Mazak

Laser Technology

Overview

Mazak Optonics Corporation's North American headquarters in Elgin, IL continues to grow. The expansion features a new auditorium, increased capacity for parts and customer service support, and a new research and development center.

Global Mazak Overview

YAMAZAKI MAZAK

Yamazaki Mazak was established in 1919. Today it is one of the world's largest manufacturers of machine tools. Mazak produces systems for the precision manufacturing of metal parts including laser-cutting machines, CNC turning centers, horizontal and vertical machining centers, multi-tasking machining centers, turnkey cells and software solutions to help customers achieve lean, efficient manufacturing operations. Developing unique products that realize unsurpassed productivity and have established 85 Technology and Technical Centers all over the world to provide total solutions and extensive service support.

MAZAK OPTONICS LASER TECHNOLOGY

Mazak Optonics offers a comprehensive range of 2D and 3D laser-cutting machine models. This innovative range of products enables Mazak to better meet fabricators specific laser applications needs. As a leader in laser technology, Mazak can significantly improve production efficiency, competitive positioning and profitability. Mazak utilizes innovative engineering and intelligent automation to simplify operations and deliver more consistent machine performance. Mazak Optonics supports the North American installation base from the North American headquarters in Elgin, IL.

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Yamazaki Mazak Minokamo Plant 1 in Gifu-Prefecture, Japan is the primary manufacturing plant for Mazak laser-cutting machines.

Mazak Corporation's Headquarters for the Americas, Manufacturing Plant and Technology Center in Florence, KY.

MULTI CONTROL
TORCH

Mazak exclusive engineered Multi-Control Torch plus integrated Intelligent Functions offer innovation, performance, and automation. This combination offers reliable, high performance laser-cutting.

Mazak Intelligent Technology

INTELLIGENT FUNCTIONS IMPROVE EASE OF OPERATION AND MACHINE EFFICIENCY

Intelligent Setup Functions

Functions that are automatically performed to improve ease of operation and reduce setup time.

- **Auto Nozzle Changing**
- **Auto Focus Positioning**
- **Focus Detection**
- **Beam Diameter Control**
- **Auto Profiler Calibration**
- **Auto Nozzle Cleaning**

Intelligent Monitoring Functions

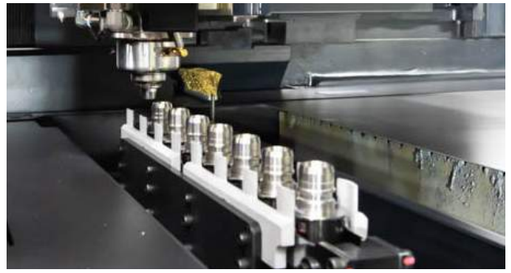
Sensors in the torch monitor piercing and cutting operations to increase throughput and enhance part quality.

- **Pierce Detection**
- **Plasma Detection**
- **Burn Detection**
- **Protection Window Sensing**

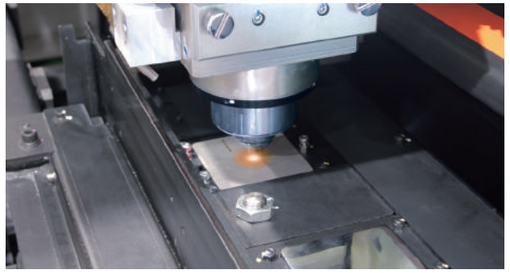
Intelligent Cutting Functions

Cutting tactics that improve quality and processing efficiency.

- **Flash Cut**
- **Fine Power Ramping**



Auto Nozzle Changing reduces operator errors, improves consistency of operation and lowers operator dependency.



Auto Focus Calibration eliminates the need to have the operator measure, adjust, and set the focal distance by automating the process.

Pierce Detection senses when the pierce breaks through the material as compared to a programmed pierce that would include added time to account for variations in the process.

Flash Cut strategies synchronize turning the laser ON / OFF with axis movement to increase throughput.

OPTIPLEX FIBER III series laser-cutting machines feature the premium performance of the MAZATROL PreviewG control and drive system now available in a powerful 10.0kW package.

