


Mazak

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- They may not be duplicated under different conditions.
(room temperature, workpiece materials, tool material, cutting conditions, etc.)

SPACE GEAR 510 Mk II 15.03.4000 S 99J440515E0 

SPACE GEAR 510 MK II

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SPACE GEAR 510 MK II

Mazak



High-speed cutting of thin sheet



Cutting of thick plate



Beveling of flat sheet



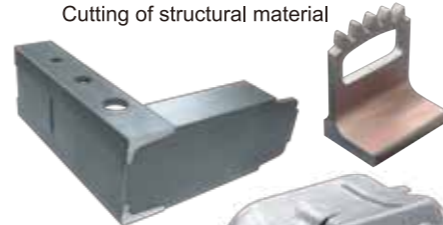
3-dimensional cutting



Cutting of pipe
(Shown with optional NC rotary table)



Cutting of structural material



A laser processing machine with exceptional versatility — designed to cut flat sheet and plate with high speed and high accuracy, as well as complex cubic components

- Performs a wide range of cutting — 2D flat sheets, thick plates, 3D formed shapes, pipes, and structural material
- Mazak's unique constant-beam length system, ensures uniform high accuracy cutting anywhere on machine table
- High-rigidity column ensures high-accuracy cutting
- Excellent accessibility to machine table
- Equipped with MAZAK FX CNC



High-speed, high accuracy 2D/3D laser processing machine

SPACE GEAR 510 MK II

Shown with optional rotary table

Higher Productivity

Cutting of pipes and structural material

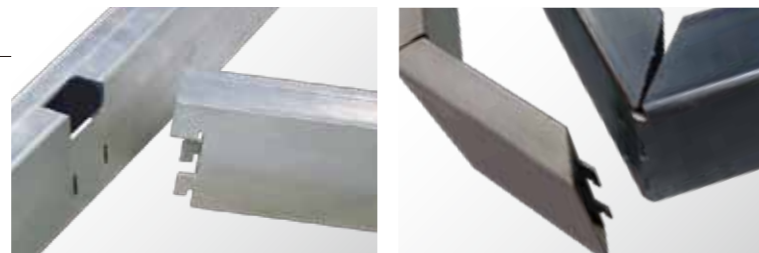
The SPACE GEAR 510 Mk II makes possible the high-efficiency cutting of any materials, — much better than a 2D laser processing machine with NC rotary table



Beveling of square pipe (NC rotary table is optional)

Joining by tab and slot

By cutting tabs and slots on pipes or structural material, joining can be done without requiring any temporary assembly fixture. Thermal distortion caused by joining can also be reduced.



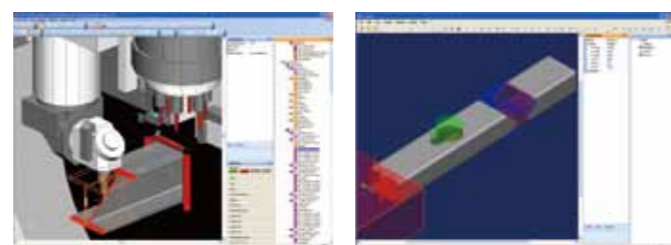
Tight pipe joints

Complex curved surfaces on mating pipes can be cut by 3D laser processing. Tight-fit pipe joints are ensured.



FX TUBE – for the easy 3D cutting programming for pipe workpieces

3D pipe and tube shapes can easily be programmed by the FX TUBE CAM system. Reliable programs with no interference are ensured.



