SMOOTH TECHNOLOGY

Mazak

JOIN THE PRODUCTIVITY REVOLUTION

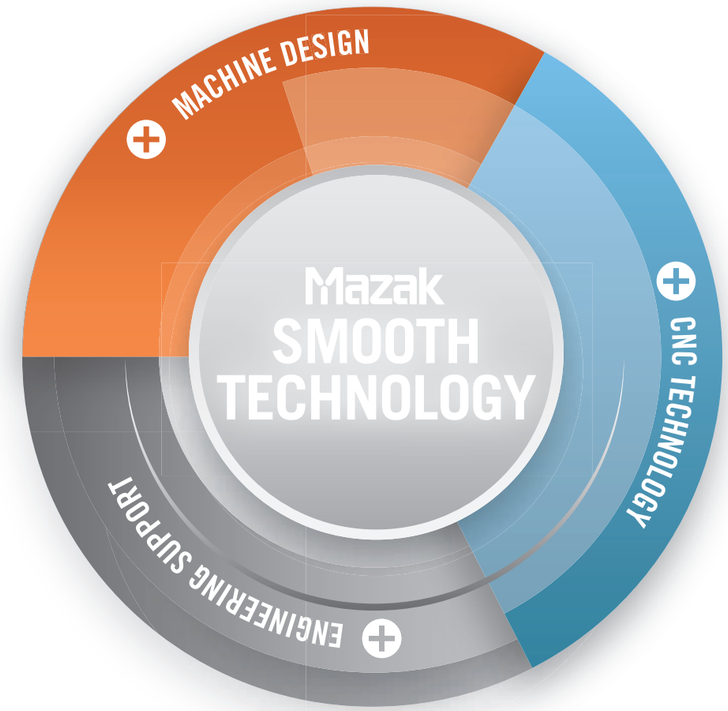
MAKE WAY FOR HIGHER LEVELS OF PRODUCTIVITY WITH OUR SMOOTH TECHNOLOGY PLATFORM THAT HAS REVOLUTIONIZED THE WAY OUR MACHINE TOOLS PERFORM, ESPECIALLY WHEN IT COMES TO 5-AXIS AND CONTOURING OPERATIONS.

Spanning the entire part-production landscape, from programming to metal removal to automation to data collection, SMOOTH TECHNOLOGY seamlessly brings unmatched speed, accuracy, functionality and ergonomics to virtually every type of metalworking application.

And as manufacturing technologies continue to advance, SMOOTH TECHNOLOGY has the means to evolve with them so you can consistently combat any part-production challenge that stands in your way.

DOMINATE THE COMPETITION

Advanced machine design, leading-edge CNC technology and unequaled engineering resources are the foundation of SMOOTH TECHNOLOGY. It is the full integration of these three elements that will put you at the forefront of manufacturing innovation, allowing you to attain unbeatable cycle time speeds, unsurpassed ease of operation and undisputed productivity.



MACHINE DESIGN

+ Intuitive hardware
+ High-speed servo systems
+ Enhanced ergonomics
+ Eco-friendly components
+ Product variety

CNC TECHNOLOGY

+ Enhanced 5-axis machining capability
+ Enhanced EIA program operation
+ Advanced MAZATROL programming
+ Unmatched productivity functions
+ New control units and software

ENGINEERING SUPPORT

+ Research and development
+ Manufacturing processes
+ Automation integration
+ Digital manufacturing
+ Service and support

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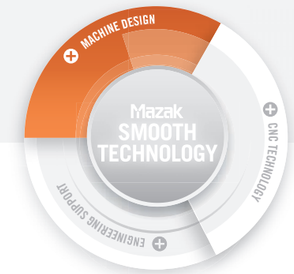
SPEED AND CONVENIENCE



MACHINE DESIGN

INTUITIVE HARDWARE

New hardware makes it possible for machines with SMOOTH TECHNOLOGY to perform like never before. Among the most noticeable are our latest CNC units, which are part of an overall intuitive human/machine interface (HMI).