OPTIPLEX FIBER III

OPTIPLEX 3015/4020 FIBER III

The integration of POWER + exclusive technology

The OPTIPLEX 3015 FIBER III is a 2D flying optics laser-cutting system that utilizes an innovative control and drive package to deliver high performance for fabrication job shops and production environments. Available from 2.0kW to 10.0kW.

- The MAZATROL PreviewG control offers a state of the art CPU for unsurpassed operating speed, high-response and high-speed machine motion.
- The high power OPTIPLEX FIBER III utilizes a new drive system that provides higher productivity through high-speed and high-accuracy.
- Designed to integrate Intelligent Setup, Monitoring and Cutting Functions, the OPTIPLEX FIBER III simplifies operations and reduces operator dependency.
- OPTIPLEX 3015 FIBER III is equipped with sensors that monitor piercing and cutting operations to improve throughput and part quality.

OPTIPLEX 3015 FIBER III with MAZATROL PreviewG is designed for high performance throughput.

Model		OPTIPLEX 3015 FIBER III					OPTIPLEX 4020 FIBER III				
Table Size		3015 x 1525 mm					4000 x 2000 mm				
Machine Unit Weight		37,532 lbs. (6.0kW)					46,760 lbs. (6.0kW)				
Watts		2.0kW	4.0kW	6.0kW	8.0kW	10.0kW	2.0kW	4.0kW	6.0kW	8.0kW	10.0kW
Thickness*	*Mild Steel*	0.625”	1.000”	1.000”	1.000”	1.000”	0.625”	1.000”	1.000”	1.000”	1.000”
	Stainless Steel	0.375”	0.750”	1.000”	1.000”	1.250”	0.375”	0.750”	1.000”	1.000”	1.250”
	Aluminum	0.312”	0.625”	0.750”	1.000”	1.250”	0.312”	0.625”	0.750”	1.000”	1.250”
Positioning System		Helical rack and pinion					Helical rack and pinion				
Positioning Accuracy		+0.002”/19.7”					+0.002”/19.7”				
Rapid Feed/Simultaneous		4,724 ipm / 6,680 ipm					4,724 ipm / 6,680 ipm				
CNC		MAZATROL PreviewG					MAZATROL PreviewG				

*Actual cutting performance is based on various parameters including the specific type and quality of material, assist gas and cutting speed.

Designed with V-BPP technology, OPTIPLEX NEXUS FIBER S series machines offer enhanced edge quality and speed with users selecting from a preset range of beam sizes and heat intensity profiles.

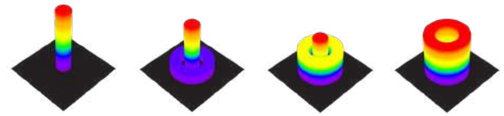
OPTIPLEX NEXUS FIBER S

OPTIPLEX NEXUS 3015 FIBER S

Groundbreaking Variable Beam Parameter Product (V-BPP) technology better controls the laser beam for superior cut performance

V-BPP enables OPTIPLEX NEXUS FIBER S series users to select from high-intensity, small-spot-size beams to large, donut-shaped beams, and everything in between. OPTIPLEX NEXUS 3015 FIBER S machines are available in either a 4kW or powerful 7kW configuration.

- Beam shaping technology delivers optimal thick and thin metal cutting, higher cutting speed, superior edge quality, and improved piercing time.
- V-BPP enables users to select specific beam shapes that can significantly enhance part quality. *See images right.*
- MAZATROL PreviewG control helps simplify set-up and operation.
- MAZATROL PreviewG control provides real-time cutting metrics and maintenance data maximizing machine utilization and reducing unexpected down time.
- Active Camera Nesting is a user-friendly solution for an operator to quickly and easily process additional parts on demand, without delay.



OPTIPLEX NEXUS FIBER S SERIES give users total control and offers an incredible cut result.

