

Mazak

FG-220 DDL

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[Direct Diode Laser]

Mazak

YAMAZAKI MAZAK CORPORATION

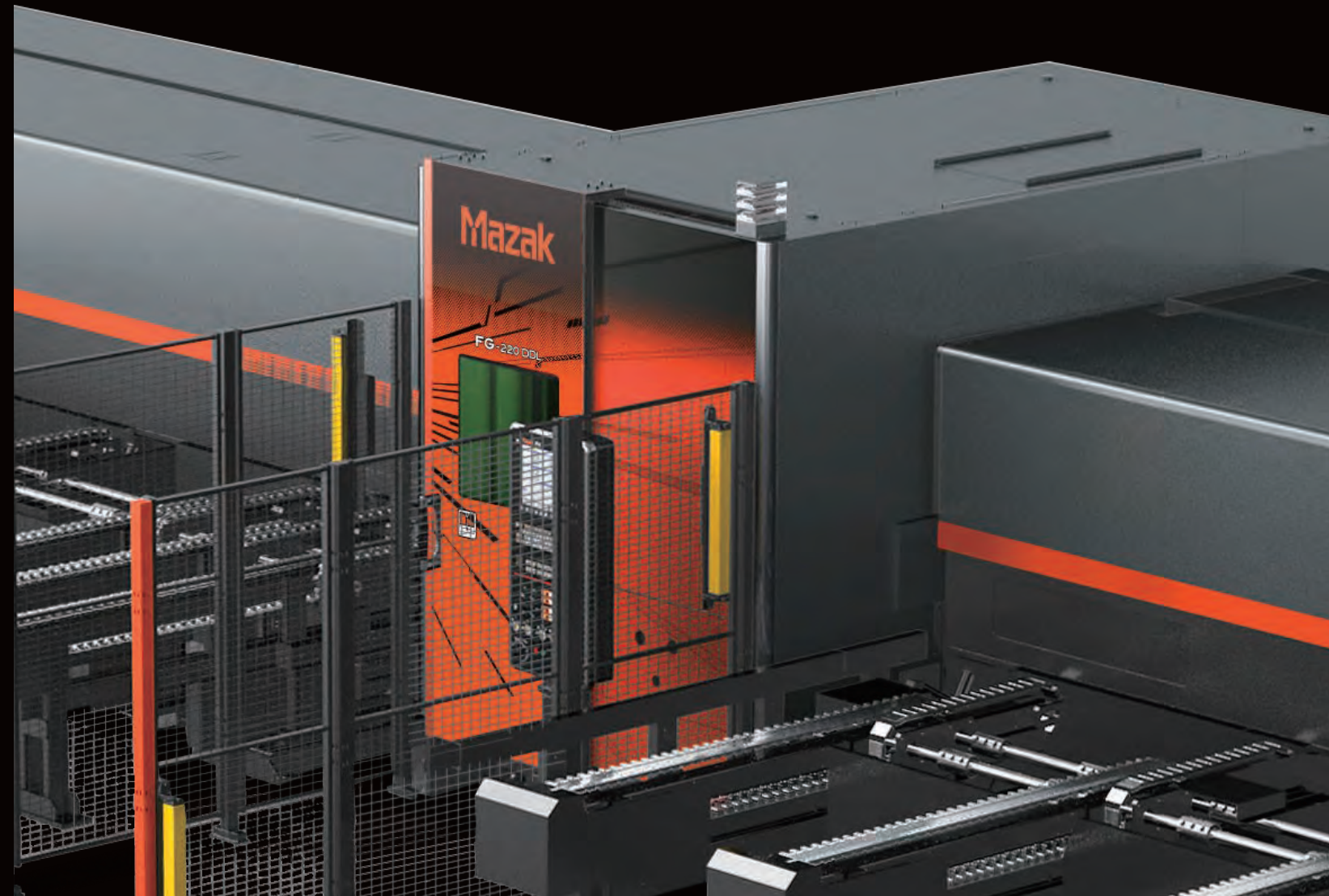
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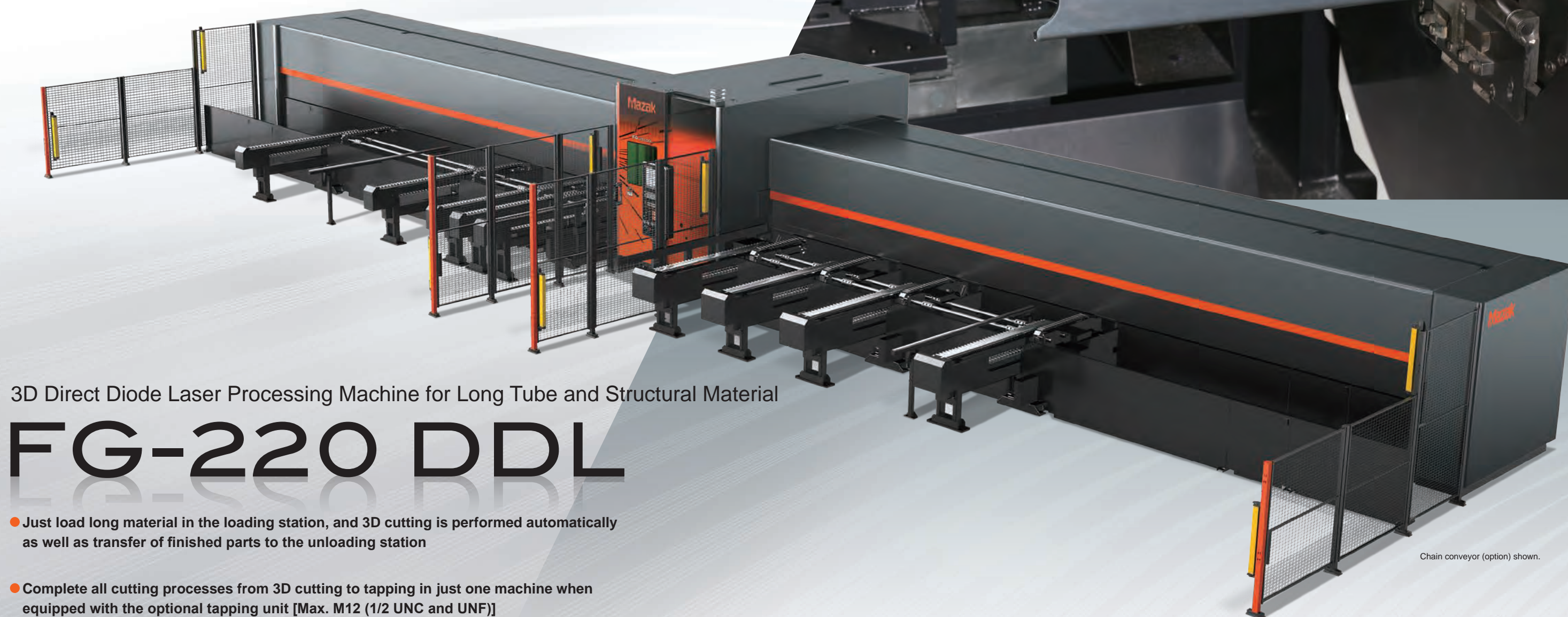
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FG-220 DDL 18.09.0 A 99J450618E0





