

Mazak AUTOMATION SYSTEMS

Automation Solutions by Mazak

**A COMPREHENSIVE, SINGLE-SOURCE
APPROACH TO AUTOMATION SOLUTIONS**

Mazak

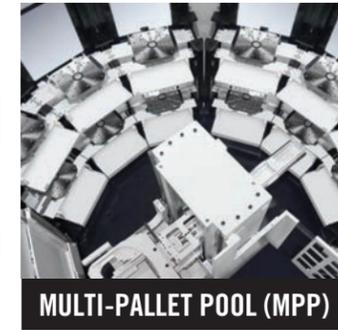
All-In-One AUTOMATION Provider

No matter what industry you're in, the only way to stay competitive in today's manufacturing world is with automation. It optimizes your spindle utilization, boosts the output of your workforce and provides unmatched part accuracy and consistency. With automation's high level of predictability and process control, manufacturers can minimize the risk of human error and maximize productivity through lights-out production.

At Mazak, we understand how matching the right type of automation to your particular part production operations is critical to project success, something we can easily demonstrate with a free system simulation. With our turnkey automation solutions, as well as our experience and expertise in implementing them, you'll have everything you need to unlock your shop's full productivity potential. And thanks to our comprehensive single-source parts and service program, you'll reap the benefits of your automation system for years to come.



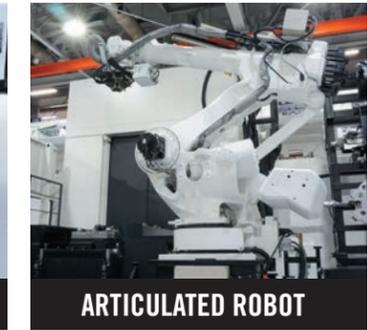
GANTRY LOADER



MULTI-PALLET POOL (MPP)



PALLETECH SYSTEM



ARTICULATED ROBOT

DETERMINE THE RIGHT LEVEL OF AUTOMATION

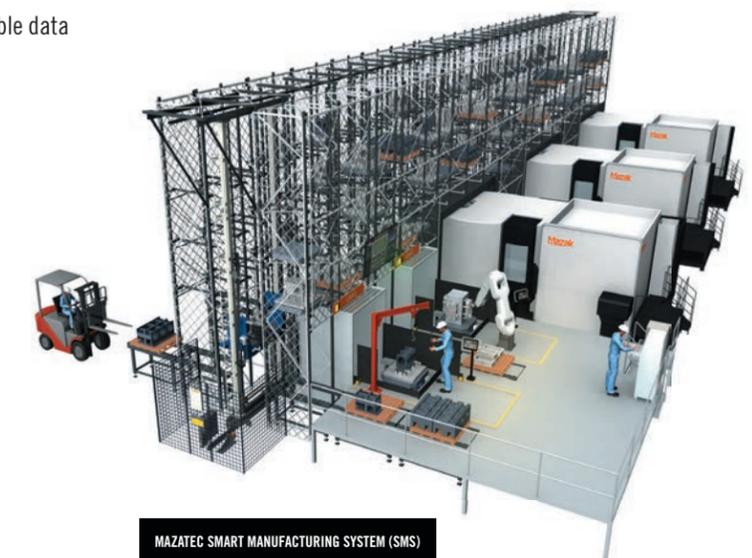
To realize the greatest gains in productivity and efficiency, it's critical to select an appropriate automation solution or package of solutions for your specific needs. Mazak's extensive range of automation systems includes everything from simple bar feeders to fully connected factory floors that feature automation across the entire process.

