



FIVE LEVELS OF MULTI-TASKING

Machine Selection Guide





Maximize Your Output With the Right Level of Multi-Tasking

Doing more with less is a requirement in today’s increasingly lean shops, and manufacturing professionals have come to demand machine tools that can Multi-Task as much as possible. Ever since Mazak first developed the SLANT TURN 40N ATC decades ago, we’ve continued to deliver game-changing Multi-Tasking innovations. Leveraging the right level of Mazak Multi-Tasking technology for your specific application needs is the key to maximizing your ROI and production output – and our Five Levels of Multi-Tasking will ensure your success in integrating the perfect solution for your part production.

WHY MULTI-TASKING?

- » Significant reductions in production lead times and part costs enable improved competitiveness and more profitable job shop pricing structures.
- » High machining accuracy and overall part quality is assured through limited part handling and optimized part designs.
- » Increased production capacity, flexibility, productivity and profitability can be achieved with fewer machine tools.
- » Just-in-time (JIT) part production improves cash flow.
- » Less floor space, fixturing, tools and labor are required.
- » Automatic load/unload functionality, integrated within machining cycles, enables unattended operations.
- » Faster returns on investment (ROI) can be realized through increased throughput for larger-scale operations.

WHY MAZAK MULTI-TASKING?

- » Mazak is a pioneer in Multi-Tasking technology and DONE IN ONE® single-setup part production.
- » The comprehensive range of machine configurations includes the industry’s leading Multi-Tasking CNC and standardized automation.
- » An extensive install base means widespread local expert service and applications support.
- » Our massive inventory of replacement and spare parts is available with 97% same-day shipping.
- » Technology and Technical Centers with engineers who know your ancillary CAM systems can provide expert programming and application advice.
- » An extensive range of Mazak solutions partners familiar with Multi-Tasking, including tooling, CAM and workholding suppliers, can provide additional assistance.



Mazak’s Five Levels of Multi-Tasking

To make the most of your investment in Multi-Tasking technology, you need to find the machine best suited for your part-processing needs now and into the future. Mazak’s Five Levels of Multi-Tasking selection guide is a tool that helps you identify the equipment that’s optimally aligned with your shop’s needs – and with the industry’s widest range of Multi-Tasking machines, from simple milling and turning capabilities to the combination of subtractive and additive operations, you will be sure to find a transformative solution for your shop.

Level One

Primarily designed for turning work with simple milling, drilling and tapping functionality, Level 1 offers simple but innovative Multi-Tasking equipment well suited for rounded parts with minimal complexity. These machines feature single main turning spindles with C-axis capability, drum-style tool turrets with rotary tool options and NC tailstocks, as well as steady rests on the larger machine models.

QUICK TURN Series

The perfect combination of productivity, accuracy and reliability, QUICK TURN CNC Turning Centers with rotary tool milling (M) spindles offer high-torque performance for unsurpassed production value with small to medium-sized parts.



SLANT TURN Series

Powerful, heavy-duty CNC turning centers made to turn large parts for industries such as aerospace and energy, SLANT TURN Series machines with rotary tool capabilities enable even greater productivity with secondary milling and drilling operations.



IVS Series

Ideal for high-volume production of automotive components and more, IVS Inverted Vertical Spindle Series machines with rotary tool milling capabilities can be arranged in a production line with a conveyor for unattended operations.



MEGA TURN Series

The MEGA TURN Series excels at heavy-duty cutting for large cast iron and steel workpieces common in the heavy equipment and aerospace industries. Rotary tool capabilities enable even greater process flexibility for this versatile series of vertical turning centers.



SQR Series

Thanks to a single-spindle, two-turret configuration for simultaneous cutting operations, the SQR Series offers highly efficient machining that can be further enhanced with milling spindle capabilities on the upper turret for secondary drilling and milling operations.

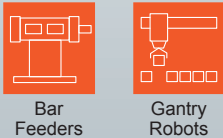


QUICK TURN part

LEVEL ONE

Control:
MAZATROL SmoothG CNC

Automation Options:



Level Two

The second level of Mazak Multi-Tasking introduces true DONE IN ONE® efficiency, either with two spindles and a milling turret with Y-axis off-centerline capabilities or two spindles and two turrets. This enables manufacturers to easily handle more complex secondary machining requirements, including flats, grooves and keyways milled above or below the part's centerline, as well as simple probing routines.

