitoring
- ⑥ Real Time Humidity Monitoring



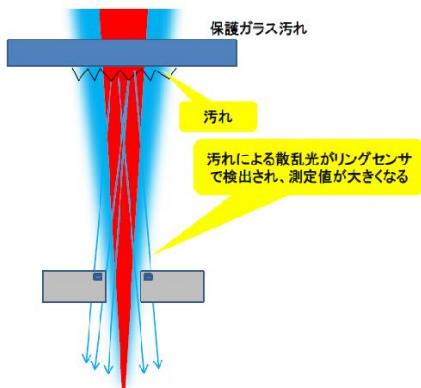
-Adopt Japan Optical Technologies

-Spot mode intelligent switching

-High precision polishing technology, low absorption coating scheme

-Design by HSG maintenance and use cost is lower

-Max $\pm 45^\circ$ beveling angle

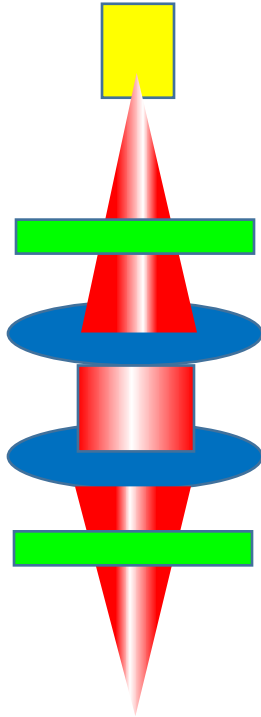


The Special Coating Technology

- ✓ The coating technology developed in Japan is used to prevent dust and pollution.
- ✓ Good coating makes the beam more concentrated and not easy to burn the lens.
- ✓ Normal or cheap protective lens will be exploded when stand long-time high laser power, even caused human safety issue.

High Transmittance

- ✓ Above 99% light transmittance, most laser works for material cutting.
- ✓ More stable focus could make the cutting quality better.
- ✓ The lens absorbs less energy, quickly reaches thermal balance, stable cutting in production.

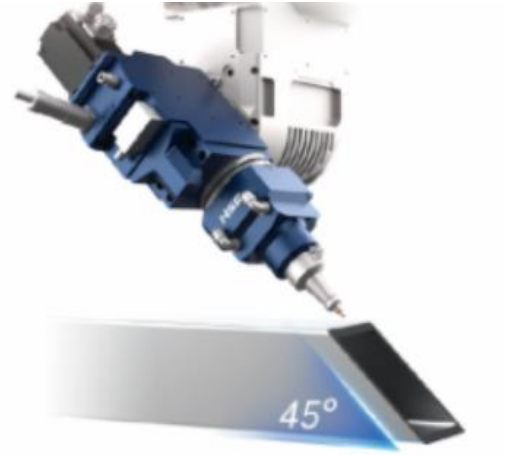


Japan Special Tightness Technology

1. Reduce the probability of lens pollution.
2. Improve the service life of cutting head.

Double Protective Lenses

1. Change the protective lens faster and more convenient in maintenance.
2. Low replacement cost in long time production.

**Bevel angle $\pm 45^\circ$**

- ✓ Acceleration is 200rad/s^2
- ✓ Positioning accuracy ± 0.015
- ✓ Beveing cut with round pipe, square pipe, rectangular pipe, channel steel, angle steel, H steel

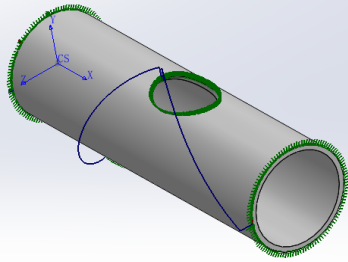
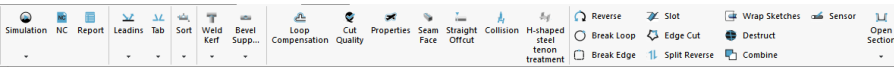
**Optical
System**

A large, dark blue rounded rectangle with a vertical gradient, serving as a background for the text.

**Nesting
Software**

**Mechanical
System**

**Control
System**



-3D drawing software developed based on Solidworks
Solidworks is an excellent 3D design software. The nesting software based on its secondary development can be very intuitive and convenient to quickly switch between design and nesting.

-Supporting various tube types

Closed tubes: round/ square/ rectangular/ runway/ oval/
triangular/D-shaped tube and other closed-shaped tubes

Open tubes: angle/channel/H-beam/I-beam/strip, open rectangle, T-
shaped pipe and other open-shaped tubes

-Direct import of assemblies for automatic nesting

Users can directly import the assembly model, and the system will automatically split all the parts and accurately identify the pipe types. In the nesting environment, users can operate all parts, automatically generate tool paths, and complete automatic nesting



Part Design

- Rich templates library
- Parametric draws graphics
- Advanced beveling and chamfering design functions



Part Programming

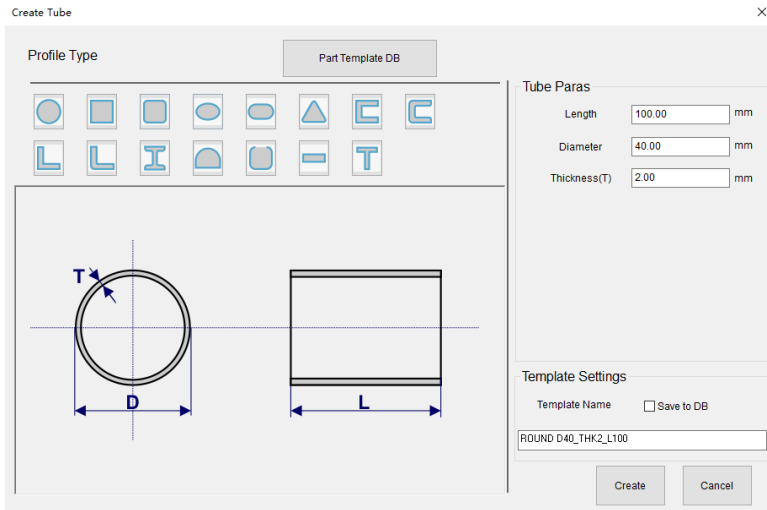
- Automatically/manually generate laser cutting path
- Laser cutting simulation
- Various technologies for tube design
 - Lead in&lead out
 - Micro joint
 - Manual/Auto sorting
 - Weld compensation
 - Contour compensation
 - Cutting process layer
 - Weld surface
 - Contour chopped