Our pre-engineered solutions are ideal for common machining operations:

- **Bar feeders** – perfect for increasing the productivity of shaft-type part-processing applications
- **Gantry loaders** – speedy loading and unloading for common part families produced in small-batch runs
- **Multi-Pallet Pool (MPP)** – a multiple pallet stocker system with a space-saving design capable of expanding to fit a shop's needs
- **PALLETECH** – an advanced palletized system with a modular design that can accommodate any manufacturing requirements and a wide variety of load stations to suit your load/unload requirements
- **MAZATEC Smart Manufacturing System (SMS)** – Mazak's machining, automation and Smart technologies combined with Muratec's automated high-density storage and retrieval system
- **SMOOTH TECHNOLOGY** – SMOOTH PMC and SMOOTH MPP software enables the remote monitoring of PALLETECH, MAZATEC SMS and MPP systems

For more complex operations, Mazak offers fully custom automation solutions, including:

- **Articulated robots** – Two to seven-joint robots that can perform highly complex movements to accomplish peripheral operations and part transfers
- **Connectivity** – Utilizing MTConnect® and other tools to gather all available data and optimize processes by identifying lean manufacturing strategies



MAZATEC SMART MANUFACTURING SYSTEM (SMS)

BAR FEEDERS

EASILY INCREASE PRODUCTIVITY AND MATERIAL UTILIZATION



Made for increasing productivity, throughput and quality when turning shaft-type parts, a bar feeder is one of the simplest, most cost-effective forms of automation available. It allows you to automate the loading and feeding of bar material into your CNC lathe with minimum build-up area required. Standard bar feeders typically feed bar material up to four inches in diameter, but if you need a larger size, we can help with a custom solution.

With a bar feeder, you can:

- Easily and affordably boost machining efficiency and productivity
- Increase throughput by not having to individually feed slug material
- Automatically sequence workpiece machining for minimal bar material scrap
- Machine multiple part types from one piece of bar material
- Save workspace via side storage and bar loading
- Precisely machine at high speeds as the lathe's spindle remains unaffected
- Process bar materials with imperfect shapes and dimensions

Pairs with:

- INTEGREX i-Series
- HYPER QUADREX Series
- MULTIPLEX II Series
- MULTIPLEX W Series
- QUICK TURN NEXUS Series
- QUICK TURN Series
- Articulated robots
- Gantry loaders

INTEGREX i-100 BARTAC-S WITH AN INTELLIGENT BAR LOADER SYSTEM



GANTRY LOADERS

FAST, EFFICIENT PART LOADING AND UNLOADING



Ideal for small-batch runs of a common part family up to eight inches in diameter, gantry loaders quickly load and unload workpieces into and from machines. Essentially an overhead rail-mounted robot, this form of automation is most suitable for chucker-style work. It can, however, handle shaft work that is less than six inches in length. Overall, gantry loaders are easy to install and operate, providing a quick, turnkey system that results in immediate productivity increases.

With a gantry loader, you can:

- Economically boost efficiency through unsupervised loading and unloading of workpieces
- Achieve continuous operation with accurate and consistent performance
- Shorten workpiece change times for an overall increase in productivity
- Increase versatility via a variety of loading stations and robot hands
- Effectively run several machines with only one operator

Pairs with:

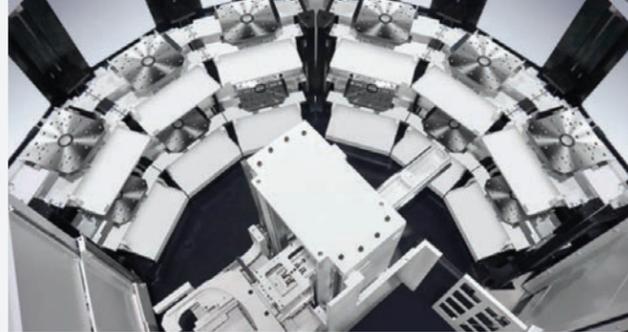
- DUAL TURN 20
- INTEGREX i-Series
- MULTIPLEX II Series
- MULTIPLEX W Series
- QUICK TURN NEXUS Series
- QTU Series
- Articulated robots
- Bar feeders

FF-5000/40 WITH GANTRY LOADER



MULTI-PALLET POOL (MPP) SERIES

UNMANNED OPERATION SYSTEM FOR SMALL-VOLUME PRODUCTION



SMOOTH MPP



Our space-saving MPP system is a pre-engineered and compact multiple-pallet stocker that is ideal for manufacturers who require basic automation to increase a single machine's productivity but lack the required floor space for traditional horizontal pallet stockers. Designed as a modular system, it allows you to vertically expand an existing MPP to fit the needs of your growing facility. You can also add a new MPP system to an existing compatible machine. The MPP Series has the stability and flexibility to handle all varieties of small-volume part production.

