

OPMT Machining Solutions for Automotive Industry

Light 5X 60V

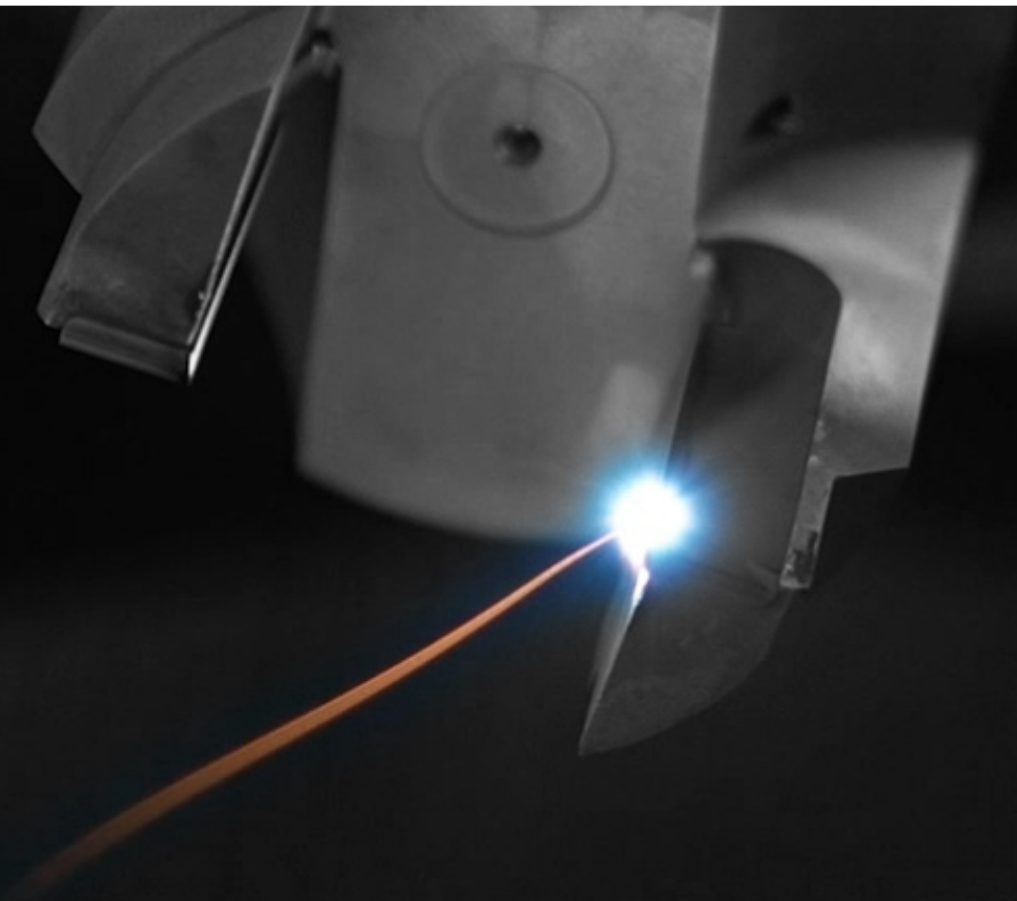
Vertical 5-Axis Laser Machining Center



With the laser into a new dimension of machining cutting edges of precision tools

Traditional processing methods such as grinding and corrosion often lead to the deterioration of the cutting edge quality of the tool, which in turn affects the processing accuracy and efficiency. In contrast, the innovative laser technology stands out with its unique advantages and wide application benefits. By adopting advanced ultra-precision lasers, not only the processing accuracy, processing speed and economic benefits are improved, but also green environmental protection is achieved. Since no consumables are required, the impact on the environment is greatly reduced.

At present, the main tool materials used in the automotive industry are PCD, CBN, carbide, ceramics, etc., which are mainly used in the finishing of key automotive parts such as parts, engines, gearboxes, and brake systems. They can improve the efficiency and accuracy of the workpiece while ensuring the smoothness of the machined surface. Laser technology can well solve the problems of traditional processing technology in processing complex contours and profiles of superhard materials such as PCD, CBN, carbide, and ceramic tools.



