5-AXIS
MACHINE TOOL

Xhorse® 3D

Xmachine

Desktop 5-axis CNC Machining Center V1.1

The Future of Creation, Now on Your Desktop

5-AXIS
MACHINE TOOL

EXPLORE THE
BOUNDARY OF CREATION

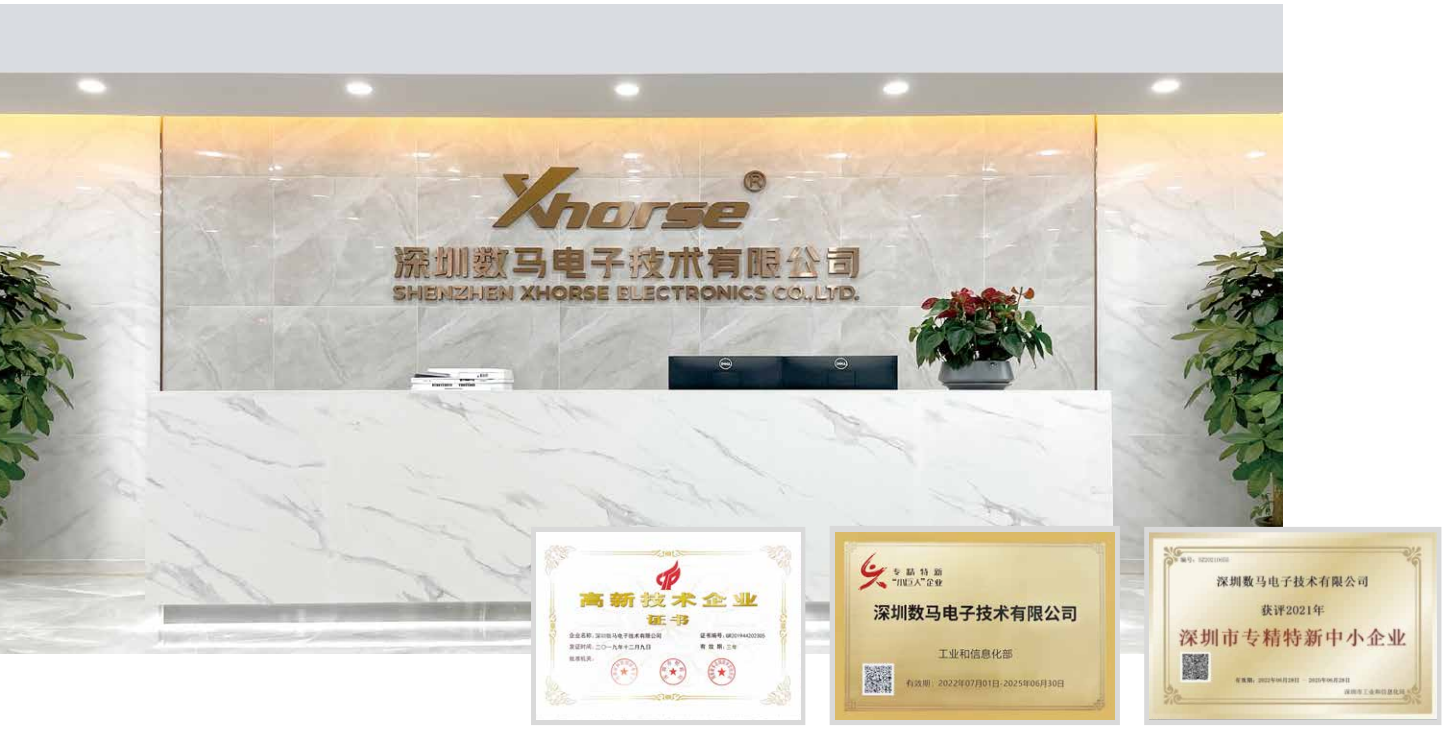
ABOUT US

SHENZHEN XHORSE ELECTRONICS CO., LTD

Founded in 2010, headquartered in Shenzhen Nanshan District Liuxiandong, Xhorse has been named National High-tech Enterprise specializing in R&D, manufacturing, sales, and service. Its products cover multiple fields, including precision machinery, automotive electronics, industrial automation, chip design, and optical sensing. As a recognized 'little giant' enterprise, its products reach customers in over 170 countries and regions.

