Machine Dimensions

Unit : mm (inch)

Mazak

Optiplex Nexus 3015 Fiber

2980 (117.32")

2310 (90.94")

5315 (209.25")

Oscillator   Chiller   Hydraulic pump

Dust collector

6572 (258.74")   3387.2 (133.36")   1605.8 (63.22")

11565 (455.31")

2210 (87.01")

900 (35.43")

YAMAZAKI MAZAK CORPORATION

1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131

www.mazak.com

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E

Fiber laser processing machine designed to provide you the maximum value

Optiplex
Nexus 3015 Fiber

High speed, high quality cutting,
thanks to Multi-Control Torch

Intelligent Functions

• Automatically perform setup and cutting tasks
• Monitoring of cutting status – optionally available

Low Operation Cost

• The higher efficiency of the fiber laser results in lower electrical power
  consumption than a CO_2 laser
• Beam delivery path mirrors and laser gas are not required by the fiber laser –
  providing lower operating cost than a CO_2 laser
• Less heat generation of the fiber laser results in a longer resonator service life
  with lower maintenance cost

MAZATROL CNC SYSTEM

High speed response CNC system for high speed operation.
Large 19" touch screen with operation similar to your smartphone or tablet

Shown without area sensor for clarity

Versatile cutting performance of the fiber laser

Higher productivity when cutting thin to medium thickness material

Micro cutting – can only be done by the fiber laser

Stable cutting of highly reflective material such as copper, brass and aluminum

Slit width 0.1 mm (0.004")
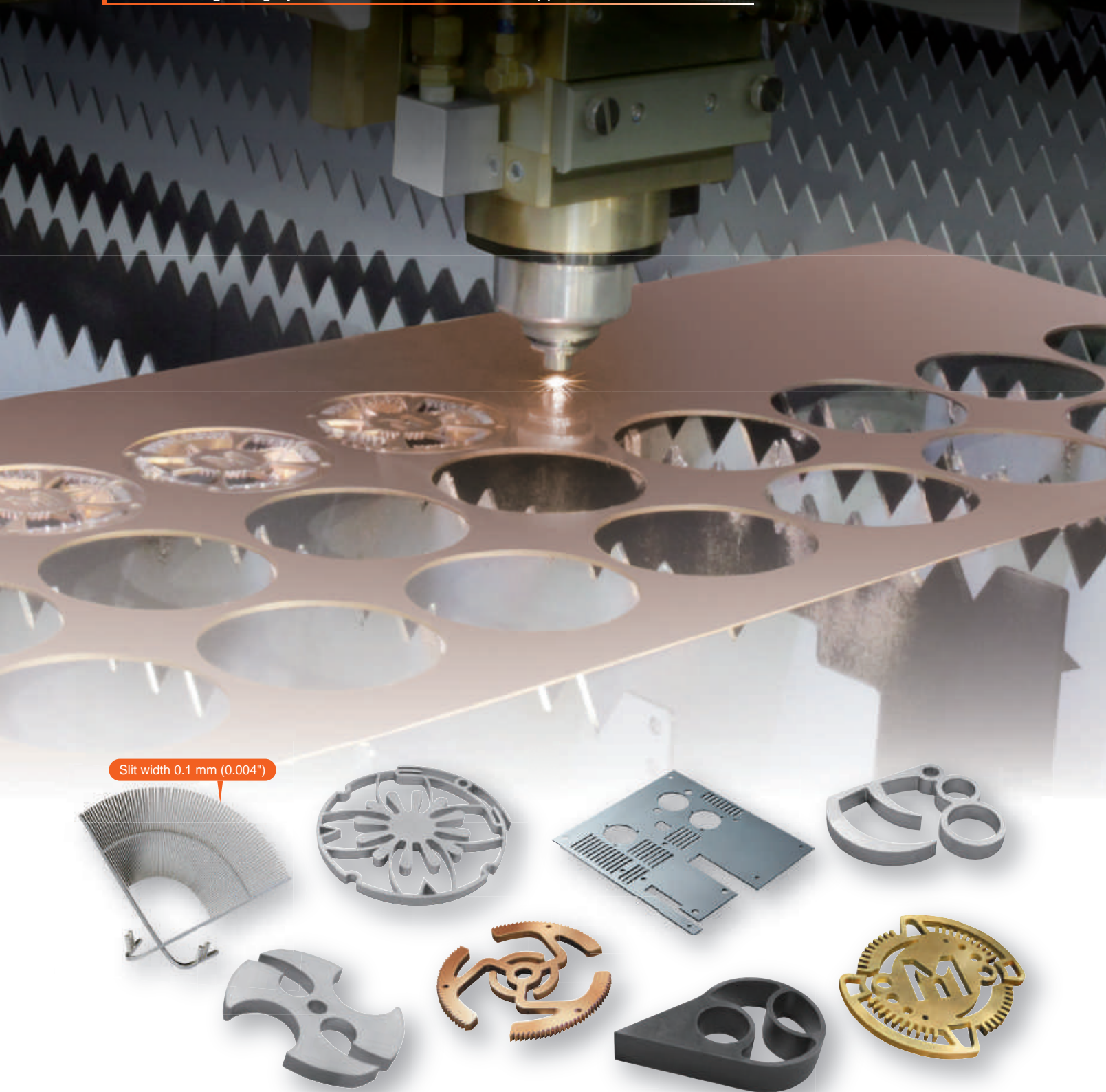
Lower Running Cost

The OPTIPLEX NEXUS 3015 FIBER does not require laser gas, which is used by CO_2 laser machines - also electrical power consumption is considerably lower, which results in a large reduction of running cost.