These CNCs feature eye-catching, entirely multi-touch home screens that, within single-page views, present all critical data to operators. As a result, operators can instantly jump from the home screen to any other area or section within the CNC. It is also possible for them to manipulate 3D part renderings by using their fingertips to pan, rotate or zoom on the screen.

Furthermore, the CNCs have a streamlined navigating/dashboard-type screen that displays typical data output such as machine rapid speeds, horsepower, axis positioning, machining loads, estimated time of part completion and more.

+ Scaling and 3D rotation on screen
+ On-screen keyboard
+ Touch panel menu selection

HIGH-SPEED SERVOS

New servo systems are part of what make SMOOTH TECHNOLOGY an all-encompassing platform. These systems achieve high-speed and accurate machining when used in conjunction with the technology's new control functions and hardware improvements. In fact, the communication speeds of these new servo drives are three times faster when compared with those used with our previous-generation controls.

ENHANCED ERGONOMICS

Driven to further increase the convenience of our products, we took a fresh approach when it came to the ergonomics of our SMOOTH TECHNOLOGY-based machine tools.

Large front doors on these machines provide total access to the work areas, from both the front and top of the equipment. Machine windows are significantly larger and interior lighting is brighter to provide quick, easy visual access to the work areas during cutting operations.

Our control layouts have been re-imagined to include bigger screens and more intuitive interfaces. It is also possible to tilt the control panels to allow for optimum positioning based on operator height.

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EFFICIENCY AND RANGE

MACHINE DESIGN

ECO-FRIENDLY COMPONENTS

Environmental impact has always been a key concern of ours during product development. In fact, the factories where we manufacture our SMOOTH TECHNOLOGY-based machines are ISO 14001 certified, an international standard that confirms our production plants do not adversely affect air, water or land.

We rely on grease rather than oil to lubricate our MX Hybrid Roller Guides that facilitate the fast, accurate linear axes movements of our machines. As a result, you get a reduction of tramp oil in your coolant, which ultimately results in extended coolant life and less frequent disposal.

We also help lower your shop's power consumption by using high-efficiency LED lights within machine work areas. These lights automatically shut off after a predetermined period of time. When the personnel sensors on our machines detect nearby movement, these lights automatically turn back on. Our CNC displays and optional chip conveyors also feature this automatic shut-off mode.

eco-friendly

PRODUCT VARIETY

When it comes to machine tool design, we understand that one machine cannot address every possible customer need, especially in an industry as diverse as manufacturing. That is why we have long offered one of the most advanced and comprehensive selections of machine tools on the market. And this extends into our SMOOTH TECHNOLOGY platform.

You will find SMOOTH TECHNOLOGY in each of our machine types, from basic turning centers to highly advanced Multi-Tasking solutions. Such variety is important because we want you to only have to invest in the machining capabilities that best apply to your specific application.

INTEGREX i-630V/6

INTEGREX e-1600V/10S

VARIAXIS i-700T

VORTEX i-800V/8

INTEGREX i-400ST

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CNC PERFORMANCE REDEFINED

CNC TECHNOLOGY

We set a new precedent in CNC development with the introduction of our MAZATROL programming language in 1981. As part of the first conversationally programmed CNC system in the world, MAZATROL made it possible for almost anyone to make a machining program.

In 1998, we combined MAZATROL and PC technology to create the MAZATROL FUSION control, which greatly improved machine tool management and operator efficiency.

Then, with the launch of our MAZATROL MATRIX control in 2005, we managed to up the CNC ante even further by providing considerable increases in quality, productivity, ease of operation and safety.

Today, we have once again set a new industry standard in advanced, versatile and user-friendly CNC design, with our MAZATROL SmoothX control that is taking the manufacturing world by storm.