Driven by continuous R&D investment and a high-level innovative team, Xhorse takes a market-oriented approach and keeps exploring new industries and developing new products, and has consistently increased its R&D investment by over 50% annually. 65% of the team members are graduates from 985/211 universities, and 45% hold master's degrees or higher.

Xhorse places great importance on independent R&D and innovation, possessing a complete system of intellectual property rights and quality management. By the end of April 2024, Xhorse has applied for over 600 certificates of patents, Software Copyright, and Layout-designs of Integrated Circuits and more than 90 registered trademarks in more than 20 countries.



Branches & Affiliates

Zhejiang Yongyuan Technology Co., Ltd
Yuyao Production Base

Zhejiang Unionx Electric Machinery Technology Co., Ltd
Yuyao Sanqi Robot Town

Ningbo

Shenzhen Xhorse Electronics Co., Ltd
R&D Headquarters

Shenzhen Xhorse Electronics Co., Ltd
Baoan Branch
Shenzhen Production Base

Zhejiang Yongyuan Technology Co., Ltd
Shenzhen Branch
Automation R&D Center

Shenzhen

Shenzhen Xhorse Electronics Co., Ltd

National High-tech Enterprise
National "Little Giant Company"
Shenzhen Specialized and Special New Enterprise
Shenzhen Nanshan District High-Level Innovative Talent Training Base

Zhejiang Yongyuan Technology Co., Ltd

National High-tech Enterprise
Yuyao Enterprise Engineering (Technology) Center
Yuyao City Intelligent Manufacturing Benchmark Enterprise
Yuyao City Innovation and Growth Demonstration Enterprise
Top 10 "Growth Stars" Enterprises with High-Quality Development in Yuyao City's Manufacturing Industry

Intellectual Property Rights Trademarks and Certification

Possess complete independent intellectual property rights system and certification system

IATF16949

ISO9001:2000版
质量体系认证

Intelligent Production Base

Zhejiang Yongyuan Production Base spans 10,000m^2, with a total building area of 20,000m^2. The facility is equipped with modern, efficient, and standardized workshops, along with advanced production equipment. It features state-of-the-art CNC production lines, automated SMT lines, automated injection molding lines, and automated assembly lines. By integrating cutting-edge artificial intelligence and advanced automation technologies, the base has optimized its production processes for high efficiency and automation, establishing a comprehensive intelligent manufacturing and process workflow.

● Automated Equipment Assembly Production Line

● CNC Machining Center Production Line

● Injection Molding Machine Production Lin

● SMT Machine Production Line

Zhejiang Unionx Electric Machinery Intelligent Production Base represents an investment of 400 million RMB, covering over 40，0000m² with a building area exceeding 80,000m². The base will focus on the construction of a R&D center, modern production workshops, and advanced logistics and warehousing facilities, all centered around intelligent manufacturing. Upon completion and commencement of operations, the facility will primarily be dedicated to the research, development, and manufacturing of equipment for multi-axis motion control, binocular vision and image recognition, and automated manufacturing solutions.


On-Site Photo


On-Site Photo

5-AXIS
MACHINE TOOL

Xmachine

Desktop 5-axis CNC Machining Center

Xmachine is a state-of-the-art desktop 5-axis CNC machine designed to offer exceptional precision and efficiency for producing intricate parts. Combining a compact design with robust machining capabilities, it's ideal for machining a wide range of materials and supports multiple machining modes, including engraving, milling, drilling, and tapping.

As a premium CNC machining center, Xmachine features RTCP and 3+2 positioning machining functions. It integrates advanced CNC system capabilities such as 5-axis simultaneous control, high-speed and high-precision machining, and spindle synchronization.

Equipped with a 10.1-inch HMI, an innovative automatic tool changer and a next-gen high-precision wireless probe, Xmachine is designed to meet the demands of complex and precise component machining, ensuring both accuracy and efficiency in production.

Ultra-Precise
Simultaneous 5-axis Machining

Innovative
Automatic Tool Changer

All-rounded
Engraving, Milling, Drilling, Tapping

Versatile
Metal, Plastic, Jade, etc.