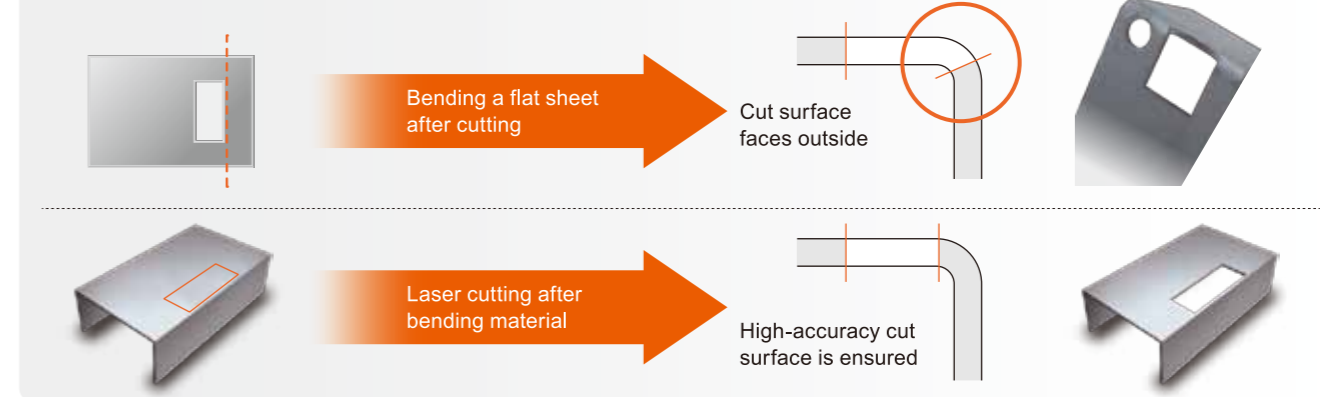
3D cutting by SUPER GEAR 510 Mk II



Piercing on top and sides of 3D formed material
Cutting of arbitrarily shape

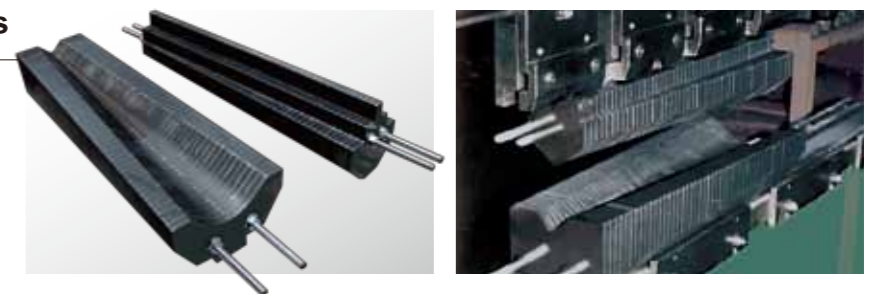


Cutting of formed material can be performed



3D processing of laminated dies

Laminated dies for press brakes can be produced by the SPACE GEAR. By using both software and 3D laser, different shaped dies for small lot production can be produced.



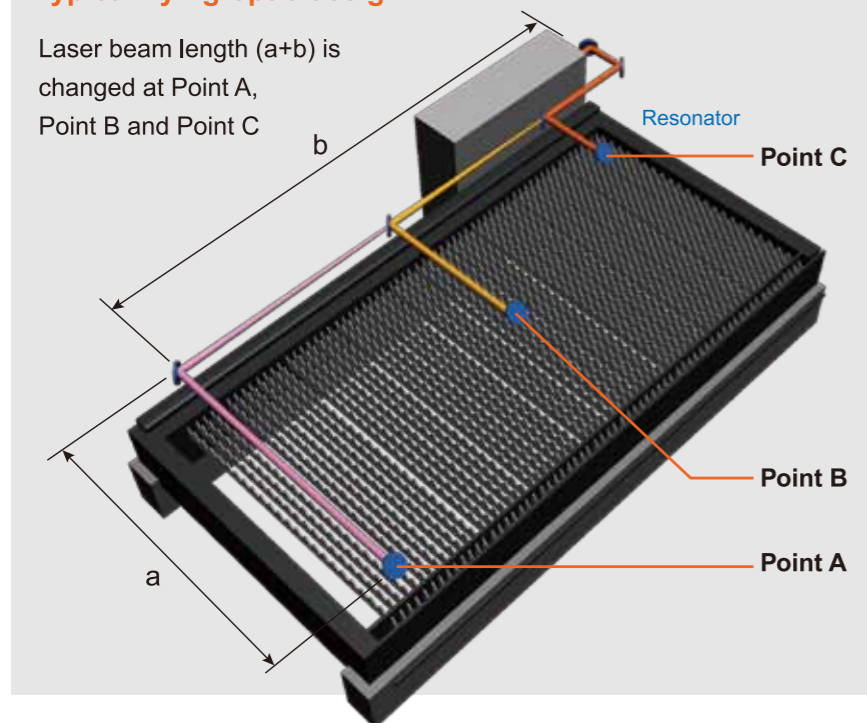
Higher Accuracy

Mazak's unique constant-beam length system, ensures uniform high accuracy cutting anywhere on machine table