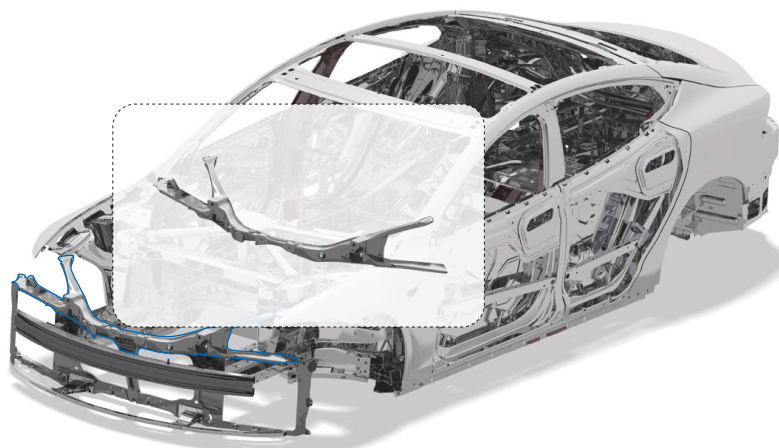
Perfect combination of Efficiency and Precision

Laser finishing of automotive cutting tools with accuracy $\leq 0.003\text{mm}$

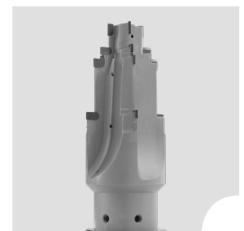
Processing tools display



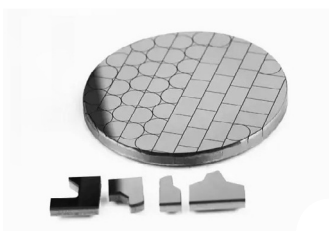
Milling cutter



Automobile step forming milling cutter



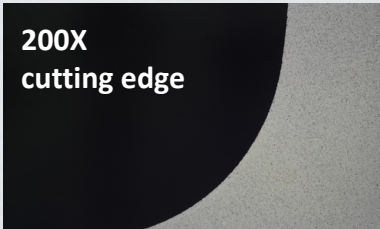
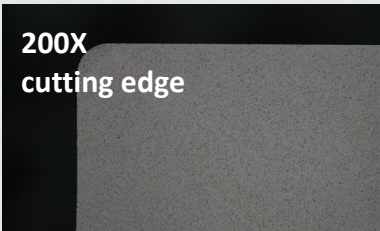
Automobile step forming milling cutter



Precision Tool / PreCut:

Separation of cutting segments and rear chamfer machining for PCD / CVD and CBN blanks .

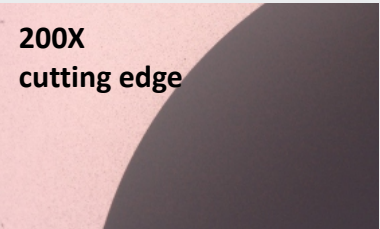
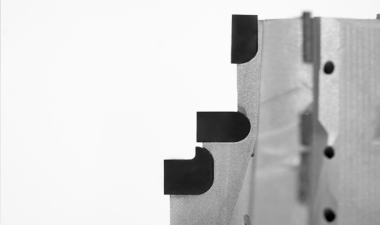
Milling Cutter



Processing time: 50min
Blade width: 0.2mm
Relief angle: 8°
Profile: 0.006mm
Passivation value: 0.0043mm

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Automobile step forming milling cutter



Processing time: 1h40min
Blade width: 0.15mm
Relief angle(Large): 10°
Relief angle(Small): 5°
Profile: 0.008mm
Passivation value: 0.0048mm



