MITSUBISHI ELECTRIC

The Art of *Economy*

Are you ready for the future of laser processing? More output, less input.

Mitsubishi Electric can beam you up where no one has lasered before …

We found that more sensors are needed to monitor quality – throughout the process we use sound, cameras and additional optical sensors so that we can check what happens inside the laser source and much, much more.

Once we had all the required data, we needed an ultra-fast CNC to evaluate them. Luckily, Mitsubishi Electric had already produced it – it is called D-CUBES.

Now we only needed to control more process parameters than ever before, obtain

a laser source that delivers the highest beam quality and eliminate delays that occur through interfaces.

A unique laser source was developed that can generate a brilliant beam quality permitting predictive maintenance. The only thing we kept was the wavelength of the traditional fiber laser. After a period of intense development, a solution ideal for automated systems is ready for you to run and run and run.
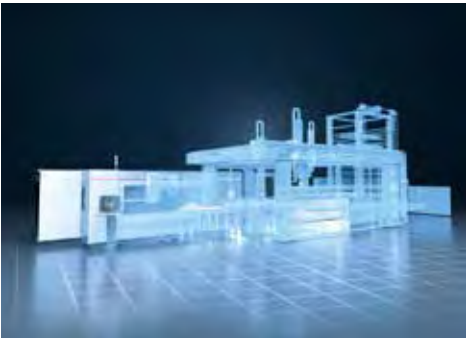
Mitsubishi Electric laser source

AI-assisted control

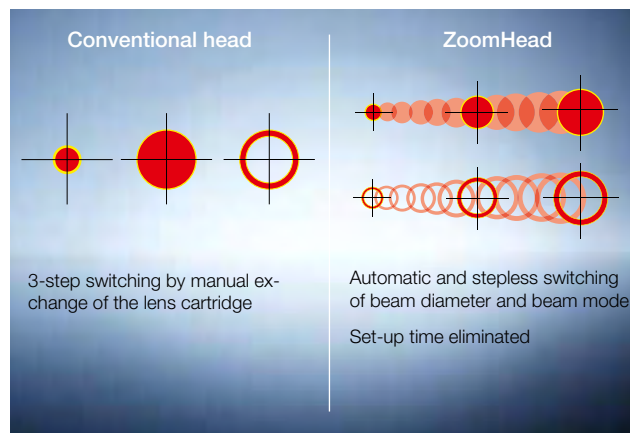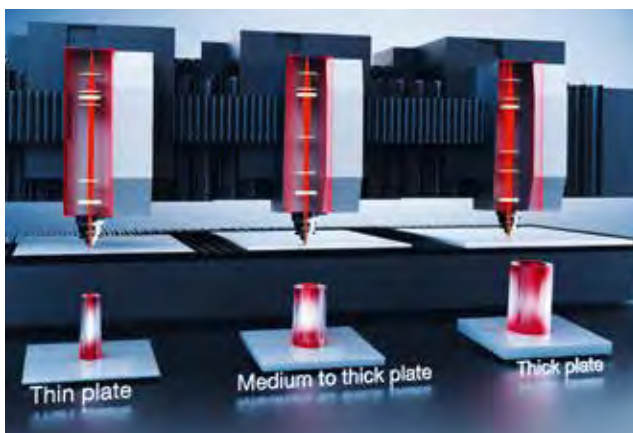**Designed for automation**

Achieving higher profits

Achieves the best-possible results.
The Mitsubishi Electric fiber laser source.

High reliability and high productivity are built-in in Mitsubishi Electric's own fibre laser source. It comes with a 5-year warranty and is equipped with a sensoric system which allows predictive maintenance to enable service intervention before a machine breakdown.

5-YEAR
WARRANTY

Exceptional beam quality
is the fundamental requirement.