Comparison of OPTIPLEX NEXUS 3015 FIBER and conventional CO_2 laser processing machine

Lower electrical power consumption *[1]

Reduction of laser gas

35% lower

100% lower

0

Conventional CO_2 laser processing machine

OPTIPLEX NEXUS 3015 FIBER

Conventional CO_2 laser processing machine

OPTIPLEX NEXUS 3015 FIBER

*[1] Example comparison of 2.5 kW CO_2 laser processing machine and OPTIPLEX NEXUS 3015 FIBER 3.0 kW.
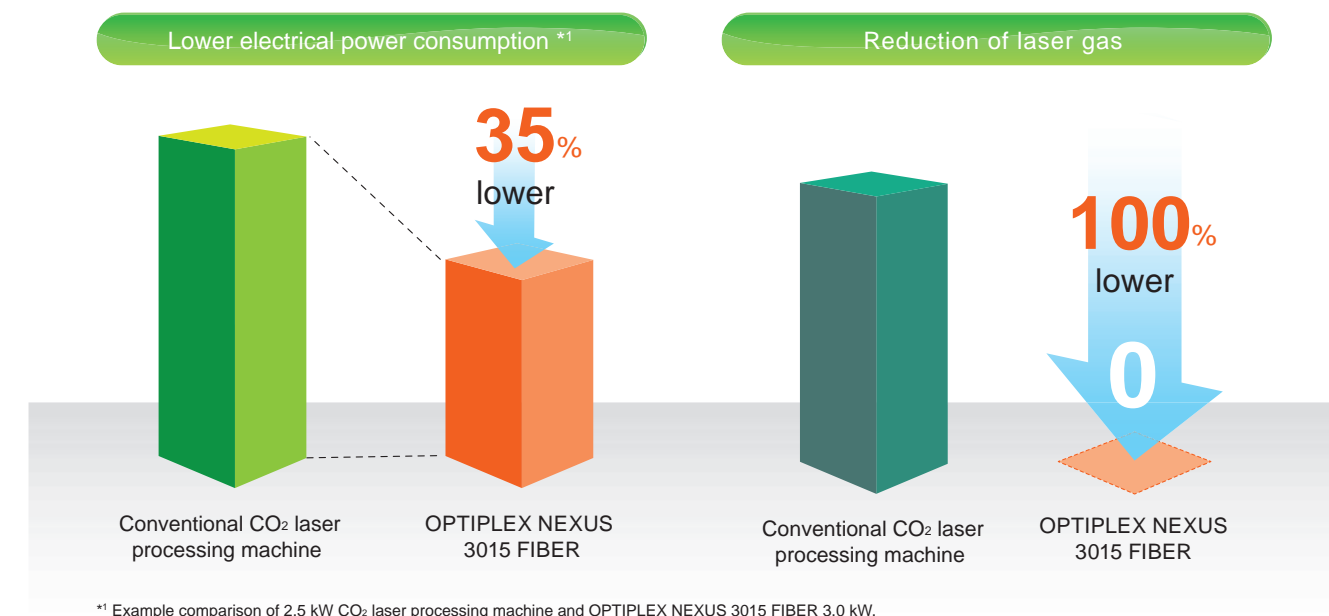
Considerable reduction in cost of maintenance

For conventional CO_2 laser processing machines, regular maintenance of components such as the oscillator and mirrors is required in order to maintain stable cutting performance. The fiber laser processing machine eliminates the mirrors and other components by using optical fiber to significantly reduce the cost of maintenance.