**200X Curved
cutting edge**

**200X Straight
cutting edge**

100X-Chipping

100X-Chipping

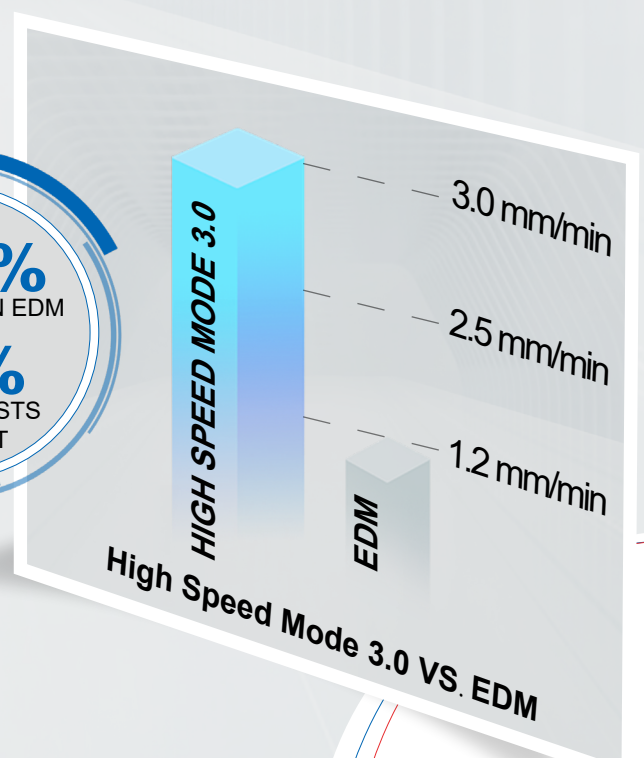
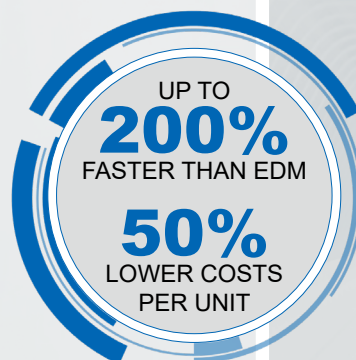
Laser process:

- 1-200X curved edge/straight edge without chips
- 2-Processing accuracy in $\leq 0.003\text{mm}$, tolerance stabilized in $\leq 0.001\text{mm}$
- 3-Realizing RTCP 5-axis linkage
- 4-High consistent in lot production
- 5-Ability to process non-conductive materials, such as CVD, MCD

