

PCD LASER

5-axis Laser Precision Machines

Up to 5× the efficiency of conventional processes



www.pcdlaser.com

Power Creative Development Tools Co., Ltd.



Modern Manufacturing Facility

Power Creative Development Tools Co., Ltd.

2017

The company was established in September 2017 with an initial investment of RMB 50 million.

13,500

The company is located in the Lingang Electronic Information Industrial Park, Nankang District, Ganzhou, Jiangxi Province, covering an area of approximately 13,500 m².

PCD

We specialize in the design, development, and production of 5-axis laser machines for manufacturing PCD, CBN, and other ultra-hard material cutting tools, as well as high-precision micro-tools.

Application Fields

- Aerospace industry
- Electric vehicles and new energy automotive industry
- "Belt and Road" international capacity cooperation markets
- Leveraging the strategic advantages of Ganzhou International Port, we support global customers along major industrial routes and contribute to advanced intelligent manufacturing in leading industrial countries.

Technology & Innovation under one roof

Everything under one roof: from laser source development and software engineering to machine design and production, all activities are performed in-house and supported by close cooperation with leading universities, research institutes, and research centers.

- University of Electronic Science and Technology of China
- Harbin Institute of Technology
- Lithuania Laser Technology R&D Center
- PCD East China Training Institute & Kunshan Prototyping Center

we have developed advanced five-axis laser machining solutions for diamond and superhard tools. Our technologies integrate:

- New processing methods
- Advanced equipment design
- Continuous innovation over 13+ years of industrial validation

High-precision 5-axis laser machining centers

Our Advantages

1. Advanced laser processing concept

No consumables, no pollution, quiet and clean production environment.

2. Natural granite machine base

Ensures long-term stability and high machining accuracy, benchmarked against precision measuring instruments.

3. Vertical machining structure

Eliminates accuracy deviations caused by workpiece weight during processing.

4. Linear motors with closed-loop encoder control

High-speed, high-precision 5-axis machining performance.

5. Strong R&D and IP foundation

Since 2013: workshop experience with continuous improvement; simple and intelligent operation.

6. Smart programming workflow

DXF import, simple parameter setup, automatic machining after probe measurement.

7. Easy operation & maintenance

Low skill requirement for operators, fast training and quick start-up.

Wide machine portfolio

- ◆ **APEX 380VN:** Vertical Nanosecond
- ◆ **APEX 380HN:** Horizontal Nanosecond
- ◆ **APEX 380HF:** Horizontal Femtosecond



◆ WOOD 300



APEX 380

Accuracy

Linear axes repeatability: 0.003 mm

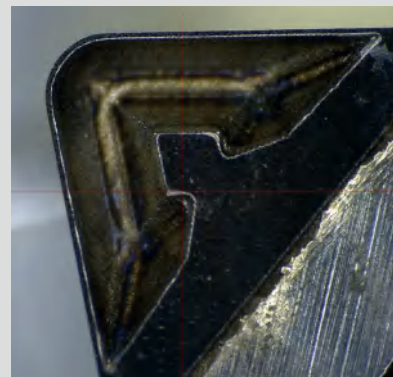
Rotary axes repeatability: ± 1.5 arc sec

Linear axes positioning accuracy: ± 0.003 mm

Rotary positioning accuracy: ± 3 arc sec

Key Functions

- 5-axis machines for manufacturing PCD, CBN, and other ultra-hard cutting tools and high-precision micro-tools
- Chip breaker slot machining for advanced tool geometries
- Chip breaker machining for complex insert geometries



Key Features

Precision and Durability: The 5 Axis Laser machine series is built on a natural granite base and equipped with linear motor drives and optical-linear scale closed-loop control; ensuring high precision even at high operating speeds and long-term durability.

User-Friendly Design: Easy to learn and operate, it delivers high efficiency while remaining simple and cost-effective to manage.

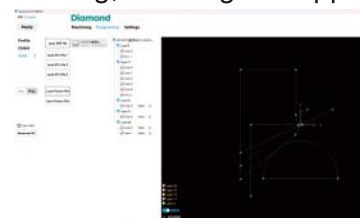
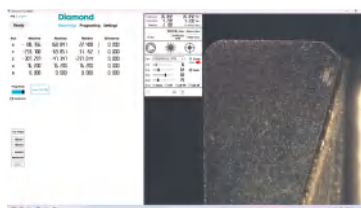
Intelligent Operation: The intuitive system interface and smart functions allow complex machining tasks to be executed with ease.