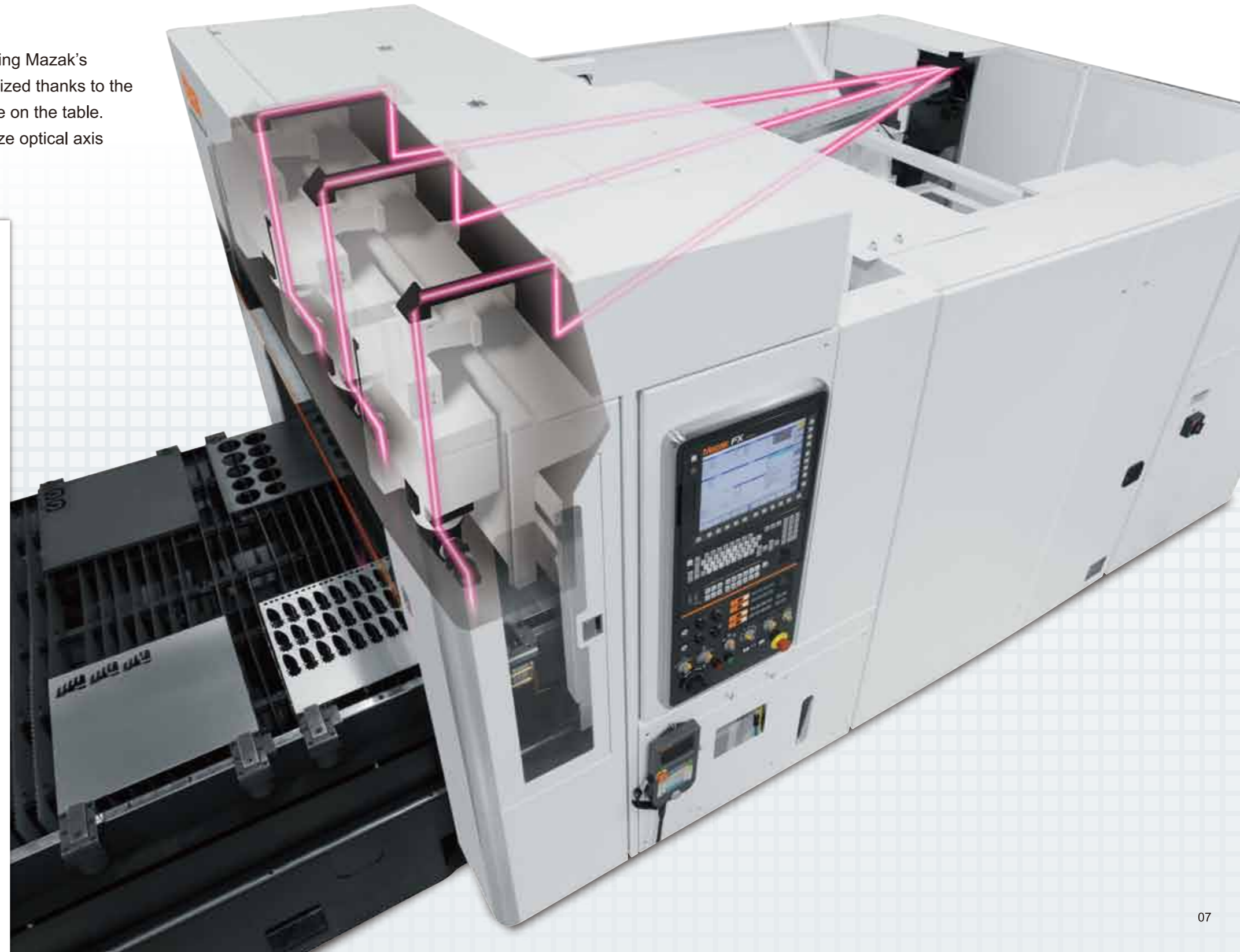
The laser beam is directed from the laser resonator to the cutting torch using Mazak's exclusive constant-beam length delivery system. Stable processing is realized thanks to the constant-beam length that provides uniform cutting performance anywhere on the table. Additionally, the resonator is integrated with the machine proper to minimize optical axis adjustments as well as reducing floor space requirements.