ZoomHead – adjustments and piercing in record time

Thin plate   Medium to thick plate   Thick plate

Conventional head	ZoomHead
3-step switching by manual exchange of the lens cartridge	Automatic and stepless switching of beam diameter and beam mode
	Set-up time eliminated

Anyone constantly switching between sheet material of different thicknesses wants to resume cutting as quickly as possible – and without compromising on cutting quality. The ZoomHead developed by Mitsubishi Electric delivers speed and flexibility – for many years to come. Combined with the high quality beam from Mitsubishi Electric's own laser source, piercing time dropped dramatically by up to 60 %, making it possible to pierce a 25 mm thick mild steel within 0.8 seconds (8 kW fiber laser source).

If you monitor the heartbeat of your laser, the results will follow. AI makes it possible.
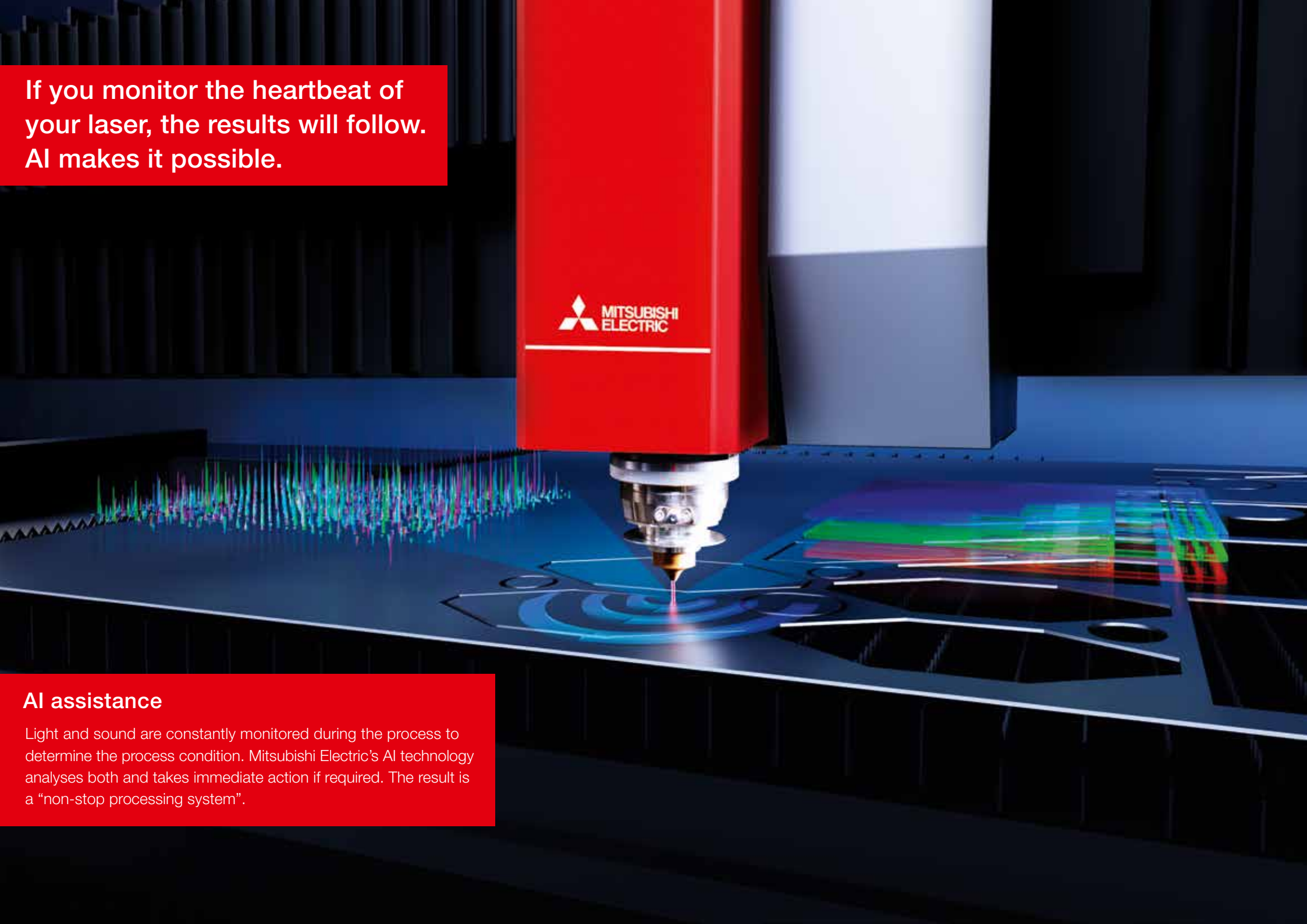
AI assistance

Light and sound are constantly monitored during the process to determine the process condition. Mitsubishi Electric's AI technology analyses both and takes immediate action if required. The result is a "non-stop processing system".