With an MPP Series system, you can:

- Increase production efficiency and flexibility on existing machines
- Obtain 24/7 machine utilization without additional manpower
- Create just-in-time production schedules to minimize inventory overhead
- Successfully optimize high-mix, low-volume production
- Expand the modular system for higher volume operations
- Manage production queues from anywhere using web-based control software

Pairs with:

- VARIAXIS i-600
- VARIAXIS i-700
- HCN-4000

The powerful management software used to oversee MPP operations, SMOOTH MPP is based on the SMOOTH PMC software created for PALLETECH and MAZATEC SMS. After an operator inputs the production schedule, the machine will perform operations automatically. With the machine's equipped MAZATROL SmoothX or SmoothG CNC controls, operators can analyze production results, system utilization and other data. If connected to a user-prepared network, system data is accessible on office PCs, tablets and smart phones.

Monitoring

System and production status are displayed visually. The monitoring of system operation is extremely convenient.



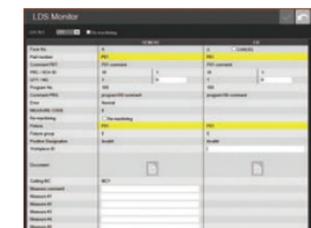
Home screen



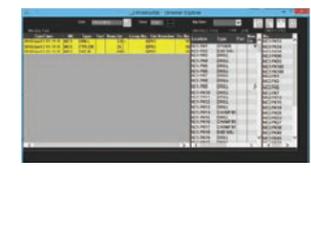
System monitoring screen

Production schedule display

To assist the operator, displays such as the production schedule and the list of missing tools are available.



Production schedule display



Missing tools display

Production results display

A wide variety of graphs display the production results for convenient system utilization analysis.



Gantt chart screen
(One week of operation results data)



Analysis screen
(Analysis of machining time and setup time)



MULTI-PALLET POOL SYSTEM

PALLETECH SYSTEM

ADVANCED, PRE-ENGINEERED PALLETIZED MANUFACTURING SYSTEM



PALLETECH, our exclusive pre-engineered palletized manufacturing system, brings continuous uninterrupted machining operations to today's advanced manufacturing environments. Compatible with our range of Horizontal Machining Centers as well as most of our vertical, 5-axis and Multi-Tasking machines, PALLETECH is a modular solution with the flexibility to accommodate any manufacturing environment or volume requirement. The system is designed with specific rows for computer-controlled raw material storage. Plus, it's not limited to a specific workpiece type or material.

With a PALLETECH, you can:

- Optimize your labor with one employee operating multiple machines
- Keep your machines running 24/7 without adding night or weekend shifts
- Give priority to last-minute jobs without reorganizing other work
- Increase your pallet storage while taking up minimal floor space
- Gain the flexibility required for shorter product life cycles
- Reduce in-process inventory and accomplish just-in-time production
- Easily queue up and prioritize production using the web-based cell controller software

Pairs with:

- HCN Series
- INTEGREX e-V Series
- INTEGREX i-V Series
- ORBITEC 20
- VARIAXIS i-Series
- Articulated robots

Modular Flexibility

PALLETECH comes standard with a single-level pallet stocker. However, its modular design makes it easy to add pallets, loading stations and part wash stations to your system, allowing you to match the pace of your capital investments with the growth of your business. In fact, it accommodates up to 15 Mazak machines, 6 to 240 pallets and as many as 8 loading stations. Pre-engineered expansions are easy to implement. In fact, many multi-machine PALLETECH systems began as single standalone machines.