Typical flying-optic design

Laser beam length (a+b) is changed at Point A, Point B and Point C



Generally, flying optics construction has the issue that laser beam quality is not stable when the laser delivery distances changes. As a result, cutting performance is not the same at different table locations. The long-standing challenge for laser processing machine manufacturers is to maintain a constant beam delivery length. Even today, many manufacturers have been developing various technologies to solve this problem. The Mazak constant beam delivery system eliminates this by not changing the beam length.



Ergonomics

Table feed system — designed for excellent table access, ease of operation, and convenient processing of a wide variety of workpieces in small size lots

Small pieces of material can be easily loaded on the table and workpieces quickly removed after completion of cutting.



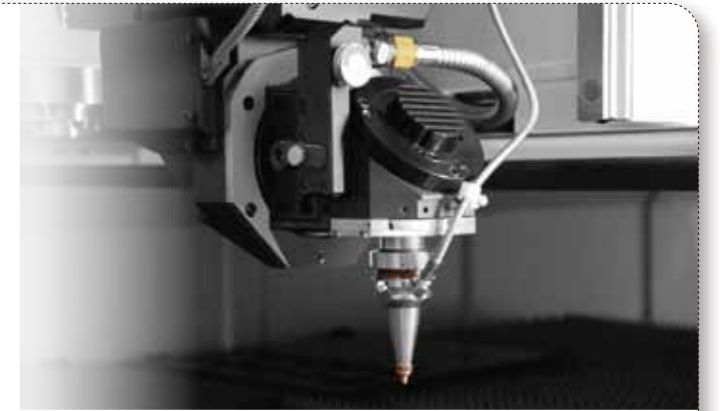
Totally enclosed cover STANDARD

The total machine cover, which covers the entire processing area, protects operators from the laser beam and cutting spatter. Safe operation, no matter what position the laser head is in, as well as excellent accessibility to the machine table are ensured.



Compact cutting head

Equipped with a 7.5" lens, the head can be positioned anywhere between the vertical and horizontal positions, and is designed to handle a wide range of materials and thicknesses.



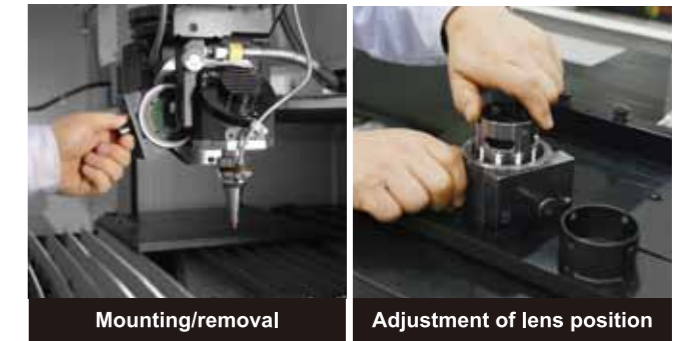
Protection torch

Minimizes damage if torch collides with workpiece



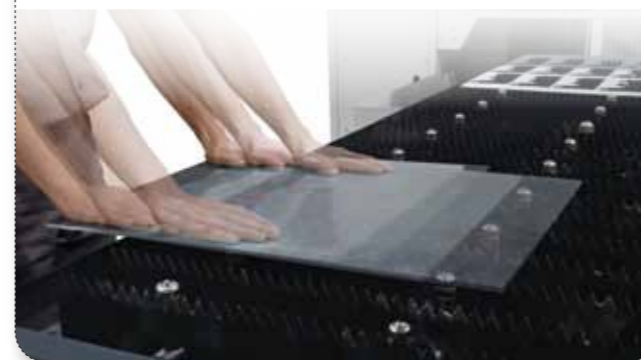
Ease of mounting/removal and adjustment

The torch lens is easily removed. Lens cleaning and focal point adjustment can be done without removing the cutting head.