CO_2 laser

Oscillator

Mirrors

Cutting torch

Fiber laser

Oscillator

Fiber laser

Cutting torch
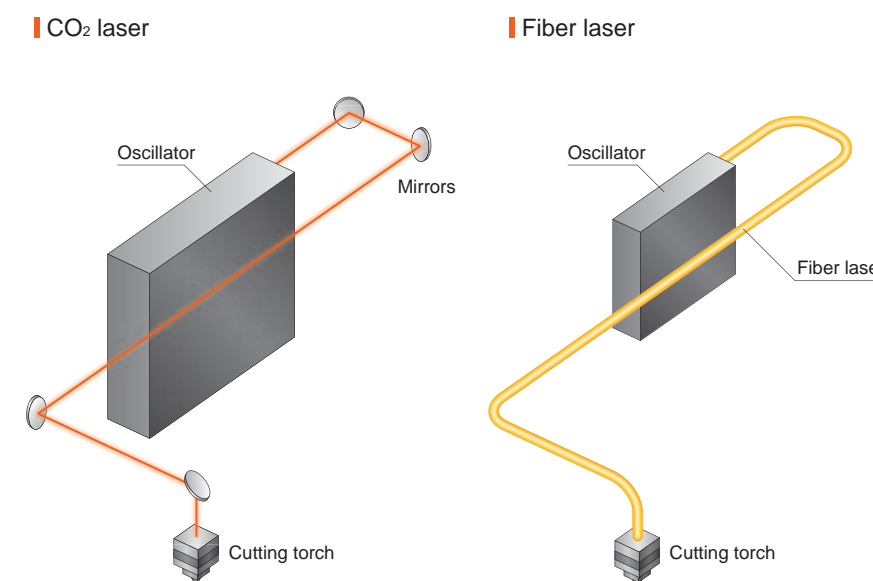
Intelligent Machine

A variety of Intelligent Functions provides incomparable operator support for exceptional ease of operation and the optimum machine efficiency

INTELLiGENT MACHiNE®

Yamazaki Mazak has developed a variety of functions for the improvement of productivity, high accuracy cutting and operator support. A variety of unique technologies has been developed that incorporate the expertise of experienced machine operators that realizes unsurpassed productivity and higher accuracy cutting.

INTELLIGENT SET-UP FUNCTIONS

ISF

A wide variety of automation functions is available for ease of operation and reduced setup time.

- Beam Diameter Control
- Focus Detection (OPTION)
- Auto Nozzle Changing (OPTION)
- Auto Focus Positioning
- Auto Profiler Calibration
- Auto Nozzle Cleaning

INTELLIGENT MONITORING FUNCTIONS (OPTION)

IMF

Operation status of laser processing can be monitored. The laser processing head is equipped with a sensor to check piecing and to detect defects (burning or plasma). If any defect is detected, the operation is corrected or paused to realize optimum cutting. The OPTIPLEX NEXUS 3015 FIBER series is equipped with the following INTELLIGENT MONITORING FUNCTIONS:

- Pierce Detection
- Plasma Detection
- Burn Detection

INTELLIGENT CUTTING FUNCTIONS

ICF

Automatic functions incorporating Mazak's expertise accumulated over many years that ensure high quality and high efficiency laser cutting.

- Fine Power Ramping
- Flash Cut

Multi-Control Torch - standard equipment

Variable beam diameter provides optimum cutting at high speed with high accuracy, thanks to automatic set-up for different materials and thicknesses

The OPTIPLEX NEXUS FIBER series features advanced functions - the optimum lens and nozzle can automatically be selected and changed for each material and thickness. Improved quality of processed workpieces as well as reduced cost are ensured.
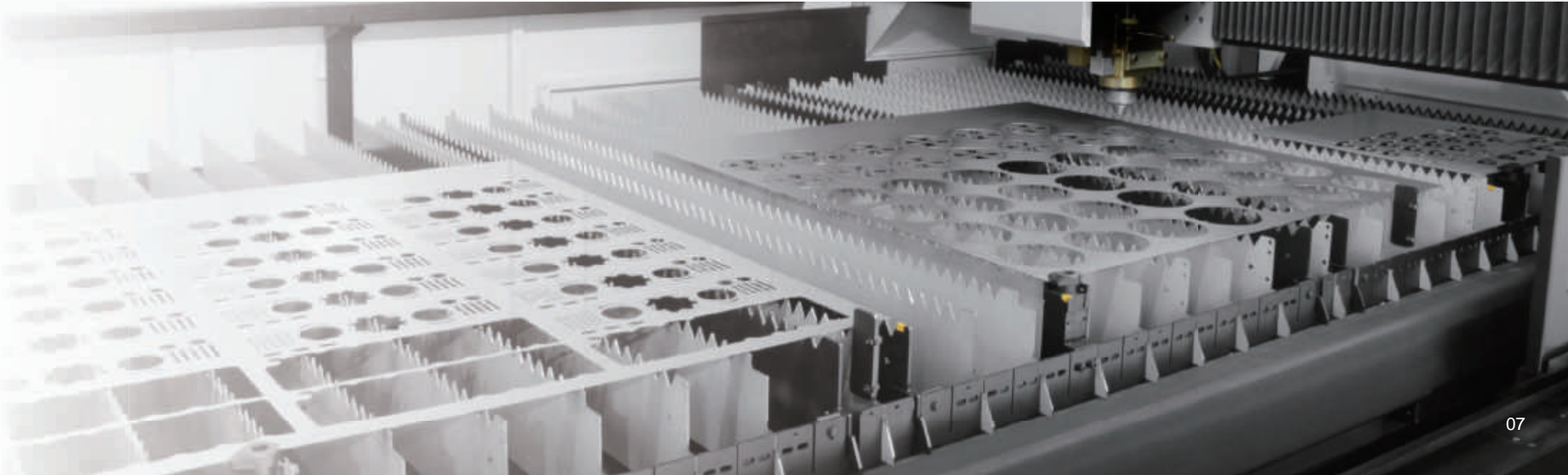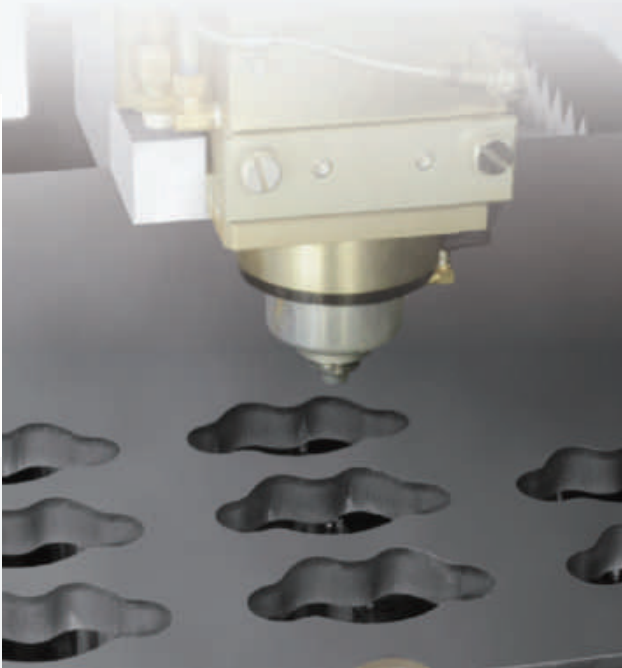
Intelligent Machine