Continuing our tradition of utilizing the most advanced technology available -
The newest member of the Mazak DDL series - the FG-220 DDL



3D Direct Diode Laser Processing Machine for Long Tube and Structural Material

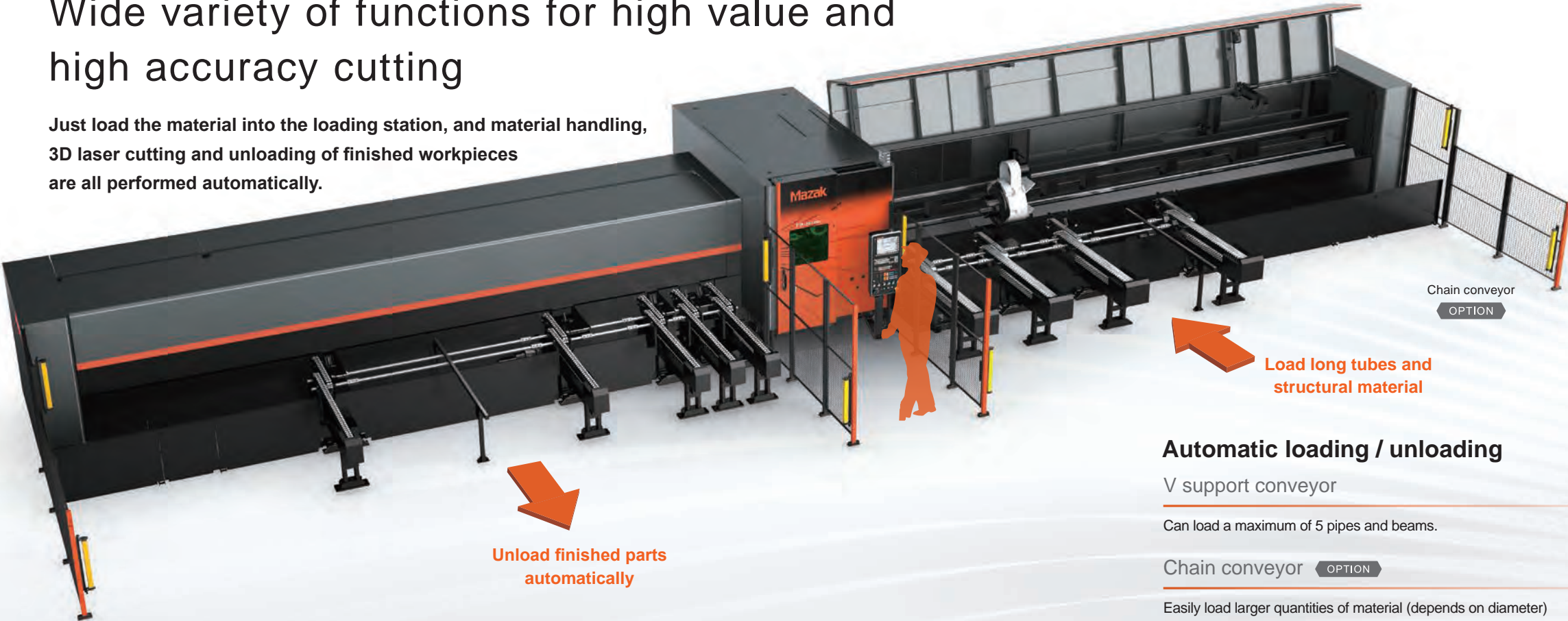
FG-220 DDL

- Just load long material in the loading station, and 3D cutting is performed automatically as well as transfer of finished parts to the unloading station
- Complete all cutting processes from 3D cutting to tapping in just one machine when equipped with the optional tapping unit [Max. M12 (1/2 UNC and UNF)]
- Loader / unloader specifications are available to meet your production requirements

Chain conveyor (option) shown.

Wide variety of functions for high value and high accuracy cutting

Just load the material into the loading station, and material handling, 3D laser cutting and unloading of finished workpieces are all performed automatically.



Safety

The enclosed cover, which covers not only the entire cutting area but also the internal loading / unloading area, protects operators from the laser beam. The enclosed cover can be automatically opened and closed for chuck jaw adjustment, maintenance and cleaning.

Automatic loading / unloading

V support conveyor

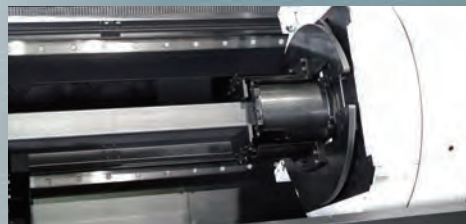
Can load a maximum of 5 pipes and beams.

Chain conveyor OPTION

Easily load larger quantities of material (depends on diameter) for continuous operation.



High accuracy cutting of long material



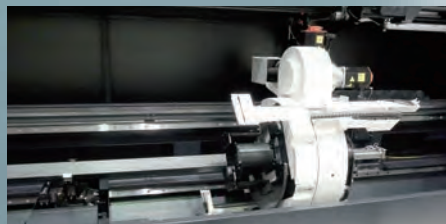
Auto centering and clamping of material

Automatically center and clamp different material shapes, such as round, square and rectangular.



Flat support

Flat roller follows the shape of material, so that the material will not sag from its own weight.



Workpiece measurement OPTION

Automatically measures material length after loading into machine, eliminating manual measuring for each piece of material.



Horizontal workpiece centering OPTION

Horizontal workpiece centering for long beams and small pipes by roller to prevent material displacement.

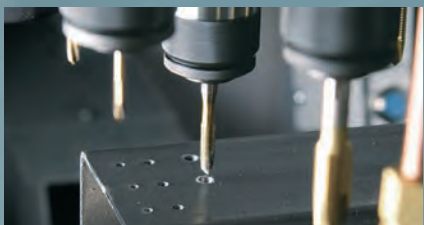


Touch sensor OPTION

Measures the OD of pipe material and automatically compensates for material distortion to ensure high precision positioning.



High value and high quality cutting



Tapping unit OPTION

Perform 3D laser cutting, tapped hole preparation and tapping- all in the same machine. The hole to be tapped is cut by the laser and then tapped for shorter production lead time and higher productivity. [Max. M12 (1/2 UNC and UNF)]



Bevel cutting

Improved quality of processed components thanks to unsurpassed 3D laser cutting.



Parts catcher

Can catch a finished part up to 810 mm (31.89") long and remove from machine.

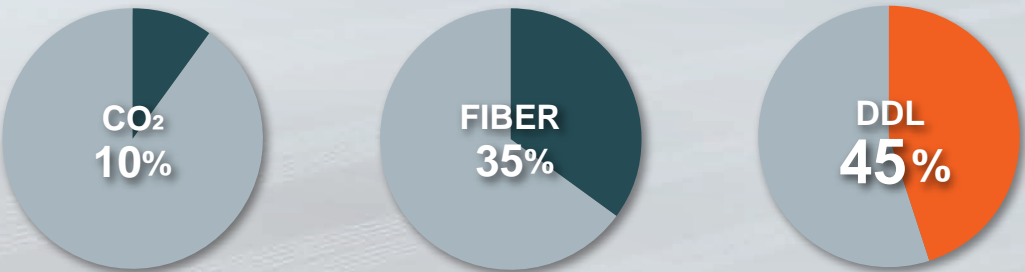
Direct Diode Laser

The advanced technology of the Direct Diode Laser provides higher productivity and higher efficiency than other systems