Work lifter for convenient material positioning STANDARD

Even heavy material can be easily moved and positioned. Additionally, marring of the back surface of materials such as stainless steel is minimized.



Chip conveyor STANDARD

After cutting, small pieces of scrap or small workpieces fall down onto the chip conveyor for convenient removal.



High-Performance CNC System

Mazak FX

The MAZAK FX CNC — featuring simplified operation

ALL IN ONE

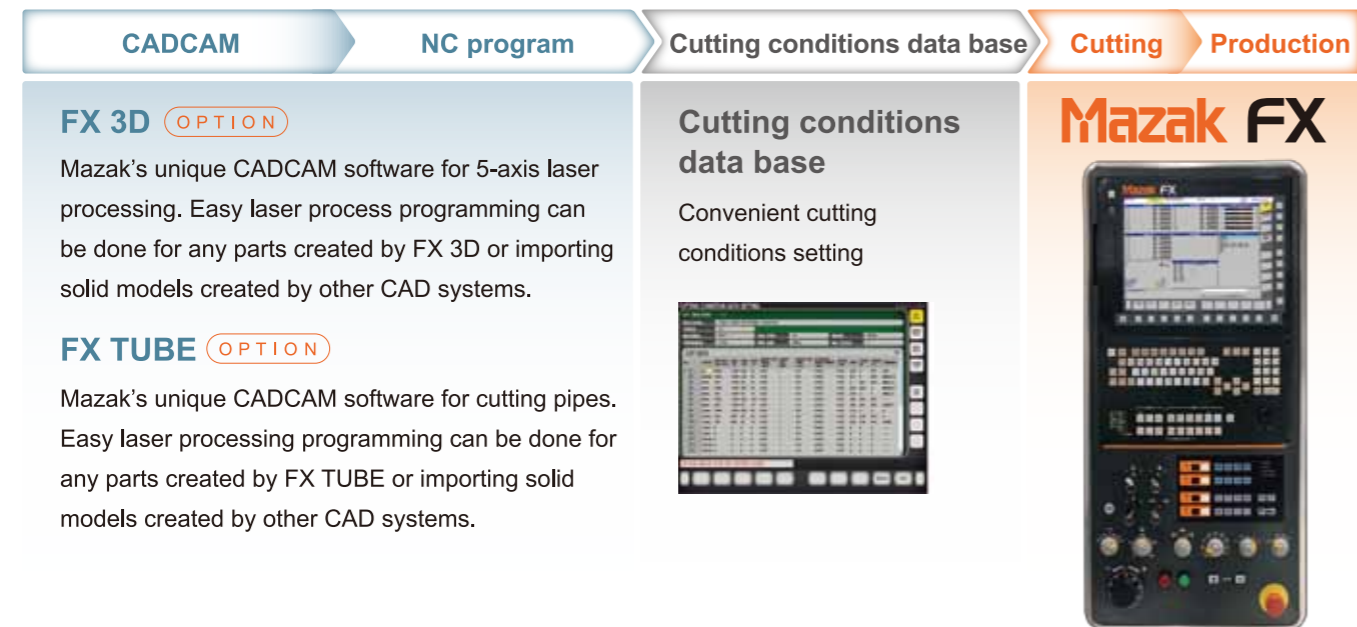
The Mazak FX CNC controls all operations in one machine.

ERGONOMICS ergonomics

The keys on the operation panel are arranged in an operator-friendly layout. The large, easy-to-read 15 inch" color monitor is standard equipment.