EXTREME
HORSE POWER

The Future of Creation
Now on Your Desktop

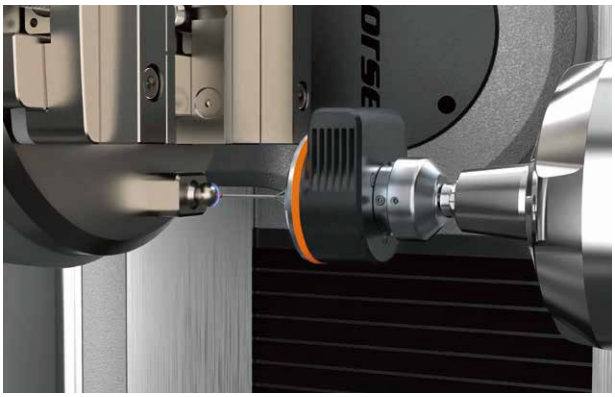
HIGHLIGHTS

Desktop CNC with Compact Design

Xmachine desktop 5-axis CNC machining center features a compact and space-efficient design. Its compact size offers flexible layout options in workshops, making it ideal for makers, DIY enthusiasts, hobbyists, machinists, and small workshops.

5-axis Simultaneous Machining

Xmachine introduces 5-axis simultaneous machining capabilities, enabling the creation of intricate and precise components with exceptional efficiency and accuracy. This advanced technique reduces setup time, increases productivity and ensures superior surface finishes, overcoming the limitations imposed by traditional 3-axis machining and unlocking new possibilities for multiple industries.

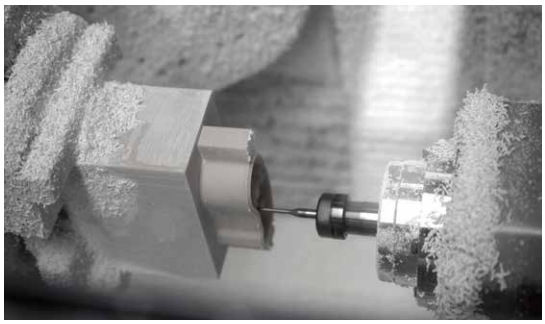


Advanced Automatic Measurement

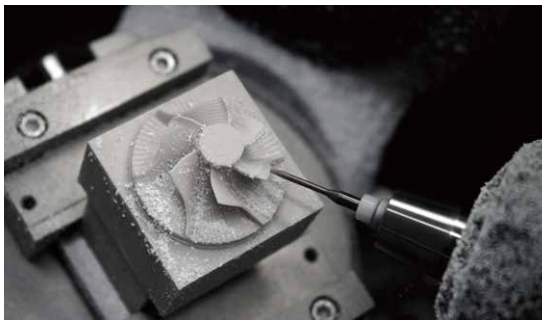
Equipped with the next-gen wireless probe, Xmachine supports fully automatic axis measurement and high-precision automatic workpiece centering. This high degree of automation significantly enhances processing quality.

Innovative Automatic Tool Changer Design

Xmachine pioneered the concealed automatic tool changer system in desktop milling machines, which automatically unfolds during tool changes and folds during operation, accommodating up to 6 tools. This innovative system allows for rapid switching between various processes, significantly reducing processing time and increasing efficiency.

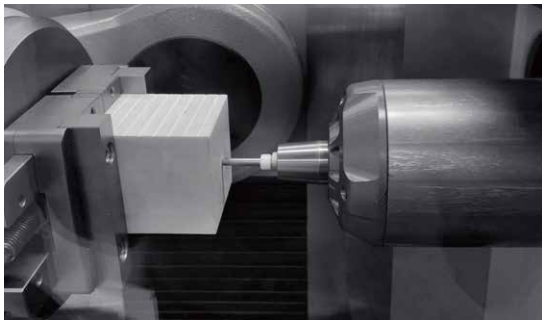


Engraving



Milling

Drilling

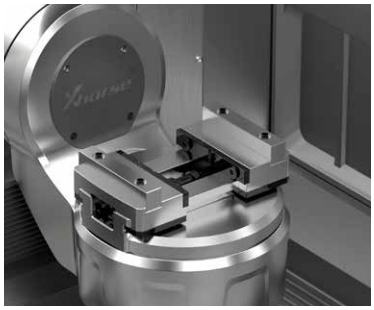


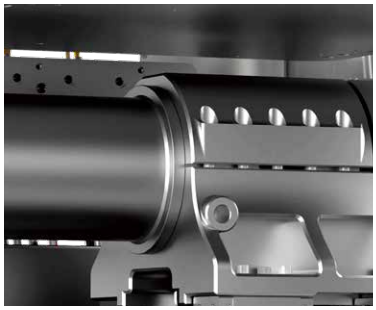
Tapping

Versatile Machining Capabilities

Our novel designs pack tremendous performance and capabilities into this compact machine while offering a full suite of features as a versatile machining center.