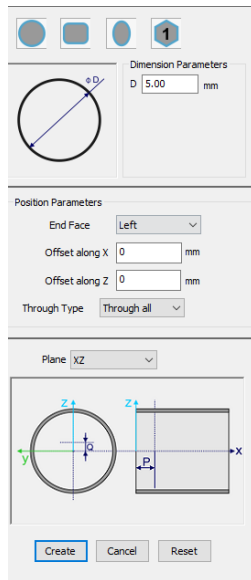
Automatic Nesting

- Pipe stock list
- Import assembly parts then nest directly
- Island coedge, weld compensation coedge
- Nesting based on length and priority

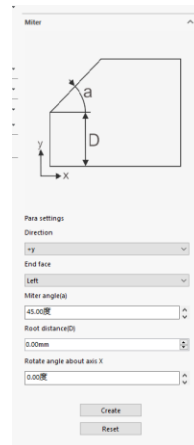
Part Design Function



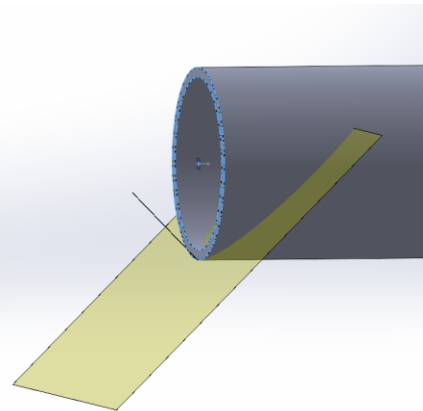
① Parts stock, supporting parametric creation of common tubes



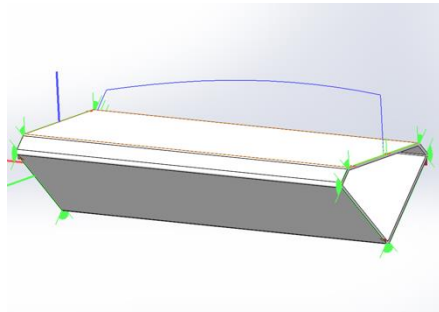
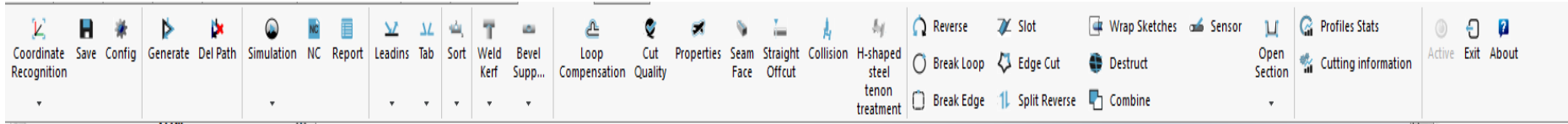
② Design holes function



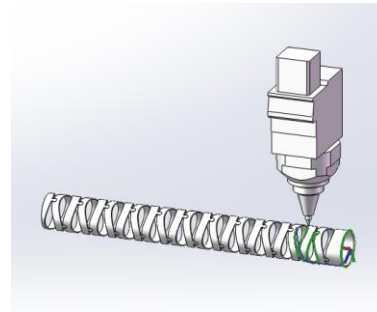
③ Miter function



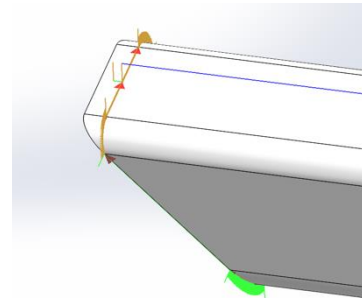
Part Programming Function



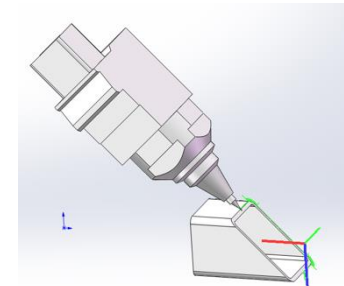
Automatically generate cutting path



Simulation

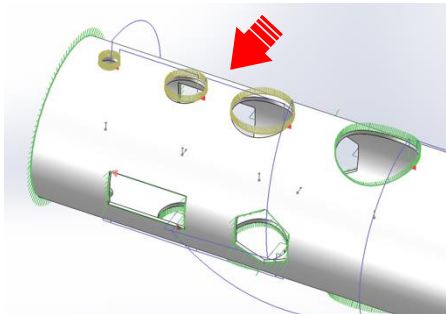
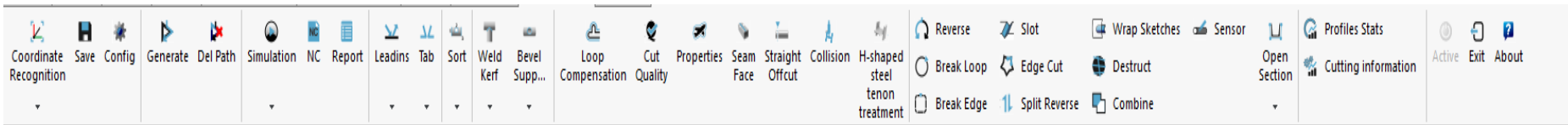