Model		OPTIPLEX NEXUS 3015 FIBER S4	OPTIPLEX NEXUS 3015 FIBER S7
Table Size		3000 x 1500 mm	3000 x 1500 mm
Machine Unit Weight		29,762 lbs. (4.0 kW)	30,424 lbs. (7.0 kW)
Watts		4.0kW	7.0kW
Thickness*	*Mild Steel*	1.000”	1.000”
	Stainless Steel	0.750”	1.000”
	Aluminum	0.750”	0.750”
Positioning System		Helical rack and pinion	Helical rack and pinion
Positioning Accuracy		+0.002”/19.7”	+0.002”/19.7”
Rapid Feed/Simultaneous		2,362 ipm / 3,340 ipm	2,362 ipm / 3,340 ipm
CNC		MAZATROL PreviewG	MAZATROL PreviewG

*Actual cutting performance is based on various parameters including the specific type and quality of material, assist gas and cutting speed.

OPTIPLEX NEXUS FIBER series laser-cutting machines are affordable solutions that do not sacrifice cutting-edge technology, delivering features normally only available on the highest level machines.

OPTIPLEX NEXUS FIBER

OPTIPLEX NEXUS 3015 FIBER

An affordable solution that delivers cutting-edge technology

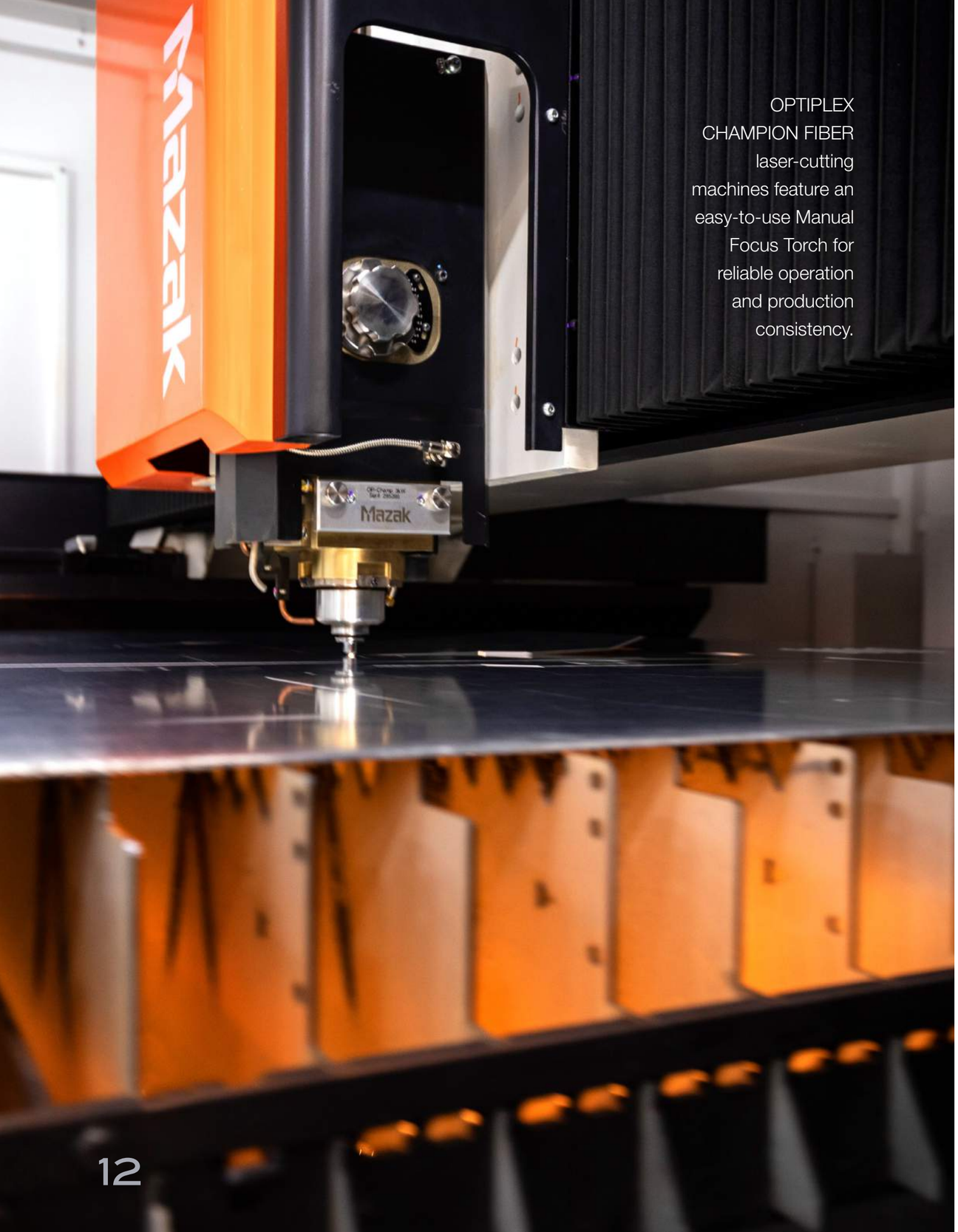
The OPTIPLEX NEXUS FIBER is a 2D flying optics laser-cutting system that utilizes an innovative design to deliver high performance for fabrication job shops and production environments. OPTIPLEX NEXUS FIBER is available in 2.0kW, 3.0kW, 4.0kW and 6.0kW generator configurations.