With exceptional stability and rigidity, the machine comes with great capabilities in engraving, milling, drilling, tapping, etc. to flexibly meet the needs of different work.



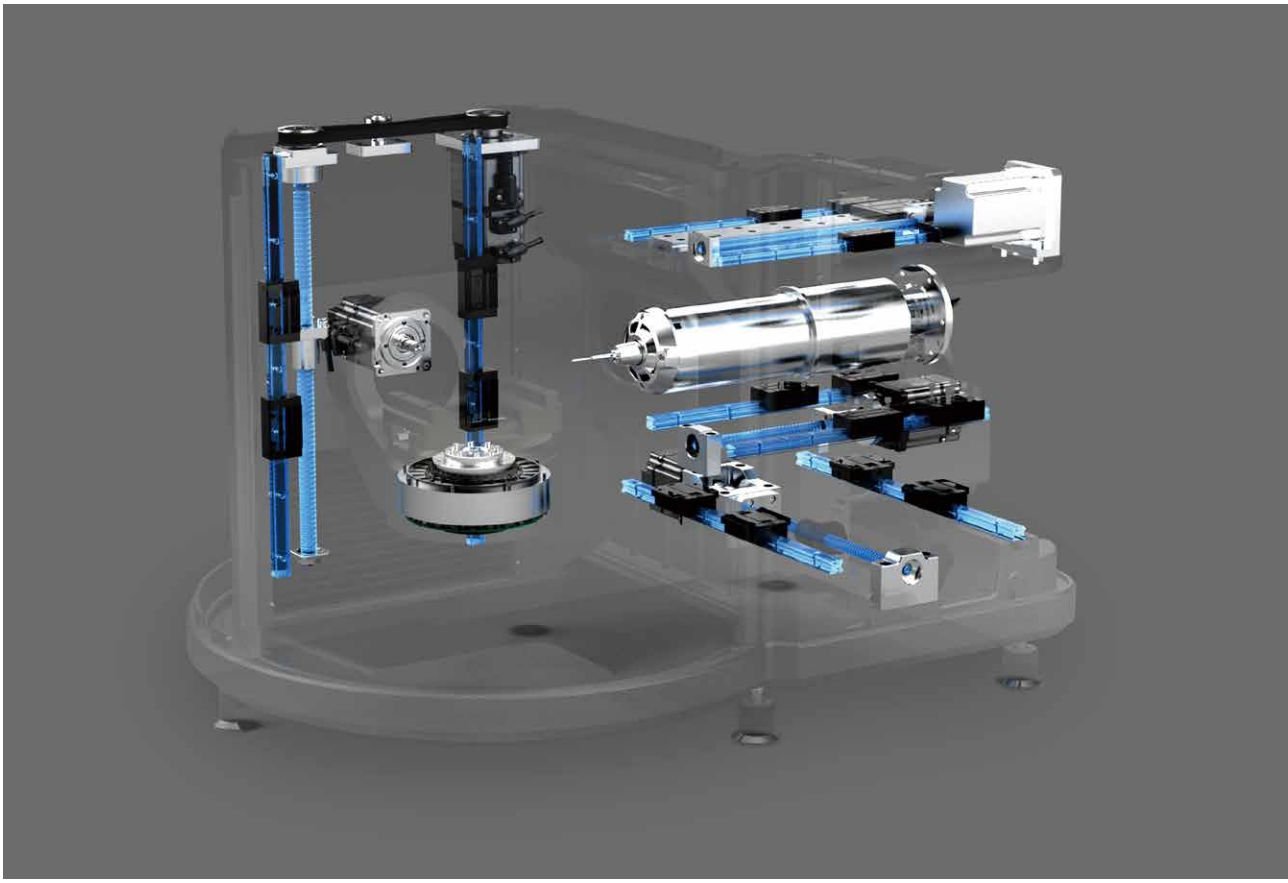


High-Speed Machining Begets High Efficiency

Driven by a permanent magnet synchronous motor, the machine spindle features a built-in inductive encoder and this means minimal inertia and maximum torque density and smoother operations across a wide range of tasks. With a spindle speed of over 18000rpm, the machine ensures faster productivity rates with its high-speed machining.