HQR Series

Developed for high-volume throughput and part-processing versatility, the HQR Series uses a two-turret/two-spindle configuration that reduces part cycle times for operations ranging from chuck work to the machining of large-diameter bar stock.



QUICK TURN Series

The reliable QUICK TURN Series delivers even more productivity with second turning spindle (S) and Y-axis capability (Y) packages.



MULTIPLEX W Series

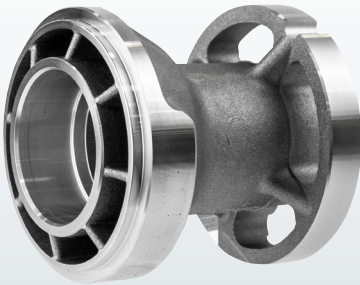
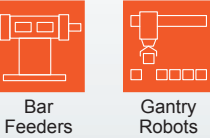
A dual-spindle/dual-turret machine series with a center partition for added part-processing flexibility, MULTIPLEX W Series Turning Centers are ideal for mid-size lot production.



LEVEL TWO

Control:
MAZATROL SmoothG CNC

Automation Options:



MULTIPLEX part



Level Three

Featuring independent milling spindle headstocks with B-axis indexing, full Y-axis travels, part probing across the centerline, and expanded tool magazines, machines at Level 3 let shops efficiently handle feature-rich, medium-sized parts with exceptional Multi-Tasking capabilities, 4-axis simultaneous machining and 5-axis tool tip positioning with outstanding speed and precision.

INTEGREX j Series

With its space-saving machine design and high-speed, high-torque milling spindle, the INTEGREX j Series provides increased part-processing flexibility for shops that need automatic tool changing capabilities without simultaneous 5-axis capabilities.



VARIAXIS j Series

High-accuracy, high-value Multi-Tasking machines capable of handling a wide range of aerospace, automotive and general machinery applications, the VARIAXIS j Series dramatically reduces overall production time with a range of automation and machine configuration options that further reduce setup time.



LEVEL THREE

Control:

MAZATROL SmoothG or SmoothX CNC

Automation Options:



Bar Feeders



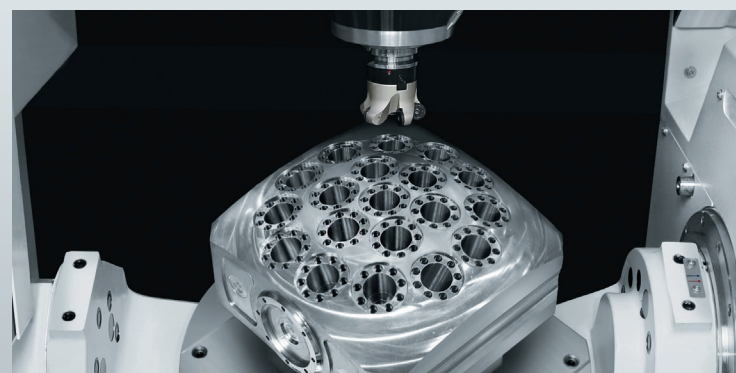
Gantry Robots



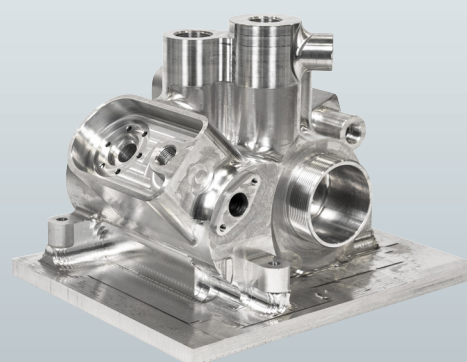
Part Loaders/Unloaders



Parts Catchers



VARIAXIS j Series facemilling



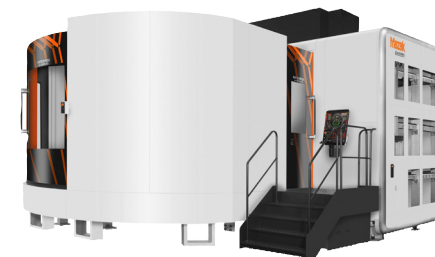
VARIAXIS i Series part

Level Four

With the introduction of full simultaneous 5-axis machining with independent B-axis milling headstocks, the machining centers at Level 4 use large-capacity tool changers, integrated pallet changers, programmable steady rests and SUPERFLOW high-pressure coolant to handle large, heavy and highly complex parts with incredible efficiency.