- The OPTIPLEX NEXUS FIBER features Intelligent Setup, Monitoring and Cutting Functions to simply operations. The combination of cutting-edge technology at an affordable investment makes the NEXUS FIBER a tremendous value.
- The OPTIPLEX NEXUS FIBER series machines offer rugged construction and a large side access door that delivers flexibility for short run applications.
- MAZATROL PreviewG control simplifies set-up and operation.

OPTIPLEX NEXUS FIBER offers both high technology and incredible value.

Model		OPTIPLEX NEXUS 3015 FIBER			
Table Size		3000 x 1500 mm			
Machine Unit Weight		28,396 lbs. (6.0 kW)			
Watts		2.0kW	3.0kW	4.0kW	6.0kW
Thickness*	*Mild Steel*	0.625”	0.750”	1.000”	1.000”
	Stainless Steel	0.375”	0.500”	0.750”	1.000”
	Aluminum	0.312”	0.500”	0.625”	0.750”
Positioning System		Helical rack and pinion			
Positioning Accuracy		+0.002”/19.7”			
Rapid Feed/Simultaneous		2,362 ipm / 3,340 ipm			
CNC		MAZATROL PREVIEW 3			

*Actual cutting performance is based on various parameters including the specific type and quality of material, assist gas and cutting speed.



OPTIPLEX CHAMPION FIBER laser-cutting machines feature an easy-to-use Manual Focus Torch for reliable operation and production consistency.

OPTIPLEX CHAMPION FIBER

OPTIPLEX CHAMPION 3015 FIBER

Economical production machine for low variation environments

The OPTIPLEX CHAMPION FIBER is a 2D flying optics laser-cutting system designed for production environments or low volume job shops with fewer job changeovers. OPTIPLEX CHAMPION FIBER is designed for thinner gauge material and is available in 2.0kW and 3.0kW generator configurations.

- The OPTIPLEX CHAMPION FIBER is built on the rugged OPTIPLEX NEXUS platform, but does not include Auto Nozzle Changing or other Intelligent Setup or Monitoring Functions that are ideal for high variation operations.
- It is available for use with all Mazak automation systems, but is best suited to load/unload automation solutions.

Model		OPTIPLEX CHAMPION 3015 FIBER	
Table Size		3000 x 1500 mm	
Machine Unit Weight		28,396 lbs. (3.0kW)	
Watts		2.0kW	3.0kW
Thickness*	*Mild Steel*	0.625”	0.750”
	Stainless Steel	0.375”	0.500”
	Aluminum	0.312”	0.500”
Positioning System		Helical rack and pinion	
Positioning Accuracy		+0.002”/19.7”	
Rapid Feed/Simultaneous		2,362 ipm / 3,340 ipm	
CNC		MAZATROL PREVIEW 3	

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OPTIPLEX CHAMPION FIBER is an economical solution for reliable laser-cutting performance.

The FT-150 FIBER includes an agile U-Axis to facilitate speed and productivity. It utilizes a series of advanced technologies and optional features to streamline and automate laser-cutting tube production processes.