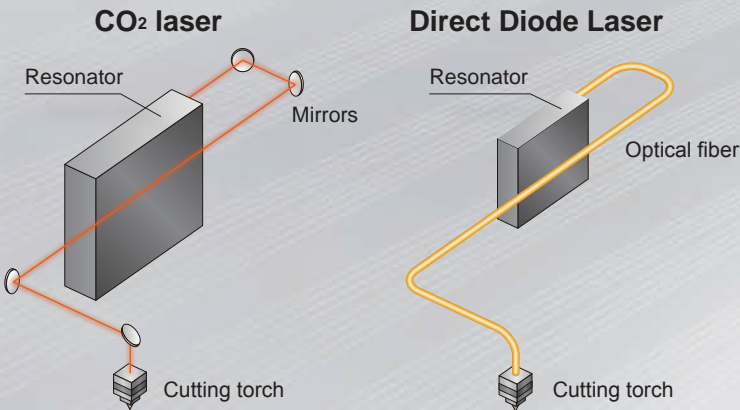
Laser energy conversion efficiency

The conversion of electrical power input is significantly more efficient for the Direct Diode Laser compared to CO₂ and fiber lasers.



Considerable reduction in maintenance example

For conventional CO₂ laser processing machines, regular maintenance of components such as the resonator and mirrors is required in order to maintain stable cutting performance. The Direct Diode Laser processing machine eliminates the mirrors and other components by using optical fiber to significantly reduce the cost of maintenance.



Applications

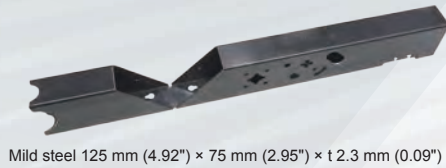
H beam
Size : 100 mm (3.94") × 100 mm (3.94")
Assist gas : Oxygen

Round pipe
Material : brass
Size : Φ50.8 mm (2.00") × t 1.0 mm (0.04")
Assist gas : Nitrogen

Round pipe
Material : copper
Size : Φ50.8 mm (2.00") × t 1.5 mm (0.06")
Assist gas : Oxygen