Weld compensation

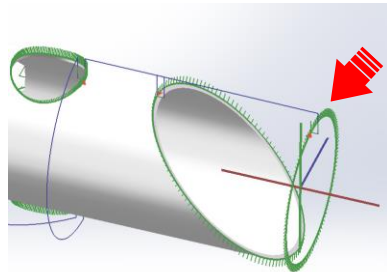


Bevel cutting

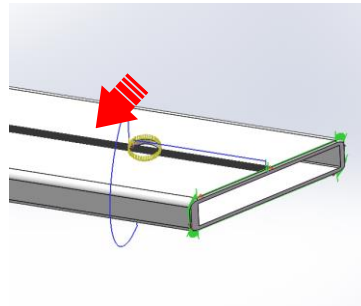
Part Programming Function



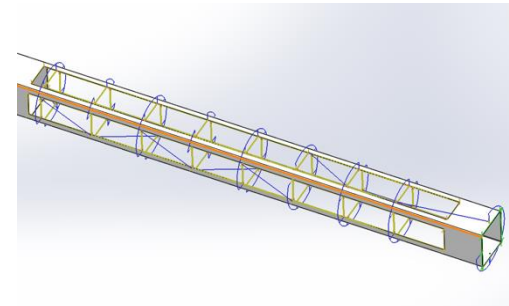
Lock Rotary Cutting



Vertical cutting of edge material



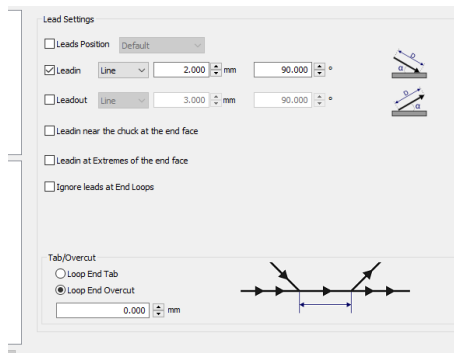
Select weld surface



Long hole cutting

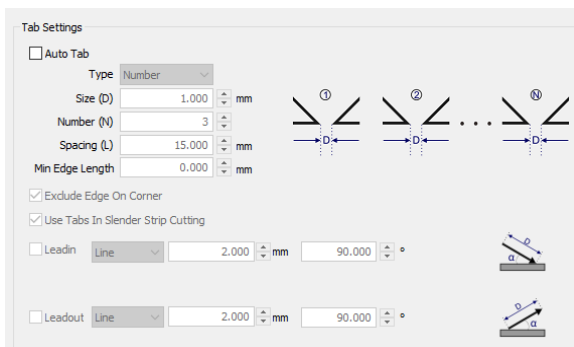
Part Programming Function

Auto/manual Lead Line



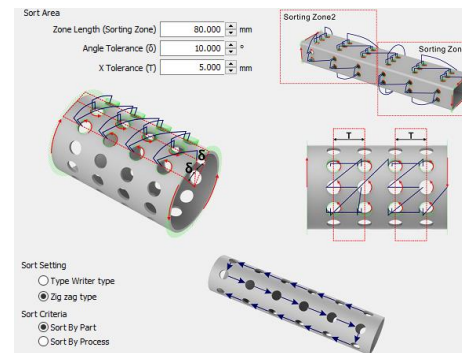
- Select lead line position
- Lead line type : straight line + arc
- Support undercut or overcut

Automatic/manual Micro-joint



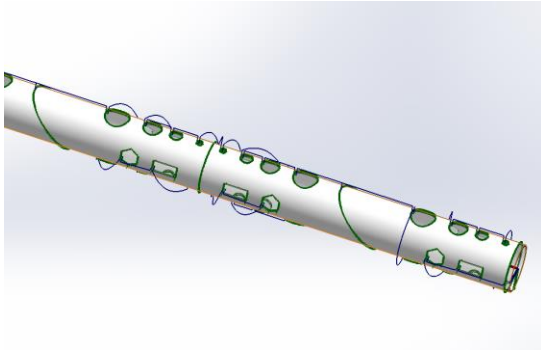
- Micro-connection specification can be selected by quantity or spacing distance
- Setting of parameter
- Setting of lead-in and lead-out lines

Automatic/manual Sorting

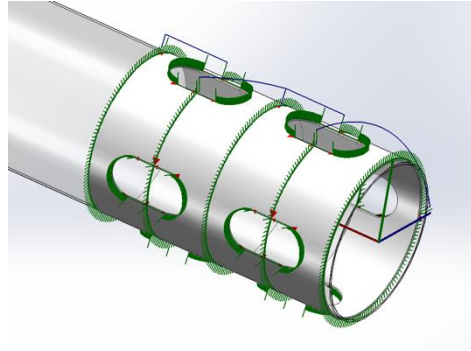


- Support for sorting by input region length
- Supports sorting by parts
- Supports sorting by cut type