PALLETECH OPTIONS

- 1, 2 and 3-level pallet stocker configurations
- Tilting load stations
- Part wash stations
- Raw material storage

PMC Web Cell Controller Software

With our PALLETECH Manufacturing Cell controller software, shop management can monitor operations, view and change schedules on-the-fly, manage part program files from anywhere on the network, track tool life/breakage and issue instructions to the shop floor, all over standard PCs and networks. Users are also able to interrupt a planned machining queue to produce an emergency part with no cost penalty. PALLETECH features cell-controller and ERP connectivity using optional software.

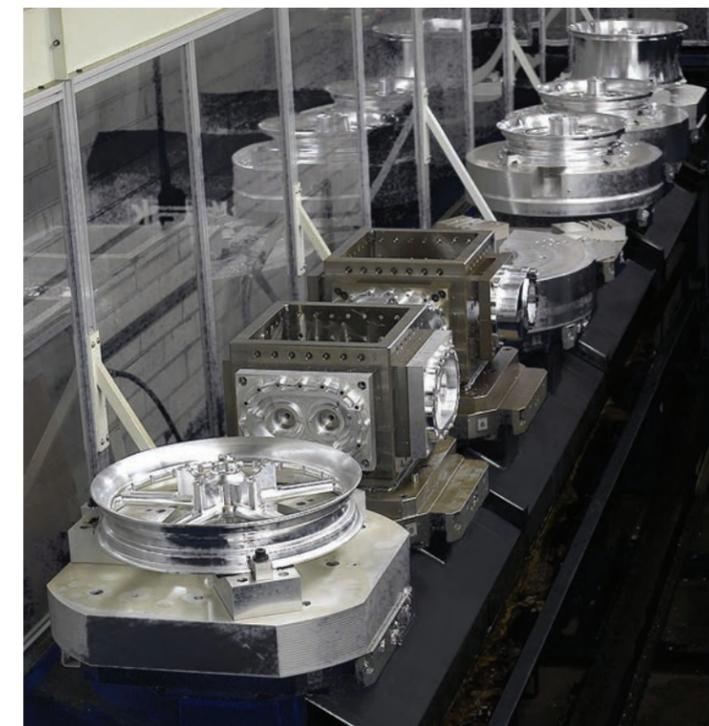
Plot Out Your PALLETECH

PALLETECH has the highest number of successful installations of any pallet handling system on the market because we offer free manufacturing simulations to ensure you get the best system configuration for your needs.

By entering inputs, such as part cycle times, parts per pallet and load/unload times, into our computer simulation software, we can help you determine the number of machines, fixtures and operators necessary to complete a specific production schedule.



HCN-6800 WITH PALLETECH SYSTEM



MAZATEC SMART MANUFACTURING SYSTEM (SMS)