AI assistance is like a built-in operator
with 37 years of laser experience and still constantly learning.

| Step 1 | AI diagnosis | Step 2 | AI nozzle monitor | Automatic nozzle changer |

Nozzle OK

Automatically adjusts processing parameters

Nozzle not OK

Nozzle changer automatically changes nozzle

AI diagnosis constantly monitors the cutting process using different sensors. If an abnormality is detected, it interrupts the process and inspects the condition of the nozzle with the AI nozzle monitor.
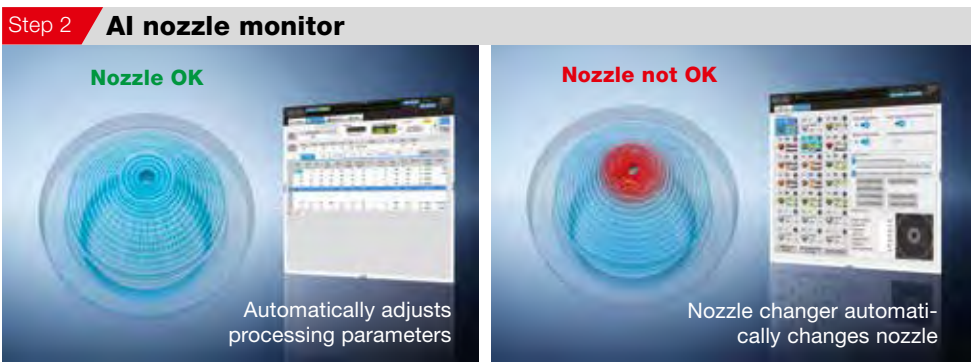
If the AI nozzle monitor does not detect any nozzle damage during its inspection, the processing parameters are adjusted automatically and the cutting process can continue accordingly.

If nozzle damage is identified, the nozzle changer automatically replaces the nozzle – without operator intervention being required. The cutting process can continue.

With up to 21 nozzles, you are ready for any changes in material thickness and AI assistance also has enough spare nozzles in case of any nozzle damage. The result is that very long unmanned jobs are possible.

Masterpiece of AI – the control for extra convenience

The intelligent D-CUBES control simply shifts the future into the present. The user has almost half a metre of user interface to work with, assisted in this by mouse and keyboard. The monitoring of the cutting process generates neatly displayed information at a glance and detailed analysis where desired.

Fast track to the perfect result.
Dialogue assisted navigation.

Multi-touch display with gesture control


tap

swipe

pinch

Simply swipe to the required screen. Graphics can be easily scaled.

An easy start thanks to dialogue guidance

Simply touch the destination on the screen and press the start button to move the processing head to the desired position.