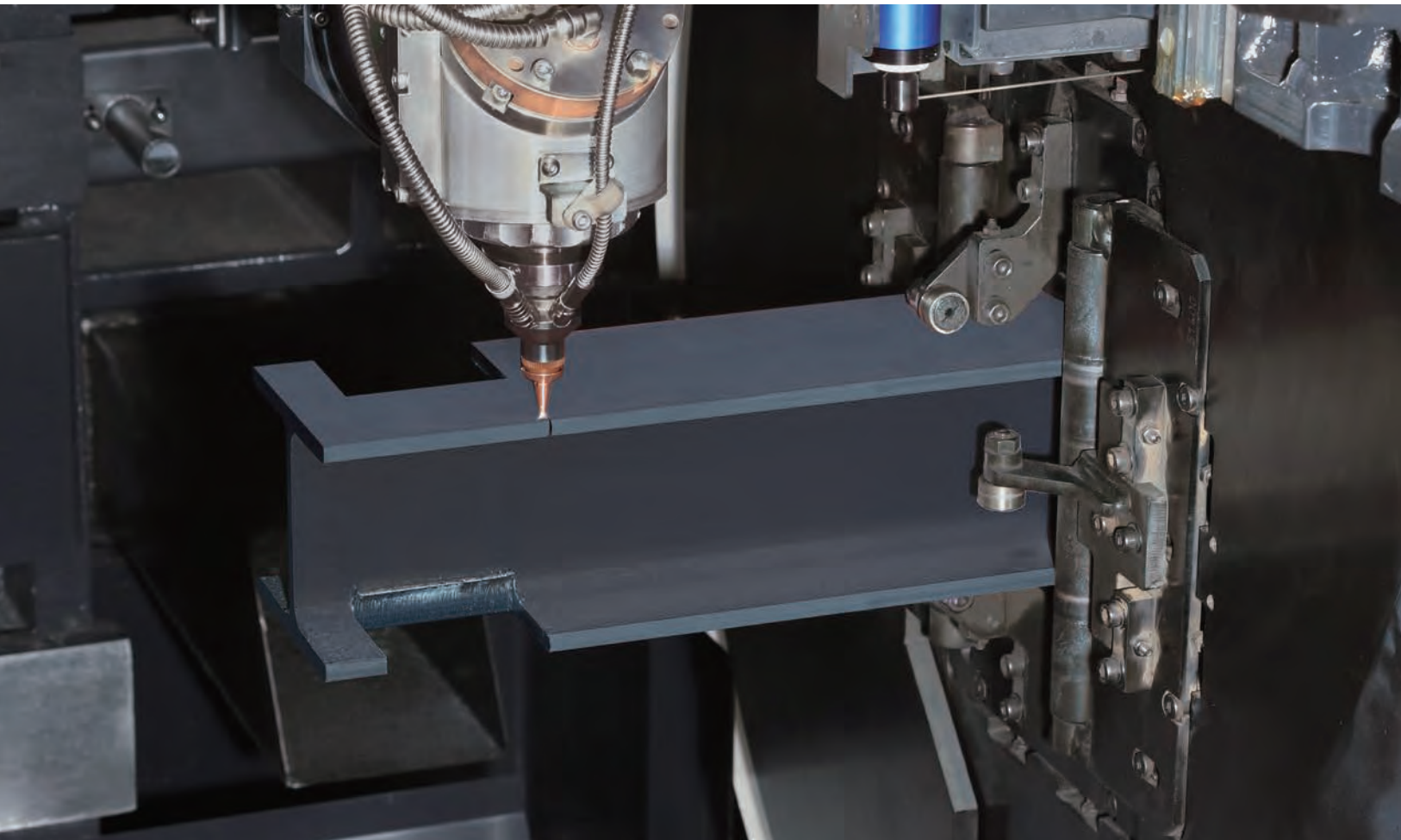
High Productivity

The Direct Diode Laser has a shorter wavelength than a CO₂ laser for high speed cutting of mild steel with nitrogen assist gas. The FG-220 DDL improves productivity of cutting thin to mid thickness pipe and other structural material.



Previous model CO ₂ laser processing machine (4.0 kW) Assist gas : Oxygen	Cutting time	4 min 11 sec
NEW FG-220 DDL (4.0 kW) Assist gas : Nitrogen	Cutting time	3 min 27 sec
		Cutting time reduced by 44 sec

Higher Productivity

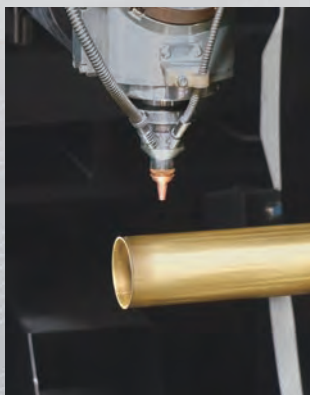


Auto profiler calibration and nozzle cleaning

The Auto Profiler Calibration and the Auto Nozzle Cleaning reduces setup time

Auto Profiler Calibration

Cutting distance position must be maintained for dross free cutting. When installing a new nozzle, gap distance is properly maintained with the use of auto profiler calibration. This automatic calibration maximizes the time between necessary operator intervention.



Auto Nozzle Cleaning

The torch head can be moved to the nozzle cleaning brush by program command which removes spatter that has adhered to the nozzle.



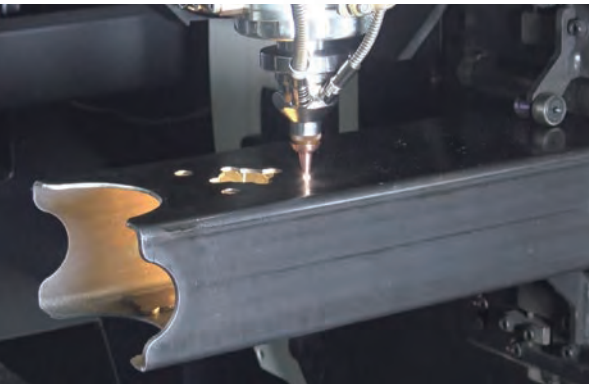
Auto Focus Positioning ensures reduction in setup time and piercing time

Auto Focus Positioning