ADVANCED MAZATROL PROGRAMMING

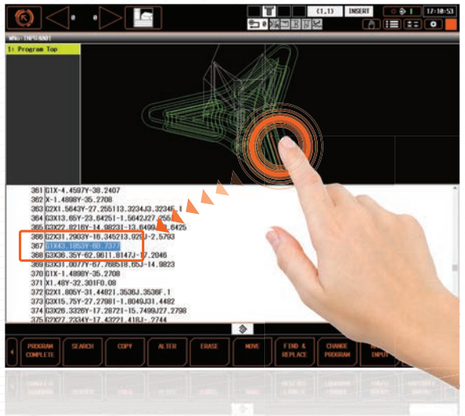
For more than three decades, MAZATROL has been the proprietary programming language featured on all of our CNC systems. Both versatile and user-friendly, MAZATROL allows you to run our machine tools using either conversational programming or more traditional G-code programming (EIA/ISO).

Now better than ever, this programming language, when paired with SMOOTH TECHNOLOGY, puts infinite part-production possibilities under your control. In fact, with our MAZATROL SmoothX control, you will be able to machine in ways you never thought possible.

QUICK EIA

If you prefer EIA instead of conversational programming, this new patent-pending function allows you to quickly generate any toolpath prior to running the program. Plus, you get fast, extremely accurate full 5-axis 3D machining simulation and interference checking capability.

The Quick EIA function lets you touch select a toolpath and then drag it to the corresponding EIA program line, where the program analysis function checks for any problems.



1981
MAZATROL
T-1, M-1

1985
MAZATROL
T-2, M-2

1989
MAZATROL
T32, M32

1995
MAZATROL
TPLUS, MPLUS

1998
MAZATROL
FUSION 640

2005
MAZATROL
MATRIX

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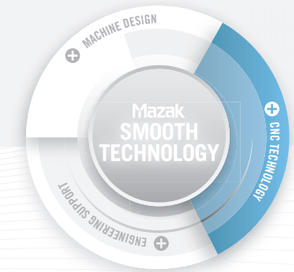
10 AMAZING PRODUCTIVITY ADVANTAGES



CNC TECHNOLOGY

With MAZATROL being a key feature of SMOOTH TECHNOLOGY, we have been able to revolutionize CNC technology and provide you with unequaled productivity advantages.

1 World's Fastest CNC

As the most progressive CNC to power the machine tool industry yet, the MAZATROL SmoothX makes use of hardware enhancements and a new Super High-Speed Mode function to achieve processing times that are four times faster than its predecessor. In other words, the control interpolates code and sends it to the machine tool servos in the shortest time possible.

Such high performance allows you to eliminate common CNC bottlenecks (sluggish hardware and slow processing speeds) from your shop and dramatically shorten your machining times. You also benefit from enhanced full simultaneous 5-axis machining and complex mold processing that involves fine segment feeding.

FAST FACTS

When comparing the MAZATROL SmoothX CNC with the MATRIX 2, you get:

- Triple core CNC processing x 2
- 1.5X faster PLC (program logic controller) performance
- 3X faster servo communication speeds
- 4X faster interpolation capabilities

2 High Gain Feed Forward Control

Through this new motion control function that is tied into the machine tool servos, you can cut your parts three times faster and still achieve the same high level of accuracy as our previous controls.

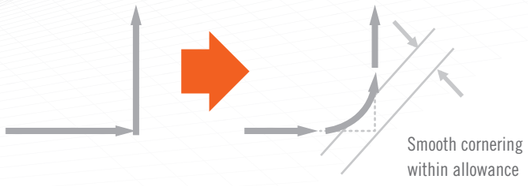
3 Faster Rotary Axis Speeds

With the enhancement of our CNC technology comes faster maximum rotary axis speeds that make it possible for the machine tool to quickly perform gear hobbing and skiving operations. These high speeds also allow for high-quality rotary axis threading processes.

4 Smooth Corner Control

Perfect for machining into corners and curves, this function reduces vibrations and helps shorten part-machining cycle times through cutter path adjustments. Rather than moving the cutter directly into a 90-degree corner, the function inserts a preset radial tolerance.

This tolerance eliminates any dwell resulting from a rapid deceleration in the axial movement often associated with conventional corner machining. Thus, you can achieve smoother corner surfaces, lower the risk of cutter gouging and feed the cutters at a much faster rate.