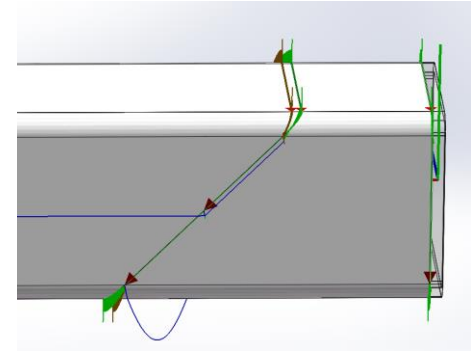
Part Programming Function



Normal coedge



Island coedge



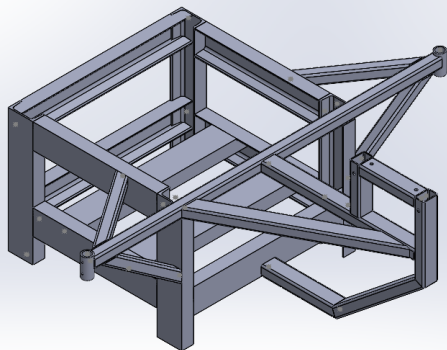
Weld compensation coedge

Automatic Nesting Function

Part Name	Search	Part rename						
Num	Part Name	Quantity	Nested ...	Profile(mm)	Length(mm)			
1	实体1	1	0	RECTANGLE 60X40_R6-4_THK3.2	300.000			
2	实体2	6	0	CHANNEL 100X48_R40B.5_THK...	500.000			
3	实体3	1	0	RECTANGLE 60X40_R6-4_THK3.2	455.674			
4	实体4	1	0	CHANNEL 100X48_R40B.5_THK...	500.000			
5	实体5	1	0	RECTANGLE 60X40_R6-4_THK3.2	678.992			
6	实体6	1	0	ROUND D=40_THK4.85	80.000			
7	实体7	4	0	RECTANGLE 40X40_R6-4_THK3.2	394.364			
8	实体8	1	0	RECTANGLE 40X40_R6-4_THK3.2	1400.000			
9	实体9	5	0	CHANNEL 100X48_R40B.5_THK...	689.400			
10	实体10	1	0	RECTANGLE 60X40_R6-4_THK3.2	615.000			
11	实体11	1	0	CHANNEL 100X48_R40B.5_THK...	500.000			
12	实体12	1	0	RECTANGLE 60X40_R6-4_THK3.2	185.000			
13	实体13	1	0	RECTANGLE 60X40_R6-4_THK3.2	220.000			
14	实体14	1	0	RECTANGLE 60X40_R6-4_THK3.2	300.000			
15	实体15	1	0	ROUND D=40_THK4.85	80.000			

Selected Part: 13239.12 mm Total Part Num: 27 Selected Part: 27

Batch Recognize Selected Recognize No OnPart Reset Parts Export



- ✓ Tube database, stock management
- ✓ Direct import assembly automatic nesting
- ✓ Auto-recognition of part type & quantity
- ✓ Various tube types nested at the same time
- ✓ Island coedge/weld compensation coedge
- ✓ Support weld surface selecting
- ✓ Nesting based on length and priority

Tube Database Function

Tube Stock

CurrentNestingStockList AllNestingStockList

Lock	Tube T...	Tube Profile(mm)	Tube Len...	Tube Thic...	Availa...	Used ...	Total ...	Priority
▶	CHANNEL	CHANNEL 100X48 RA...	6000.000	5.300	9999	2	9999	0
No	RECTA...	RECTANGLE 40X40_R6...	6000.000	3.200	9999	1	9999	0
No	RECTA...	RECTANGLE 60X40_R6...	6000.000	3.200	9999	1	9999	0
No	ROUND	ROUND D80 THK4.85	6000.000	4.850	9999	1	9999	0

Tube Image

Nesting priority:
 Default Tube Length(mm):

Add/Change Stock/Tube

Tube Type:

Tube Profiles:

Tube Length: mm

Tube Thickness: mm

ity:

Nesting priority(level 0 highest):

Is Lock

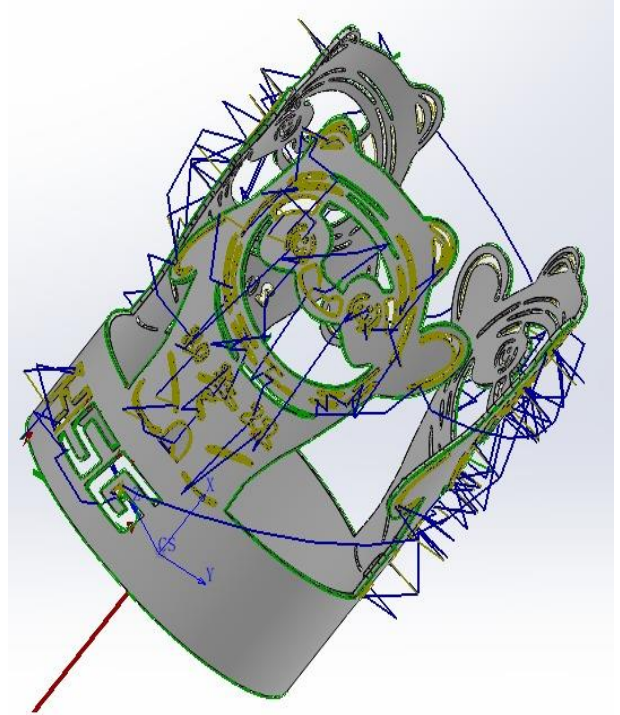
- ✓ Tube stock list, which can realize tube quantity management and automatically reduce after nesting
- ✓ Support manual addition and automatic addition of pipe stock



- Identify various parts automatically
- Avoid collision with cutting path simulation
- Tube stock management ,count cutting quantity



- Improve nesting efficiency ,less time more work
- One key nesting ,less operation more work
- Reasonable nesting algorithm,less waste more work