User-centric and Intuitive Control

The control panel features a simple design with a handwheel for precise control of the machine's axes and workpiece measurement. Knobs facilitate switching processing modes, adjusting feed rates, and spindle speed. Buttons allow for direct control of axis movement, starting and stopping programs, and resetting the machine. An emergency stop button ensures immediate halting of machine operations in emergencies.



Precision and Reliability for Superior Machining Experience

The machine guarantees precise, reliable machining with high-precision servo motors for the X, Y, Z, and A axes, supported by robust linear guides, ball screws. The C-axis features Xhorse's direct-drive motor and advanced encoder for fast, accurate rotation. Additionally, an exceptional self-centering fixture ensures easy, secure workpiece clamping and excellent machining precision.

XMACHINE-NCS FEATURES

[RTCP] Rotation Tool Center Point

In 5-axis machines with rotary axes, the RTCP function dynamically adjusts the tool orientation during machining while compensating for tool length, ensuring high precision. Even if the tool's orientation relative to the workpiece changes, the machine maintains the tool center point on the designated path. RTCP simplifies programming by planning the tool center point trajectory in the workpiece coordinate system, enhancing accuracy and efficiency.

3+2 Positioning Machining

3+2 positioning machining is also known as tilt machining. In addition to positioning along the X, Y, and Z axes, the cutting tool can be positioned at a tilted angle by rotating the A and C axes of a 5-axis machine tool. This enables machining at various angles, improving the processing of complex surfaces and slopes, and enhancing flexibility and precision for more accurate manufacturing.

Comprehensive Compensation

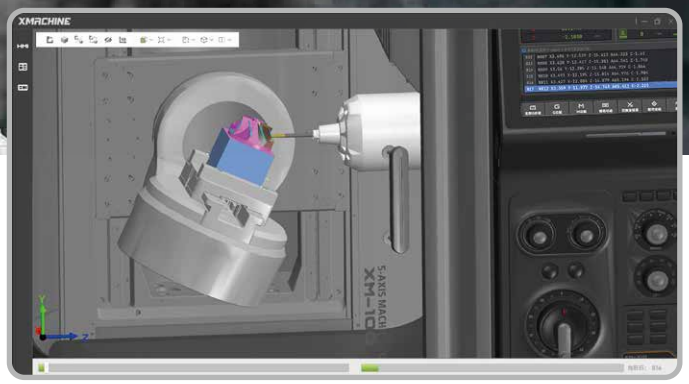
Includes bidirectional lead screw compensation, backlash compensation, and spatial error compensation functions. These functions help reduce errors caused by deviations between actual and theoretical lead screw pitches, backlash errors during axis direction changes (forward to reverse motion), and three-dimensional errors in machine tools resulting from linear and rotary axis movements. These greatly help improve positioning accuracy and repeatability.

Look-ahead Control

Incorporates trajectory and velocity look-ahead functions with a capability of up to 2000 segments. This enables early detection of trajectory changes and effective speed control, establishing optimal machining control methods to meet the processing requirements of workpieces with complex profiles.

Flexible Interpolation

Supports various interpolation methods such as linear, circular arc, NURBS, exponential, spline, S-curve, helical involute, etc. The flexible selection of interpolation methods enables rapid execution of linear and circular arc interpolations. Additionally, it supports NURBS and other techniques for directly specifying NURBS curve representations to CNC devices. This enhances real-time interpolation speed and reduces errors during machining operations.



XMACHINE-DTS DIGITAL TWIN

A 5-axis control system using digital twins maps and simulates the machining process, enabling testing and evolution throughout its lifecycle. It analyzes current conditions and predicts machine performance, preventing irreversible errors. This system supports scenarios like equipment simulation, pre-error alerts, and synchronous machining.

Real-time Monitor and Control

It includes data acquisition, online simulation, and process parameter feedback modules. Sensors collect real-time data from the worktable, linking it to simulation models and physical components. The digital twin-based machine tool creates a virtual model for motion simulation and enables real-time monitoring, data analysis, and control, improving machining quality through parameter feedback.

Pre-error Synchronized Machining Simulation

The system features a pre-error machining alarm. The XMachine-NCS sends the NC code to simulation software, and if risks are detected, real machining is halted. The user can then adjust settings to prevent potential issues with the NC code, cutters, clamps, or workpieces, ensuring machining safety.