Smooth operation from NC programming to cutting process



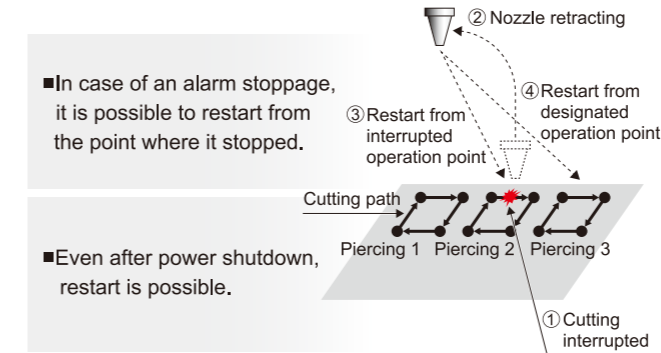
Cutting conditions data base

Optimum cutting conditions including cutting speed, laser output and assist gas pressure can be set according to the type of material and thickness to be cut.



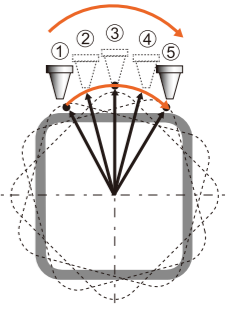
Quick Program Restart Function

When automatic operation is stopped using the NC reset button due to an interruption created by an alarm/cutting failure, the Quick Program Restart Function retains the position in its memory and can restart the machine from the point where it stopped. This Restart is particularly important when cutting expensive material such as stainless steel or Aluminum and it is interrupted by a Burn Detection Alarm.

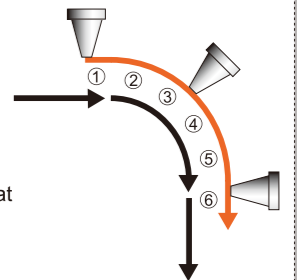


HIGH-PERFORMANCE

Real-time laser power control is realized thanks to the most advanced laser control technology available. The optimum cutting conditions are automatically determined at high speed as the feedrate changes.



Thanks to the high-speed smooth beam center point control system of the simultaneous 6-axis control, smooth, high-speed cutting at corners is realized.



Teaching pendant

The control pendant is used for teaching operation. Program editing, JOG function, as well as changing the cutting and JOG feedrates can be performed.



Automation

Enhanced Productivity

EXTENSIBLE MANUFACTURING CELL

Designed for convenient system expansion after the initial installation.



•Mazak Laser FMS

Can be expanded to CELL or FMS after initial installation

The material shelf capacity and management controller capability can be expanded as well as the number of machines up to a maximum of 4

•High-productivity

Processing is performed according to production schedule.

Worksheets up to 25 mm (0.98") can be transported for convenient loading/unloading.

Environmentally Friendly



Environmental considerations

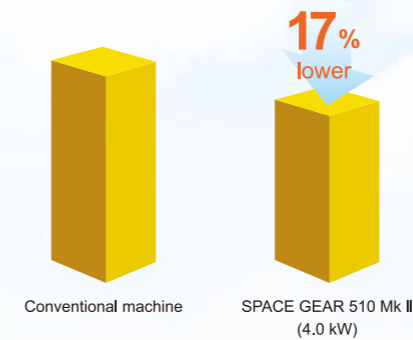
The environment and our impact on natural surroundings have always been important concerns of Yamazaki Mazak.

This is shown by the fact that all factories in Japan where Mazak machine tools are produced are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect air, water or land

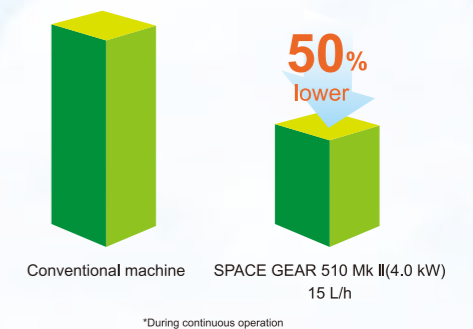
Lower operation cost

The SPACE GEAR 510 Mk II reduces the amount of laser gas used in conventional laser processing machines as well as the gas used for purging optical components. Additionally, electrical power consumption is reduced as well

Lower electrical power consumption



Reduction of laser gas



YAMAZAKI MAZAK OPTONICS CORPORATION

The temperature of this underground factory is controlled virtually year round by geothermal energy.