Staying on top of the process

75% or more

50% or more

25% or more

25% or less

0

Remaining processing time

Remaining time display
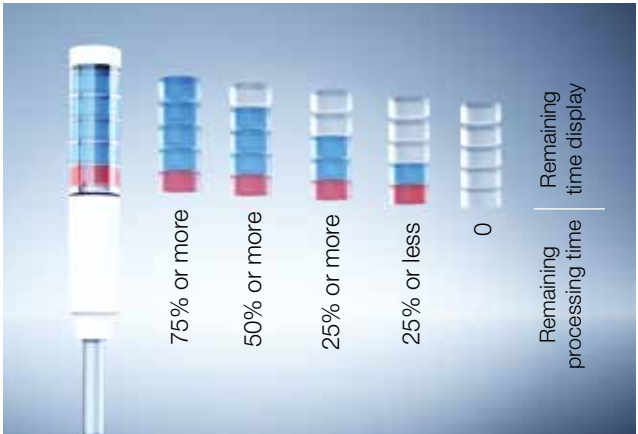
During the cutting process the remaining time until the end of the program is shown on the D-CUBES display, and this is also indicated by the 5-lamp signal tower. This way the operator can always keep on top of the process – either at the machine or at a remote location.
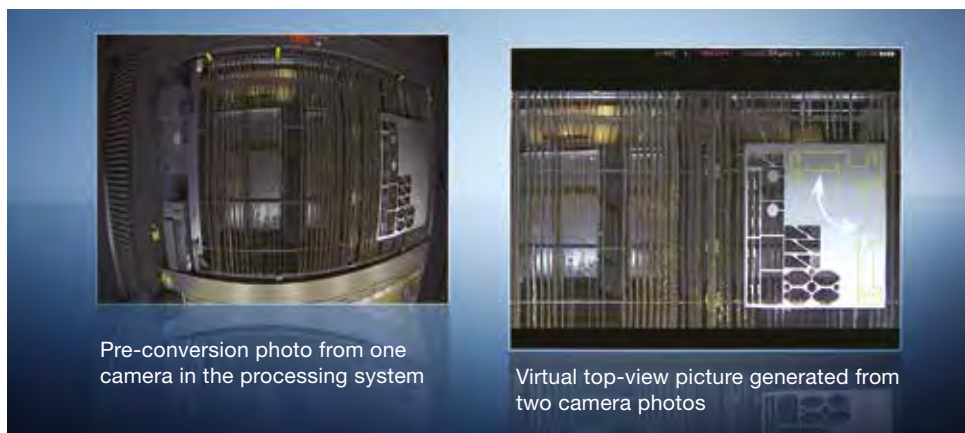
MEL's AR – Mitsubishi Electric's Augmented Reality

Intuitive positioning without guesswork for precise cutting. Get the most out of your remnant piece – right first time when accuracy counts.

2 cameras for a predictable result.

Virtual top-view for maximum remnant piece utilisation and minimum set-up time.