FT-150 FIBER

Production tube-cutting technology

The FT-150 FIBER is designed for high-speed cutting and reduced non-cutting process cycle times. The result is superior productivity with high throughput.

- FT-150 FIBER delivers high-speed and high-productivity for small to medium diameter tube production.
- Proprietary U-Axis enables impressive cutting speeds and superior part accuracy through a wide range of applications.
- This fiber tube laser utilizes a 2.5D cutting head with focus detection. The programmable angle of the B-Axis enables bevel cutting of the material thickness and improves welding, multi-tube assembly, fit and finish.
- Equipped with a standard 6.5 meter bundle loader.
- Optional extrusion tapping is a value added process that utilizes a rotary spindle and eight tool positions. Any tool position can be deployed for direct tapping or combined with extrusion, providing proper thread depth.
- Optional spatter guard protects the internal tube surfaces from cutting debris and reduces secondary operations.
- Optional weld seam detection camera orients the workpiece for proper geometry orientation.

Model		FT-150 FIBER
Standard diameter		6” round/ 4.92” square
Material Weight (8M feed)		441 lbs.
Material Length		6.5M - 255” (8M - 315” optional)
Machine Unit Weight		50,705 lbs.
Watts		3.0kW
Thickness*	*Mild Steel*	0.250”
	Stainless Steel	0.250”
	Aluminum	0.250”
Positioning System		Helical rack and pinion
Positioning Accuracy		Y/Z +0.0004”/19.7” X/U +0.0020”/19.7”
CNC		Mazak FX

*Actual cutting performance is based on various parameters including the specific type and quality of material, assist gas and cutting speed.

FG series tube-cutting machines deliver a wide range of benefits for fabricators. Multi-axis capabilities enable users to cut a much wider range of structural material not possible on 2D configurations.

FG-220 DDL

Solid state tube-cutting technology

The FG-220 DDL utilizes solid state laser technology and a rugged four-chuck construction to offer high precision and game changing flexibility to a wide range of applications.

- Multi-axis capabilities enable fabricators to cut a much wider range of structural material not possible on 2D configurations.
- Featuring a high precision 6-axis laser that cuts round, square, rectangular, triangular, I and H beams, C-channel, angle iron and other user-defined shapes.
- Cut at any desired angle for weld prep, plus achieve the highest accuracy for easy fit-up assemblies.
- Optional productivity enhancements include tapping unit, touch probe, and seam detection.

Model		FG-220 DDL
Standard diameter		8.66” round/ 6” square
Material Weight (8M feed)		794 lbs.
Material Length		6M - 246”, 8M - 321”, 12M - 486”
Machine Unit Weight		71,650 lbs 8M-8M 4.0 kW
Watts		4.0kW
Thickness*	*Mild Steel*	0.875”
	Stainless Steel	0.375”
	Aluminum	0.375”
Positioning System		Helical rack and pinion, ball screw
Positioning Accuracy		Y/Z +0.0004”/19.7” X/U/V +0.0020”/19.7”
CNC		Mazak FX

*Actual cutting performance is based on various parameters including the specific type and quality of material, assist gas and cutting speed.

The optional chain conveyor loading/ unloading system shown on the FG-220 DDL provides more loading capacity compared to V style conveyor.

FABRI GEAR series machines utilize a unique four-chuck material handling system and robust structural design to support longer and heavier applications. This type of rigid design also improves machine precision.