INTEGREX e-H and e-V Series

The INTEGREX e-H and e-V Series are built to efficiently handle the largest, toughest workpieces in the world in single setups.



INTEGREX i Series

Offering unparalleled versatility, speed, accuracy and ease of use, the INTEGREX i Series includes a wide range of configurations to handle any complex components.



INTEGREX i-H Series

The next generation of INTEGREX, the i-H Series has been fully optimized for the highest level of Multi-Tasking excellence, including an automation-ready machine enclosure design and the AI-powered MAZATROL SmoothAi CNC.



VARIAXIS i Series

With a reliable and robust machine design, VARIAXIS i Series machines easily perform multiple and complex curved-surface operations with DONE IN ONE® efficiency.



VARIAXIS C Series

The automation-ready VARIAXIS C Series uses rigid C-frame construction, a standard 30-tool changer, double-ended tilting table and fast rapid traverse rates to reduce cycle times on demanding jobs.



LEVEL FOUR

Control:

MAZATROL SmoothG, SmoothX or SmoothAi CNC

Automation Options:



Bar Feeders



Gantry Robots



Part Loaders/Unloaders



Parts Catchers



Articulated Robots



PALLETECH



Multi-Pallet Pool (MPP)



MAZATEC SMS



Level Five

The fifth level of Mazak Multi-Tasking technology applies the latest hybrid, joining and specialized subtractive capabilities, as well as other application-specific technologies, to Level 4 Multi-Tasking machines. These HYBRID Multi-Tasking solutions enable state-of-the-art manufacturing strategies that ensure efficiency for the most complex machining tasks, especially when paired with advanced automation solutions such as PALLETECH and process development assistance from Mazak applications experts.



MAZATROL SmoothAi CNC

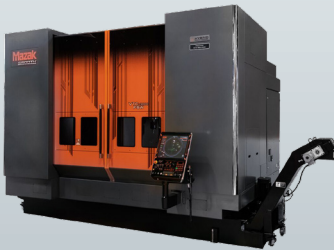
An AI-powered programming powerhouse, the MAZATROL SmoothAi CNC was designed for Multi-Tasking excellence with digital enhancements that add efficiency and value throughout the machining process. Leveraging the power of AI, machine learning and advanced data management technology, this next-generation control offers complete ease of use and helps to ensure high-speed, high-accuracy machining performance.

Friction Stir Welding

The innovative Friction Stir Welding (FSW) process involves a solid-state welding technique that uses a non-consumable tool to produce frictional heat and forging pressure for defect-free full-penetration joints. This is particularly useful for alloys with low melting points, including aluminum, copper and brass.



VTC-800 FSW



VTC-300C FSW

Auto Gear

Developed to help shops bring gear production in-house with a single-setup solution, Auto Gear (AG) machines use specialized, user-friendly software to synchronize milling and main spindles to produce parallel-axis O.D. and I.D. gear and spline types, hob O.D. spur and helical gears, and even measure and deburr gears on a single machine platform.



INTEGREX i-200ST AG



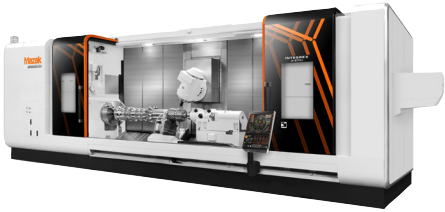
INTEGREX e-1250V/8 AG

Advanced Subtractive Machining

With application-specific machine configurations and software packages, many exceptional Mazak Multi-Tasking machines can be made into HYBRID solutions that enable advanced operations like broaching, honing, grinding, skiving and hobbing.