Software & Vision System

Software: Diamond 13

CCD camera: high-precision visual/optical inspection system

DXF import, automatic NC code generation, real-time monitoring, multilingual support



APEX 380 VN/HN: 5-Axis Laser Machine

APEX 380 VN/HN is the Nanosecond flagship laser machine in the superhard tool manufacturing industry.

VN: Vertical Configuration, HN: Horizontal Configuration.

Since 2013, we have been developing advanced laser machines featuring proprietary software innovations, delivering an intuitive human-machine interface that simplifies operation and enhances efficiency.

Superior Efficiency

APEX 380 VN/HN/HF deliver significantly higher performance compared to traditional machining methods:

- Up to 5 × the efficiency of conventional processes.
- Rough machining speed is significantly higher than traditional wire-cutting methods.
- Edge finish quality far superior to conventional techniques.

APEX 380 VN/HN/HF are widely adopted in superhard tool manufacturing, balancing efficient rough machining with high-quality edge finishing performance:

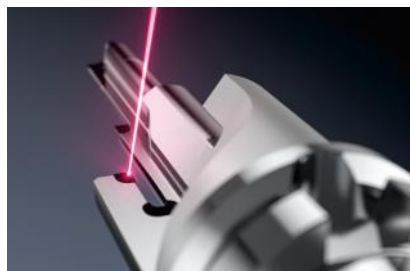
- They enable single-clamping roughing and finishing for a fully integrated process.
- They feature an integrated camera-based system for precise in-process dimensional verification.
- They process superhard materials such as PCD, CBN, and single-crystal diamond, ensuring high-quality edge finishing and cutting performance.

Laser System (APEX 380 VN/HN)

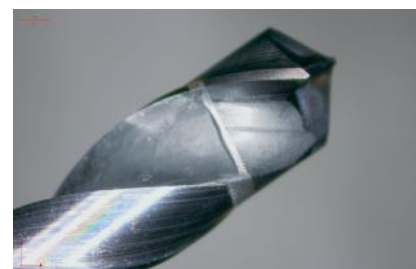
- Type: pulsed nanosecond fiber laser
- Power: 120 W
- Wavelength: 1064 nm
- Water-cooled electronics and galvanometer scanners



APEX 380 VN



APEX 380 HN



Versatile Applications

The APEX 380 VN/HN meets the requirements of most round tools and cutting tools machining in superhard materials, representing the state of the art in PCD laser machining technology.

5-axis Laser Precision Machines

APEX 380 VN

Additional Specifications

Closed-loop water cooling system

Surface roughness: Finishing $Ra \leq 0.2 \mu m$ Weight: approx. 5,000 kg

Dimensions (L × W × H): 2280 × 2950 × 2235 mm Power supply: 3 × 380 V

Power consumption: max. 5 kW

X/Y/Z-axis: linear motor, water-cooled, 380/380/380 mm travel, 15 m/min rapid speed

A-axis: high-precision torque motor, water-cooled, 0–360°

B-axis: high-precision torque motor, water-cooled, -45° to +45°

Machining Range

Diameter:	D 1- 300 mm
Length:	Up to 380 mm (with fixture)
Tool weight:	Up to 30 kg
Tool interface:	HSK-A63/BT50
Base:	Granite bed
Spindle:	Vertical



Main Applications

The APEX 380 VN excels in the machining of a wide range of tool geometries, including:



5-axis Laser Precision Machines

APEX 380 HN

Additional Specifications

Closed-loop water cooling system

Surface roughness: Finishing $Ra \leq 0.2 \mu m$ Weight: approx. 5,000 kg

Dimensions (L × W × H): 2280 × 2950 × 2235 mm Power supply: 3 × 380 V

Power consumption: max. 5 kW

X/Y/Z-axis: linear motor, water-cooled, 360/320/350 mm travel, 15 m/min rapid speed

A-axis: high-precision torque motor, water-cooled, 0–360°

B-axis: high-precision torque motor, water-cooled, -35° to +92°

Machining Range

Diameter:	D 1 - 180 mm
Length:	Up to 260 mm (with fixture)
Tool weight:	Up to 10 kg
Tool interface:	HSK-A63
Base:	Granite bed
Spindle:	Horizontal



Main Applications

The APEX 380 HN excels in the machining of a wide range of tool geometries, including:



5-axis Laser Precision Machines

APEX 380 HF

Additional Specifications

Closed-loop water cooling system

Surface roughness: Finishing $Ra \leq 0.2 \mu m$	Weight: approx. 5,000 kg
Dimensions (L × W × H): 2280 × 2950 × 2235 mm	Power supply: 3 × 380 V
Power consumption: max 5 kW	
X/Y/Z-axis: linear motor, water-cooled, 380/380/380 mm travel, 15 m/min rapid speed	
A-axis: high-precision torque motor, water-cooled, 0–360°	
B-axis: high-precision torque motor, water-cooled, -35° to +92°	

Laser System

- Type: pulsed femtosecond fiber laser
- Power: 20 W
- Wavelength: 1064 nm

Machining Range

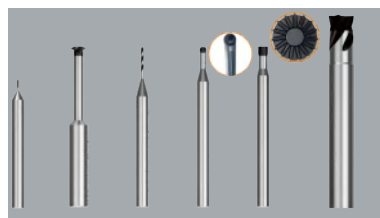
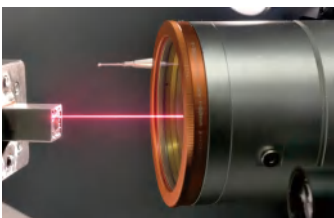
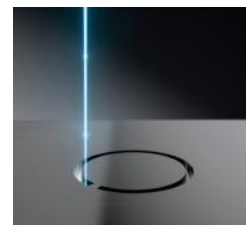
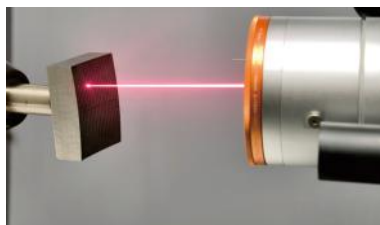
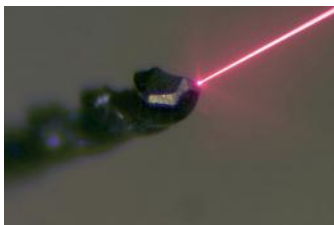
Diameter:	D 0.1- 150 mm
Length:	Up to 240 mm (with fixture)
Tool weight:	Up to 10 kg
Tool interface:	HSK-A63
Base:	Granite bed
Spindle:	Horizontal



Main Applications

The **APEX 380 HF** excels in the machining of a wide range of tool geometries, specialized for mold, micro-diameter tool, medical device manufacturing; PCD chip breaker grooving, cutting edge micro-finishing & tool surface polishing.

Wide machining range: cemented carbide, PCD, PCBN, steel and other materials with no material limitations.



5-axis Laser Precision Machines

WOOD 300

Additional Specifications

Closed-loop water cooling system

Surface roughness: Finishing $Ra \leq 0.5 \mu m$ Weight: approx. 4,000 kg

Dimensions (L × W × H): 2150 × 2670 × 2080 mm Power supply: 3 × 380 V

Power consumption: max. 5 kW

X/Y/Z-axis: linear motor, water-cooled, 300/270/300 mm travel, 15 m/min rapid speed

A-axis: high-precision torque motor, water-cooled, 0–360°

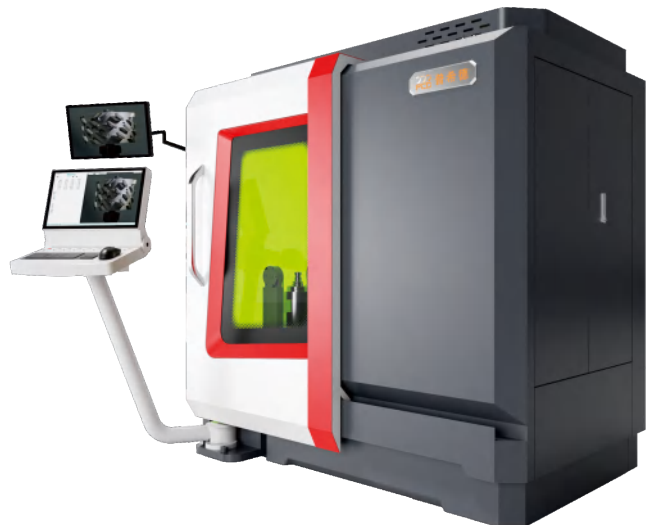
B-axis: high-precision torque motor, water-cooled, -45° to +45°

Laser System

- Type: pulsed nanosecond fiber laser
- Power: 200 W
- Wavelength: 1064 nm
- Water-cooled electronics and galvanometer scanners

Machining Range

Diameter:	D 1 - 300 mm
Length:	Up to 180 mm (with fixture)
Tool weight:	Up to 30 kg
Tool interface:	HSK-A63
Base:	Granite bed
Spindle:	Vertical



Accuracy

Linear axes repeatability: 0.004 mm Rotary axes repeatability: 5 arc sec

Linear axes positioning accuracy: ± 0.004 mm Rotary positioning accuracy: ± 5 arc sec

Main Applications

The WOOD 300 excels in the machining of a wide range of tool geometries.