The focal point position can be changed automatically. As a result, the focal point can be positioned for the optimum piercing performance as well as cutting for the maximum productivity.

Reduction in piercing time

Optimum focus positioning determination for considerable reduction of piercing time. Continuous processing thanks to auto focus positioning determination.



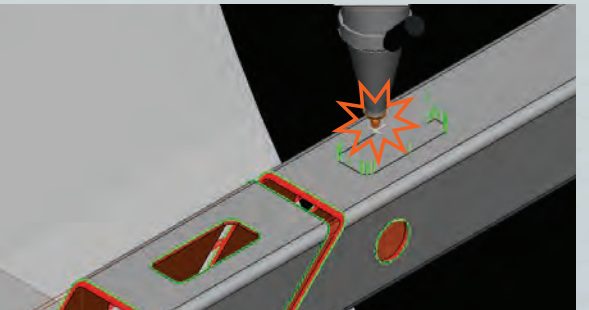
Quick Program Restart Function

When automatic operation is stopped using the reset button due to an interruption created by cutting failure, the Quick Program Restart Function registers the position in its memory and can restart the machine from the point where it stopped.

Without Quick Program Restart Function

When automatic operation is stopped, restarting from the point where cutting stopped is difficult because the interrupted operation point is not registered. Searching the program for the interrupted operation point and confirmation can take considerable time.

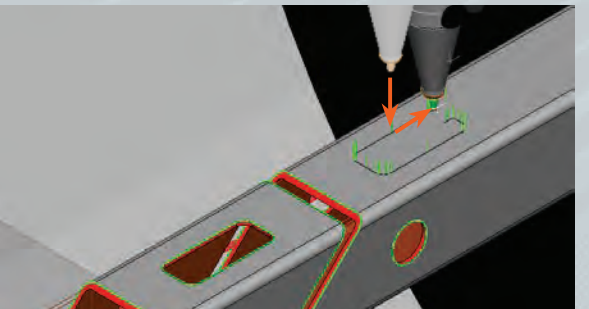
Recovery time: 10 min



With Quick Program Restart Function

When automatic operation is stopped, the Quick Program Restart Function registers the position in memory and can restart machine operation from the point where cutting stopped. Searching for the program location where cutting was interrupted is eliminated.