The entire assembly area is a clean room which minimizes dust contamination of the beam delivery mirrors and the torch lenses.

As a result, the time required for machine assembly is reduced



Machine specifications

Max. workpiece size	Flat sheet	1525 mm × 3050 mm (60.24"× 120.08")
	Cube	1775 mm × 2710 mm × 300 mm (69.88"× 106.69"× 11.81")
Work table height		900 mm (35.43")
Axis travel	X-axis	3070 mm (120.87")
	Y-axis	1545 mm (60.83")
	Z-axis	300 mm (11.81")
	A-axis	±99999.999°
	B-axis	±135°
	C-axis (option)	±360°
Rapid traverse rate	X-axis	24 m/min (945 IPM)
	Y-axis	24 m/min (945 IPM)
	Z-axis	24 m/min (945 IPM)
	A-axis	9600°/min
	B-axis	9600°/min
	C-axis (option)	12000°/min
Positioning accuracy	X , Y-axis	±0.01 mm / 500 mm (±0.0004" / 19.69")
	Z-axis	±0.01 mm / 100 mm (±0.0004" / 3.94")
Repeatability	X , Y , Z-axis	±0.005 mm (±0.0002")
	A , B , C-axis	±0.01°
Machine weight	(Without chiller and transformer)	14100 kg (31085 lbs)
Electrical requirement		51.0 kVA (2.5 kW) / 68.0 kVA (4.0 kW)
Sound*1		Less than 80 dB

*1 : Equivalent continuous sound pressure level at operator position (dependent on equipment options)