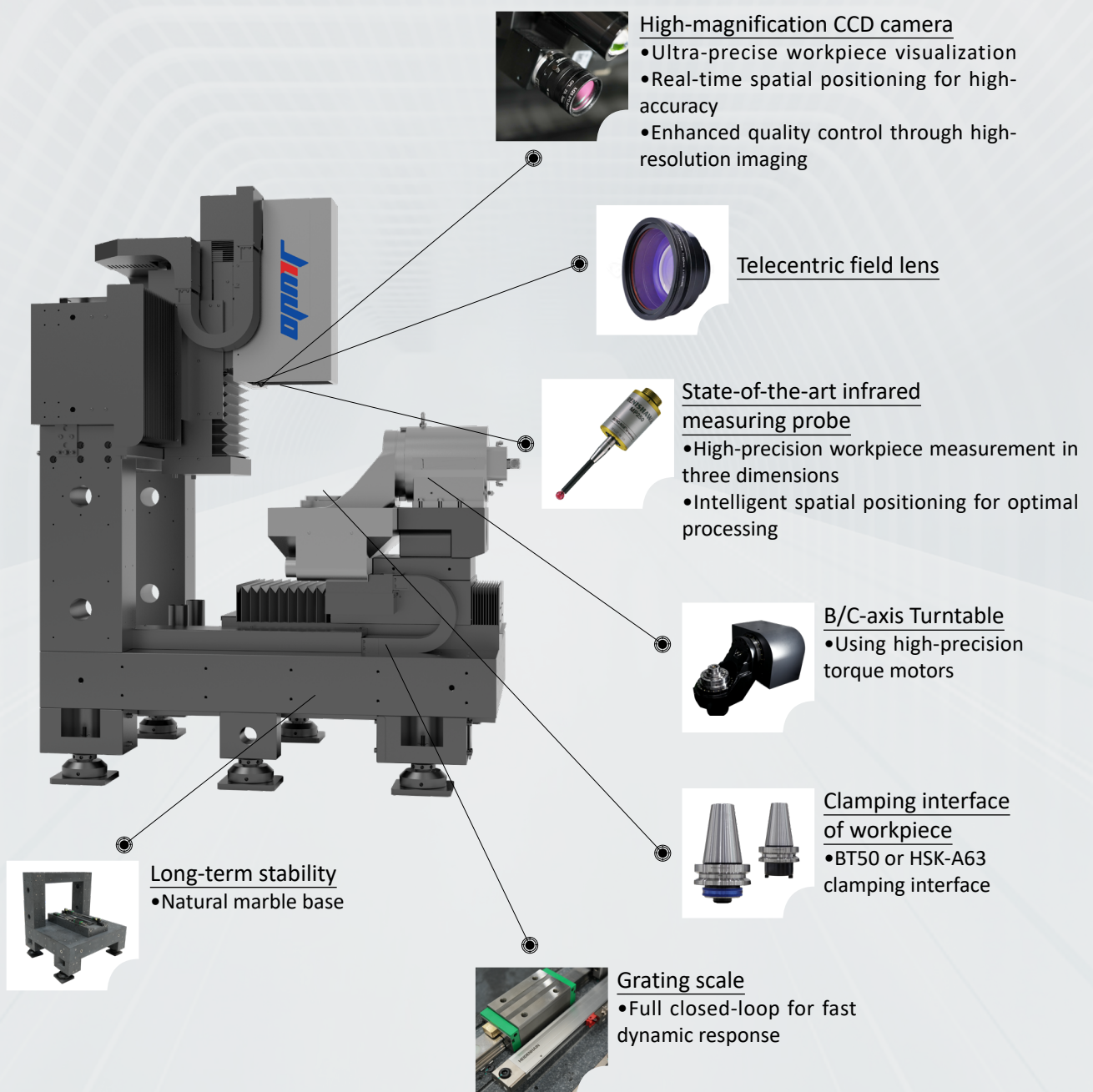
Traditional EDM:

- 1-Chips and cracks may occur at the cutting edge during processing, resulting in increased costs and longer working hours. In severe cases, the blade needs to be replaced;
- 2-When processing large particles or polycrystalline diamond with poor conductivity, wire skipping will occur and machining can not be continued.

- High speed mode 3.0 = 200% faster and 50% lower costs per unit in comparison to the EDM
- Laser finishing of PCD tools with up to 3.0 mm/min
- Flexible machining of PCD, PCBN, CVD
- Individual cutting edge machining -negative chamfers, sharp cutting edge $< 0.001\text{mm}$
- PERFECT CUTTING EDGES
Complete machining including relief angle, chip breaker, defined cutting edge chamfering of ultra-hard materials
- High degree of flexibility, quick switching between different processing tasks
- Environmentally friendly, no cutting fluid required, reducing pollution