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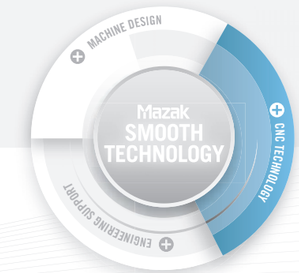
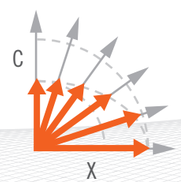
10 AMAZING PRODUCTIVITY ADVANTAGES



CNC TECHNOLOGY

5 Variable Acceleration Control

Through this function, you can maintain the optimal acceleration/deceleration for each combination of moving axes, also known as a block. Not only does this bring out the maximum capability of each axis – especially high acceleration for linear axes and low acceleration for rotary axes – it also reduces overall machining cycle times and ensures part accuracy.



Achieve maximum acceleration for each individual linear and rotary axis, as opposed to being restricted by the one with the lowest acceleration.

6 Smooth Machining Configuration

This cutting condition selection function makes it easy to tune the parameter settings on your machine to correspond with the workpiece material and application at hand. Such dynamics support precision across the entire program while improving throughput.

7 5-Axis Virtual Machining

Utilizing VOXEL graphics technology, this 5-axis 3D simulation function allows you to run real-life part programs on the CNC to check for errors and machine interferences. These extremely realistic and accurate simulations for both MAZATROL and EIA/ISO programming use the exact same machine movement parameters as your Mazak machine model.

8 Intuitive Human/Machine Interface

The CNC features an eye-catching, multi-touch home screen that, within a single-page view, presents all the critical data you need. You can also use your fingertip to pan, rotate or zoom and otherwise manipulate a 3D part rendering. Or, you can flick an area of the screen to scroll through the displayed program G-code. All screen functions are similar to those of a smartphone or tablet.

Accurate machining data is everything in part production, and the new UNDO/REDO function makes changing and saving your CNC program and settings quick and easy. This advanced editing tool supports multiple undo/redo steps so you can go a few steps back and forward as well as repeat undo actions.

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10 AMAZING PRODUCTIVITY ADVANTAGES

CNC TECHNOLOGY

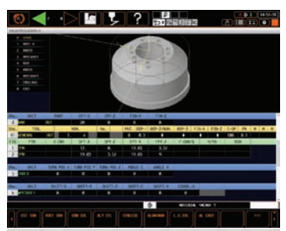
9 Quick Programming Screen

Whether you are programming in MAZATROL or EIA/ISO, this portion of the CNC interface can streamline your efforts, reduce your number of test cuts and boost your overall part quality.

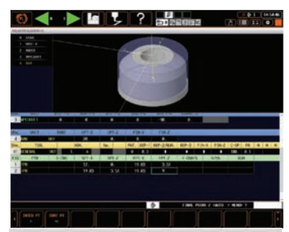
The 3D-ASSIST function within the Quick MAZATROL programming screen easily retrieves the dimensions and coordinates of a part from its 3D CAD drawing for placement into the MAZATROL program. Such capability saves time and reduces operator data entry errors.

The View Surf function within the Quick EIA programming screen provides high-speed toolpath data analysis that easily identifies and corrects errors. It also performs axis reversal point analysis within 5-axis machining toolpaths.

QUICK MAZATROL
New patent-pending function imports 3D CAD models and checks for program errors.



3D model in the process list is displayed with updated programming in real time.



Quickly move to the corresponding section in the MAZATROL program by touching the 3D model.

10 Intelligent MAZATROL Pocket Milling

This function engages a high-efficiency toolpath when milling out part cavities. It maintains a constant angle of tool engagement and cutting loads to ensure optimum machining conditions. This results in the full use of your machine tool's power capabilities and up to 35 percent faster and more efficient machining of even the most difficult-to-cut materials.