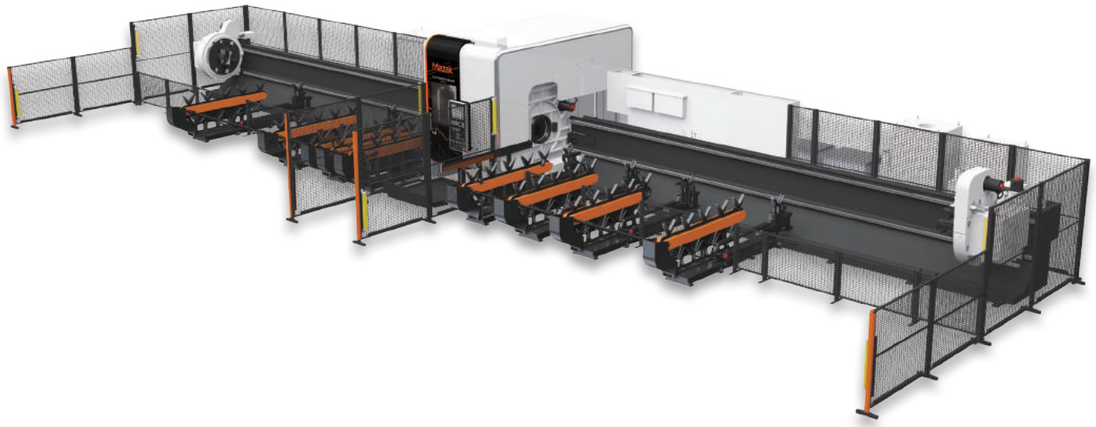
3D FABRI GEAR CO2

FABRI GEAR 220/400

Rugged 3D precision for tube and structural applications

The FABRI GEAR cuts a wide variety of tubes including round, square, rectangular and triangular. It can also process I and H beams, C-channel, angle iron and additional user-defined shapes.

- Featuring a powerful, high-precision 6-axis laser, the FABRI GEAR can handle larger, longer, thicker and heavier material than similar machines due to its rigid workpiece handling system incorporating a four-chuck design.
- FABRI GEAR series machines are available in 220 or 400 size CO2 configurations.
- Cut at any desired angle for weld prep, plus achieve the highest accuracy for easy fit-up assemblies.
- Optional productivity enhancements include tapping unit, touch probe, seam detection, and bundle loader.



Model		3D FABRI GEAR 220 III CO2		3D FABRI GEAR 400 III CO2	
Standard diameter		8.66” round/ 6” square		16.0” round/ 11.8” square	
Material Weight (8M feed)		794 lbs.		1764 lbs.	
Material Length		6M - 246”, 8M - 321”, 12M - 486”, 15M - 590” (15M only available on FG400)			
Machine Unit Weight		65,036 lbs 8M-8M 4.0 kW		77,162 lbs 8M-8M 4.0 kW	
Watts		2.5kW	4.0kW	2.5kW	4.0kW
Thickness*	*Mild Steel*	0.750”	0.875”	0.750”	0.875”
	Stainless Steel	0.312”	0.375”	0.312”	0.375”
	Aluminum	0.250”	0.375”	0.250”	0.375”
Positioning System		Helical rack and pinion, ball screw			
Positioning Accuracy		Y/Z +0.0004”/19.7” X/U/V +0.0020”/19.7”			
CNC		Mazak FX			

*Actual cutting performance is based on various parameters including the specific type and quality of material, assist gas and cutting speed.

Mazak Optonics patented the first laser FMS in 1991. Today's approach to automation is not a one-size-fits-all solution. Mazak utilizes a modular or building block approach that enables future growth.

Mazak Advanced Automation

MATERIAL AUTOMATION SYSTEMS WILL EXTEND THE THROUGHPUT CAPACITY OF LASER-CUTTING MACHINES

Automation systems provide the ability to flex capacity through lights-out operation, without the burden of adding manpower.

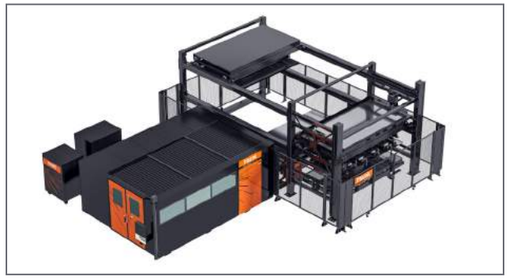
Mazak was the first manufacturer to introduce laser-cutting machines into a Flexible Manufacturing System (FMS). Today Mazak offers the following range of automation solutions:

- M-SERIES
- K-SERIES
- L-SERIES
- C-SERIES
- LASER FLEX
- QUICK CELL
- EXTENSIBLE MANUFACTURING CELL
- AUTOMATED STORAGE/RETRIEVAL

Mazak automation can be designed to incorporate part sorting systems to separate parts and automatically load them onto pallets in production environments.