Highly dynamic 5-axis laser precision machine with linear drives

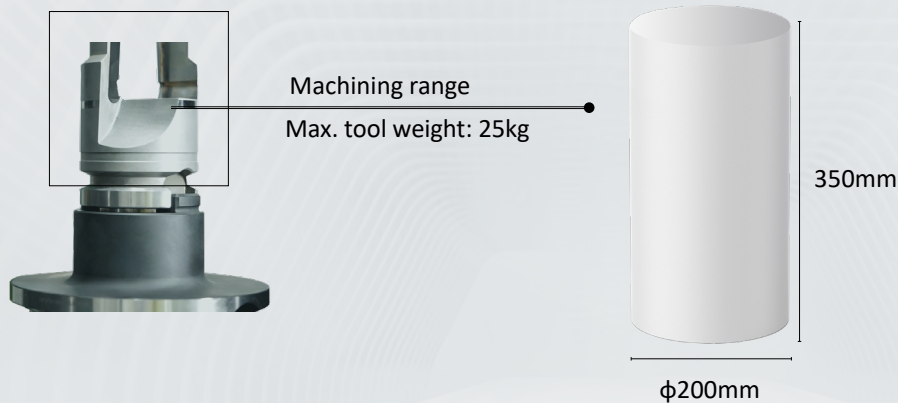


•The X/Y/Z linear axes utilize linear motors combined with roller guides, offering rapid response times and high precision. The positioning accuracy is $\leq 0.005\text{mm}$ (5 microns).

Technology features for an optimized process and the highest flexibility

Work area

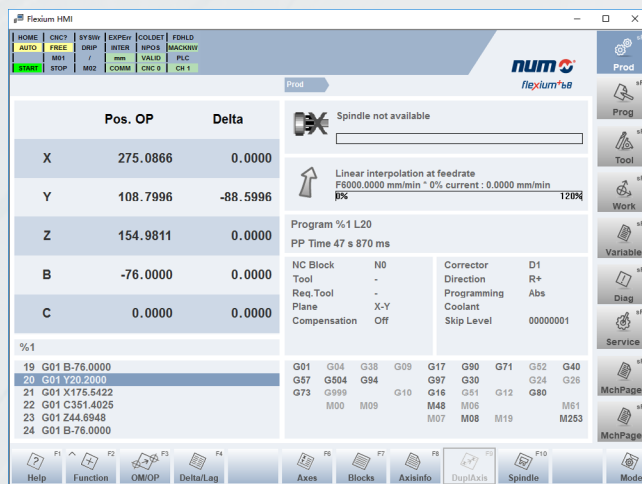
A workpiece can be rough and finish machined in one clamping operation, thus realizing high-speed and high-precision machining of complex parts.



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Powerful and user-friendly NUM CNC control system

• Ensures maximum ease of operation and process reliability, combine high-tech performance with genuine customer benefits and ensure application-orientated, simple programming and operation

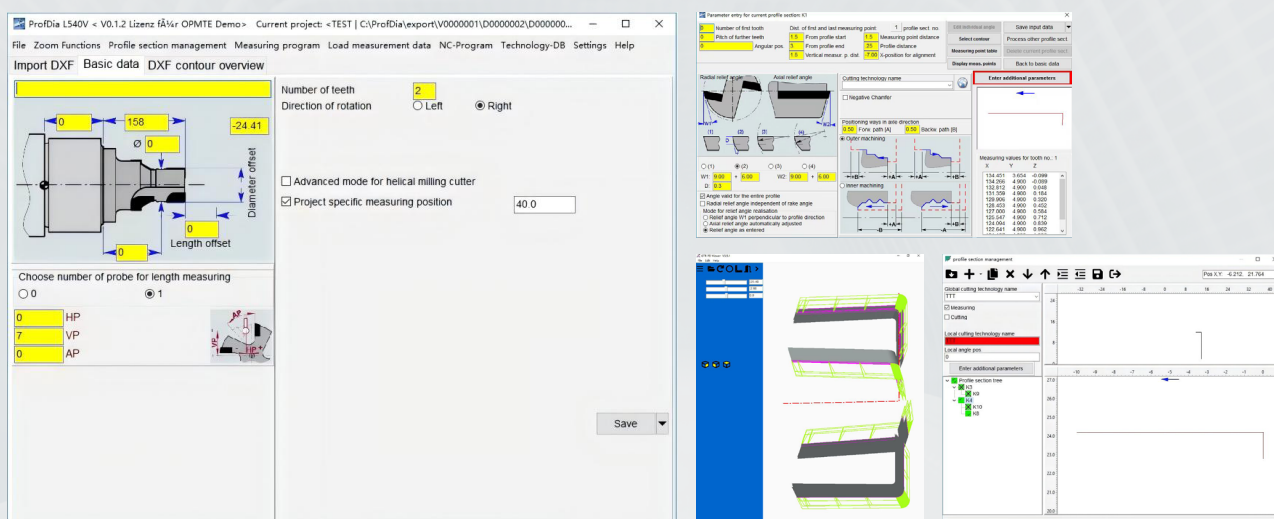


• The open universal CNC system can meet various machine tool applications such as turning, milling, planing, grinding, laser, water jet, etc.