Virtual top-view picture

Pre-conversion photo from one camera in the processing system

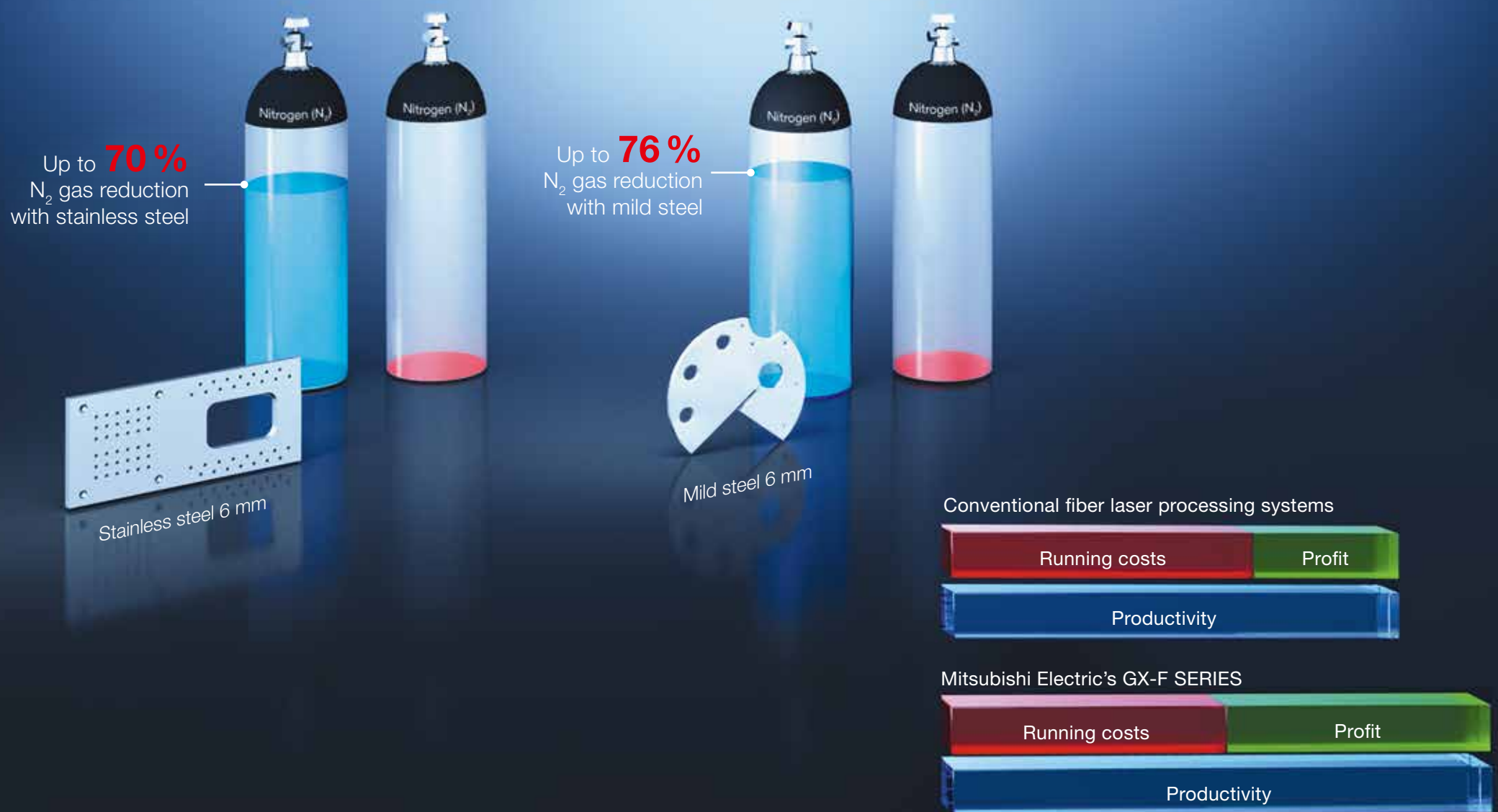Virtual top-view picture generated from two camera photos

After placing the remnant sheet somewhere within the working area, a virtual top-view picture can be taken by using two cameras within the processing system.

Easy placing and nesting

Afterwards single parts or nestings can be placed on the remnant sheet. This makes sure that the parts really fit on the designated remnant sheet. Just press start to cut the required parts or nestings.

Never waste material again with this precise user-friendly solution.   **GX-F SERIES**

Up to **70 %**
N_2 gas reduction
with stainless steel

Up to **76 %**
N_2 gas reduction
with mild steel

Stainless steel 6 mm

Mild steel 6 mm

Conventional fiber laser processing systems

| Running costs | Profit |

| Productivity |

Mitsubishi Electric's GX-F SERIES

| Running costs | Profit |

| Productivity |

# Improving the competitiveness of our customers
is always the main development focus.

Higher productivity

PRODUCTIVITY

MIN   MAX

Make higher profits by raising productivity. Increasing productivity by up to 26 % is achieved by shorter piercing times and higher cutting speeds due to the high beam quality of Mitsubishi Electric's own fiber laser source, but mainly also due to faster communication by the AI-assisted D-CUBES CNC control.

Lower running costs

RUNNING COSTS

MIN   MAX
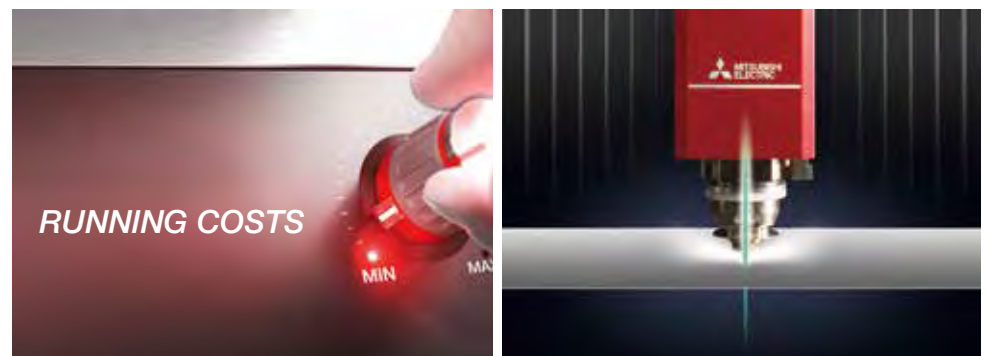
Make higher profits by reducing running costs. Reduced running costs are achieved by decreasing nitrogen consumption by up to 76 %. This value can be achieved by using Mitsubishi Electric's original nitrogen gas flow technology with the advantage of reducing consumption dramatically without the nozzle touching the material surface – meaning no scratches on the surface – and working with material 1 to 25 mm thick.