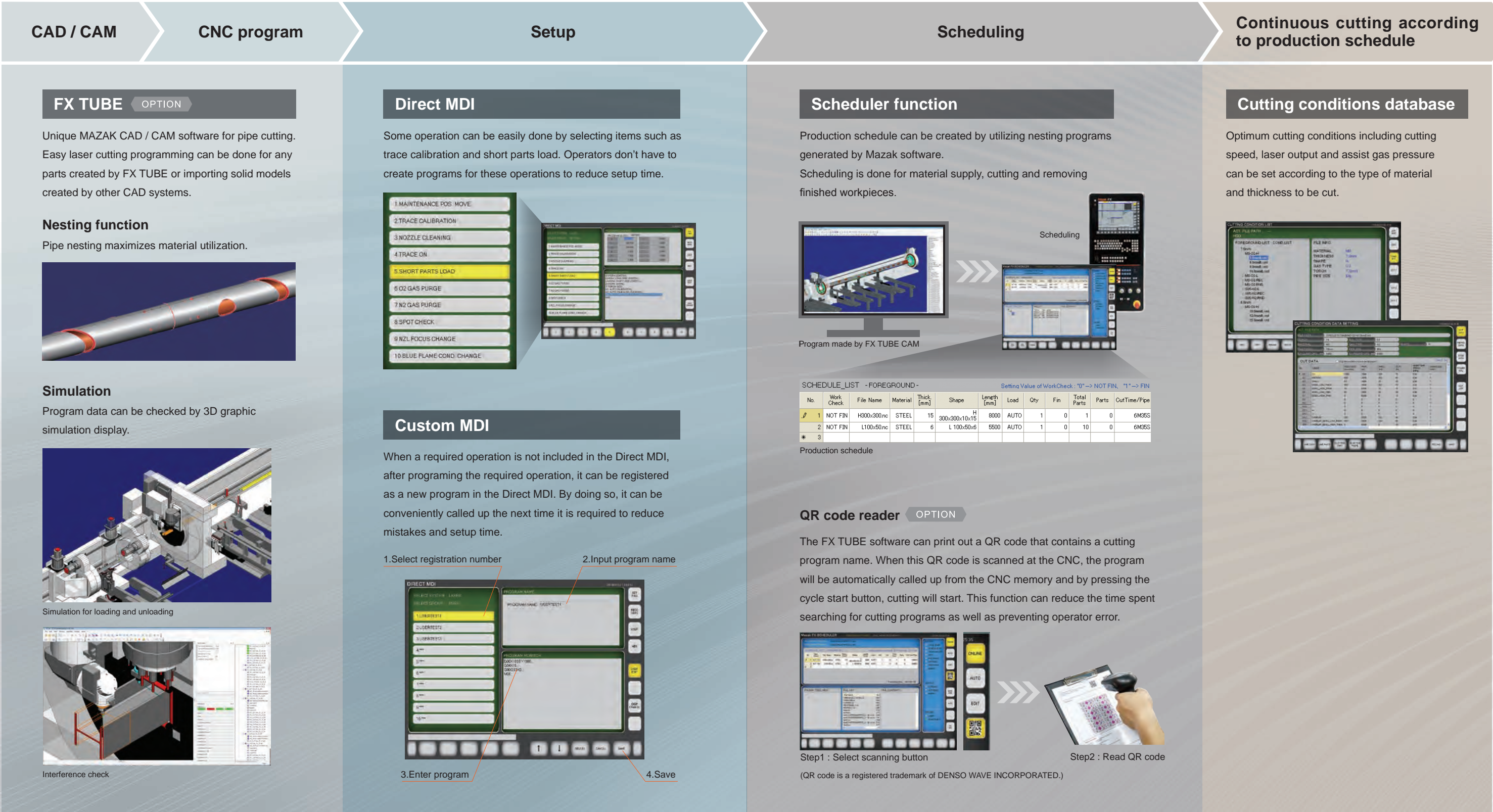
Recovery time: 2 min



Above values are example results and for reference only

Ease of Programming

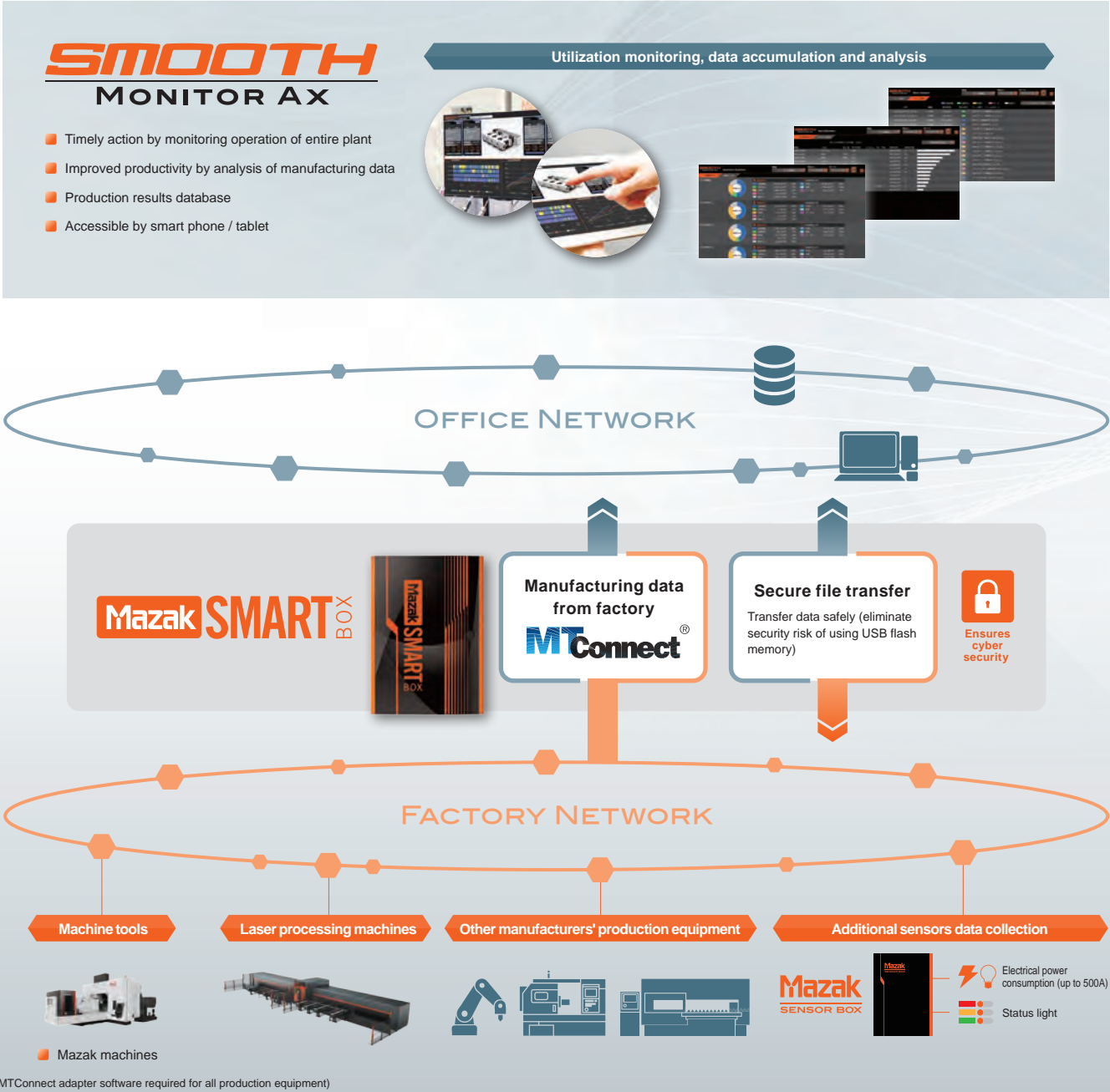
Convenient operation of FG-220 DDL from making CNC program to cutting



Smart Factory

By incorporating all production equipment in a network that utilizes the MTConnect[®] communication protocol, comprehensive monitoring can be performed in real time and production results can be thoroughly analyzed to realize higher productivity and efficiency.

Not only Mazak laser processing machines and machine tools, but also other manufacturers' production equipment connected to the Mazak SMARTBOX[™] to ensure cyber security.



CNC standard specification

Model	MAZAK FX
CPU	64 bit
Controlled axes	Max. 32
Minimum program increment	0.001 mm (0.0001")
Programming method	EIA / ISO
Monitor	15" color LCD