HCN-4000 with honing



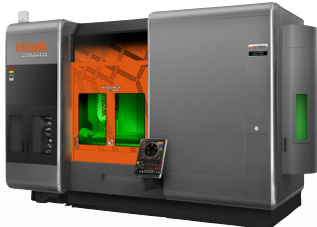
INTEGREX e-H and e-V Series



INTEGREX i Series

Additive Manufacturing

Mazak's range of Additive Manufacturing (AM) solutions, from the innovative Hot Wire Deposition (HWD) system to more conventional powder-based laser sintering, allow manufacturers to easily complete part building and finishing in single setups thanks to innovative combinations of subtractive and additive technologies.



INTEGREX i-400S AM



INTEGREX i-200S AM



VARIAXIS j-600/5X AM (WIRE ARC)



VC-500A/5X AM HWD



VC-500 AM



Additive parts

LEVEL FIVE

Control:

MAZATROL SmoothG, SmoothX or SmoothAi CNC

Automation Options:



Bar Feeders



Gantry Robots



Part Loaders/Unloaders



Parts Catchers



Articulated Robots



PALLETECH



Multi-Pallet Pool (MPP)



MAZATEC SMS

MACHINES

APPLICATION CATEGORIES

	IVS	HCN Series	HQR	INTEGREX e-H Series		INTEGREX e-V Series		INTEGREX i Series	
LEVEL	1	5	2	4	5	4	5	4	5
GENERAL MACHINE TRAITS									
Turning, drilling tapping and milling	●	●	●	●	●	●	●	●	●
Keyways on the centerline	●								
Y-axis off-centerline machining		●	●	●	●	●	●	●	●
Angle drilling, tapping and milling									
DONE IN ONE®		●	●	●	●	●	●	●	●
Contouring, full simultaneous 5-axis machining		●		●	●	●	●	●	●
HYBRID Multi-Tasking functionality (additive, joining and advanced subtractive techniques)		●			●		●		●
EQUIPMENT SPECIFICATIONS									
Turning spindle with C axis	●								
Turning spindle and second turning spindle with C axis		●	●	●	●	●	●	●	●
Drum turret with rotating tools	●		●						
Tailstock	●								
Full Y-axis travel		●	●	●	●	●	●	●	●
Milling headstock with B-axis indexing		●		●	●	●	●	●	●
Tool magazine with automatic tool changer		●		●	●	●	●	●	●
Pallet changer		●		●	●	●	●	●	●
Additional application-specific HYBRID technologies		●			●		●		●
AUTOMATION OPTIONS									
Bar feeders	●	●	●	●	●	●	●	●	●
Parts catchers	●	●	●	●	●	●	●	●	●
Gantry robots		●		●	●	●	●	●	●
Part loaders/unloaders		●		●	●	●	●	●	●
Articulated robots		●		●	●	●	●	●	●
PALLETECH		●		●	●	●	●	●	●
Multi-Pallet Pool (MPP)		●		●	●	●	●	●	●
MAZATROL SMS		●		●	●	●	●	●	●
PROTOTYPING APPLICATIONS									
Low Volume		●		●	●	●	●	●	●
Mid to High Volume	●	●	●					●	●
WORKPIECE SIZE									
Small, Light								●	●
Medium Size/Weight	●	●	●					●	●
Large, Heavy		●		●	●	●	●	●	●
PROCESSING REQUIRED									
Simple	●		●						
Complex		●		●	●	●	●	●	●
Highly Complex				●	●	●	●	●	●

INTEGREX i-H Series		INTEGREX j Series		MEGA TURN	MULTIPLY	QUICK TURN	QUICK TURN	SLANT TURN	SQR	VARIAXIS C Series	VARIAXIS i Series		VARIAXIS j Series	VC Series	VTC Series	
4	5	4	5	3	5	1	2	1	1	4	4	5	3	5	5	5
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Mazak Technology Centers

As a key component of Mazak’s comprehensive customer support, its network of Technology and Technical Centers strategically located across North America puts component machining demonstrations, experienced applications engineers and training in close proximity to customers. These Technology Centers also provide a channel for customer input to Mazak manufacturing for the development of new machine tool technology.