INTELLIGENT SET-UP FUNCTIONS

ISF

A wide variety of automation functions are available for ease of operation and reduced setup time.

Example of reduced setup time

Conventional laser processing machine	OPTIPLEX NEXUS 3015 FIBER
Long in-process time and many processes require an operator	Setup and processing time variance of different machine operators is eliminated, Even inexperienced operators can work with high efficiency
1 Operator determines cutting conditions by referring to material cutting data	1 Optimum lens and nozzle can automatically be determined from the cutting conditions data base by inputting thickness and type of material
2 Focal distance is determined by operator	2 Focal distance can automatically be detected and set
3 · Select and change optimum nozzle by operator · Cleaning nozzle	3 · Can automatically change to optimum nozzle*1 · Automatically removes cutting spatter from nozzle
4 Adjust calibration by operator	4 Profiling distance is automatically determined

Automation

· Conventional laser processing machine
· OPTIPLEX NEXUS 3015 FIBER

Setup operation by operator **60** min
Setup by automation **1 min***2 Setup time reduced by **59** min

0   30   60   (Unit : min)

*1 Option
*2 The above comparison is an example case of time reduction thanks to intelligent set-up functions, including some optional ones.

Beam Diameter Control

By moving the lens up or down, the laser beam diameter can be changed automatically. Stable cutting, improved cutting speed for thin worksheets and increased cutting performance for thick sheets ARE REALIZED.