5-AXIS NUMERICAL CONTROL SYSTEM

The supported software designed for Xmachine incorporates various functional modules tailored to practical machining needs. It features a user-friendly graphical interface, scientific computation visualization, and intuitive interaction design, ensuring ease of operation.

Machining Programming Functions

Program background editing: edit other NC programs in the file management interface while processing;

File management system: change the program name, the program and the contents of the program;

Macros and subroutines: use functions such as program block repetition, program arithmetic, program jumping and calling subroutines;

Fixed cycles: drilling, deep drilling and rigid tapping cycles;

Machining time: displays the current machining time and the remaining time while the program is running.

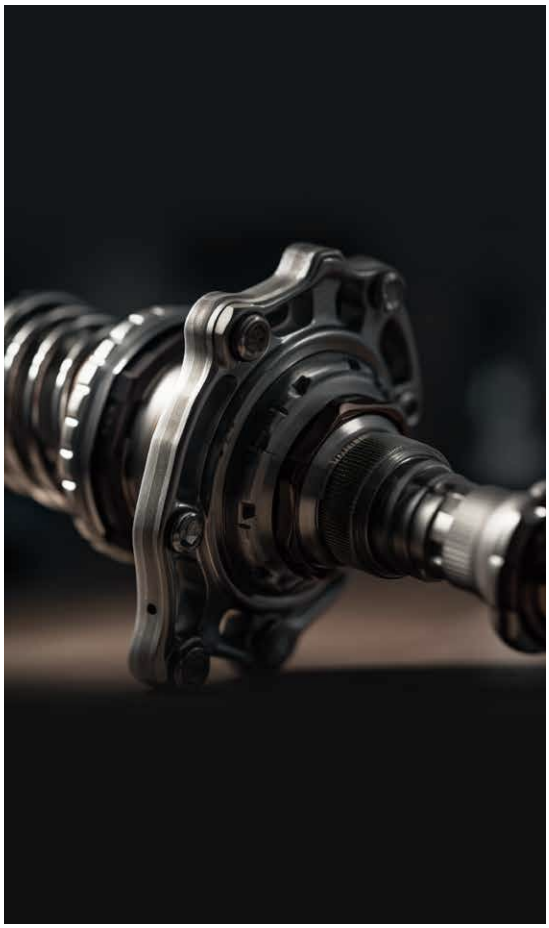
HMI

HMI (Human Machine Interface) can realize on-site operation, data storage, status monitoring, alarm query and other functions. By integrating a text display, operator panel, and touch panel, it provides a user-friendly programming interface with intuitive operational features.

Online Debugging and Diagnostic monitoring

With online debugging and diagnostic monitoring functions, the system's operation status can be monitored in real-time. In anticipation of system failure or deterioration of system performance and system operation quality, it can take corresponding countermeasures and carry out online debugging to ensure the efficient and stable operation of Xmachine.

APPLICABLE AREAS



Mechanical Parts

Xmachine is capable of machining various complex mechanical components, especially those with high-precision and intricate geometries. Through 5-axis simultaneous control, it can complete multi-surface machining within a single cycle, reducing the number of workpiece clamping operations and minimizing errors.

Competition Design

In robot competitions, racing vehicle design, and other high-performance events, Xmachine enables rapid prototyping and testing, allowing designers to continuously refine and optimize their designs.

Art Projects

Xmachine can machin
such as wood, metal,
ideal for artistic endeavo
engraving and cutting
can create their uni
pieces.

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and plastic, making it
rs. With its high-precision
capabilities, designers
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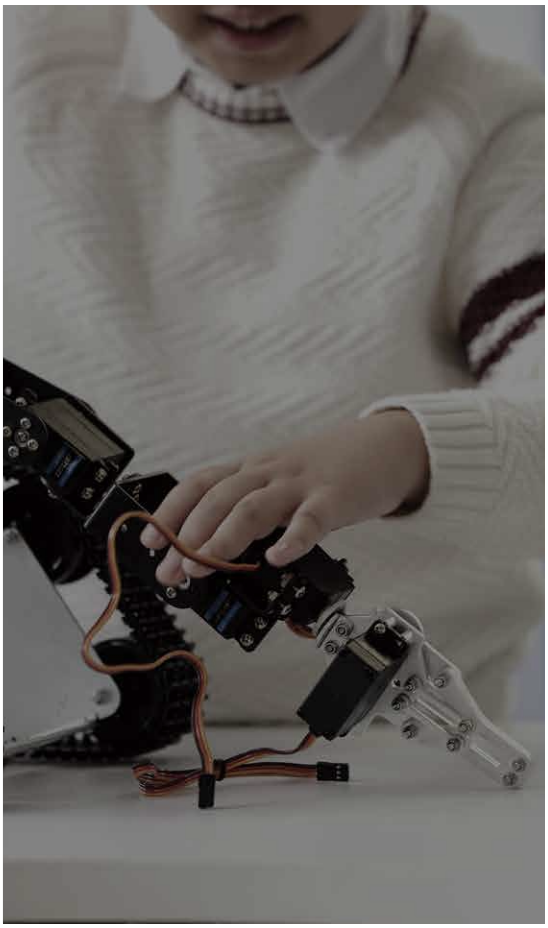