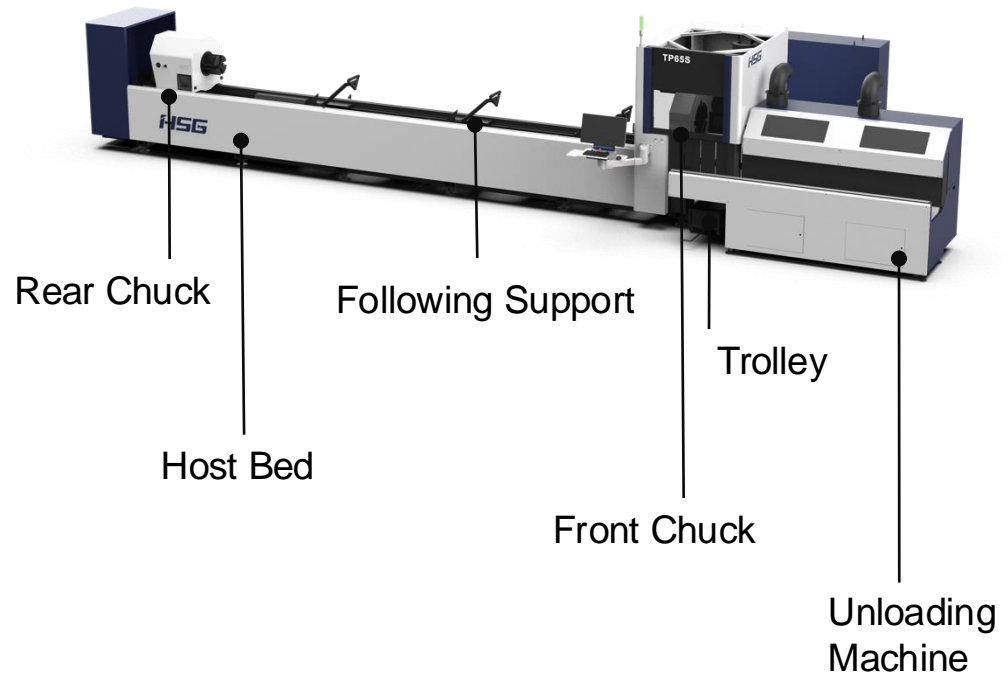
**Optical
System**

**Nesting
Software**

**Mechanical
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System**





Integrated Machine Bed

Carbon structure steel welded bed, integrated pneumatic chuck, beam, cutting head, to ensure stable running



Material: Extra-high Strength Steel

Tensile strength over 500 MPa, increase machine bed worklife.

Process: Full-welding & Stress Free

Full welding process, professional manufacturer process Stress annealing + Vibration Aging + Natural Aging

Step 1 Welding of Main Frame



Carbon dioxide shielded welding is used. Advantages: stable welding process, no internal defects, least spatter. It has become the most important welding for ferrous metal materials.

Step 2 Stress Relief Annealing



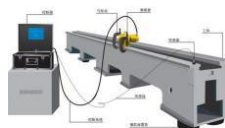
Super-large fuel heating annealing furnace is used to perform 600° stress-relief annealing on multiple main frames at the same time. The furnace temperature is stable and uniform, and the welding stress is completely removed by electronic monitoring, and the quality is guaranteed.

Step 3 Rough Machining



Quickly removing the blank allowance. As large feed rate and cutting depth as possible to remove as many chips as possible in a short period of time.

Step 4 Vibration Aging



To eliminate the internal residual internal stress. When the vector sum of the residual internal stress and the additional vibration stress in the workpiece exceeds the yield strength of the material through vibration, the material undergoes a small amount of plastic deformation, thereby making the material internal stress relieved.

Step 5 Natural Aging



The bed is placed outdoors in the open air for more than 1 month. Improve the rigidity, increase the anti-deformation ability, and ensure the dimensional stability of the bed.

Step 6 Machining



The CNC pentahedron machining center is used to process the guide rails, racks and other surfaces that require high precision to obtain a high-quality installation base surface to ensure the cutting accuracy of the machine tool.

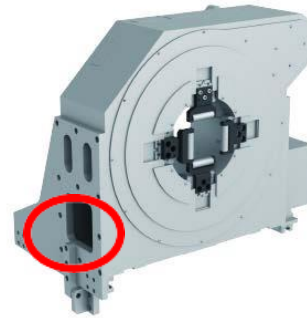


- **Much Larger**

Clamp range from 20 to 273mm, larger than other pneumatic chuck in market, only need change clamping once.

- **More Stable**

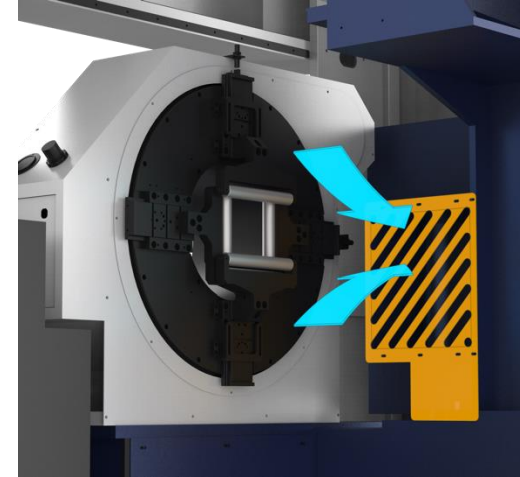
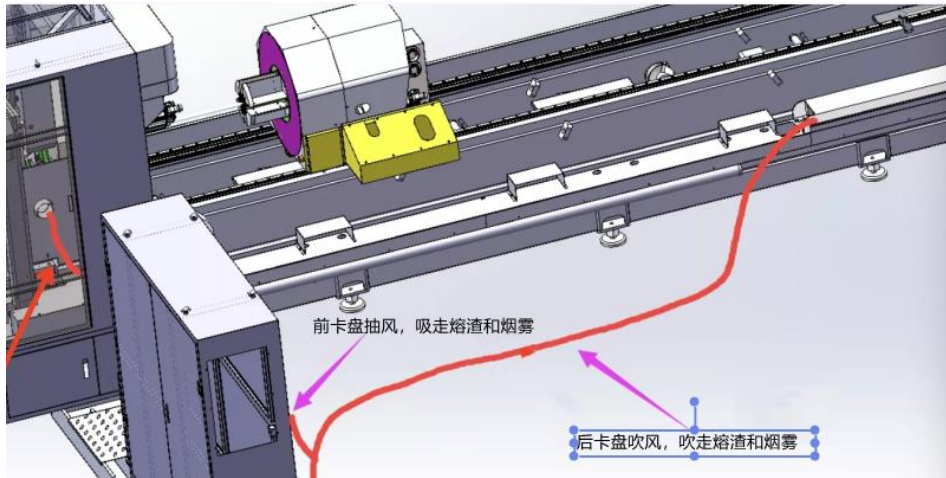
Sensor for front/rear chuck opening & clamping , front/rear chuck ventilation function, smoke-free cutting and increase chuck working life