• The core of the CNC system is NCK, each NUM® system composed of 8 NCKs, each NCK provides up to 32 axes/spindles, and provides up to more than 200 axes/spindles, and is compatible with RTCP.

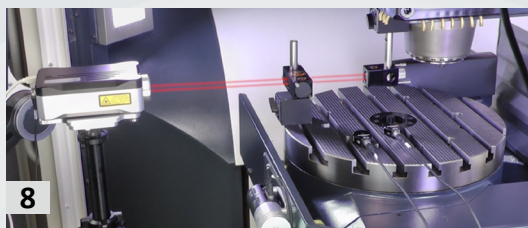
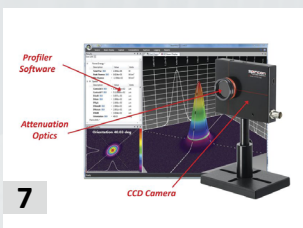
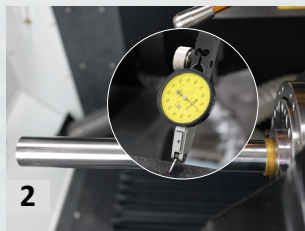
User-friendly GTR cutting tools software - the easiest entry from EDM to laser machining

3D machining path planning CAM software



- Use of industry standards as programming solutions allows the importation of existing EDM projects
- Minimal training required when switching from EDM to lasers
- Parameterized software for rotary or fixed tools
- Import of tool geometry as DFX file
- Automatic 3D measurement of the PCD surface
- Automatic program generation
- 3D simulation directly at the machine

Undergoes rigorous testing and calibration to maintain high precision and reliability



- 1 X/Y/Z-axis parallelism accuracy detection
- 2 B/C-axis parallelism accuracy detection
- 3 Precision line parallelism accuracy detection
- 4 Ballbar
- 5 Alignment laser
- 6 Rotary axis calibrator
- 7 Laser beam profiler
- 8 Laser interferometer

Perfect cutting edges

Complete machining including relief angle, chip breaker, defined cutting edge chamfering of extremely hard materials.



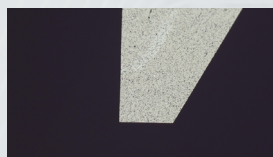
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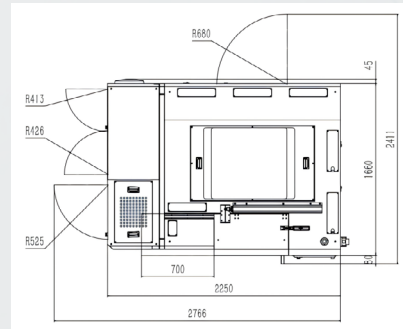


- 1 ZOLLER-Setting for tool presetting
- 2 ZOLLER-Presetting and Measuring Machine
- 3 Laser microscope

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Overview of the Light 5X 60V

Machine dimensions	Unit	Light 5X 60V
Floor space (L x W x H)	mm	2300 x 1800 x 2600 (incl. 2300 x 2400 accessory)
Weight	kg	4500