Change to optimum beam mode for worksheets thickness and material
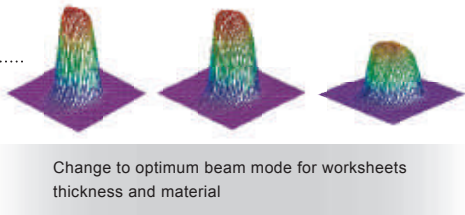
Focus Detection (OPTION)
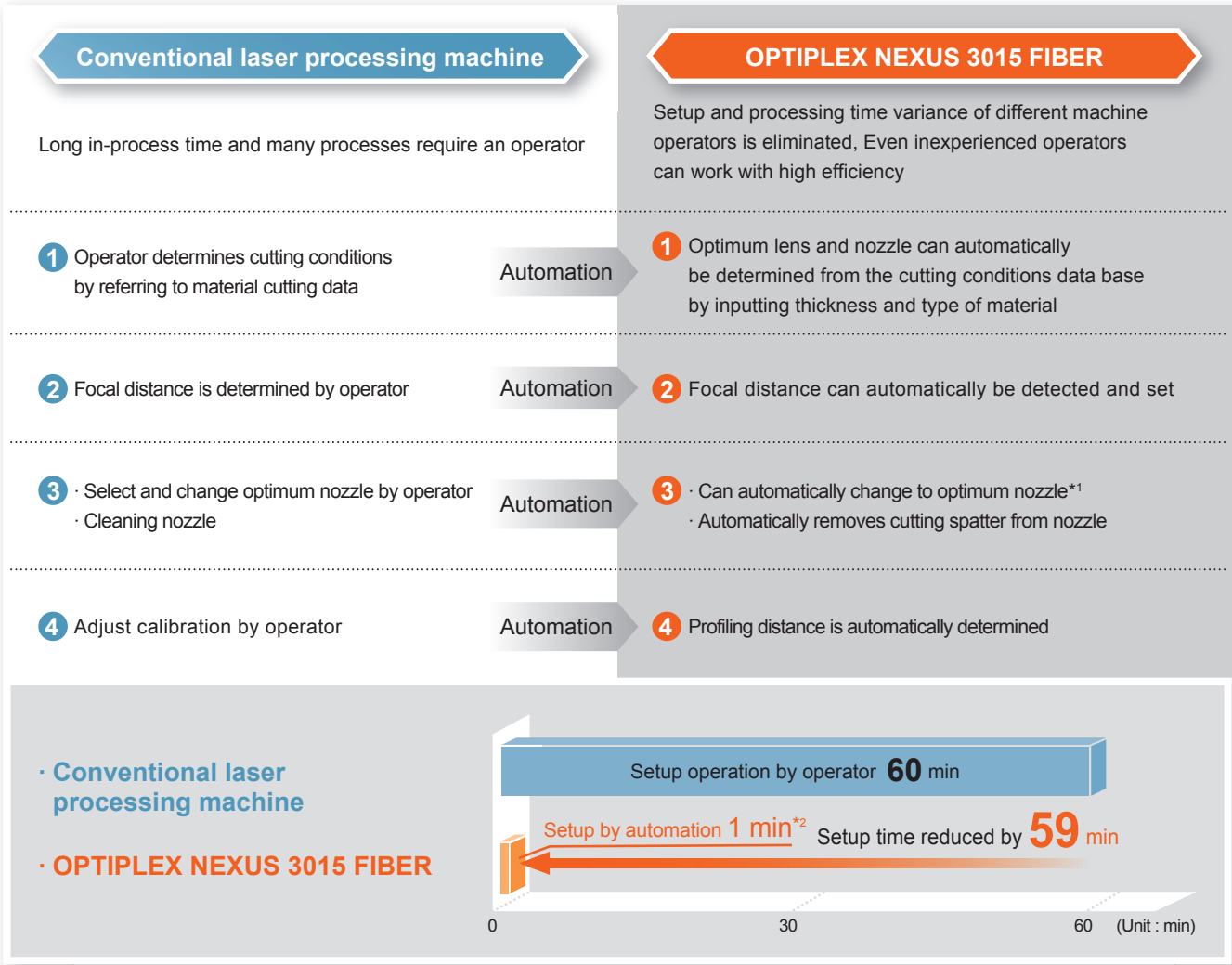
Traditionally focal distance measurement and adjustment requires considerable setup time as well as a skilled and experienced operator. Even unskilled or inexperienced operators can now easily perform these operations by using the Focus Detection system by program commands. Additionally, this system automatically compensates for focal distance changes which occur due to lens contamination.
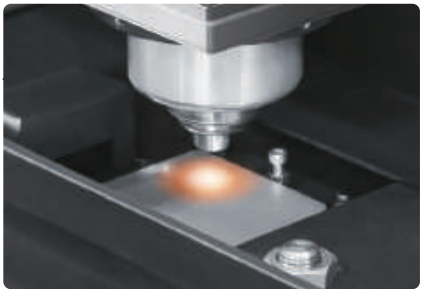
Auto Nozzle Changing (OPTION)

Automatically change to optimum nozzle for continuous automatic operation. Storage capacity : 8 nozzles.

Auto Focus Positioning

By moving a lens up or down, 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.

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.
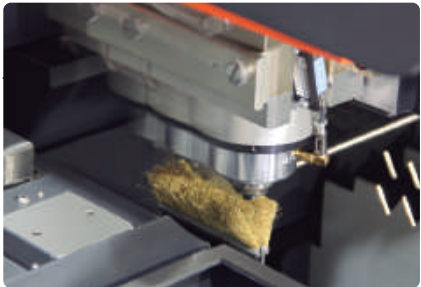
Auto Nozzle Cleaning

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

Intelligent Machine

INTELLIGENT MONITORING FUNCTIONS (OPTION)

IMF

Operation status of laser processing can be monitored. The laser processing head is equipped with a sensor to check piercing and detect defects (burning or plasma). When a defect is detected, the operation is corrected or paused to realize optimum cutting.

Reduced piercing time for medium and thick worksheets

Pierce Detection

During the piercing cycle, if cutting starts before the completion of piercing, the result will be cutting failure. To avoid this, normally the piercing program is made for a longer cycle than the anticipated piercing time. By Pierce Detection, sensors detect the penetration of the laser beam through the material, and then cutting starts automatically - eliminating non-cutting time for higher productivity.