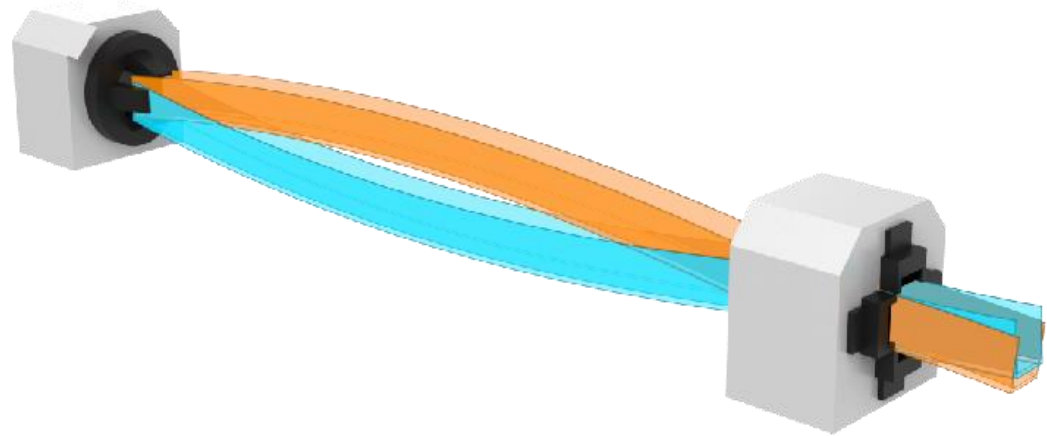
- ✓ Digital pneumatic chuck with digital feedback forms a full closed-loop control system.
- ✓ Fast clamping speed, high working efficiency, low starting air pressure (can be less than 0.18MPa), high clamping accuracy;
- ✓ Wireless real-time monitoring clamping status, empty clamp alarm, high equipment safety, avoid chuck and part's collision;
- ✓ One-key pressure regulation depending on tube's diameter and thickness;



- ✓ Clamp various type tube ,includes round tube ,square tube ,rectangle tube ,oval tube ,I beam ,channer,angel steel,T type tube,and other open type tube
- ✓ Intelligent full-stroke chuck, without manual adjustment, max stand 200kg tube.



- ✓ Remove slag and smoke avoid the dust go into the chuck
- ✓ Meet environment protective requirement Increase chuck worklife



- ✓ Avoid deformation and shakiness when cutting tube
- ✓ Improve feeding efficiency and cutting accuracy
- ✓ Share the weight of tube ,decrease the aging of chuck ,increase the working life of chuck

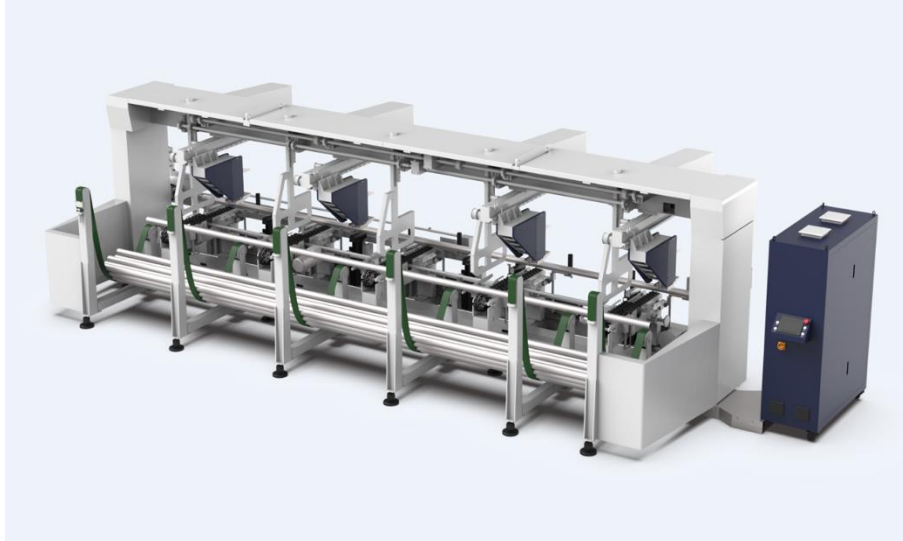
HSG Standard Pipe loading machine (Optional)

Optical

Nesting

Mechanical

Control



-Wide range of application

round, square rectangular tube

-Maximum storage area

3000Kg

- Max. weight of single tube

120kg

-Loading parameter

ϕ 20 ~ ϕ 200mm

\square 20 ~ \square 140mm

Pipe length

3600 ~ 6500mm

Optical
System

Nesting
software

Mechanical
System

Control
System



HSG-X Bus Control System (Touch)

- Simple Operation

The operation interface is intuitive, with rich auxiliary functions, and the operation procedure is simplified

- Stable and efficient

100+ process data automatic matching, machine maintenance automatic management 100+ process data automatic matching on time, efficient and manpower saving