Technology Centers offer advanced application support, education and training, new technology and manufacturing systems, along with on-site training and technology seminars.

Advanced application support

- Expert applications engineers help customers optimize part-production processes and create effective manufacturing solutions.
- Mazak-certified cutting tool, workholding and automation partners collaborate to develop optimized turnkey manufacturing solutions.
- Test cuts of customer parts run on the latest, most-advanced machine tools.
- Secure applications development and complete design privacy of each customer’s individual manufacturing system.

Education and training

- Education, training and seminar events in cooperation with Mazak technology partners.
- Free access to the most advanced machine tools.
- Industry focused education - general aerospace, energy, jet engine and construction.



New technology and manufacturing systems

- The latest, most-advanced manufacturing systems that can optimize the processing of industry-specific components.
- Productivity experts help customers select the best new machine tool technology for their particular businesses.

On-site training and technology seminars

- Hands-on applications and operator development courses.
- Regularly scheduled market-focused events that provide valuable industry insight.



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Optimum Plus Service and Support

Mazak Optimum Plus

To maximize machine tool investments, the [Mazak Optimum Plus](#) program represents a company-wide commitment to provide the best-possible, most-comprehensive support.

The Optimum Plus program encompasses Five Pillars – distinct yet interrelated areas:

- Single-source service
- Technical support – machine and CNC
- Parts support
- Progressive learning
- Spindle and unit rebuild

Single-source Service

Mazak is a single point of contact for any Mazak-related service need, whether it involves a machine, control, accessory or automation solution. This effective service approach helps customers maintain the highest possible level of productivity.

Benefits of [Mazak's single-source approach](#) include:

- Free technical phone support and software upgrades for the life of a Mazak machine.
- Software support that provides instantaneous diagnostic services via remote real-time systems.
- Guaranteed phone response to any technical question within one hour via a 24/7 technical phone support system.
- More than 350 factory-trained Mazak service representatives and certified distributor personnel who can be at a customer's site within 24 hours under most circumstances.
- Wide variety of services, including laser calibration to ISO, ANSI and JIS standards; ball bar qualification and analysis; preventive maintenance plans and programs; and vibration analysis and benchmarking.

Technical support – machine and CNC

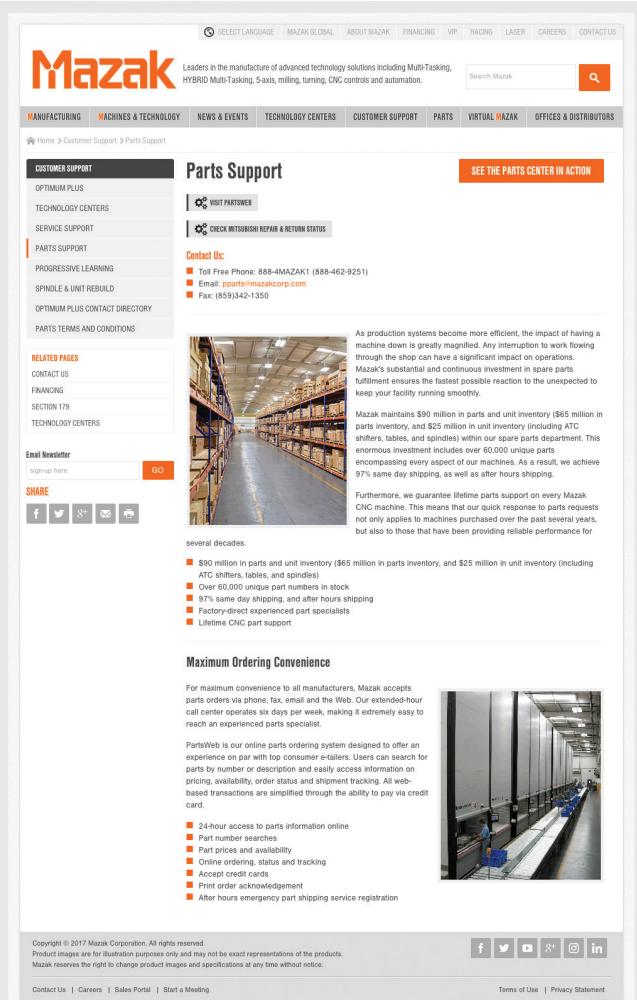
Comprehensive warranties on every Mazak machine tool component, including a two-year part warranty on CNC control components.