Conventional piercing time

Actual piercing time | Additional programmed piercing time

With Pierce Detection

Actual piercing time
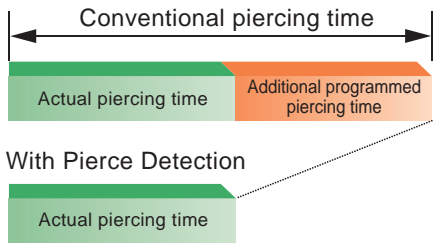
Comparison of cutting time

Machine

OPTIPLEX NEXUS 3015 FIBER (2.0 kW)

Method

Conduct 100 piercing cycles with Pierce Detection and without Pierce Detection. (Values below are results and for reference only)

32% lower — Mild steel 9 mm (0.35")

32% lower — Stainless steel 8 mm (0.31")

35% lower — Aluminum 8 mm (0.31")

■ Without Pierce Detection ■ With Pierce Detection
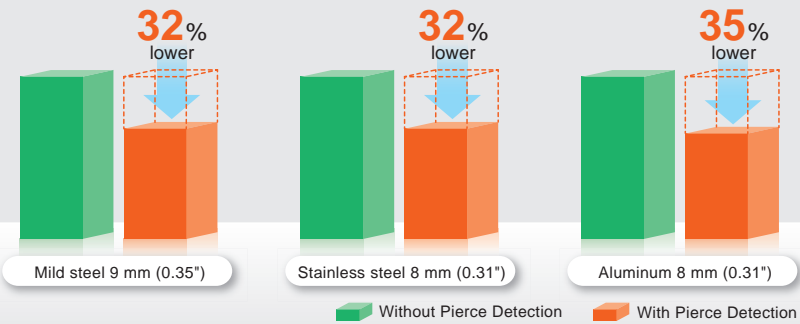
Plasma Detection

Plasma generated during cutting of medium/thick stainless steel worksheets frequently results in cutting failure that stops machine operation. The Plasma Detection monitors plasma generation during processing and makes automatic adjustments to maintain optimum conditions for consistent cutting quality.

Without Plasma Detection | With Plasma Detection
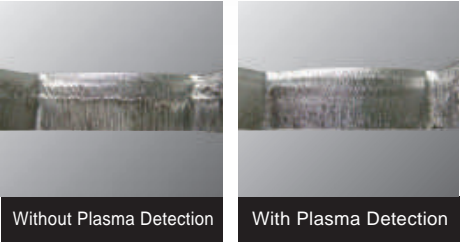
Burn Detection

Normally burning generated during the cutting of medium/thick mild steel worksheets often results in cutting failure. The Burn Detection monitors for abnormal burning during processing and automatically stops cutting if any are detected.

Burning

INTELLIGENT CUTTING FUNCTIONS

ICF

Automatic functions incorporating Mazak's expertise accumulated over many years that ensure high quality and high efficiency laser cutting.

Flash Cut

Cutting method by turning the laser ON / OFF without stopping axis. Axis movement and laser ON / OFF are synchronized to reduce cutting time.
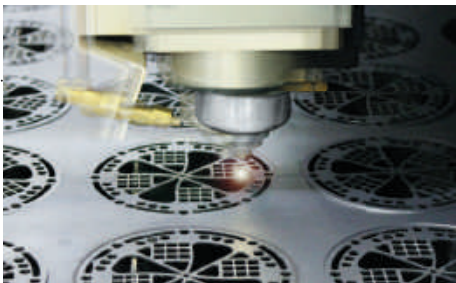
Fine Power Ramping

Fine power ramping function controls laser output and feedrate - optimum cutting conditions are automatically used for high speed straight and corner cutting to prevent dross.

1 mm (0.04") stainless steel (nitrogen assist gas)

With Fine Power Ramping | Without Fine Power Ramping

4.5 mm (0.18") mild steel (nitrogen assist gas)

With Fine Power Ramping | Without Fine Power Ramping
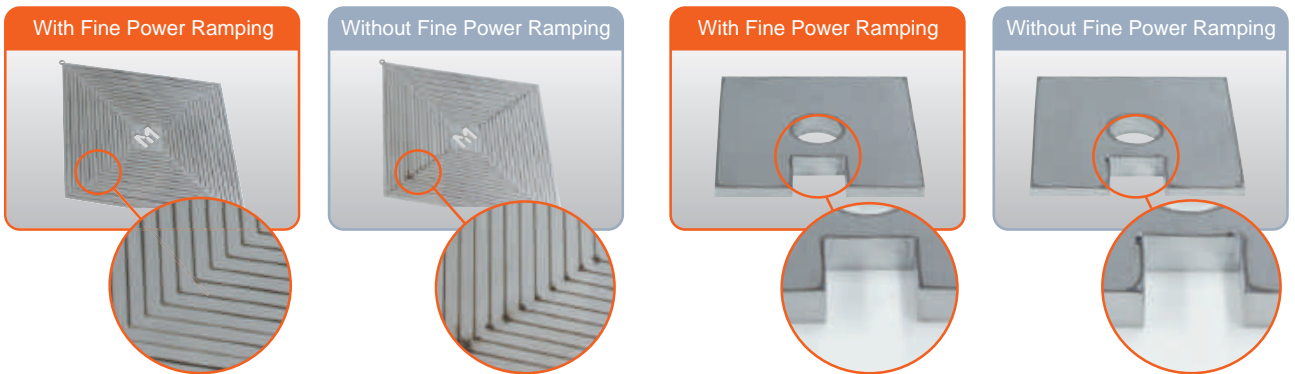
High-Performance CNC System