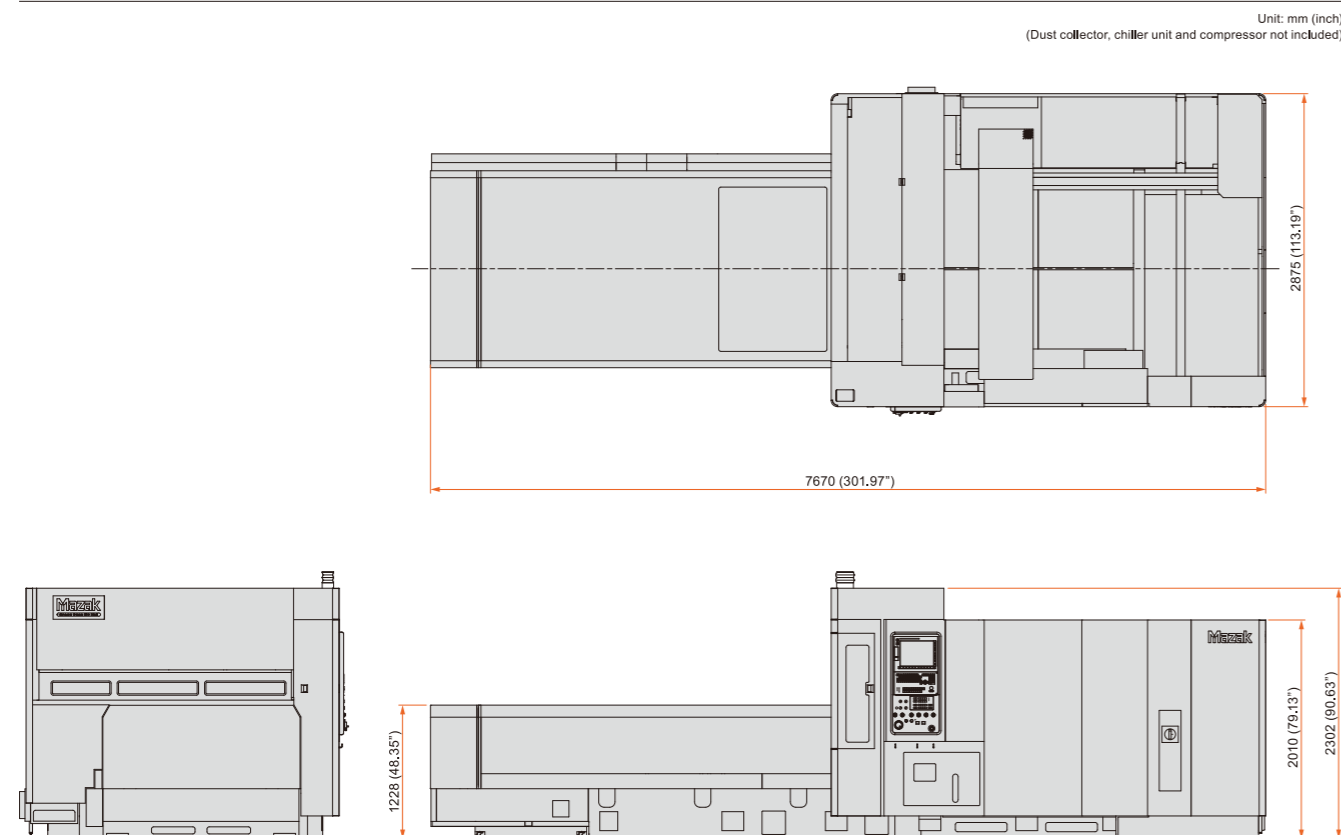
Specifications of Laser Oscillator

Resonator	2.5 kW , 4.0 kW
Laser gas	He , Ne and CO ₂
Gas consumption rate	10 L/H (2.5 kW) , 15 L/H (4.0 kW)

CNC standard specifications

	MAZAK FX
CPU	64 bit
Number of controlled axes	6-axis
Minimum program increment unit	0.001 mm (0.0001")
Programming method	EIA / ISO
Display	15" color LCD (TFT)

Floor space



Standard and optional equipment

		● : Standard	○ : Option
Machine	Through-hole rotary table : manual scroll chuck ø20~285 mm (ø0.79"~11.22")		○
	Stepped jaw (for rotary table , I.D. ø285 mm (ø11.22"))		○
	High column (720 mm raise and extended stroke)		○
	Workpiece clamps (4) and locator		●
	Manual workpiece clamps (1 for operator's side)		○
	Work lifter		●
	Work light		●
	Oscillator status indicator light		●
	Chiller unit		●
	Dust collector		○
Torch	Preparation for dust collector		●
	Automatic open/close cover		●
	7.5" non-contact profiler torch with lens		●
	Laser pointer with teaching		●
Lens	7.5" non-contact profiler torch without lens		○
	Torch for 2D cutting without 7.5" lens		○
	7.5" Mazak high accuracy lens (2.5 MPa)		●
Nozzle	Additional 7.5" Mazak high accuracy lens (2.5 MPa)		○
	5" Mazak high accuracy lens (2.5 MPa)		○
	Nozzles (for 2D cutting ø1.5 , 2.0 , 3.0 mm , 1 each)		●
	Nozzles (for 2D cutting ø1.2 , 1.5 , 2.0 , 2.5 , 3.0 mm , 3 each)		○
	M5 type nozzles (ø1.5 , 2.0 , 3.0 mm , 1 each)		●
Assist gas	M5 type nozzles (ø1.2 , 1.5 , 2.0 , 2.5 , 3.0 mm , 3 each)		○
	3rd assist gas piping (Supply 3.0 MPa)		●
	4th assist gas piping (Supply 3.0 MPa)		○
	Assist gas selector (3 types)		●
	Assist gas pressure NC control		●
Factory automation	High pressure air supply system		○
	NC retry function (2D cutting)		●
	Auto power off		●
	Preparation for FMS		○
	Scrap conveyor		●
	Laser FMS (EXTENSIBLE MANUFACTURING CELL)		○
NC , teaching	Teaching pendant		●
	Approach · trace feed		●
	USB port for PC		●
Others	Manual		●
	Additional manual		○