[Technical support](#) for machines and CNCs also includes:

- Additional warranty coverage (available upon request).

Mazak OPTIMUMplus

TOTAL SUPPORT FOR MAZAK CUSTOMERS



The Mazak Optimum Plus program enables customers to maximize the value of their Mazak purchases.

Parts Support

Mazak's spare parts fulfillment ensures the fastest possible reaction time. The state-of-the-art Mazak North American Parts Center uses the latest AS/RS fully automated warehouse storage system technology and maintains a \$65 million parts inventory.

Benefits of the North American Parts Center include:

- Average 97% same-day parts shipment and after-hours shipping.
- Over 60,000 part numbers in stock.
- Convenient web-based parts ordering.
- Factory-direct experienced part specialists.
- Lifetime CNC parts support.



Fully automated warehouse storage systems ensure the fastest delivery of Mazak spare parts.

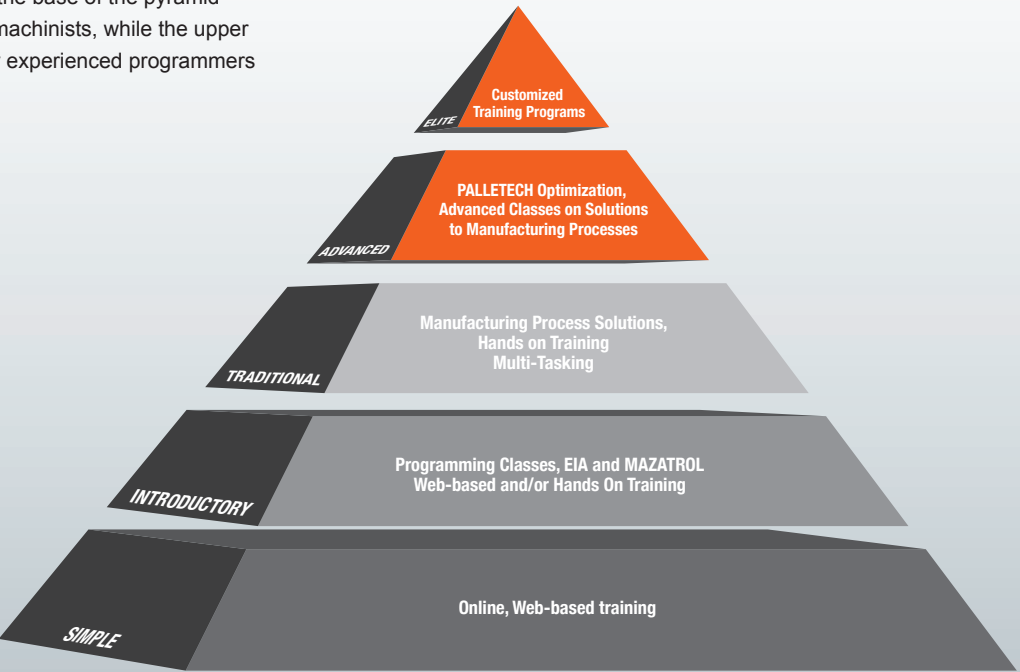
Progressive Learning

[Mazak's Progressive Learning](#) represents a unique, phased approach to education and training for customers, combining hands-on training, web-based instruction and real-world examples. The program's tiers of offerings – Pyramid of Learning – range from self-paced coursework to highly advanced classes. Every Mazak machine includes three years of programming training at no charge to customers.

[Mazak's Pyramid of Learning](#) is a visual representation of its approach to training. The lower levels at the base of the pyramid represent basic skills education for new machinists, while the upper levels signify advanced training for highly experienced programmers and operators.

Pyramid of Learning levels include:

- Simple online training
- Introductory programming training
- Traditional hands-on training
- Advanced training
- Customized training





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