Optimum acceleration / deceleration for the reduction of cutting time

Tolerance control ensures high-speed corner cutting

Advanced hardware

State of the art CPU for unsurpassed operation speed
High-response, high-speed machine motion

Improved laser operation responsiveness

Laser control is improved to generate optimum laser power in the minimum time
Improved performance for fly cutting and sharp edge cutting

19" touch panel

Rotating and tilting control panel

Operation switches

5 process home screens

Programming, confirmation, editing and tool data registration

1. Maintenance	2. Programming	3. Tool data

Maintenance items status | Check program cutting shape | Torch status display

4. Setup	5. Machining

Peripheral equipment ON / OFF, alarm | Cutting path, work coordinate and axes speed

Unsurpassed ease of operation with touch screen

MAZATROL PREVIEW G
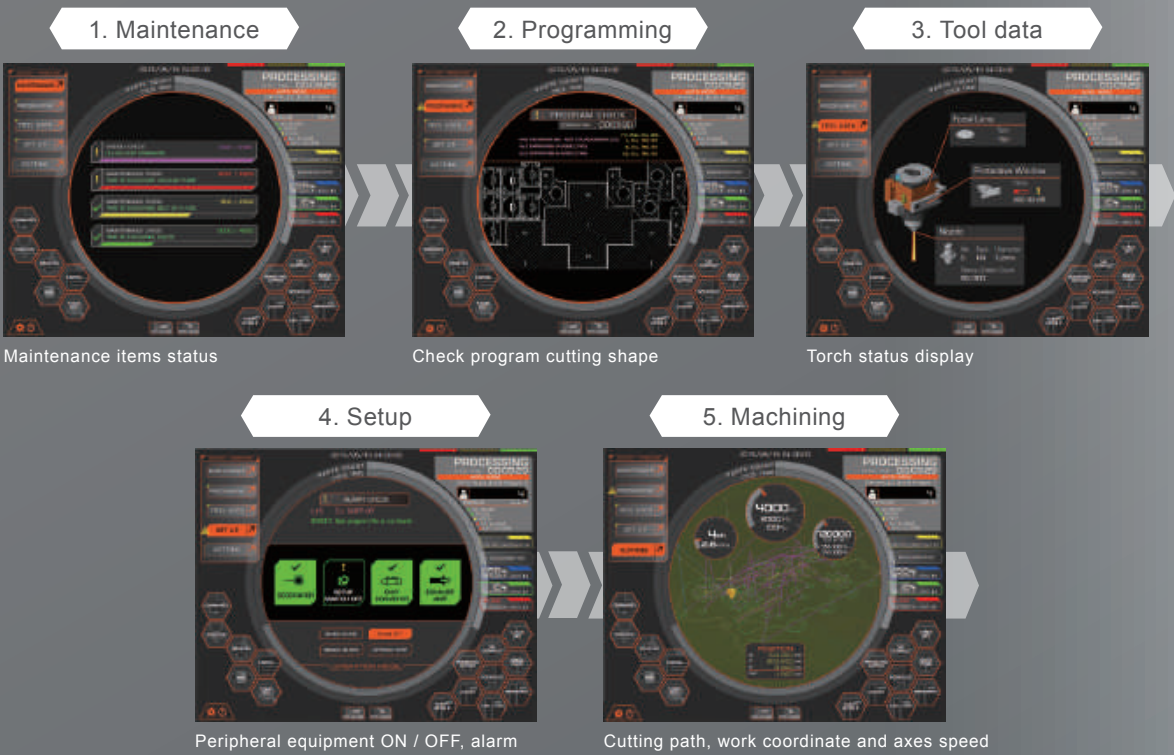
Automatic determination of processing conditions

The required lens, nozzle, feedrate and laser output are automatically determined by the CNC for different materials and thicknesses. Cutting conditions can be edited while monitoring operation and registered in the CNC. The next time the same material is processed, the new cutting conditions will automatically be used.

■ Automation

Variety of automation systems available to meet a wide range of production requirements

EXTENSIBLE MANUFACTURING CELL ▶

Designed for convenient system expansion after the initial installation

OPTIPLEX NEXUS 3015 FIBER + material stocker (10 shelves) + loader / unloader + finished work sheet table

Mazak Laser FMS

◆ A single machine can be expanded to a 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

◆ Production control can be managed thanks to scheduled operation

◆ 25 mm (0.98") worksheet can be transported for reduced loading/unloading time and heavy labor for operator

COMPACT MANUFACTURING CELL ▶

10 pallets with material and finished worksheets can be stored in the stocker. The number of micro-joints used can be minimized since the finished worksheets are unloaded to the stocker with the pallet. Time for finishing operations can also be reduced

OPTIPLEX NEXUS 3015 FIBER + COMPACT MANUFACTURING CELL

QUICK CELL 3015 ▶

The loader and unloader units each have a separate drive system instead of one used for both. As a result, the operation time of each unit is much faster when compared to a conventional system. By loading and unloading the pallets at the same position, factory floor space is used more efficiently.