4-axis Laser Precision Machines

PCD LASER-SAW-D600

Specifically designed for the production of PCD-tipped saw blades

Dimensions (L × W × H): 2650 × 2300 × 2290 mm

Weight: approx. 4,000 kg

Power consumption: max. 5 kW

Power supply: 3 × 380 V

X/Y/Z axes: Linear motors; travel: 160/160/110 mm

B-axis: High-precision torque motor, -15° to $+15^{\circ}$

Specifically designed for manufacturing PCD-tipped saw blades

Laser System

- Type: pulsed nanosecond fiber laser
- Power: 200 W
- Wavelength: 1064 nm

Machining Range

Diameter:	≤ 600 mm
Base:	Granite bed
Tool weight:	Up to 30 kg
Tool interface:	Interchangeable mandrel sleeves for different saw blade bores



Accuracy

Linear axes repeatability: 0.004 mm

Rotary axes repeatability: 5 arc sec

Linear axes positioning accuracy: ± 0.004 mm

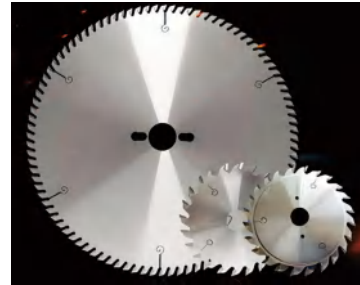
Rotary positioning accuracy: ± 5 arc sec

Main Applications

1. This saw blade machine is equipped with an integrated gantry automatic loading & unloading system. It can process up to 12 saw blades in one batch.

>Maximum machinable saw blade diameter: 600 mm

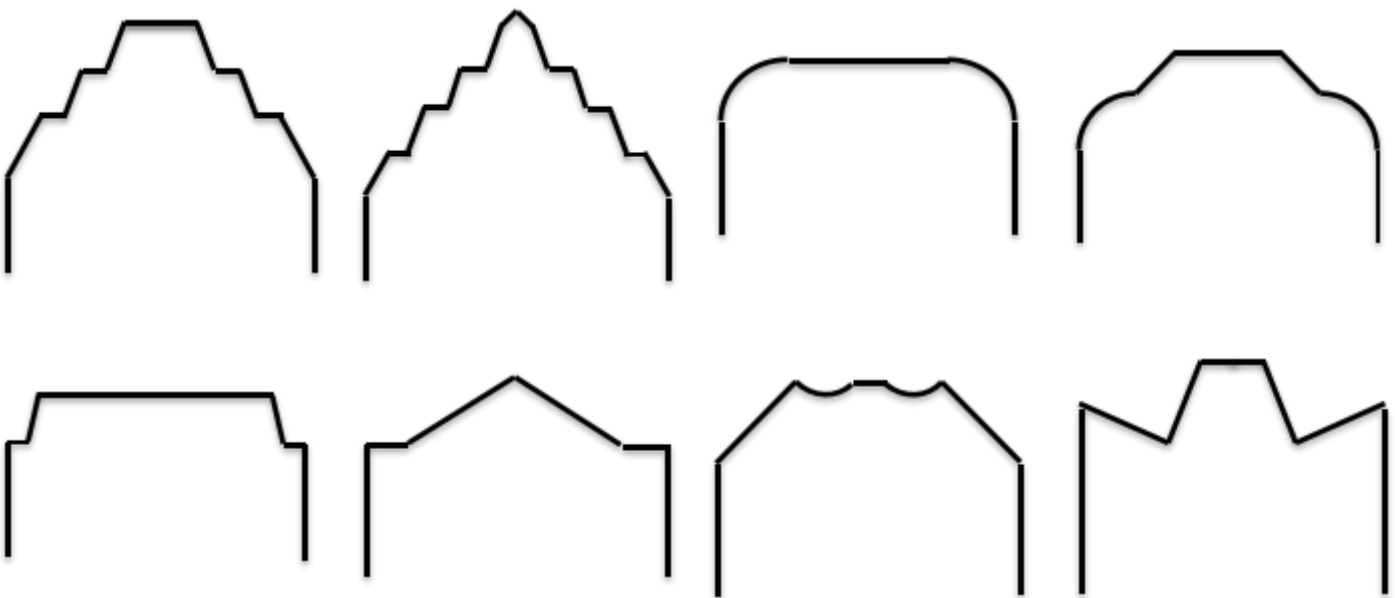
>Minimum machinable saw blade diameter: 80 mm