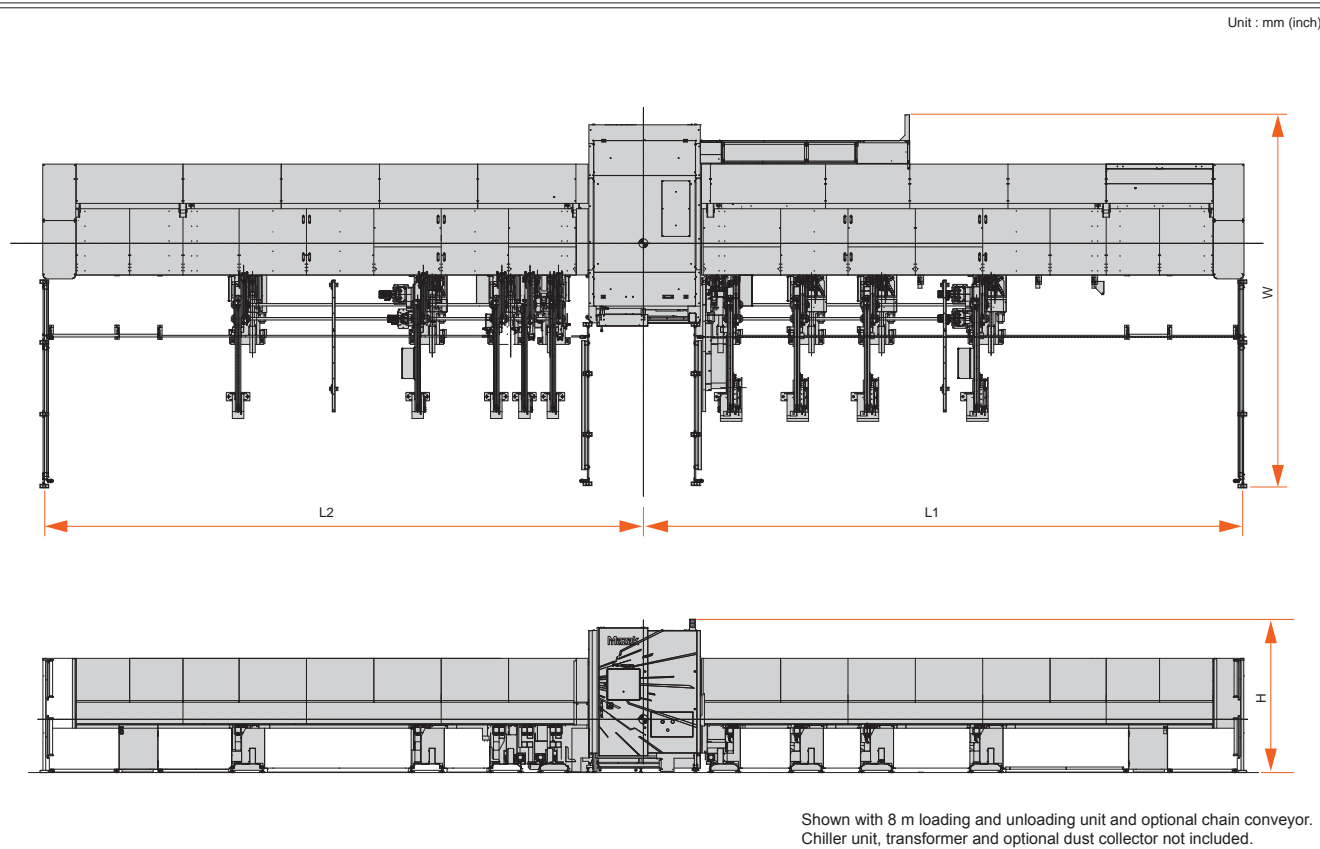
Specification of Laser Resonator

Resonator	4.0 kW
Wave length	975 nm (Center wave)

Standard and optional equipment

● : Standard ○ : Option		
FG-220 DDL		
Machine	Work light	●
	Resonator status indicator light	●
	Chiller unit	●
	8 m loading equipment	●
	8 m unloading equipment	●
	6 m / 12 m loading equipment	○
	3 m / 6 m / 12 m unloading equipment	○
	Additional loader	○
	V support conveyor	●
	Chain conveyor	○
	Safety fence & area sensor	●
	Material support function (flat support, fixed support and round pipe support)	●
	Workpiece measurement	○
	Short material carrying function	○
	Horizontal workpiece centering	○
	Small-diameter workpiece support jaws	○
	Parts catcher	●
	Auto power off	●
Cutting head	Additional protection window	○
	Nozzle pointer	●
	Profiling retry function	●
	Auto profiler calibration	●
	Auto nozzle cleaning	●
	Auto focus positioning	●
	Beam diameter change function	●
	Nozzle cooling function	●
	Touch sensor (X-axis end measurement, rechucking and twist compensation)	○
	Seam detector	○
	Tapping unit	○
Assist gas	3rd assist gas piping (supply : 3.0 MPa (435 PSI))	●
	4th assist gas piping (supply : 3.0 MPa (435 PSI))	○
	Assist gas changer (O ₂ , air and 3 rd gas)	●
	Assist gas pressure NC control	●
Environment	Chip pan	●
CNC	Scheduler	●
	Automatic cutting conditions determination	●
	Power control function	●
	Laser monitor	●
	Cutting conditions sharing over network	●
	MTConnect adapter	○
	QR code reader	○
Others	1 set of manuals	●

Floor Space



		FG-220 DDL			
Model		3 m (option)	6 m (option)	8 m	12 m (option)
Length	L1	–	8850 mm (348.43")	10750 mm (423.23")	14950 mm (588.58")
	L2	5750 mm (226.38")	8850 mm (348.43")	10750 mm (423.23")	14950 mm (588.58")
	W (V support)	6148 mm (242.05")			
	W (chain (option))	6648 mm (261.73")			
	H	2732 mm (107.56")			