OPTIPLEX 3015 FIBER Ⅲ + QUICK CELL 3015 shown with optional 6 pallet stocker

Machine specifications

Max. workpiece size		1525 mm × 3050 mm (60.04" × 120.08")
Table height		900 mm (35.43")
Axis travel	X-axis	3100 mm (122.05")
	Y-axis	1580 mm (62.2")
	Z-axis	150 mm (5.91")
Rapid traverse rate	X-, Y-, Z-axis	60 m/min (2362 IPM)
	Vectorial (X&Y)	85 m/min (3346 IPM)
Max. feed	X-, Y-, Z-axis	60 m/min (2362 IPM)
Positioning accuracy	X-, Y-axis	±0.05 / 500 mm (±0.0012" / 19.69")
	Z-axis	±0.01 / 100 mm (±0.0004" / 3.94")
Repeatability	X-, Y-, Z-axis	±0.03 mm (±0.0012")
Machine Weight		2.0 kW : 13210 kg (29123 lbs) / 3.0 kW : 13400 kg (29541 lbs) / 4.0 kW : 13420 kg (29586 lbs) / 6.0 kW :13480 kg (29718 lbs)
Electricity consumption - actual measurement (stand-by to maximum)[1]		2.0 kW : 9 ~ 17 kW / 3.0 kW : 9 ~ 22 kW / 4.0 kW : 9 ~ 24 kW / 6.0 kW 9 ~ 27 kW
Electrical requirement[2]		2.0 kW : 32 kVA / 3.0 kW : 40 kVA / 4.0 kW : 47 kVA / 6.0 kW : 51 kVA
Sound[3]		Less than 80 dB

[1] Electricity consumption is for reference only.
[2] Total electrical requirement does not include optional equipment.
[3] Equivalent continuous sound pressure level at operator position. (dependent on equipment options)

Speafications of Laser Oscillator

Resonator	2.0 kW , 3.0 kW , 4.0 kW , 6.0 kW
Wave length	1070 nm

CNC standard specifications

	MAZATROL PreviewG
CPU	64 bit
Control method	Preview control
Minimum program increment unit	0.001 mm (0.0001")
Programming method	EIA / ISO
Display	19" color LCD (TFT)

Standard and optional equipment

● : Standard ○ : Option

Machine	Laser light shielding cover window (1 position)	●	Environment	Scrap bucket	●
	Additional laser light shielding cover window	○		Preparation for dust collector installation	●
	Work lifter	○	CNC	Focus Detection	●
	Knife-edge (100 mm (3.94")pitch)	●		Beam Diameter Control	●
	Knife-edge (50 mm (1.97")pitch)	○		Pierce Detection	○
	Non-Contact Profiler with retry function	●		Plasma Detection	○
	Manual workpiece clamps (2 × 2 pallet)	●		Burn Detection	●
	Work light	●		Fine Power Ramping	●
	Oscillator status indicator light	●		Flash Cut	●
	Chiller unit	●		Work edge detection / coordinate rotation function	●
	Side air blast	●		LAN I/F (Ether Net)	●
Torch	Multi-control torch	●		USB I/F	●
	Additional Protective Window	○		NC retry function	●
	Additional Protective Window Catridge	○		Data guard	●
Nozzle	Mazak pencil nozzle(single Φ1.0 mm , Φ1.2 mm , Φ1.5 mm , Φ2.0 mm , Φ3.0 mm 1 each)	●		Network nesting	●
				Simple monitor	●
	Mazak pencil nozzle (single Φ1.0 mm , Φ1.2 mm , Φ1.5 mm , Φ2.0 mm , Φ2.5 mm , Φ3.0 mm , Φ3.5 mm , Φ4.0 mm , Φ5.0 mm / 1 set of 3)	○		Auto Focus Positioning	●
				Auto nozzle changer (holders : 8)	○
	Mazak pencil nozzle (dual Φ1.5 mm , Φ2.0 mm , Φ2.5 mm , Φ3.0 mm , Φ3.5 mm , Φ4.0 mm , Φ4.5 mm , Φ5.0 mm / 1 set of 3)	○		Auto profiler calibration	●
				Auto nozzle cleaning	●
Assist gas	3rd assist gas piping (Supply 3.0 MPa) (435 PSI)	●		Cutting condition automatic setting function	●
	4th assist gas piping (Supply 3.0 MPa) (435 PSI)	○		Simple input function for machining shape	●
	Assist gas changer	●		Laser net	●
	Assist gas pressure NC control	●		MTConnect adapter	○
Factory	2 pallet changer	●		Robot open interface	○
Automation	QUICK CELL 3015 application	○		QR code reader	○
	Auto power off	●		Remote manual pulse generator	○
	FMS preparation	○		Camera network nesting	○
				PV scheduler (for 2-pallet changer)	○
				PV scheduler (for another manufacture's FMS)	○
			Others	MAZA-CARE 4.0(BOX) only for Europe	●
				1 set of manuals	●
				Additional manuals	○