2. Capable of machining all common tooth profiles, as shown below:



3. Capable of machining other complex tooth profiles, including:



Power Creative Development

- 5-axis laser machining centers for superhard tools
- Various optional functions for automated operations



Robotic automatic loading and unloading (optional)

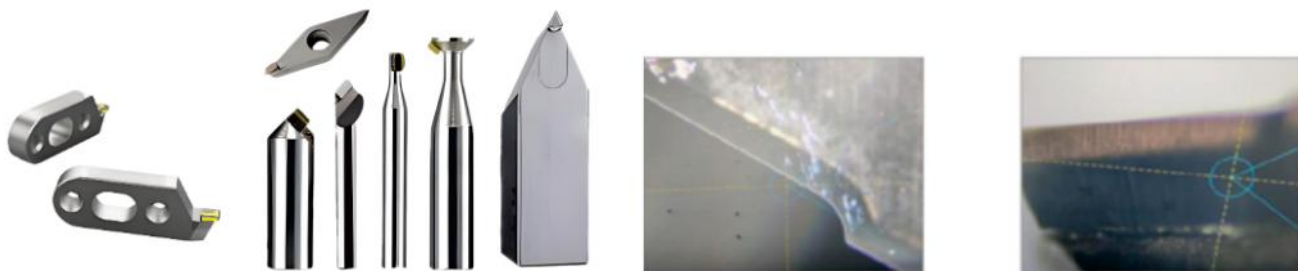


HSK63 (optional BT50)

PCD tools



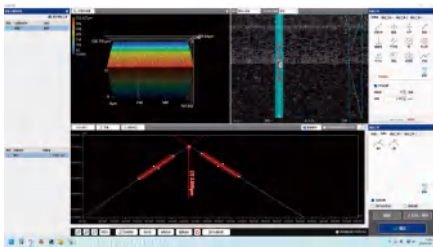
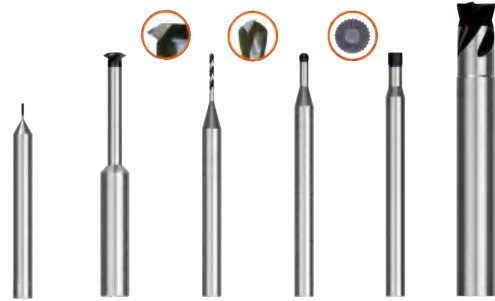
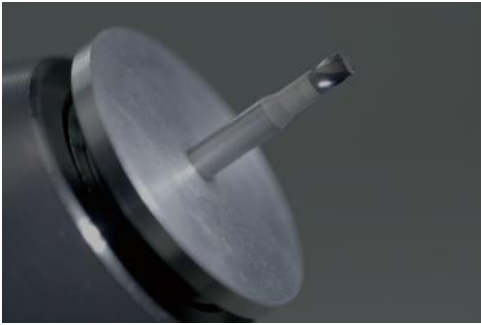
MCD tools



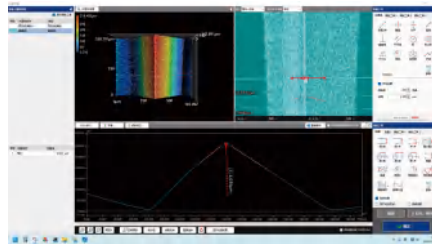
PCBN chipbreaker and tools



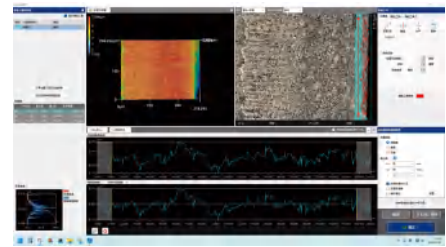
Solid PCD tool



Edge radius machining
(back to front)



Edge radius machining
(front to back)



Flank surface roughness

CE Certification:

ISO 230.2 • EN ISO 12100 • EN 60204-1



Corporate Philosophy

Integrity • Sharing • Cooperation • Win-Win

Management philosophy

Service • Credibility • Forward-thinking

We are committed to delivering high-quality machines and services, contributing to shared industrial progress and sustainable development.



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