LARGE-CAPACITY, HIGH-EFFICIENCY AUTOMATED SYSTEM FOR HIGH-MIX, LOW-VOLUME PRODUCTION



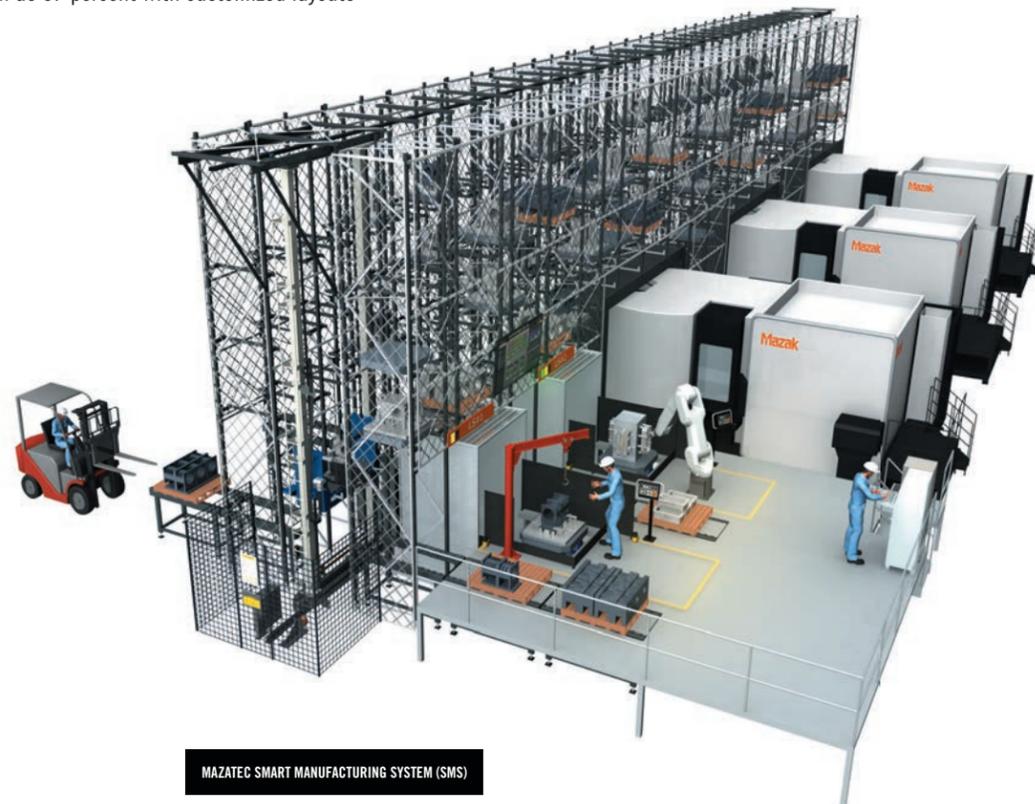
The MAZATEC SMS system combines unmanned lights-out manufacturing, IIoT connectivity and a space-saving stocker-type system to achieve the highest levels of output and productivity. Made in conjunction with Muratec, the MAZATEC SMS uses the Mazak SmartBox and SMOOTH PMC management software to pair interconnected machines to Muratec's vertically oriented system, which includes pallets, a material bucket and high-speed stocker crane. To match each manufacturer's specific production needs, the fully modular system can have a maximum of 240 pallet stockers in a six-level configuration, depending on part and tool size.

With MAZATEC SMS, you can:

- Fully automate entire production cells or facilities
- Add up to 150 pallets in six different sizes with a stocker system as high as 39.4 feet
- Collect and synthesize data across processes and machines
- Increase ROI by applying automation universally to a spectrum of part types
- Boost space efficiency by as much as 67 percent with customized layouts

Pairs with:

- Horizontal Machining Centers
- Multi-Tasking machines



Complete Modularity and Flexibility

The MAZATEC SMS has incredible capacity but makes it easy for manufacturers to start with only the components they most need. The system can be expanded as necessary, with a maximum of 240 pallet stockers serving 15 machines and 8 loading stations. For greater cost efficiency, the system can incorporate various sizes and types of machine tools into the same automated manufacturing system. Such flexibility is possible because the MAZATEC SMS accommodates different sizes of machine tool pallets, as does the system's single stocker crane.

Take Control of Your Data

As key components of the MAZATEC SMS, the SMOOTH PMC production management system and Mazak SmartBox's IIoT technology, along with Muratec's automated system control, all interconnect/synchronize with a customer's enterprise resource planning ERP/MRP host and MES execution systems. With the addition of network connectivity, operators can manage the MAZATEC SMS from any computer or tablet.

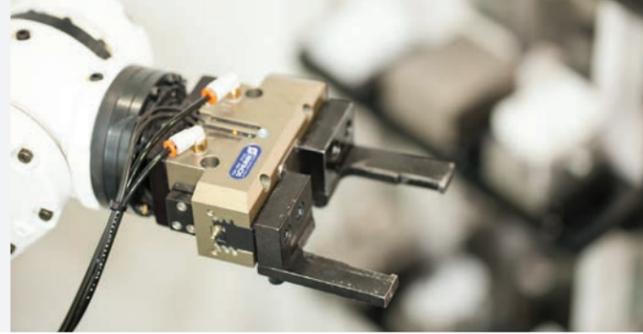
Achieve a Fully Automated Workflow

Peripheral equipment includes individual stations for loading and centering, tilt loading, raise and lower loading, work setup and part washing. In addition to keeping the machine tools supplied with work, the system's stocker crane handles the system's overall input of raw parts and the output of finished ones.