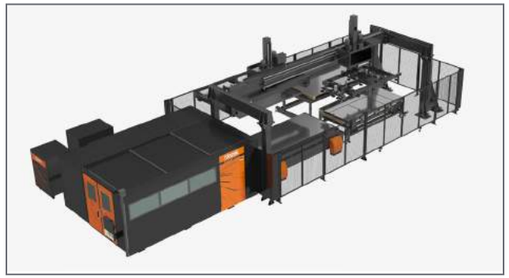
See Mazak's Laser Automation Solutions Catalog for system details.

EXAMPLES OF MAZAK AUTOMATION SOLUTIONS

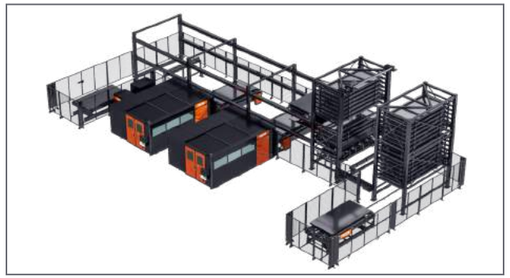


MCS 3015 ONE LASER (LUL)

MST 3015 ONE LASER + ONE TOWER



LCS 3015 ONE LASER (LUL)



MDT 3015 TWO LASERS + TWO TOWERS + UL CART

Mazak Customer Support

COMPREHENSIVE CUSTOMER SUPPORT

Post-sale support is what matters most

Mazak's customer service goal is to maximize the performance of customers' laser-cutting machines to help make them successful and lifelong partners.

While laser-cutting technology is robust, if the need for laser machine service arises, having immediate customer support is a must.

Partnering with a laser manufacturer that can provide reliable and responsive customer support will help ensure fabricators have successful laser operations for the long run.

ORANGE SUPPORT MOBILE APP

The Mazak laser service phone app that enhances customer experience

- Remote video capabilities offer more efficient service support allowing technicians to physically see the operator's concern without the need to travel on-site.
- Enhances tracking of support requests, improves customer experience and reduces total time from issue to resolution.
- Support requests through Orange Support are linked to Call Log System, prioritizing customer cases accordingly.
- Enables access to machine information through QR code on the machine or through serial number look-up including machine details and warranty information.
- Access to "How To" maintenance videos.

TECHNICAL SUPPORT CALL CENTER

Assistance is just a phone call or email away

- Live operator answers call center requests.
- New digital technology enables prioritization.
- Phone support engineers often assist customers to resolve issues without dispatching a technician.

LOCALIZED SERVICE SUPPORT

Accessible highly skilled service engineers

- Mazak continues to increase and strategically place engineers near customers and major airports.
- Service engineers have multiple years of Mazak laser experience translating to more efficient serving.

RAPID RESPONDER

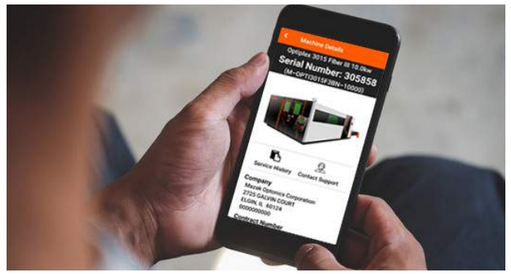
Prepared to help at a moment's notice

- An unscheduled technician is available for dispatch when situations occur after scheduling.
- Until dispatched, this engineer provides additional support to the technical support call center.

PARTS SUPPORT

Readily available parts locally and abroad

- $8 million of spare parts inventory in the newly expanded 10,000 sq. ft. parts department at Elgin, IL headquarters.
- Access to international inventory from World Parts Center.
- Guaranteed lifetime parts support on every Mazak laser.



The Orange Support app offers Mazak laser customers access to remote video capabilities, support requests, how-to videos, and more.

People make the difference. That's why Mazak is committed to building a team of experts to better support customers in every way possible.

LASER TECHNOLOGY
OVERVIEW

Mazak

MAZAK OPTONICS CORPORATION
2725 Galvin Court, Elgin, Illinois 60124
847.252.4500

www.mazakoptonics.com