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HIGHLY ADVANCED PROGRAMMING

WORKS WITH

INTEGREX i-Series
INTEGREX e-H Series
INTEGREX i-V Series
INTEGREX e-V Series
VORTEX i-V Series
VARIAXIS i-Series
VARIAXIS j-5X Series
VERSATECH Series

CNC TECHNOLOGY

We developed the MAZATROL SmoothX to be the fastest, most progressive CNC in the industry. Every feature and function of this control comes as a direct response to real-world issues and customer input. As a result, you benefit from shorter machining cycle times, especially in fine increment programs for simultaneous 5-axis operations and free-form die-mold machining. Plus, this CNC makes it easy for you to monitor up to five of our machines from one location.

PERFORMANCE FUNCTIONS

+ Super High-Speed Mode provides maximum interpolation capabilities
+ High Gain Feed Forward Control boosts machining speeds and accuracy
+ Fast Rotary Axis Speeds offer fast gear skiving and rotary axis threading
+ Variable Acceleration Control calculates optimal acceleration for a combination of axes
+ Smooth Machining Configuration provides optimized tuning for various machining styles
+ Intelligent Pocket Milling engages a high-efficiency toolpath when milling part cavities
+ Data Guard security limits screen display and data access for up to eight operator levels
+ Minute Spindle Instruction provides rpm control at fractional increments below 1 rpm

PROGRAMMING AND SUPPORT FUNCTIONS

+ 5-Axis Virtual Machining simulates real-life programs to check for machine interferences
+ Quick MAZATROL imports 3D CAD models into MAZATROL and checks for program errors
+ Quick EIA makes it fast and easy to generate toolpaths prior to running a program
+ Smooth CAM RS simulation software offers easy program management via a PC
+ Smooth Tool Management software consolidates a shop's MAZATROL tool data

INTELLIGENT FUNCTIONS

+ Smooth Corner Control makes cutter path adjustments to help shorten cycle times
+ Intelligent MAZA-CHECK compensates for rotary axis errors to ensure high-accuracy machining
+ Intelligent Thermal Shield provides better heat displacement control for improved stability
+ Intelligent Safety Shield offers protection during machine setup and operation
+ Intelligent Maintenance Support prevents unexpected machine downtime
+ Active Vibration Control reduces vibration for high-accuracy positioning
+ Intelligent Balance Analyzer eliminates unbalanced machine table conditions
+ Mazak Voice Adviser provides verbal support for machine setup and confirms safety
+ Intelligent Performance Spindle monitors milling spindle status to minimize downtime

MONITOR AND MAINTENANCE FUNCTIONS

+ Smooth MONITOR allows for equipment monitoring and utilization analysis
+ Mazak Data Library makes it possible to develop software to collaborate with the CNC

HARDWARE FUNCTIONS

+ Large 19" display presents all critical data within a single-page view
+ Multi-touch screen enables smooth operation similar to smartphones and tablets
+ Tilting CNC panel ensures optimum positioning based on operator height
+ A 32GB flash memory
+ Smooth Manual Pulse Generator simplifies setup operations inside the machine*

**Wired pendant control comes standard. Wireless pendant control available as option.*

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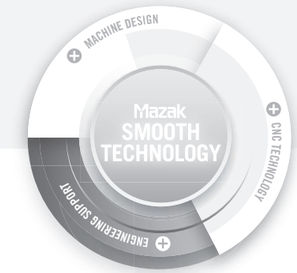
DESIGN TO DATA COLLECTION

ENGINEERING SUPPORT



RESEARCH AND DEVELOPMENT

For us, ongoing research and development is everything as it is critical to the innovation process. In fact, we have R&D Centers in all of our manufacturing plants around the world, and each one is staffed with master innovators and expert engineers. This helps ensure that we are making machine tools that reflect local customer requirements.

Additionally, our massive investment in R&D gives us a constant influx of knowledge that allows us to continuously develop our product lines, which includes the latest integration of SMOOTH TECHNOLOGY into our machines.

MANUFACTURING PROCESSES

Not only do our machine tools with SMOOTH TECHNOLOGY provide you with the highest possible productivity levels, we also manufacture them under the most productive of circumstances.