ARTICULATED ROBOTS

HIGHLY ADVANCED ALTERNATIVE TO TRADITIONAL PRODUCTION



Primarily a customized type of product, articulated robots provide automation for part transfers and peripheral operations. They can also eliminate the challenges that come with handling large, heavy or cumbersome parts, such as a 2,200-pound rail car axle. From simple two-joint robots to complex seven-joint robots, you have the power to choose just how much range of motion is necessary to gain the competitive advantage.

With an articulated robot, you can:

- Achieve increased throughput and better part quality
- Ensure production reliability and repeatability through controlled automation
- Efficiently service one or multiple machines with minimal operator involvement
- Perform multiple tasks and eliminate the number of components in a system
- Reprogram it to perform new tasks while still performing the original task



Pairs with:

- Most Mazak machines
- PALLETECH System
- Bar feeders
- Gantry loaders

MTCONNECT

MAKE A POWERFUL CONNECTION



MTConnect, an open-source, royalty-free manufacturing protocol, easily connects devices and systems from different suppliers to capture and share information in a common format like XML. It gives you the means to gather valuable data on the machines and automated systems in your manufacturing operations and then use the information to improve equipment utilization.

Implementing MTConnect is one of the simplest and fastest ways to improve productivity and boost equipment utilization. With the right manufacturing equipment and strategies, MTConnect allows domestic manufacturers to run highly agile operations and compete more effectively in the global marketplace.

Today, we build our machines to be MTConnect compliant as well as offer affordable adapters for existing Mazak machines in the field.

With MTConnect, you can:

- Gain real-time data sharing throughout your shop
- Calculate your overall equipment efficiency
- Monitor all of your equipment from one system
- Reduce your production losses
- Identify lean manufacturing strategies

Did You Know?

Mazak was the first in the machine tool OEM industry to convert its manufacturing plant over to the MTConnect open communications protocol.



WE'VE GOT YOUR BACK

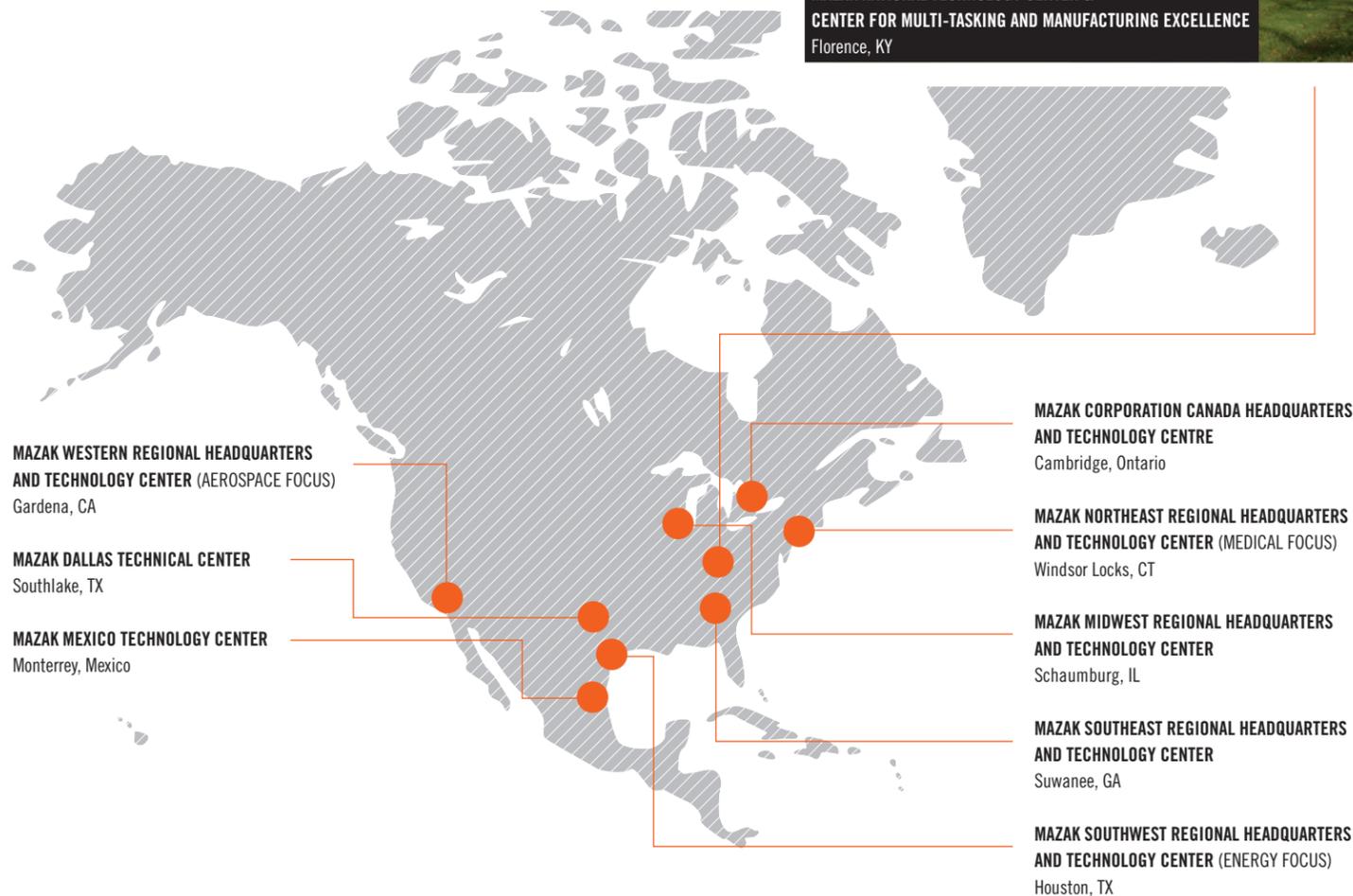
We believe in working closely with each of our medical customers to increase their productivity, efficiency and equipment utilization, and we are able to do so through our Technology and Technical Centers and Optimum Plus total support program.