Overview of the Light 5X 60V

- Technical data

Travel	Unit	Light 5X 60V
X-axis (left and right along the sliding plate)	mm	600
Y-axis (forward and backward the workbench)	mm	250
Z-axis (up and down the laser head)	mm	300
Workbench		
Dimensions of the horizontal workbench	mm	500 x 500
Load capacity of the horizontal workbench	kg	300
Max. load capacity of the C-axis workbench	kg	40(incl. fixture)
Feed rate		
Cutting speed & X/Y/Z-axis rapid traverse speed	m/min	20/30
B-axis rated/max. speed	rpm	100/200
C-axis rated/max. speed	rpm	150/200
Accuracy		
X/Y/Z-axis positioning accuracy	mm	0.005
X/Y/Z-axis repeat positioning accuracy	mm	0.003
B/C-axis positioning accuracy	"	10
B/C-axis repeat positioning accuracy	"	5
Laser		
Pulse width	/	ns
Power	W	100
Machining range		
Max. tool diameter	mm	φ200
Max. tool length	mm	350
Max. tool weight	kg	25
Clamping interface of workpiece		BT50 or HSK-A63
Power		
Power supply voltage	V	AC380V±10%
Electric capacity	KVA	23
Air supply		
Air supply pressure	Mpa	≥0.7MPa
Air supply flow rate	L/min	≥500L/min

Obtained RoHS certification, ISO14001 and ISO45001 management system certification



● **Dedicated protective glass**

The machine operation interface and the protective window are in the same direction which is convenient to operate. The protective window adopts special design to prevent burns from the laser light source and facilitate monitoring of the processing process.

● **Laser CNC machine tool safety lock device**

Effectively improve the safety of operators and maintenance personnel, reduce the risk of personal injury, and reduce facility maintenance costs.

● **Ergonomic structural design**

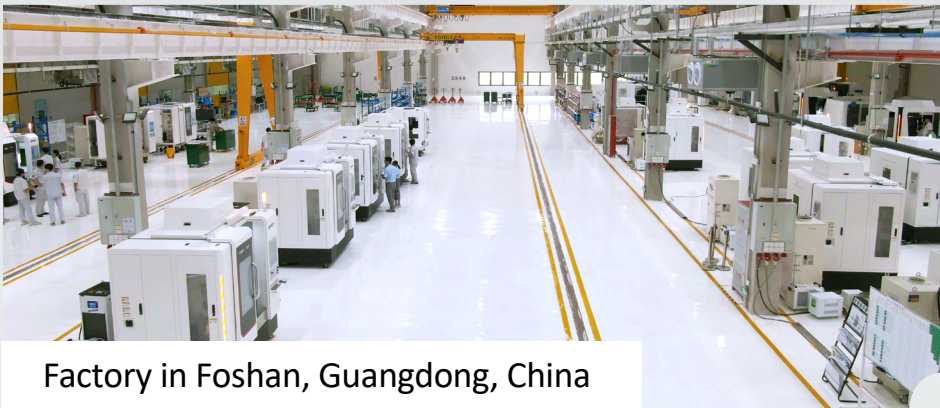
The operator adjustment space is within 1.6m from the ground.

Turnkey provider with impressive technology expertise

Cover 50,000 m², 210 employees, multi-axis CNC laser machine manufacturer, and provide smart factory manufacturing solution.



Factory in Foshan, Guangdong, China



Factory in Foshan, Guangdong, China



R&D Centers & Labs

1,000 sets/year
Full production capacity

300⁺ Patents

302 patents for inventions, utility models, etc.
62 invention patents,
147 utility model patents,
17 exterior design and
9 software

113 R&D Employees

54% total employees
7 PH.Ds
7 Masters,
65 Undergraduates, covering
talents in various fields
such as Laser application,
Mechanics, Electrics and
Software

5 R&D Centers & Labs

Provincial Manufacturing Innovation Center,
Engineering Technology Research Center,
Ultrafast Laser Processing Joint Laboratory,
Foshan Postdoctoral Workstation,
Graduate Student Joint Training Demonstration Site

● **EASY MAINTENANCE**

Use high-end international
universal accessories

● **FLEXIBLE CUSTOMIZATION**

Customized base on customer needs

● **TRAINING PROGRAM**

Provide operation training



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To make manufacturing smarter and intelligent manufacturing easier

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From origin to infinity