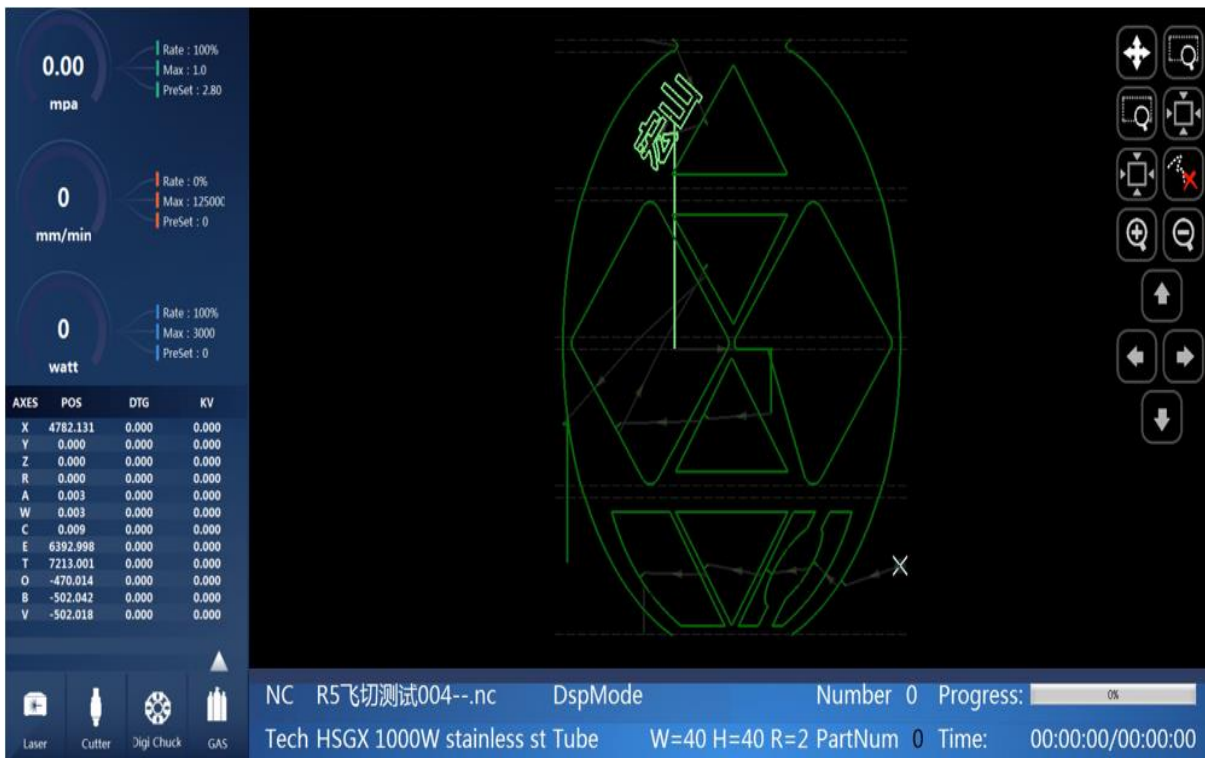
Functional modules

The screenshots show the following functional modules:

- Top Left:** Laser setup interface with steps for Setup Laser Power, Stick tape, Click "Emission", Observing the piercing point, Adjust the Screw, and Repeat Step 2-5 Until OK. Parameters include Power (15%), PWM Freq (3000 Hz), PWM Duty (25%), Emission Time (100 ms), and Emission Focus (0.000 mm).
- Top Right:** Calibration interface with steps: Move Z Axis to about 10mm above the tube, Enable Calibration, Start Calibration, and Feedback (-9394.00 mV, Set Height: 1.00 mm).
- Bottom Left:** Auto Center and Manual Center interface. Auto Center shows Tube (Rect), Height (70.0 mm), Width (70.0 mm), Auto Y Center (0.000), and Current Y Center (-103.400). Manual Center includes Activate Manual Center, Chuck Homing, Return Y Center, Point 1/2, Step Value (0.000), and Center controls.
- Bottom Right:** Digital Chuck control interface with OpenClamp, Blow, and A control buttons, and W/A Open/Close options.

- ✓ Beam control
- ✓ Calibration
- ✓ Tube center
- ✓ Support assistance
- ✓ Auto load
- ✓ Digital chuck

Real time monitoring



- ✓ Real-time monitoring of cutting power /speed/gas pressure
- ✓ Real-time monitoring current coordinates of each motion axis of the machine
- ✓ The graphic shows the processing path in real time
- ✓ Show the cutting time and cutting quality in real time

Cutting Database

Large	Middle	Small	R Corner	坡口	Pierce L1	Pierce L2	Pierce L3	Mark	
			Standard	User				Description	Open
R Corner Speed	100	90	RPM/Min	Preset R Corner cut...					Save
R Corner Max Power	900	750	W	Max Laser Power w...					Load Standard
R Corner Min Power	600	600	W	Min Laser Power w...					Load User
Laser Mode	Continue	Continue		Laser PWM Mode					
PWM Freq	5000	5000	Hz	PWM Frequency					
PWM Duty	100	100	%	PWM Duty					
Gas Pressure	1.400	1.400	MPa	Gas Pressure when...					
Follow Height	1.000	1.500	mm	nozzle following he...					
Focus	-1.000	-1.000	mm	Focus setting while...					
AW Rapid Speed of Round Tube	100	90	RPM/Min	the rapid moving s...					
AW Cutting Speed of Round Tube	100.000	60.000	RPM/Min	the cutting speed ...					
X Axis Cutting Speed of Round Tube	10000	5000	mm/min	the cutting speed ...					
Speed planning rotation I factor	0.000	0.000		Speed planning rot...					
File: 40X40 T1.00,SS,N2, Nozzle Single 1.5.xml				Diameter: 30-50mm					File
Power:3000W		Material:Stainless Steel Thickness:1.0mm		Nozzle:JGL S1.5		Focus:125mm			
RESET	PRODUCE	TECH	MANUAL	DIAGNOSE	SETUP	MAINTAIN	HELP		

- ✓ Various cutting parameters, one-click import
- ✓ Detailed cutting parameters includes chamfer,bevel,piece
- ✓ Standard for reference ,User is real parameters



Maintenance

Current Records Statistic

Maintenance Part All Status All

Index	Status	Maintenance Content	Maintenance Part	Cycle	Remaining Time
1	Expired	Clean the NC files in the CNC Controller	Electric Cabinet	90 days	
2	Expired	Clean Laser head, mirror and nozzle	Laser Head	1 days	
3	Expired	Check whether the following height is correct or not	Laser Head	1 days	
4	Expired	Check the laser beam center	Laser Head	1 days	
5	Expired	Drainage of gasholder	Gas	1 days	
6	Expired	Check whether there is noise in the movement of each axis	Tube Machine	1 days	
7	Expired	Clean up Waste	Unloading System	1 days	
8	Expired	Check the buttons on the operation panel	Tube Machine	1 days	
9	Expired	Check Homing function	Tube Machine	1 days	
10	Expired	Check whether the gas pressure is correct or not	Gas	1 days	
11	Expired	Clean front and back chucks	Chuck	7 days	
12	Expired	Check the concentricity of chucks	Chuck	7 days	
13	Expired	Check wether the relays are working properly	Electric Cabinet	360 days	
14	Expired	Clean the dust in the electric cabinet	Electric Cabinet	360 days	
15	Expired	Check and reinforce cable connections	Electric Cabinet	360 days	
16	Expired	Check the level of machine and reinforce the foot of machine	Tube Machine	360 days	
17	Expired	Check and replace claws of chuck	Chuck	360 days	
18	Expired	Clean up dust of Electric Cabinet	Electric Cabinet	30 days	
19	Expired	Check wether the SMC cable of laser head is worn or not	Laser Head	180 days	