Technology and Technical Centers

Our eight Technology Centers and a Technical Center spread across North America provide easy access to the latest, most advanced manufacturing systems for optimizing your part-production processes. You can also take advantage of each location's industry expertise, training programs and application resources to achieve improved throughput, shorter production lead times and increased profitability.



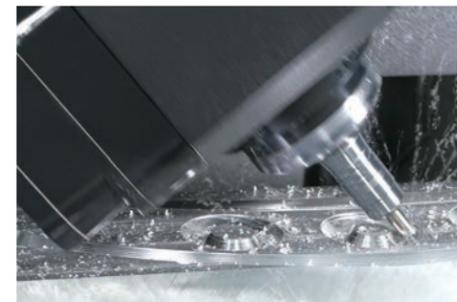
MAZAK NATIONAL TECHNOLOGY CENTER & CENTER FOR MULTI-TASKING AND MANUFACTURING EXCELLENCE
 Florence, KY



Optimum Plus

This total support program represents our company-wide commitment to helping you maximize the value of your Mazak purchase, achieve the best possible competitive advantage and keep your equipment running smoothly at all times.

The program encompasses five distinct areas to ensure complete customer care:



SINGLE-SOURCE SERVICE

We are your single point of contact for any Mazak-related service need, whether it involves a machine, control, accessory or automation solution.



MACHINE & CNC SUPPORT

Every Mazak machine comes with a comprehensive warranty, free technical phone support and software upgrades for the entire life of the product.



SPINDLE & UNIT REBUILD

With a capacity of up to 100 spindles per month, our industry-leading exchange and rebuild program offers new and remanufactured spindles, index tables, ATC shifters and milling turrets for 24-hour shipment. All rebuilt spindles receive a 1-year or 4,000-hour warranty with Mazak-certified installation.



PROGRESSIVE LEARNING

We partner with our customers to train them to achieve the highest levels of productivity and profitability.



PARTS SUPPORT

We have the industry's largest inventory of spare parts, ensuring 97% same-day shipping on part orders.



www.MazakUSA.com

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