No reliable automation without AI.

Automation gives your competition sleepless nights – and enables you to sleep soundly.

If your laser system can neither see nor hear, how can it ensure a smooth and stable process? If it has no AI, how can it change parameters or nozzles as soon as required to keep the process stable when you are not there?

This is exactly why the GX-F is the machine for automation, delivering a degree of reliability and quality previously unattainable. Fully integrated with all different kinds of automation, ranging from simple loading/unloading systems to fully automated flexible manufacturing systems, inclusive of sorting systems. This is the next level of automation that you have been waiting for.

Automatic loading and unloading systems.

Parts sorted pallet-ready! Automatically the perfect tool for every part.
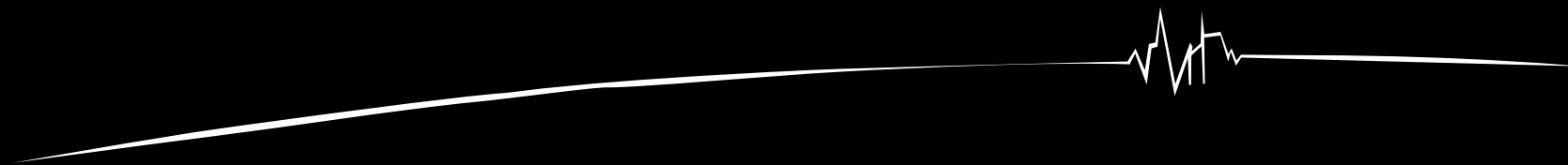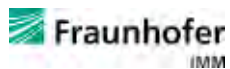
GX-F Series | GX-F40 | GX-F60 | GX-F80

Machine data		
Machine design		Flying optics
Control		D-CUBES – 19" Mitsubishi Electric multi-touch
Axis travel path	X-axis	3,100 mm
	Y-axis	1,565 mm
	Z-axis	120 mm
Rapid feed rate		Max. 170 m/min (simultaneously)
Repeat accuracy		+/- 0.01 mm
Max. sheet size		3,050 x 1,525 mm
Max. weight per sheet		950 kg

Dimensions and weight		
Dimensions	Laser cutting system including pallet changer	10,550 x 2,970 mm
	Laser source	Integrated
Weight	Laser cutting system including laser source	7,000 kg
	Pallet changer	2,400 kg

Laser			
Laser manufacturer		Mitsubishi Electric	
Laser type	F40	F60	F80
Laser power	4 kW	6 kW	8 kW
Processing head		ZoomHead	

Material	Assist gas	GX-F40	GX-F60	GX-F80
Sheet material thickness in mm (nominal/maximum)				
Mild steel	Oxygen	25 / 28	25 / 28	25 / 28
	Nitrogen	6 / 9	6 / 9	9 / 12
Mild steel, galvanised	Nitrogen	3 / 4	3 / 5	3 / 5
Stainless steel	Nitrogen	20 / 22	25 / 28	25 / 28
Aluminium alloy	Nitrogen	20 / 22	25 / 28	25 / 28
Copper	Air	6 / 8	10 / 12	12 / 15
Brass	Nitrogen	12 / 15	15 / 18	15 / 18

All the values mentioned in this catalogue are based on a certain power of the laser source and on the condition of the machine, environment, operator skills and required parts quality. Please be aware that the achievable values could be different due to the costs for energy, gas, service and others in your specific country/region.

Notes.

Got it all written down.

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