Our iSMART Factories take a Production-On-Demand approach as well as rely on the full digital integration of our manufacturing cells and systems to achieve optimal levels of quality, efficiency and productivity in machine production.

More importantly, however, our advanced manufacturing processes enable us to maintain the agility and responsiveness you require to be competitive and grow your business.

AUTOMATION INTEGRATION

Our modular PALLETECH System is the industry's most advanced pre-engineered palletized manufacturing solution. So, in developing SMOOTH TECHNOLOGY, we wanted to make sure this exclusive piece of automation was key to the platform. Therefore, we applied the technology to the PALLETECH Manufacturing Cell (PMC) software and are calling it Smooth PMC.

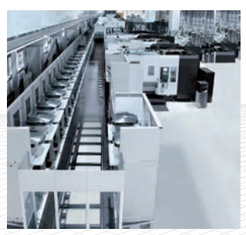
Smooth PMC features a home screen that has the same look and feel as the one on the MAZATROL SmoothX CNC. This schedule operation software predicts the necessary tools and output according to the production schedule. A variety of graphs within the software also allows for utilization analysis. Furthermore, you can use a smartphone or tablet to check the operation status of the equipment.

DIGITAL MANUFACTURING

For digital manufacturing functionality, SMOOTH TECHNOLOGY supports the MTConnect® open communications protocol and includes an NC Data Library – an Ethernet interface to a library of data-accessing functions for programmers if they wish to communicate with the machine via an Ethernet network. This also means machines with SMOOTH TECHNOLOGY can have an MTConnect adapter for collecting data from the MAZATROL CNCs.

MTCONNECT FACT

An MTConnect-enabled machine monitoring system can give you all the facts and figures you need to improve equipment utilization inside your shop.



A CUSTOMIZED APPROACH TO AUTOMATION

Our dedicated automation team can provide you with an automated solution that fits your unique needs, whether it involves our advanced PALLETECH System or a simple bar feeder.

They will also help you implement software solutions, such as Smooth PMC, to ensure you get the maximum return on your automation investment. And prior to the implementation of your automation solution, we will evaluate its impact on your entire operations.

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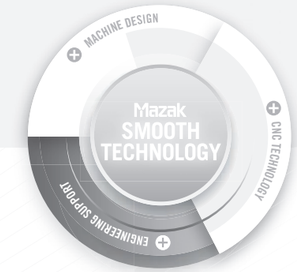
SERVICE AND SUPPORT

ENGINEERING SUPPORT

LOCAL ACCESS

Through our Optimum Plus program, we provide the best, most comprehensive customer service and support in the industry, from machine and CNC technical support, to fast spare parts fulfillment to progressive learning courses.

Additionally, our eight Technology Centers throughout North America can assist you with process and engineering expertise as well as turnkey system integration.



Mazak OPTIMUM plus
TOTAL SUPPORT FOR MAZAK CUSTOMERS

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SERVICE AND SUPPORT

ENGINEERING SUPPORT

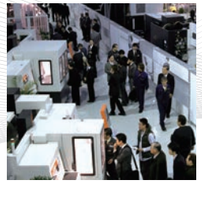
GLOBAL NETWORK

While a lot of time and energy went into the development of our SMOOTH TECHNOLOGY platform, we do not stop our efforts after you purchase your machine.

Thanks to our global support network, we can easily provide you with everything you need to achieve higher productivity and timely service for as long as you own your machine.

Designed to supply spare parts 24 hours a day, 365 days a year, our World Parts Center works closely with our regional part centers across the globe to ensure we can keep your machine running smoothly at all times.

With more than 38 Technology Centers and 41 Technical Centers in over 20 countries, we can provide you with highly accessible learning opportunities as well as applications and service support.



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Mazak

MAZAK SMOOTH TECHNOLOGY

www.MazakUSA.com

MAZAK CORPORATION
NORTH AMERICAN MANUFACTURING HEADQUARTERS
8025 Production Drive, Florence, KY 41042
Tel: (859) 342-1700 Fax: (859) 342-1865