Educational Projects

In the educational sector, Xmachine provides a highly interactive, hands-on learning platform, helping students gain a deeper understanding of manufacturing, engineering design, and programming concepts.

Custom Tools

Xmachine offers the ability to manufacture not only parts but also specialized custom tools, improving production efficiency and fulfilling unique application requirements.

WHAT MATERIALS CAN BE CUT

Xmachine offers efficient processing of a wide range of materials, including metal, plastic, wood, and composites, providing users with a versatile and flexible machining solution for multiple applications.


Copper


Brass


Aluminum


Marble


Jade

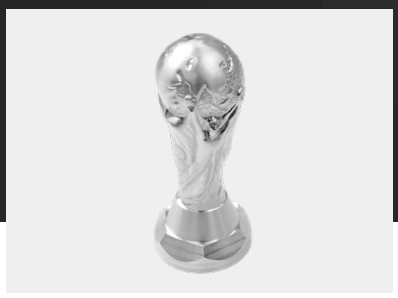

Obsidian

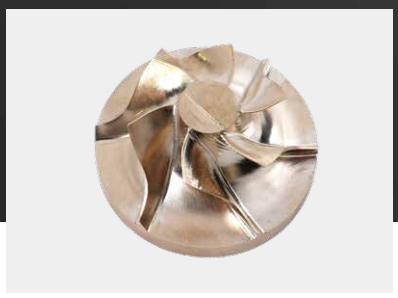

Polycarbonate (PC)


Wax


Acrylic

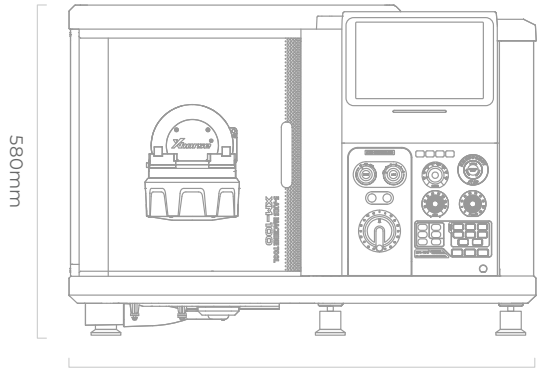

Wood

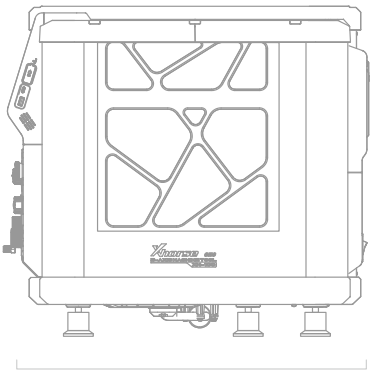




TECHNICAL SPECIFICATIONS

Numerical Control System	XMachine-NCS
Lathe Structure	Horizontal
X/Y/Z Axis Travel	156mm/203mm/125mm
A-Axis Travel	-30~110°
C-Axis Travel	360°
X/Y/Z Axis Rapid Rate	≥4000mm/min
A/C Axis Rotation Rate	A: 15r/min; C: 15r/min
Spindle Speed	18000rpm
Spindle Config	EtherCat
Tool Changer Capacity	6 Tools
Rotary Table	Direct Drive Motor
Worktable Size	100mm
Worktable Load	≤10Kg
Max. Workpiece Size	100×100×100mm
Rated Power	2.2Kw
Coolant System	Air Cooling
Machine Weight	Around 130kg
Machine Dimensions	797×614×580mm





Xhorse 3D