ActiveAlm HistoryAlm

Level	Number	Time	Source	Content
0	817	2023-01-14 15:47:14	nc1	
i	14	2023-01-14 15:45:45	plc	
i	14	2023-01-14 15:45:45	plc	
i	14	2023-01-14 15:45:45	plc	
i	14	2023-01-14 15:45:45	plc	
i	14	2023-01-14 15:45:42	plc	
i	14	2022-11-02 14:46:44	plc	
i	14	2022-11-02 14:46:44	plc	
i	14	2022-11-02 14:46:44	plc	
i	14	2022-11-02 14:46:43	plc	
i	14	2022-11-02 14:46:41	plc	
i	14	2022-08-10 18:25:31	plc	
i	14	2022-08-10 18:25:31	plc	
i	14	2022-08-10 18:25:31	plc	

All Search Current Records Statistic

Input	Value	Description	Output	Value	Description
EMG STOP	●	AP1_IOA_B, 11C02-TRUE	X Servo Enable	●	Axis 1-TRUE
Home	●	AP1_IOA_A, 12C01-TRUE	Y Servo Enable	●	Axis 2-TRUE
Plus Limit	●	AP1_IOA_A, 11C01-TRUE	Z Servo Enable	●	Axis 3-TRUE
Minus Limit	●	AP1_IOA_A, 13C01-TRUE	A Servo Enable	●	Axis 4-TRUE
Home	●	AP1_IOA_A, 15C01-TRUE	W Servo Enable	●	Axis 5-TRUE
Plus Limit	●	AP1_IOA_A, 14C01-TRUE	R Servo Enable	●	Axis 6-TRUE
Minus Limit	●	AP1_IOA_A, 16C01-TRUE	Alarm Reset	●	AP1_IOB_D, 14C10-TRUE
Home	●	AP1_IOA_A, 17C01-TRUE	Guide Enable	●	AP1_IOB_D, 15C10-TRUE
Plus Limit	●	AP1_IOA_A, 17C01-TRUE	Laser Request	●	AP1_IOB_D, 12C10-TRUE
Minus Limit	●	AP1_IOA_A, 18C01-TRUE	PWM	●	AP1_IOA_D, 11C08-TRUE
Home	●	AP1_IOB_B, 14C05-TRUE	AD1835-REQUEST	●	P1_IOB_E, 15C11-TRUE
Home	●	AP1_IOB_B, 13C05-TRUE	AD1835-STROBE	●	AP1_IOB_E, 16C11-TRUE
Plus Limit	●	AP1_IOB_B, 11C05-TRUE	N2 Valve Open	●	AP1_IOA_D, 12C08-TRUE
Minus Limit	●	AP1_IOB_B, 12C05-TRUE	O2 Valve Open	●	AP1_IOA_D, 13C08-TRUE
Servo Alarm	●	Axis 1-TRUE	AIR Valve Open	●	AP1_IOA_D, 14C08-TRUE
Servo Alarm	●	Axis 2-TRUE	Support 2 Up	●	AP1_IOA_E, 15C09-TRUE
Servo Alarm	●	Axis 3-TRUE	Support 3 Up	●	AP1_IOA_E, 11C09-TRUE
Servo Alarm	●	Axis 4-TRUE			

Maintenance Part All Start Time 2000-01-01 End Time 2023-02-10

Index	Maintenance Content	Maintenance Part	Cycle	Commit Time
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- ✓ Real time shows alarms
- ✓ Record history alarm
- ✓ I/O port shows in real
- ✓ Maintenance reminder



II.About HSG

HSG Laser, dated back to 2006, is a hi-tech enterprise that integrates research, development, production and sales of metal forming equipment.



About HSG Laser



13

13 branches/subsidiaries/
sub-subsidiaries across the globe



100+

Serve 100+ countries
and regions



21000

Sell 21000 sets globally
till now



China Headquarters



Japanese subsidiary



German subsidiary



US subsidiary



HSG



Location	Model	Installed in
Ibaraki, Japan	TP65S	2020

HSG machines were introduced into Japanese market in Nov. 2020, and were frequently reported by local media.

- HSG Laser, dated back to 2006, is a hi-tech enterprise that integrates research, development, production and sales of metal forming equipment.



4
Manufacturing
Bases in China



96000m²
Occupied Area



8000+ Sets
of Annual Output



Global Headquarters in China

📍 Foshan, Guangdong Province



Puxiang Manufacturing Base in the Southern China

📍 Foshan, Guangdong Province



Manufacturing Base in the Northern, China

📍 Jinan, Shandong Province



Manufacturing Base in the Yangtze River Delta Region, China

📍 Suzhou, Jiangsu Province



About HSG Laser

➤ Since the establishment, HSG Laser always stress on its independent development of software and hardware and has founded 3 R&D centers, applied for 300+ patents and got multiple quality certifications overseas.



3
R&D Centers



9
R&D Laboratories



Chinese
Optical R&D Laboratory



Japanese
Optical R&D Center

Quality inspection process



STEP1
COLORIMETER



STEP2
FILM THICKNESS GAUGE



STEP5
COLLIMATOR
(beam)



STEP4
HARDNESS TESTER



STEP3
2D CATHETOMETER



STEP6
COLLIMATOR
(bed)



STEP7
INTERFEROMETER

**ASSEMBLY PLATFORMS
WITH CE
CERTIFICATION, STRICT
IN QUALITY CONTROL
FLOW**



HSG